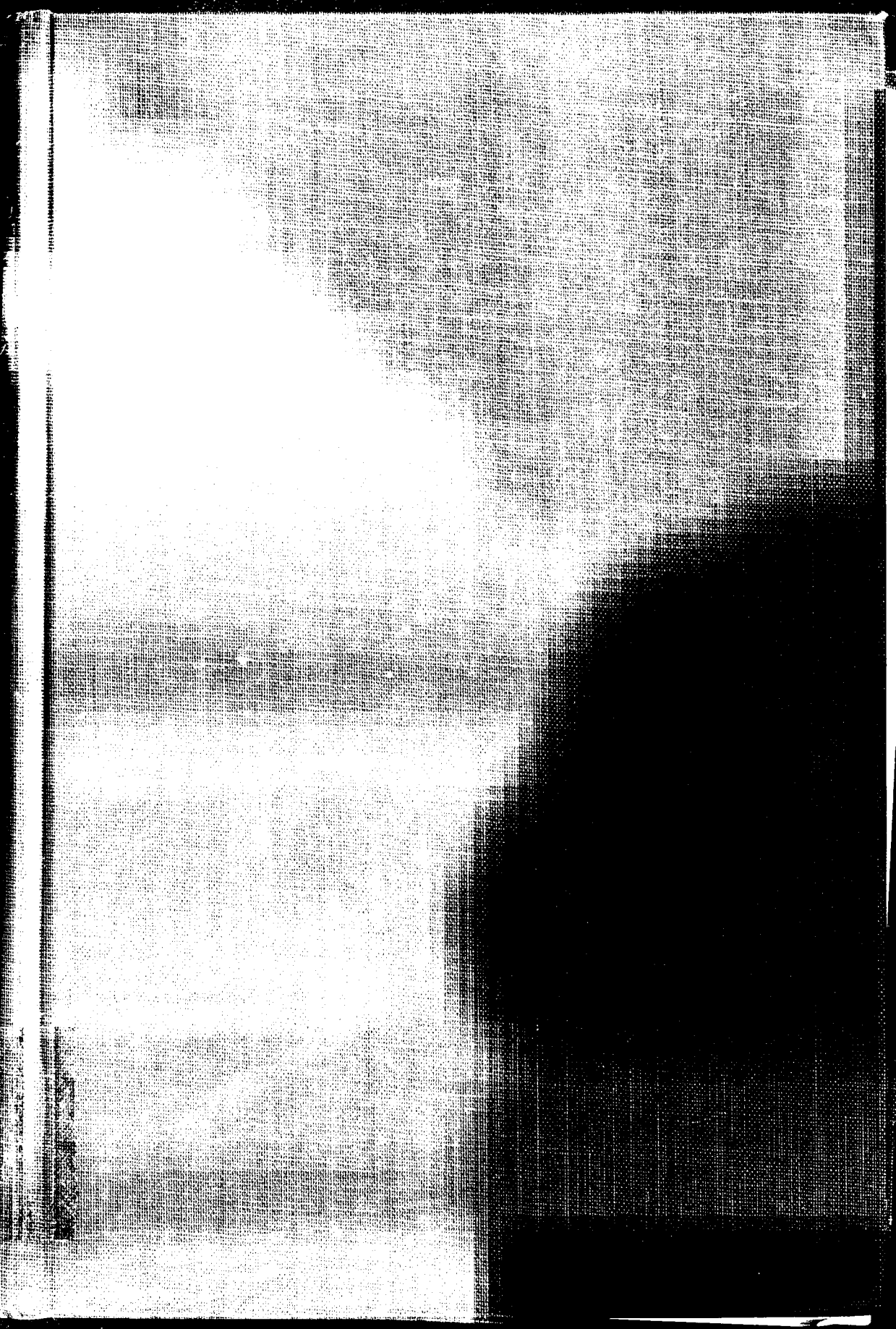

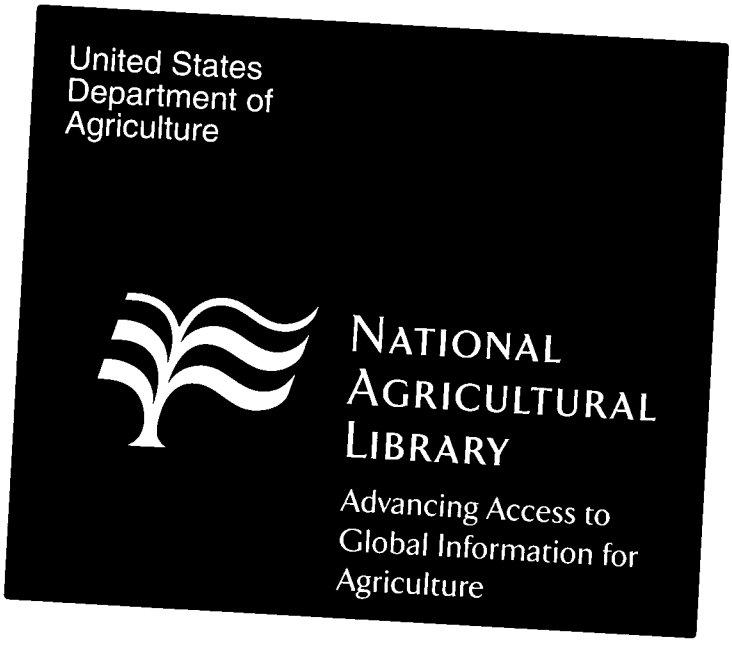
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*A Monograph of the Fungus Genus*

# CERCOSPORA

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*A Monograph of the Fungus Genus*

# CERCOSPORA

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BY CHARLES CHUPP

*Professor of Plant Pathology, Cornell University*

ITHACA, NEW YORK, 1953

# PREFACE

MY HOPE is that this monograph will be nearly enough correct to simplify the classification of the species of Cercospora. If it is not, it will not be the fault of more than 250 mycologists from all parts of the world who have been kind enough to contribute of their time, knowledge, and materials. I should like to name each one personally and list the favors he or she has extended to me. This, unfortunately, would take too much space. Besides, the many errors that must creep into such an extensive work might be attributed to some of the real mycologists, rather than to the author, who is just a plant pathologist.

But I wish to add that it has given me thirty years of pleasure to meet personally or through letters so many kind, helpful people.

Miss Elfriede M. Abbe prepared most of the drawings.

Without the grants made by the National Research Council, the American Academy of Arts and Sciences, and Cornell University, the work on this manuscript could not have been continued. And without the generous financial aid of the Foundation for Microbiology and Dr. Selman A. Waksman, its president, this manuscript could not have been printed. For all of this help I am most grateful. I cheerfully acknowledge the debt to my brother, Ralph Chupp, who most kindly lent the remaining sum to cover publication costs, without thought of asking for security on his loan.

C.C.

*Ithaca, New York*
*January 1954*

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# GENERAL DISCUSSION

*CERCOSPORA* Fresenius, one of the genera of the Fungi Imperfecti, belongs to the order, Hyphomycetales.

Most authors list it in various groups of the family, *Dematiaceae,* although certain of its species could well be classed among the *Mucedinaceae.*

The CERCOSPORA species are pathogenic on plant parts, causing either distinct necrotic spots or an effuse fruiting layer without definite spots on leaves, pedicels, stems, fruits, and bracts; they are never wholly saprophytic, although often accompanying or following other fungi; they never cause soft rots; their mycelium is internal or external, filamentous, branched, septate, hyaline or colored; true sclerotia probably never form. Stromata are lacking to prominent; when present, pale colored to black, globular, irregular or elongated, mostly borne superficially on the affected tissue or finally become erumpent; the fascicles are absent to extremely dense, widely spreading to almost coremoid in density, rarely approaching tuberculate. The conidiophores arise singly from procumbent threads or in fascicles from interlacing threads or from a distinct stroma; always colored, the color varying from very pale to almost black, mostly some shade of olivaceous or brown; septate or unicellular; branched or simple; uniform in width or clavate to obclavate; straight, curved or tortuous; smooth to strongly geniculate; spore scars invisible to prominent; tip sharply conic, rounded, or subtruncate; the length varies in the different species from $5\mu$ to $1000\mu$, and the width from $1.5\mu$ to $10\mu$. Conidia are borne singly and terminally or by the further growth of the conidiophore later becoming lateral; acicular, obclavate, cylindric or rarely clavate; hyaline to deeply colored, the color being mostly some shade of green or brown; thin walled; never echinulate nor spiny; without appendages; averaging more than three septa, never with vertical septa; straight to strongly curved or undulate; base sharply obconic to truncate; tip acute to obtuse; width varying among the different species from $1\mu$ to $10\mu$ and the length from $30\mu$ to $600\mu$.

Fresenius (Beiträge zur Mycologie. Drittes Heft pp. 91-94. 1863; and Hedwigia 3: 17-21. 1864) described the genus, which he based on the species found on celery. The name implies that the fungus has tail-like (obclavate) spores. His herbarium contained still other specimens that he thought should belong to the new group. Consequently he changed *Fusisporium bacilligerum* to *Cercospora bacilligera, Cylindrosporium phaseoli* to *Cercospora phaseoli,* and *Cylindrosporium major* to *Cercospora malvae.* He did not describe these species individually, but gave a composite description to characterize his conception of *Cercospora:*

*Conidiophores:* Biophilous, colored, geniculate, in fascicles, straight or crooked,

with or without septa, bearing one or more spores at one time and bearing spores laterally as well as at the tip.

*Conidia:* Obclavate, straight or curved, multiseptate, not cylindric, hyaline.

He enlarged upon this description by adding *C. penicillata* from *Passalora penicillata,* and *Cercospora ferruginea* Fuckel. These species implied the changing of the description to include also nonfasciculate conidiophores as well as colored, cylindric conidia.

Cooke (Grevillea 3: 182. 1874) described the genus VIRGOSPORIUM. His species *V. maculatum* later was changed to *Cercospora resedae* and *V. clavatum* to *C. clavata.*

*Perfect stage:* No special attempt has been made to include literature dealing with the perfect stages of CERCOSPORA species. Only incidentally is their presence recorded. Apparently all the known species are MYCOSPHAERELLA. Higgins and Wolf have been the most assiduous workers in making these ascomycete determinations.

The host names and the range as listed in this monograph of the *Cercospora* species are not nearly complete. The records for the most part are taken from the specimens found in the various herbaria in the United States and western Europe. No exhaustive study was made of the literature but notes were taken only from those publications in which original descriptions are given or from such printed articles as were found accidentally while reviewing the general literature dealing with plant pathology and mycology. It was not believed safe to quote every statement regarding either hosts or distribution, for most herbaria have wrongly determined Cercosporae, and many of these mistaken identifications are published. Furthermore, there are hundreds of new and undescribed species, as is indicated by unnamed herbarium specimens and by insufficient material sent me from many countries and states.

Early in the study it was found that only a large group of investigators could hope to make the necessary cross inoculations required for determining the host range of any species. My long years of work lead me to believe that the Cercosporae are limited remarkably in their host range; some, like those on *Solanum,* occur on only one host species. But it finally will be necessary to make cross inoculations, using conidia as inoculum and performing the experiments without an excess of moisture or in other ways injuring the plant. There is some indication that when the host tissue is saturated with water certain species of *Cercospora* can attack a host semi-saprophytically which they could not infect under normal conditions. This has led several investigators astray in listing synonyms. Miss Bertha Stoneman (Bot. Gaz. 26: 93. 1898) makes a similar statement for Colletotrichum species. In the laboratory under moist bell jars the results of cross inoculations cannot be accepted.

## RELATED GENERA

The Hyphomycetales have not been classified on any natural basis, therefore it is not surprising that many genera overlap the borders of CERCOSPORA and may, at times, be confused with this genus. For instance, ALTERNARIA has been mistaken for CERCOSPORA, probably because ALTERNARIA conidia are not always muriform, especially when immature. The conidiophores of the two genera resemble each other, although those of ALTERNARIA are inclined to be borne singly and usually are more rigid in form or more sturdy in appearance.

CLADOSPORIUM may resemble the nonfasciculate olivaceous forms of CERCOSPORA so closely that it is difficult to distinguish among the intermediate forms. CLADOSPORIUM varies widely in the size of its spores, which are more or less cylindric and rarely with more than 3 septa, and the conidiophores or fertile hyphae generally are long in proportion to the length of the conidia. CERCOSPORA is likely to have more uniform conidia, which have a tendency to be borne on short conidiophores distinct from the procumbent hyphae. If there is no fasciculation and the specimen shows characteristics of both genera, I have adhered to the rule of classifying the one with cylindric, 1-3 septate conidia under CLADOSPORIUM and the one with multiseptate or obclavate conidia as CERCOSPORA.

It is equally difficult to distinguish between border species of HELMINTHOSPORIUM and CERCOSPORA. Ordinarily HELMINTHOSPORIUM is dark colored, but the depth of color is not always a sure guide. When that is so, the thick wall (which under the microscope has the appearance of a double wall) is combined with color to differentiate HELMINTHOSPORIUM. The fascicles, too, rarely are dense, the conidiphores are mostly rigid or sturdy, and the conidial septa close together and well defined.

NAPICLADIUM is described as "fertile hyphae short, flabby, subfasciculate; conidia acrogenous, solitary, large, oblong, 2-pluriseptate, rather flabby, glabrous." A number of the named specimens show very long conidiophores. It has been mistaken for CERCOSPORA, but the fact that its conidia are almost grotesquely large should set it apart from any other genus.

There are a few border cases between CERCOSPORA and the three hyaline forms, CERCOSPORELLA, RAMULARIA, and OVULARIA. Even though the conidiophores are hyaline, if the stromata are colored distinctly, the fungus is classed as a CERCOSPORA. When the stromatal color is pale or lacking and the conidiophores hyaline, these characters are considered sufficient to separate the fungus from this genus.

FUSICLADIUM has been mistaken for CERCOSPORA, but the differences are so marked that there should be no trouble in separating them.

## PREVIOUSLY PROPOSED DIVISIONS OF THE GENUS

CERCOSPORA being such a large genus, it has been divided by various mycologists. Undoubtedly if a suitable dividing point could be found where there would be only a few border line species to cause confusion, a division would make for ease in handling the species. But even with such a supposedly simple character as hyaline and colored conidia, there are almost thirty species that could readily be classed in either category. About thirty more species have conidial color so dilute that only high powers of the microscope reveal its presence.

Spegazzini (Anal. Mus. Nac. B. Aires III **20**: 424. 1910), the first to split the genus, divided it into CERCOSPORA with colored conidia and CERCOSPORINA with hyaline conidia. Unfortunately for his classification the type species of CERCOSPORA has hyaline conidia. Therefore, the term CERCOSPORINA is not valid.

The second division that the genus underwent was on the basis of spore catenulation. Cooke had named a peculiar looking fungus, *Cercospora melonis*. Güssow (Ztschr. Pflanzenkr. **16**: 12. 1906) seeing that the spores sometimes were borne in chains and that the fungus in other respects did not resemble CERCOSPORA, named it CORYNESPORA. Solheim (Mycologia **23**: 365. 1931) also deciding that the melon fungus did not belong to CERCOSPORA, placed the Cercosporae with

catenulate conidia under the genus, RAGNHILDIANA. The main objection to the division on catenulation is that nearly all of the cylindric forms and even some of the obclavate conidia may be borne in short chains if the environment permits rapid development. Catenulation as it applies to CERCOSPORA is so evanescent that it hardly seems a stable enough character for generic distinction.

Fragoso and Paul (Bol. Real. Soc. Espan. Hist. Nat. p. 128. 1915) described SEPTORIOPSIS. This included forms in the family with pronounced stromata-like pycnidia. Stevens and Dalby (Mycologia **11**: 4. 1919) used the same name for CERCOSPORA and CERCOSPORELLA-like species having pronounced stromata, and narrowly obclavate or linear conidia borne on very short profuse conidiophores. Petrak (Ann. Myc. **23**: 69. 1925) recognized that the Stevens and Dalby name was not valid and proposed the name CERCOSEPTORIA. Here again is such an intergradation of short and very short conidiophores that the use of this genus would cause doubt in the classification of almost half of the species which might come under CERCOSEPTORIA. Dr. J. J. Davis of Wisconsin favored the use of Petrak's genus. When I visited him in 1934, we made mounts of the species which he thought might be included. After a number of trials we both admitted that there would be considerable difficulty in exactly delimiting this group.

Consequently I believe that all these almost sessile forms with colored conidiophores and stromata should still be retained in the genus CERCOSPORA.

Corda (Icones Fungorum **6**: 8. 1854) described DIDYMARIA as a leaf inhabiting parasite with conidiophores mostly unbranched, bearing at their tips 2-celled, ovoid, hyaline conidia. Solheim (Ill. Univ. Biol. Monogr. **12**: 20, 64. 1929) revised the description of this genus so that it would include all species with conidiophores of the CERCOSPORA type and producing clavate conidia with two or more cells. It is true that there are a certain number of CERCOSPORA species, which have cylindric conidia showing long obconic bases and therefore are definitely clavate in form. There are, however, many more species that have a mixture of such conidia and those that are typically cylindric or obclavate. This, in my opinion, would complicate classification rather than making it easier.

Spegazzini (Anal. Mus. Nac. B. Aires **20**: 437. 1910) described PSEUDOCERCOSPORA as a dematiaceous Hyphomycete with large PHRAGMIDIUM-like conidia. As an example he changes the *Cercospora* species on grape to *Pseudocercospora vitis* (Lév.) Speg. There are more than twenty species with such ALTERNARIA-like conidia. After an extended period of doubt, which the author has not yet been able fully to dispel, he is inclined to use the Spegazzini nomenclature.

Montagne (Ann. Sc. Nat. 2, ser. VI. pp. 28-36. 1836) described PASSALORA Fries and Montagne. This included the effuse, nonfasciculate type of fungi which now in part are included under CERCOSPORA and CLADOSPORIUM. Earle (Muhlenbergia **1**: 16. 1901) named a similar group, CERCOSPORIDIUM, but the next year (Torreya **2**: 159, 160), admitted that it was identical with PASSALORA. Curzi (Bol. R. Staz. Pat. Veg. n.s. **12**: 149. 1932) added the name CERCODEUTEROSPORA to include the same procumbent group.

In some respects PASSALORA makes the most satisfactory division which has yet been suggested for CERCOSPORA. Again the disadvantage is that there are many intermediate forms where fasciculate and nonfasciculate conidiophores intermingle or where the nonfasciculate form is represented on the lower leaf surface and the fasciculate form on the corresponding upper surface.

After many trials in generic divisions, it still seems more practicable to retain all the species in a common genus until the perfect stages of each can be found.

## SIGNS AND SYMPTOMS

Leaf spots may be absent or be present in every degree of distinctness from a faint discoloration on the upper leaf surface to definitely defined and often characteristically marked lesions.

When no leaf spots are visible, an effuse fruiting of the fungus ordinarily shows on the lower leaf surface. This fungous layer may be so minute that a hand lens is required to detect it, or it may have spread to any size from a few millimeters to the entire leaf area. When the attack of the pathogen reaches a certain stage of severity, the leaf may curl, dry and drop from the plant. Almost complete defoliation can be caused by some of the more virulent species.

Rarely neither leaf spots nor effuse fruiting are present, but the presence of the fungus is made evident by single or clustered groups of dark stromata. These may occur on one or both sides of the leaf as well as on petioles or tender stems of the host. Ordinarily such signs of the disease are not followed by leaf drop.

Many Cercosporae affect also the blossoms, fruits, pods, succulent petioles, and young stems. Frequently the dying portion dries and in shrinking tears away from the living leaf tissue, leaving a shot-hole effect. One to numerous spots may turn the entire leaf yellow or brown, after which it shrivels and dies.

In describing the symptoms of the individual CERCOSPORA species, the shot-hole effect and defoliation rarely are mentioned for herbarium specimens mostly are pressed leaves, so that only the leaf symptoms as they show in freshly collected or herbarium material need here be taken into account.

## CONIDIA

Conidia are the principal source for the characters which separate CERCOSPORA from other genera and which differentiate the species within the genus itself.

*COLOR:* Originally a number of species were described as having very dark colored conidia. In nearly every instance these proved also to have thick walls and thus belonged to HELMINTHOSPORIUM or PSEUDOCERCOSPORA. Most true species of CERCOSPORA have either hyaline or pale colored conidia, while only a few have medium dark colored ones.

*SEPTATION:* A rather large number of named species have conidia which are mostly 1-septate and with extremes of 0 to 3 septa. These are being placed in DIDYMARIA if they do not have a pronounced stroma; if nonfasciculate, in CLADOSPORIUM, and if they have exceptionally large stromata, FUSICLADIUM, EXOSPORIUM, or CORYNEUM (see key for differentiation). The only exceptions to this rule are conidia which are narrow and as long as 50$\mu$ or more. The constrictions at the septa, when present, have little significance except in a very few species where the constrictions are deep indentations and almost always present. If only one authentic muriform conidium is found, the specimen to which this conidium belongs is ruled out of CERCOSPORA. Usually these are Alternariae, but may be other related genera.

*WALLS:* Thick walls are important. Apparently they distinguish even differences in the perfect stages, for MYCOSPHAERELLA rarely, if ever, has a conidial form with thick walls; that is, walls which appear double under ordinary high power of the microscope. A more detailed discussion of the type of wall I have in mind is given by F. L. Stevens (Bul. Nat. Hist. Survey, Ill. 14: III. 1922).

So far as is known, the genus, MYCOSPHAERELLA, has only smooth-walled asexual spores. None shows spores with spore-like, flagella-like, or germtube-like

appendages, nor with spines nor echinulations of any kind. Consequently only forms having conidia with smooth walls are considered as Cercosporae. It is interesting too in this connection to note that nearly all species of CERCOSPORA are limited narrowly in their host range, usually to one host genus; but the echinulate forms are rather given to having several to many host genera. As an example may be named the fungi that formerly were known as *Cercospora graminis* and *C. thujina.*

*LENGTH:* The length of the conidia has little significance, for it is impossible to detect when the conidium is fully mature. Therefore, when one mount shows such bodies varying from 35 to 350$\mu$ in length, or even much longer, the only thing left to do is to consider all detached conidia as being fully grown. In fact the short ones seem to germinate in as great a percentage and with as much rapidity as do longer ones. With such variation often present in one microscopic mount, the length as a basis for classification is almost perfectly useless. In moist weather or in moist chambers the elongation may be double that under a more nearly dry environment. It is true that the cylindric, colored conidia are more inclined to be finite in growth than are obclavate ones regardless of color.

*WIDTH:* The conidial width is important in classification. It seldom varies more than a few microns even though the longest ones may be twelve times the length of the shortest ones. Therefore, within limits width is safe to depend upon in classification. As an example, if collections in Canada or northern Europe are compared with those of the same species found in Italy or Central America, the width classes of 1-3.5$\mu$, 3-5$\mu$, 5-7$\mu$, etc., are as stable as one can well obtain where living organisms are concerned.

*BASE:* The form of the basal end of the conidium is probably the most dependable character on which differences in species of CERCOSPORA are based. If one is found in any given country or climate with truncate base, that same form of base will differentiate it wherever collections are made. Then there are all degrees of the obconic base, from those being acute to those which are very short obconically truncate. The sides of this conical base may also be straight, concave, or convex. The chief difficulty in using the base of the conidium in classification is that there are only a few basal types distinct enough to make unfailing classes or groups among the species. But these usually are sufficient to separate the species that might occur on any given host genus.

*TIP:* The form of the tip is rather unstable unless such widely separated characters as narrowly acute and broadly rounded are available for comparison. A few species show plainly acute tips or rarely subtruncate ones, and when these easily distinguishable forms are present they can be employed in classification. A few species have an occasional conidium with multiple tips.

Nearly all CERCOSPORA species have a mixture of straight and mildly curved or undulate conidia. An occasional form will have strongly curved or markedly bent conidia, and then can be recognized by this character alone, or when the latter is accompanied by one or several other well-known characters.

*SHAPE:* The shape of the conidium is important only when a large percentage of these have a single form. For instance, it is perfectly simple to separate the species with distinctly acicular conidia from those with cylindric or obclavate ones. But a few species have a rather uniform mixture of these three forms, and under that condition the shape of the conidium is of only slight value in classification. Fortunately the species generally have rather uniformly shaped conidia,

especially when the largest ones only are considered, so that the following terms are of great value in any key concerned with CERCOSPORA:

*Acicular:* The form expressed by the gradual attenuation from the truncate base to the acute or subacute tip. This is exemplified by the type species, *Cercospora apii*, and many others. Atkinson used the word "terete" for this form.

*Obclavate:* The various types of attenuation, gradual or sudden, uniform or irregular, from an obconic or obconically truncate base to an acute to subobtuse tip. Examples, *C. tenuis* on Galium and *C. hosackiae*. A few species have conidia with such a sudden attenuation that the tip is like a beak, thus resembling except in width the outline of conidia in ALTERNARIA.

*Cylindric:* Fairly uniform in diameter from near the base to near the tip. Example, *C. variicolor* on Peony and *C. cinchonae* on Cinchona. LINEAR is sometimes used to express a condition when the conidia are very narrowly cylindric resembling those of SEPTORIA or CYLINDROSPORIUM.

Many species have conidia with hardly enough attenuation to be considered obclavate or almost too much to be cylindric. Therefore, the term cylindro-obclavate is used where the tendency is to be more nearly obclavate than cylindric, and obclavato-cylindric for the reverse condition.

*Clavate:* The obconic bases of some conidia are so elongated that the body is clavate in form. Only a few species have predominantly such conidia, but among the obclavate and cylindric forms may be a mixture of clavate ones, especially when they are short.

*Catenulation:* When weather conditions of moisture and temperature are ideal for spore production, these spores are borne so rapidly that they are catenulate in a very evanescent manner. This holds true for most of the species with the possible exception of those with hyaline, acicular conidia. But there are certain CERCOSPORA species, especially those with cylindric colored conidia, that may show spore catenulation with considerable permanency. Even though they may fall apart in a liquid mounting fluid, the catenulation can be determined by the scars of attachment at both ends.

The catenulation has been used as a basis for new genera, such as CORYNESPORA (Lindau, Rabenhorst, Kryptogamen-Flora 9: 805. 1910) and RAGNHILDIANA (Mycologia 23: 402. 1931). The former genus appears to have sufficient other characters to keep it distinct, but all the characters of the latter blend so well with our general idea of CERCOSPORA that it is here retained in its original genus. Catenulation, therefore, is considered a minor character unless it accompanies several major ones.

## CONIDIOPHORES

The conidiophores are less dependable than are the conidia in furnishing stable characters for use in classification. They, however, have a number of specific variations which should be used in determining the identity of any given specimen.

*COLOR:* The depth and uniformity of color are important. When the monograph was begun, an attempt was made to give specific names to the colors, using the terms of some well-known reference such as Ridgway's Color Standards, to insure accuracy of expression. The color of the conidiophores varied in such delicate tints that at once it was found impossible to match exactly the color observed under the microscope with the one on the printed plate. Finally it was decided that only degrees or depth of color could successfully be used in any

quick identification. It was relatively easy to divide the observed colors, olivaceous to brown, into very pale to pale, medium, dark, and very dark. Some conidiophores show the same degree of color throughout their entire length; others are paler near the tip, while rarely they may have less depth of color at the base.

*UNIFORMITY OF DIAMETER:* This probably is the second most important character of the conidiophores. Many are perfectly uniform in diameter and so nearly straight that one observer exclaimed, "gun barrel" when he first studied them. Most frequently this type is associated with hyaline acicular conidia. A second group represents those which have varying degrees of attenuation toward the tip. This tapering may be almost imperceptible or evident in increasing amounts until in some species the tip is almost acute. In rather rare instances the conidiophores may be wider near the tip than at the base. When this character is pronounced, the term, clavate, is used to describe the condition. In only a few instances do conidiophores have intercallary swellings or are otherwise irregular in width, such as a broadened area below a branch or at a prominent geniculation.

The length of conidiophores is as variable as is that of the conidia, and only in certain instances is important in classification. The width, however, is important, and next to the width and bases of conidia, is one of the major characters for separating species. Naturally, no one character alone is ever used in classifying Cercosporae.

*FASCICLES:* Conidiophores may arise singly either as branches from procumbent threads or as stalks from a few stromatic cells. In the former arrangement there usually are many mycelial threads on the leaf surface and with the numerous erect conidiophores form a continuous fruiting layer which is described as being "effuse." The stromatic cells may be on the surface of the host tissue or embedded among the cells and especially just below the stomatal openings.

By far the larger number of CERCOSPORA species show fasciculate conidiophores; that is, those growing in clusters. Such fascicles may be dense or composed of only a few stalks. Rather arbitrarily the number ten was taken to represent the fewest conidiophores in a dense fascicle. Occasionally fascicles may be composed of 30 to 50 stalks or more and are then described as being very dense.

Aside from density there are also degrees of compactness. These range from widely divergent stalks to fascicles so compact that they resemble a coremium. This character is fairly stable for individual species.

Geniculation, like the length of conidia and conidiophores, depends to such an extent on the weather conditions that only occasionally is it of diagnostic importance. The conidiophores of most species may show scarcely any geniculation if there is one prolonged warm moist period, while if nights are especially cool or dry periods are interspersed among wet ones, repeated crops of conidia with their consequent geniculations are formed. A few species can be recognized by conidiophores with geniculations so closely spaced that the stalk resembles the rachis of a wheat head. In other rare instances the geniculations may not be numerous, but extend far enough from the main stalk to give the appearance of incipient branching. Where such variations occur, the characters can be employed as one aid in identifying species.

True branching may or may not be variable. There are a few CERCOSPORA species which apparently never show branching of the conidiophores. There are many more that show only occasional branches, or branch only under specific

environmental conditions. Then there again are a few that branch repeatedly and persistently under all conditions. In the effuse type of fruiting the entire conidiophore may be only a distinctive branch from procumbent mycelial threads. Such branches may be simple or in turn branched one to many times. Branching has been described as being dichotomous or sympodial, but there is scarcely enough symmetry in any of the branching to designate it else than asymmetrical. Therefore, in a key branching can be used only in accordance with the number of branches and not with any particular type of bifurcation.

*STROMATA:* In many instances the presence or absence of stromata, their location, depth of color, size, and shape may offer excellent diagnostic signs. They vary in size from a few large thick-walled cells to those almost large enough to be known as sclerotia, and in color from those perfectly hyaline to those which are jet black.

In some of the species like *C. armoraciae* and *C. personata* (N. Car. Agr. Exp. Sta. Ann. Rept. **66**: 1943) the bases of each succeeding crop of conidiophores adds another layer of cells to the periphery of the stroma. When the spot has matured, the diseased tissue drops out leaving a shot-hole effect, or with many spots the entire leaf drops to the ground. The dark stromata remain alive in this decomposing tissue ,and in the spring produce a new crop of conidia to serve as a primary source of inoculum. Possibly many other species reproduce in the same manner.

## KEY OF GENERA CONFUSED WITH CERCOSPORA

A. Conidiophores not in true fascicles, nor always plainly differentiated from the mycelium.
  B. Conidiophores long and intertwining, usually branched, olivaceous to brownish, multiseptate, bearing one to numerous conidial scars.
    C. Conidia borne typically in groups about the conidiophoral nodes, smooth or sometimes minutely warted. **Ormathodium**
    CC. Conidia not borne in groups about the nodes, never echinulate nor warted.
      D. Conidia mostly 1-septate (limits 0-3); sometimes long intertwined fascicles. **Passalora** (Cercosporidium)
      DD. Conidia multiseptate. **Cercodeuterospora**
  BB. Conidiophores usually small branches indistinguishable from the procumbent, branched mycelium. In Fusarium may be arranged in a loose sporodochium.
    C. Conidia plainly catenulate.
      D. Conidia cylindric, borne in long branched chains, hyaline or slightly colored, unicellular or few-septate. **Septocylindrium**
      DD. Conidia obclavate, few in each chain which is not branched, dark colored, usually multiseptate. **Septonema**
    CC. Conidia not or rarely catenulate.
      D. Conidia obclavate to cylindric, not crescent shaped, brown or fuligenous, long, multiseptate. **Clasterosporium**
      DD. Conidia somewhat crescent shaped, more or less acute at the tip.
        E. Conidia with bluntly rounded base; conidiophores not in sporodochia. **Fusoma**

EE. Conidia with base not rounded bluntly; conidiophores sometimes in sporodochia. **Fusarium**

AA. Conidiophores in true fascicles or acervuli or if borne singly usually distinct from the mycelium or the conidia.

B. Conidiophores delicate, in acervuli; conidia narrowly linear, Septoria-like. **Cylindrosporium**

BB. Conidiophores not in acervuli; conidia not Septoria-like.

C. Conidiophores hyaline.

1. Spores spherical or nearly so, unicellular. **Ovularia**
2. Spores ovate to cylindric, 1-septate (limits 0-3 septate). (In part) **Didymaria**
3. Spores pyriform, mostly 1-3 septate; conidiophores and conidia may be colored. **Piricularia**
4. Spores obclavate, multiseptate.
   X. Spores without appendages. **Cercosporella**
   XX. Spores with germ tube-like appendages. **Centrospora** (Ansatospora)
5. Spores cylindric, multiseptate.
   X. Spores without appendages. **Ramularia**
   XX. Spores with conidial-like appendages. **Ramulispora**

CC. Conidiophores colored.

D. Conidiophores in coremium-like fascicles.

E. Conidiophores branched, spores briefly catenulate. **Vellosiella**

EE. Conidiophores simple, spores not or rarely catenulate, cylindric, 1-3 septate, borne singly on the reflexed ends of condiophores.

F. Coremium black; conidia densely capitate. **Arthrobotryum**

FF. Coremium pale to medium olivaceous brown; conidia not densely capitate. **Isariopsis**

DD. Conidiophores not in a coremium.

E. Conidiophores arising from unusually elongated or otherwise enlarged stromata.

F. Conidiophores arising in layers from a continuous subcuticular stroma; conidia 0-1 septate. **Fusicladium**

FF. Conidiophores arising in very dense fascicles from mostly superficial stromata, 500-1000$\mu$ in diameter; conidia 1-3 septate. **Exosporium**

EE. Conidiophores not in layers from a continuous stroma, nor from unusually large subglobular stromata, mostly in true fascicles.

F. Spores spiny or echinulate.

G. Spores muriform. **Thyrospora**

GG. Spores not muriform.

H. Spores pyriform or oval. **Asperisporium**

HH. Spores cylindric. **Heterosporium**

FF. Spores not spiny nor echinulate.

G. Spores muriform.

H. Conidiophores in compact fascicles, relatively short; conidia 0-3 septate. **Septosporium**

HH. Conidiophores usually not in compact fascicles, and mostly not very short; conidia generally more than 1-3 septate.

I. Conidiophores swollen at apex, growth continues through terminal scar; conidia borne singly, oval to subangular, not beaked. **Stemphylium**
(Macrosporium)

II. Conidiophores not swollen at the apex; conidia often catenulate, obclavate, with short to long beak.
**Alternaria**

GG. Spores not muriform.

H. Spores thick-walled and sometimes dark colored.

I. Fascicles compact, dense.

J. Conidiophores not rising from inflated head nor from closely compacted vesicular cells, relatively short; conidia 1-3 septate. **Coryneum**

JJ. Conidiophores rising from inflated head or from closely compacted vesicular cells. **Camptomeris**

II. Fascicles mostly not compact nor dense; conidiophores may be long.

J. Spores cylindric, or not strongly attenuated.

K. Spores often curved or coiled. **Helicomina**

KK. Spores mostly straight to mildly curved, never coiled.

L. One or two of the middle cells of the conidia larger than the others, mostly 2-4 septate. **Curvularia**

LL. Conidia without enlarged cells, multiseptate.
**Helminthosporium**

JJ. Spores plainly obclavate, multiseptate, tip often thinly drawn out. **Pseudocercospora**

JJJ. Spores pyriform to oval.

K. Conidiophores rigid; conidia 2 to several septate.
**Brachysporium**

KK. Conidiophores with upper third rachis-like with geniculations, conidia 1-septate. **Polythrincium**

HH. Spores thin-walled, hyaline or not dark colored.

I. Conidia very variable in shape and size, mostly olivaceous, 1-5 celled; conidiophores usually forming effuse layers, not in distinct fascicles. **Cladosporium**
(Hormodendron)
(Scolecotrichum)

II. Conidia fairly uniform in shape and size; conidiophores mostly in fascicles, ordinarily not forming effuse layers.

1. Spores very broadly spindle shaped, multiseptate.
**Napicladium**

2. Spores ovate, 1-septate (limits 0-3).
(In part) **Didymaria**

3. Spores subulate (awl-shaped) with distal cell long drawn out. **Spermospora**

4. Spores obclavate to cylindric or rarely clavate, multiseptate. **Cercospora**
(Virgosporium)

*Synonyms:*

1. Spores hyaline. (Cercosporina)
2. Spores catenulate. (Ragnhildiana)
3. Conidiophores almost obsolete, arising in mass from a large stroma. (Cercoseptoria) (Septoriopsis)
4. Spores distinctly clavate. (Didymaria as revised)

# DESCRIPTIONS OF SPECIES

**Cercospora acanthi** Passerini
Hedwigia **16**: 123. 1877

*Cercospora acanthi-longifolii* Savul. et Sandu., Anal. Acad. Romane Memor. Sect. Stüntif. Ser. III. **15**: 484. 1941.

Leaf spots circular to subcircular, 2-7 mm. in diameter, a brown point in the center, surrounded by a white or gray zone which in turn is bounded by a brown border. Each zone may be limited by a narrow dark brown line. Fruiting epiphyllous; stromata dark brown, globular to elongate, 15-70$\mu$ in length; fascicles mostly dense; conidiophores pale olivaceous brown, in mass dark, paler and somewhat

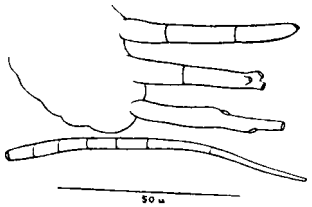



Fig. 1
*C. acanthi*

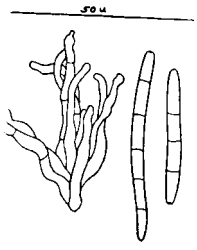



Fig. 2
*C. blechi*

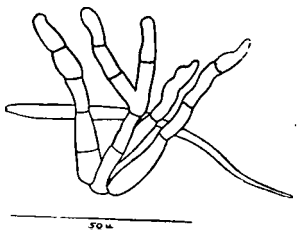



Fig. 3
*C. consociata*

attenuated toward the tip, sparingly septate, branched occasionally, straight to curved or undulate, 0-3 geniculate, medium spore scar at the subtruncate tip, 4-6 x 10-60$\mu$, mostly 10-40$\mu$ in length; conidia hyaline, acicular to obclavate, straight to curved, indistinctly multiseptate, base truncate, tip subacute, 3-5 x 20-125$\mu$, rarely 230$\mu$.

HOSTS: *Acanthus longifolius* Poir. *A. mollis* L. (*A. spinosissimus* Host.), *A. niger* Mill., *A. spinosus* L. (*A. spinulosus* Host.).

TYPES: Parma, Italy, Botanical Garden; *Acanthus spinosissimus;* Passerini; July, 1875. Co-type was distributed as Rabenhorst, Fungi Europaei No. 2273. (*C. acanthi-longifolii*) Near Cazane, Dist. of Severin, Roumania; *Acanthus longifolius;* July 16, 1937.

DISTRIBUTION: Italy, Hungary, Germany, Roumania, Algeria

NOTE: *Cercosporella acanthi* D. Sacc. (Mycol. Ital. No. 191. 1899) is supposed to be a synonym, and *Cercosporella compacta* Trav. (Hedwigia **43**: 424. 1904) closely connected. Compare *C. acanthicola.* Savulesco and Sandu-Ville state that their species, having long conidiophores and conidia, is distinct. Length does not mean much in classifying Cercosporae. Otherwise the description fits well that of the co-type.

**Cercospora acanthicola** Hansford

Proc. Linnean Soc. London **1943-4**: 121. 1944

Leaf spots scattered, angular, 5-8 mm. in diameter, vein-limited, brown to reddish brown; conidiophores in loose spreading fascicles, usually less than ten, irregularly 1-2 branched, dark olivaceous to reddish brown, 3-10 septate, flexuose to nodular or geniculate, 4-6 x 150-250$\mu$; conidia sometimes catenulate, subhyaline to pale brown, cylindric, 0-4 septate, not constricted, rounded at both ends, straight to curved, 4-6 x 20-90$\mu$.

HOST: *Acanthus arboreus* Forsk.

TYPE: Kampala, Uganda; *Acanthus arboreus;* Hansford, 3144

DISTRIBUTION: Uganda

NOTE: Compare with *C. acanthi.* I have not seen the Uganda material.

**Cercospora barlericola** Payak & Thirumalachar

Indian Phytopathology **2**: 191. 1949

Leaf spots irregular to angular, 2-5 mm. in diameter, at first dark reddish brown, later becoming pale brown or dingy gray in the center, causing premature defoliation; fruiting amphigenous; stromata subglobose, brown, 15-30$\mu$ in diameter; conidiophores pale olivaceous brown, 2-4 septate, geniculate, not branched, 4-6 x 50-90$\mu$; conidia hyaline, clavato-cylindric, 3-9 septate, base long obconically truncate, tip acute, 2-4 x 35-135$\mu$.

HOST: *Barleria cristata* L.

TYPE: Banares Hindu University, India; *Barleria cristata;* M. M. Payak; Dec. 9, 1949.

DISTRIBUTION: India

**Cercospora blechi** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 37. 1942

Leaf spots on upper leaf surface indistinct to irregularly reddish areas without distinct border, 0.5-3 mm. in extent or coalescing into larger areas; fruiting on corresponding lower surface sparingly effuse, dark olivaceous to almost black; stromata lacking or only a few brown cells; fascicles 3-10 stalks or rarely 20; conidiophores pale to very pale olivaceous brown, uniform in color, irregular in width or somewhat attenuated, 0-3 septate, longer ones may be branched, curved, tortuous or 1-2 geniculate, minute spore scar at conic tip, 2-4 x 15-90$\mu$, obclavato-cylindric, a few of the longest ones plainly obclavate, straight or nearly so, indistinctly 1-4 septate, base short obconic, tip subobtuse, 2.5-4 x 15-60$\mu$.

TYPE: Caracas, Venezuela; *Blechum brownei* A. Juss; A. S. Muller, No. 2240; July 28, 1938.

DISTRIBUTION: Venezuela.

**Cercospora consociata** Winter
Hedwigia 22: 70. 1883
(also in Jour. Myc. 1: 53. 1885)

Leaf spots indefinite or none, at least at first, sometimes yellowish to brown discoloration in irregular patches on upper leaf surface, fruiting scantily effuse, ashen to dark, on corresponding lower surface; sometimes small stromata filling stomatal openings; non-fasciculate to dense fascicles; conidiophores pale to medium olivaceous brown, fairly uniform in color and width, plainly multiseptate, branched, sinuous, not or rarely once geniculate, tip short conic or rounded, 3-5 x 20-80$\mu$; conidia narrowly obclavate, somewhat curved, subhyaline to pale olivaceous, base fairly long obconic, tip acute, septa indistinct, 2-4 x 40-150$\mu$.

HOST: *Ruellia* (Dipteracanthus) *ciliosa* Pursh.

TYPE: Illinois; *Dipteracanthus ciliosus* Nees; A. B. Seymour.

DISTRIBUTION: Most southern states and as far north as Kansas and Illinois. Also reported from China.

**Cercospora diantherae** Ellis & Kellerman
Jour. Mycol. 1: 2. 1885

*Cercospora jacobinae* Mendoza, Philipp. Jour. Sci. 75: 169. 1941

Leaf spots circular to subcircular, 1-4 mm. in diameter, sometimes coalescing, occasionally slightly zonate, white to gray center with a rather wide brown border; stromata none or a few brown cells; fascicles amphigenous, divergent, 2-15 stalks; conidiophores pale to medium brown, not branched, multiseptate,

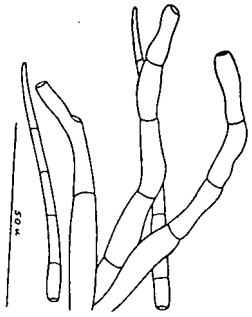


Fig. 4
*C. diantherae*

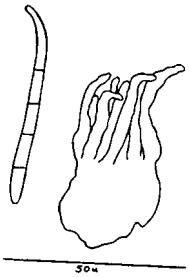


Fig. 5
*C. odontonemae*

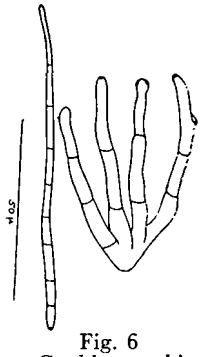


Fig. 6
*C. rhinacanthi*

0-4 mildly to abruptly geniculate, paler and more narrow toward the tip, which is subtruncate and with medium sized spore scar, 4-5.5 x 15-100$\mu$; conidia acicular, hyaline, truncate base, tip subacute, straight to slightly curved, indistinctly multiseptate, 2-4 x 40-175$\mu$, rarely 5$\mu$ wide.

HOSTS: *Dianthera americana* L., Jacobina sp., *J. carnea* Nichols.

TYPE: Manhattan, Kansas; *Dianthera americana;* W. A. Kellerman, No. 615; September, 1884. (*C. Jacobinae*) Manila, Philippines; *Jacobina carnea;* Mendoza, No. 7124.

DISTRIBUTION: Texas, Kansas, Missouri, West Virginia, Delaware, Venezuela, Philippines.

NOTE: The type is listed in the New York Botanical Garden Herbarium as *Cercospora flagellaris* var. *Diantherae* E. + M. Venezuela Collection No. 3955 on Jacobina is identical with the fungus on Dianthera. Apparently the same is true of the Mendoza species. See also *C. jacobinicola.*

**Cercospora jacobinicola** Muller & Chupp
Ceiba 1: 174. 1950

Leaf spots subcircular to irregular, 2-6 mm. in diameter, lead colored to almost black, with narrow raised line border; fruiting chiefly hypophyllous; stromata small, dark olivaceous to brown; fascicles sometimes dense, compact; conidiophores subhyaline to pale olivaceous brown, uniform in color and in width, rarely septate, not branched, 0-1 geniculate, slightly curved or undulate, conic tip, 2.5-5 x 10-40$\mu$; conidia hyaline to subhyaline, cylindric or longest ones distinctly obclavate, straight to mildly curved, multiseptate, base short obconically truncate, tip blunt to conic, 2.5-5 x 30-105$\mu$.

HOST: *Jacobina spicigera* (Schl.) Bailey.
TYPE: Chimaltenango, Guatemala; *Jacobina spicigera;* A. S. Muller, No. 42; Oct. 2, 1941.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. diantherae.*

CERCOSPORAE ON JUSTICIA

A. Conidia hyaline, acicular, 3-4 x 50-155$\mu$; fascicles spreading loosely; conidiophores 5-6 x 90-135$\mu$. *C. justiciaecola*
AA. Conidia colored, not acicular.
  B. Leaf spots distinct; fruiting not effuse; stromata small; fascicles sometimes dense; conidiophores 3-4.5 x 10-45$\mu$. *C. rhinacanthi*
  BB. Leaf spots indistinct; fruiting effuse; stromata lacking; partly nonfasciculate; conidiophores 4-5 x 50-120$\mu$. *C. justiciae*

**Cercospora justiciae** Tai
Lloydia 11: 47. 1948

Leaf spots indistinctly yellowish on the upper surface; fruiting hypophyllous in a sooty effuse layer on roundish spots 2-5 mm. in diameter; stromata absent; conidiophores in loose, spreading clusters, also arising from procumbent septate olivaceous brown branched hyphae, straight or usually curved to undulate, apex bluntly rounded, denticulate near tip, olivaceous brown, 3-7 septate, 4-5 x 50-120$\mu$; conidia pale olivaceous, at first subcylindric, finally clavato-cylindric, 5-11 septate, base conico-truncate, 3.5-5 x 50-100$\mu$.

HOST: *Justicia procumbens* L.
TYPE: Chengtu, Szechuan, China; *Justicia procumbens;* Lee Ling, No. 125; 1943.
DISTRIBUTION: Reported only from the type locality.
NOTE: I have not seen the type of this species. See also *C. rhinacanthi* and *C. justiciaecola* in key above.

**Cercospora justiciaecola** Tai
Lloydia 11: 47. 1948

Spots along the edge of the leaf, hemicircular, 3-10 mm. in diameter, ashy

center with dark brown border, in turn surrounded by a yellowish zone; fruiting amphigenous, mostly epiphyllous; stromata present, 16-31$\mu$ in diameter; conidiophores in loose spreading fascicles, subflexuous and geniculate, 5-6 septate, olivaceous brown, spore scars evident, about 3$\mu$ wide, 5-6 x 90-135$\mu$; conidia acicular to obclavate, 6-17 septate, base obconically truncate, subhyaline, 3-4 x 50-155$\mu$.

HOST: Justicia sp.
TYPE: Chengtu, Szechuan, China; Justicia sp.; H. C. Lin; Oct. 15, 1944.
DISTRIBUTION: China
NOTE: I have not seen this species. See also *C. rhinacanthi* and *C. justiciae.*

**Cercospora odontonemae** sp. nov.

Maculae amphigenae, orbiculares vel plus minus irregulares, 2-5 mm. diam., aequabiliter fuscae vel centro tandem leniter canescentis; stromata 15-30$\mu$ diam.; caespituli hypophylli; conidiophora plerumque numerosa dense stipata, simplicia, vix septata, pallide olivaceo-brunnea, recta vel undulata, 2-4 x 10-40$\mu$; conidia pallidissime chlorinula, cylindracea vel angustissime obclavata, spurie septata, recta vel leniter curvata, ad basim subtruncata, ad apicem subacutata, 2-4 x 20-80$\mu$.

Leaf spots subcircular to irregular, 2-5 mm. in diameter, uniformly brown or with dingy gray center; fruiting hypophyllous; stromata small, 15-30$\mu$ in diameter, brown; fascicles dense; conidiophores pale to very pale brown, septa indistinct, undulate, fairly uniform in color and width, not branched, rarely once geniculate, minute spore scar at rounded tip, 2-4 x 10-40$\mu$; conidia very pale olivaceous, linear to narrowly obclavate, straight or mildly curved, septa indistinct, base long obconically truncate, tip subacute, 2-4 x 20-80$\mu$.

HOSTS: *Odontonema callistachyum* (Schlecht.) O. Ktze. (*Thyrsacanthus callistachyus* Nees).
TYPE: Cordoba, Mexico; *Odontonema callistachyum*; O. A. Plunkett; July 25, 1932.
DISTRIBUTION: Known only from the type locality.

**Cercospora rhinacanthi** von Höhnel

Sitzungs. K. Akad. Wissensch. Math. Naturw. Wien 121: 414. 1912

Leaf spots circular to irregular, 2-10 mm. in diameter, uniformly brown or with dingy gray center, indistinct on dried leaf; fruiting hypophyllous; small brown stromata, from a few cells to 25$\mu$ in diameter; fascicles 2-5 stalks to dense; conidiophores pale olivaceous brown, sparingly septate, sometimes once abruptly bent or geniculate, longest ones undulate, rarely branched, minute spore scar at the rounded tip, 3-4.5 x 10-45$\mu$; conidia very pale olivaceous, linear to narrowly obclavate, straight to slightly curved, septa indistinct, base subtruncate to long obconically truncate, tip subacute, 2-3.5 x 25-125$\mu$, mostly 45-80$\mu$.

HOSTS: Rhinacanthus sp., *Rh. communis* Nees (*Rh. nasuta* Kurz), *Justicia procumbens* L.
TYPE: Botanical Garden, Buitenzorg, Java; Rhinacanthus sp.; F. von Höhnel; 1907.
DISTRIBUTION: Java, China, Philippines.
NOTE: See also *C. justiciae* and *C. justiciaecola.*

**Cercospora acericola** Woronichin

Trav. Mus. Bot. Acad. Sc. U. R. S. S. **21**: 231. 1927

Leaf spots circular to angular, 2-3 mm. in diameter, gray to white with a distinct dark border, in severe cases the entire leaflet is discolored; fruiting hypophyllous; fasciculate; conidiophores brown, slightly geniculate, not branched, not septate, 4-6 x 15-45$\mu$; conidia hyaline to pale olivaceous, straight to mildly curved, 3-9 septate, obclavate to almost cylindric, rarely catenulate, base rounded to obconic, tip obtuse, 3-5.5 x 30-120$\mu$, mostly 30-75$\mu$.

HOSTS: *Acer campestre* L., *A. opulifolium* Vill. (*A. opalus* Mill.), *A. pseudoplatanus* L.

TYPE: Tersk, distr. Pjatigorsk, prope p. Nikolajevskoje, Caucasus; *Acer campestre;* Woronichin; July 26, 1925.

DISTRIBUTION: Florence, Italy; Russia.

NOTE: Briosi and Cavara, I Funghi Parass. No. 296 is *C. acericola* rather than *C. acerina* as labeled.

**Cercospora acerina** Hartig

Untersuchungen aus dem Forstbot. Inst. zu München **1**: 58. 1880

HOSTS: *Acer opulifolium* Vill. (*A. opalus* Mill.), *A. platanoides* L., *A. pseudoplatanus* L.

TYPE: No type is given. Only Allescher and Schnabl, Fungi Bavarici No. 100 was available for study.

NOTE: This fungus has conidia with appendages, therefore has been named *Centrospora acerina* (Hart.) Newhall (Phytopath. **36**: 893. 1946). F. von Thümen (Centralbl. f. d. Ges. Forstwesen No. 10. 1880, Hedwigia **20**: 63. 1881) says that the fungus produces minute sclerotia in the host tissue, and formerly was considered a Sclerotium. Garbowski (Bul. Soc. Mycol. France **39**: 258. 1923) describes the variety, *C. acerina* var. *tatarici* on *Acer tataricum* L., near Bachczysaray, Crimea, and collected by him, June 17, 1916. No material being available for study, it was impossible to know whether it was really a variety of this species or whether it was a true Cercospora. Garbowski mentions colored conidiophores, but nearly all affected maple leaves may have Alternaria present aside from other fungi. It may be a distinct species or a synonym of *C. acericola* which also was described from southern Russia.

**Cercospora aceris** Hori

HOSTS: Acer spp.

TYPE: No definite type is given.

NOTE: Hori did not describe this species, but Kanesuke Hara includes it in his textbook on Dendropathology (Jubyo-gaku Kakuron) first edition, p. 253, 1923, and second edition, p. 228, 1925. Dr. Togashi in a letter dated May 1, 1941, wrote that Hara had misspelled the species name, recording it as *C. acerina.* Dr. Togashi also kindly translated Hara's meager description. This fits so closely Hartig's species that for the present it is considered identical and not a true Cercospora. In each instance during rainy weather, the cotyledons and first leaves of maple seedlings are affected by dark spots, which finally may kill the injured part or the entire seedling.

**Cercospora negundinis** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. Part I. **43**: 89. 1891

Leaf spots large circular to irregular blotches, up to 12 mm. in diameter, center grayish brown to dingy gray, margin medium brown; fruiting mostly epiphyllous; stromata brown, globular, 20-60$\mu$ in diameter; some of the fascicles dense; conidiophores pale olivaceous brown, uniform in color, attenuated toward the tip, sometimes with enlarged base, occasionally with one septum near stroma, not geniculate, not branched, medium spore scar at subtruncate tip, and usually one or two more near the tip, 5-7 x 20-60$\mu$; conidia hyaline, acicular to cylindric, straight to rather prominently curved, septa indistinct, base truncate to subtruncate, tip mostly blunt, 5-6 x 50-110$\mu$, (reported as long as 150$\mu$).

HOST: *Acer* (Negundo) *Negundo* L. (*Acer aceroides* Moench).
TYPE: Nebraska; Negundo (Box Elder); Roscoe Pound; August, 1889.
DISTRIBUTION: Nebraska and Wisconsin.

**Cercospora molluginis** Halsted

Bul. Torrey Bot. Club **20**: 251. 1893

*Cercospora molluginis* Davis, Wisc. Acad. Trans. **21**: 285. 1924
*Cercospora molluginicola* Lieneman, Ann. Missouri Bot. Gard. **16**: 42. 1929

Leaf spots circular, 0.5-3 mm. in diameter, pale brown to yellowish tan, almost same color of dried leaf and difficult to find unless the sooty-like fruiting which occurs on both leaf surfaces is present; stromata slight or lacking; fascicles mostly not dense, 1-7; conidiophores pale to medium brown, uniform in color, sometimes slightly attenuated, multiseptate, not branched, 0-3 mildly to abruptly geniculate, medium spore scar at rounded to subtruncate tip, 3.5-6 x 25-100$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 25-280$\mu$, mostly 25-100$\mu$.

HOST: *Mollugo verticillata* L.
TYPE: Short Hill, New Jersey; B. D. Halsted; September, 1892; (Davis species) Lone Rock, Wisconsin; *Mollugo verticillata;* J. J. Davis; July 22, 1921. The Halsted co-type was distributed as Seymour and Earle, Economic Fungi No. 286.
DISTRIBUTION: New Jersey and Wisconsin.
NOTE: Miss Lieneman changed the name of the Davis collection to *C. molluginicola* to avoid a repetition of names. A description is given also on the packet of the Halsted co-type.

**Cercospora tetragoniae** n. comb.

*Cercosporina tetragoniae* Speg., Anal. Mus. Nac. B. Aires **20**: 429. 1910.

Leaf spots circular to subcircular, 2-5 mm. in diameter, occasionally 20 mm., smaller ones with pale brown to gray center and wide brown margin, larger ones may be zonate and without the gray; fruiting mostly epiphyllous; stromata lacking or a few yellowish brown cells; fascicles usually 2-10 stalks; conidiophores pale yellowish or olivaceous brown, uniform in color, slightly attenuated, sparingly septate, not branched, straight or occasionally once abruptly or 2-3 mildly geniculate, medium sized spore scar at subtruncate tip, 3.5-6 x 20-125$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip subacute, 2.5-5 x 30-150$\mu$.

TYPE: In a garden in La Plata, Argentine; *Tetragonia expansa* Murr.; Spegazzini.

DISTRIBUTION: Studied material from Argentine and Texas. Also reported from Indiana, France, Japan, and the Caucasus.

NOTE: This differs from *C. molluginis* in having paler, more nearly straight conidiophores and slightly wider conidia.

## CERCOSPORAE ON ALISMACEAE

A. Conidia wide, 5-9 x 25-110$\mu$, 2-9 septate, obclavate; conidiophores often closely sinuous or geniculate (rachis-like).
CALLA, PELTANDRA, ALISMA — *C. callae* (See Araceae)

AA. Conidia narrow, rarely as wide as 6$\mu$, mostly acicular.
B. Conidiophores 4.5-7 x 20-100$\mu$, pale to medium dark in color; conidia 3-5 x 25-150$\mu$, acicular to obclavate.
SAGITTARIA — *C. sagittariae*
BB. Conidiophores 4-5.5$\mu$ in width, pale in color.
C. Conidiophores 15-175$\mu$ in length, not strongly attenuated, sparingly branched; conidia obclavate, 3.5-6 x 45-160$\mu$.
ALISMA — *C. alismatis*
CC. Conidiophores 15-65$\mu$ in length, strongly attenuated, not branched; conidia acicular to obclavate, 2.5-5 x 45-125$\mu$.
ECHINODORUS — *C. echinodori*

### **Cercospora alismatis** Ellis and Holway

Jour. Mycol. 1: 63. 1885

Leaf spots circular or angular, various shades of brown or with dingy gray center and brown margin, 0.5-5 mm. in diameter or sometimes as large as 8 mm.; fruiting amphigenous; stromata slight to 30 or 40$\mu$ in diameter; fascicles sometimes dense; conidiophores pale to medium dark olivaceous brown, slightly paler and more narrow toward the tip, straight to mildly curved, multi-septate, 0-2 geniculate, branched occasionally, spore scar at subtruncate tip, 4-7 x 15-175$\mu$; conidia obclavate, hyaline, straight or curved, base long obconically truncate, tip obtuse to subacute, 3-6 x 50-160$\mu$.

HOST: *Alisma plantago* L. (*A. plantago-aquatica* L.), *A. subcordatum* Raf., Alisma sp.

TYPE: Decorah, Iowa; Alisma; Holway; July 29, 1884.

DISTRIBUTION: North Dakota, Wisconsin, Iowa, Missouri, and New York.

NOTE: *C. pachyspora* also has been described on Alisma. It differs from *C. alismatis* in having sinuous or verruculose conidiophores, and conidia 7-10$\mu$ wide. The type of *C. alismatis* seems to have more narrow conidiophores and more nearly truncate conidia than does *C. sagittariae*, also denser fascicles, not as many geniculations, and more nearly subtruncate tip. See also *C. callae*.

### **Cercospora echinodori** sp. nov.

Maculae orbiculares, 3-12 mm., atro-brunneolae, centro canescentis; caespituli amphigeni; conidiophora dense stipata, pallidissime olivaceo-brunnea, recta, simplicia, 5-6.5 x 15-65$\mu$; conidia hyalina, obclavata, recta vel curvata, ad basim truncata, 2.5-5 x 45-125$\mu$.

Leaf spots subcircular, 3-12 mm. in diameter or coalescing into large areas, gray center, wide dark to black margin, indistinctly zonate; stromata subglobular, medium brown, 15-40$\mu$ in diameter; fascicles dense, divergent; conidiophores pale to very pale olivaceous brown, medium brown near the base, strongly attenuated toward the tip, appearing even more so when the conidia remain attached as they frequently do, sparingly septate, not geniculate, not branched, straight or almost so, subtruncate tip, 5-6.5$\mu$ wide at the base, 2-5$\mu$ at the tip, 15-65$\mu$ in length; conidia hyaline, acicular to obclavate, straight to curved, indistinctly multiseptate, base truncate to long obconically truncate, tip subacute, 2.5-5 x 45-125$\mu$.

TYPE: Etang, Etang Saumatre, Haiti; *Echinodorus cordifolius* (L.) Griseb.; E. C. Leonard; April 12, 1920.

DISTRIBUTION: Known only from the type locality.

**Cercospora sagittariae** Ellis & Kellerman

Jour. Mycol 2:1. 1886

Leaf spots orbicular, 3-8 mm. in diameter, dark tan or brown to gray, wide pale brown margin, when brown difficult to distinguish on dried herbarium material; fruiting amphigenous; stromata lacking or a few dark brown cells; most fascicles dense; conidiophores pale olivaceous brown, tip almost hyaline, attenuated or rarely slightly wider near tip, sparingly septate, not branched, straight or 1-2 mildly to abruptly geniculate, medium spore scar at subconic tip, 4.5-7 x 20-60$\mu$, rarely 100$\mu$ in length; conidia hyaline, acicular to obclavate, straight to slightly curved, indistinctly multiseptate, base truncate to obconically truncate, tip subobtuse, 3-5 x 25-150$\mu$.

HOSTS: *S. latifolia* Willd. (*Sagittaria variabilis,* Engelm.), *S. rigida* Pursh, *S. montevidensis* Cham. & Schlecht., *S. sagittifolia L.,* (*S. arifolia* Nutt.) *S. lancefolia* L., *S. trifolia* L., Sagittaria sp.

TYPE: Manhattan, Kansas; *Sagittaria variabilis;* W. A. Kellerman, No. 681; 1884.

DISTRIBUTION: Material studied from nearly every state from Manitoba to Texas and eastward, as well as from Puerto Rico, Argentine, and Germany. Also reported from Hungary, Japan, and Hawaii.

NOTE: In many respects this resembles *C. alismatis.* It seems, however, to have wider conidiophores, more attenuation, more geniculation, paler, more nearly conic conidiophore tips, and less dense fascicles.

## CERCOSPORAE ON ACHYRANTHES

(All conidia hyaline)

A. Conidia cylindric to cylindro-obclavate, base obconic, tip obtuse, 3-5.5 x 20-80$\mu$; conidiophores delicate, very pale in color, 2-3 x 40-220$\mu$. *C. centrostachydis*

AA. Conidia acicular, base truncate, tip acute or subacute.

B. Leaf spots distinct; fruiting not effuse, chiefly epiphyllous; conidia 2.5-5 x 35-130$\mu$; conidiophores 4-5.5 x 15-80$\mu$. *C. achyranthina*

BB. Leaf spots indistinct; fruiting effuse, hypophyllous; conidia 3-5.5 x 40-150$\mu$; conidiophores 4.5-7 x 50-450$\mu$. *C. achyranthis*

**Cercospora achyranthina** Thirumalachar & Chupp

Mycologia 40: 352. 1948

Leaf spots circular, 0.5-2 mm. in diameter, tan to gray center, red to reddish

brown margin; fruiting amphigenous but chiefly epiphyllous; stromata dark brown, a few cells to 25$\mu$ in diameter; fascicles 2-10 divergent stalks; conidiophores pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, not branched, straight to bent, 0-5 geniculate, narrowly subtruncate tip, 4-5.5 x 15-80$\mu$, mostly 25-45$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2.5-5 x 35-130$\mu$.

HOST: *Achyranthes aspera* L.

TYPE: Bangalore, India; *Achyranthes aspera;* M. J. Thirumalachar; Sept. 2, 1945.

DISTRIBUTION: Known only from the type locality.

NOTE: Compare *C. achyranthis* and *C. centrostachydis* for differences among the species on this host genus. See also key above.

**Cercospora achyranthis** H. et P. Sydow

Ann. Mycol. 7: 171. 1909

Leaf spots indistinct or irregular, faintly ferrugineous areas on upper surface; fruiting effuse, dark, on corresponding lower surface; stromata lacking; nonfasciculate or 2-5 stalks; conidiophores pale to medium dark brown, uniform in color, irregular in width, plainly multiseptate, branched, 0-7 geniculate, medium sized spore scar at rounded to subtruncate tip, 4-5.7 x 50-150$\mu$, or even as long as 450$\mu$; conidia hyaline, acicular, straight or nearly so, indistinctly multiseptate, often closely septate, base truncate, tip subacute or rarely subobtuse, 3-5.5 x 40-150$\mu$.

HOSTS: *Achyranthes bidentata* Blume var. *japonica, A. japonica* Nakai, *A. aspera* L.

TYPE: Ome, Musashi; *Achyranthes bidentata* var. *japonica;* Sydow, No. 65; September 22, 1905.

DISTRIBUTION: Japan, China.

NOTE: This has been reported from Puerto Rico (Mycologia 23: 378. 1931) but Solheim's description does not fit Sydow's species, which has hyaline, acicular conidia. Authentic specimens have been received only from Japan and China. See also *C. achyranthina* and *C. centrostachydis.*

**Cercospora acnidae** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. Part I. 43: 89. 1891

Spots circular, gray or pale tan center with wide dark purple or almost black border, 0.5-3 mm. in diameter; fruiting amphigenous; stromata slight; fascicles sometimes dense; conidiophores mostly multiseptate, slightly geniculate, rarely branched, sometimes appreciably attenuated toward the tip, spore scars evident, subhyaline to pale brown with tips almost hyaline, 4-6 x 20-100$\mu$; conidia hyaline, acicular, rarely almost cylindric, straight or nearly so, base truncate, tip subacute, septa not very evident, 2-3.5 x 30-100$\mu$.

TYPE: Wilmington, Delaware; *Acnida cannabina* L.; A. Commons, No. 1011; September 30, 1889.

DISTRIBUTION: Known only from the type locality.

**Cercospora alternantherae** Ellis & Langlois

Jour. Mycol. 6: 36. 1890

Leaf spots circular, center greenish, mouse-colored, or dingy gray, margin pale

brown, 0.5-2 mm. in diameter; fruiting amphigenous; stromata pale brown, 30-75$\mu$ in diameter; fascicles dense; conidiophores pale to very pale brown, paler and slightly more narrow toward the tip, sparingly septate, slightly geniculate, fre-

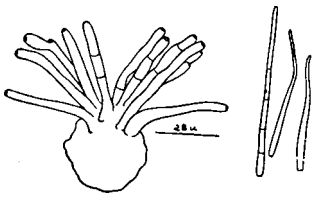


Fig. 7
*C. alternantherae*

quently crooked, not branched, spore scars evident, 3-5 x 20-80$\mu$; conidia acicular, base truncate, tip acute, hyaline, 2.5-4 x 50-125$\mu$.

HOSTS: *Alternanthera achyrantha* R. Br., *A. portoricensis.* Kuntze, *A. ficoidea* R. Br.
TYPE: St. Martinsville, Louisiana; *Alternanthera achyrantha;* A. B. Langlois, No. 1430; July 18, 1888.
DISTRIBUTION: Louisiana, Puerto Rico, Jamaica.
NOTE: See also *C. Alternantherae-nodiflorae.*

**Cercospora alternantherae-nodiflorae** Sawada
Dept. Agr. Govern. Res. Inst. Formosa Rept. **35**: 106. 1928

Leaf spots at first indistinct, immarginate, finally the lower leaf surface turns brown, the discoloration gradually extending to the upper surface after which the leaf curls and dies; stromata small; fascicles 10-25 stalks, divergent; conidiophores pale brown, straight to curved, not branched, sometimes geniculate, 1-5 septate, 4 x 35-55$\mu$; conidia obclavate with gradual attenuation, hyaline to pale brown, base obconic, tip subobtuse, 3-12 septate, sometimes constricted at septa, 2.5-4.5 x 30-135$\mu$.

HOST: Alternanthera sp.
TYPE: Formosa; Alternanthera sp. No other data available.
DISTRIBUTION: Several collections from Formosa (Taiwan).
NOTE: See also *C. alternantherae.* A 1907 collection is in the Mycological Herbarium of the U. S. Bureau of Plant Industry.

**Cercospora brachiata** Ellis & Everhart
Jour. Mycol. 4: 5. 1888

*Cercospora amaranti* Lobik, Bolezni Rast. (Morbi Plantarum) **17**: 193. 1928

Leaf spots circular to subcircular, 2-5 mm. in diameter, uniformly colored brown or reddish brown, or with white to tan center and brown margin; fruiting amphigenous; stromata not prominent, dark brown; fascicles 2-20 stalks, divergent; conidiophores pale to medium olivaceous brown, paler and more narrow tip, septate, mostly at 20-30$\mu$ intervals, not branched or tip bifurcate, 0-3 geniculate, straight or nearly so, large spore scar at tip, 4-5.5 x 40-200$\mu$; conidia hyaline, acicular, base truncate, tip acute, 2-4.5 x 40-200$\mu$.

HOSTS: *Amaranthus retroflexus* L., *A. blitoides* Watson, *A. gangeticus, A. spinosus* L., Amaranthus sp.

TYPE: Faulkland, Delaware; *Amaranthus retroflexus;* A. Commons, No. 626; August 18, 1887. (*Cercospora amaranti*) Bezirk v. Pratigorsh im Garten von d. Station Essentuki; *Amaranthus retroflexus;* A. I. Lobik; September 25, 1925.

DISTRIBUTION: Reported in Delaware, Texas, Trinidad, Russia, China, Japan, Uganda.

NOTE: This seems to differ from all the other species with acicular conidia on the Caryophyllales, in having long, pale colored, rarely geniculate conidiophores which are not attenuated. I have not seen Lobik's species, but his description and illustration resemble *C. brachiata* closely.

**Cercospora celosiae** Sydow

Ann. Mycol. **27**: 430. 1929

Leaf spots circular to subcircular, 1-5 mm. in diameter or large part of leaf, tan to pale brown, slightly darker margin, frequently causing a pronounced shot-hole effect; fruiting mostly hypophyllous; stromata lacking or small, brown; fascicles 2-15 stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, 0-3 septate, 0-4 geniculate, not branched excepting rarely a bifurcate tip, medium sized spore scar, 3-4.5 x 20-100$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 30-100$\mu$.

HOSTS: *Celosia argentea* L., *C. cristata* L., *C. argentea* var. *cristata* Kuntze, Celosia sp.

TYPE: Wang-Chia-Shau, prov. Hupeh, China; *Celosia argentea;* T. F. Yu; August 4, 1928.

DISTRIBUTION: Oklahoma, China, Japan, Uganda, Brazil, and Venezuela.

**Cercospora centrostachydis** n. sp.

*Cercospora achyranthis* (Sydow) as described by Solheim, Mycologia **23**: 378. 1931

Leaf spots at first none or indistinct, finally angular, brown, 0.5-3 mm. in diameter; fruiting effuse, olivaceous to grayish on corresponding lower leaf surface; stromata few brown cells in stomatal opening to 30$\mu$ in diameter, globular, brown; fascicles 5-17 stalks; conidiophores delicate, hyaline to very pale brown, slightly darker near base, uniform in width, straight to undulate, indistinctly septate, rarely branched or geniculate, small spore scar at rounded tip, 2-3 x 40-220$\mu$; conidia hyaline, cylindric to cylindro-obclavate, straight to slightly curved, 1-6 septate, base long sharply obconic, tip obtuse, 3-5.5 x 20-80$\mu$.

HOSTS: *Centrostachys indica* (L.) Standley, (Achyranthes), *A. bidentata* Blume, *A. crispa* Desf.

TYPE: Mayaguez, Puerto Rico; *Centrostachys indica;* Whetzel and Olive, No. 464; March 2, 1916.

DISTRIBUTION: Several collections from Puerto Rico.

NOTE: See also *C. achyranthis* and *C. achyranthina* for the differences among the species on this host genus. The description which Solheim and Stevens (Mycologia **23**: 378. 1931.) give of *Cercospora achyranthis* fits instead the above species closely, and since both were collected in Puerto Rico, probably are identical.

**Cercospora crassoides** Davis
Wisc. Acad. Trans. **21**: 298. 1924

TYPE: Lone Rock, Wisconsin; *Froelichia floridana* (Nutt.) Moq.; J. J. Davis; July 23, 1921.

NOTE: The type shows this to be an Alternaria. The conidia rarely have vertical walls. Only one was found among several hundred. Even though they might not be muriform, conidia so wide (7-17$\mu$) and with thick walls are not considered as belonging to Cercospora.

**Cercospora cyathulae** (Stev. & Solh.) Sydow
Ann. Mycol. **35**: 239. 1937

*Ragnhildiana cyathulae* Stev. & Solh., Mycologia **23**: 403. 1931

Leaf spots none or indefinite yellowish areas on upper leaf surface; fruiting in dark olivaceous effuse areas on the corresponding lower surface; stromata lacking; nonfasciculate or pseudo-fasciculate; mycelial threads often woven into strands, which sometimes enclose leaf hairs; conidiophores branches from the procumbent threads, subhyaline to pale yellowish brown, uniform in color, multiseptate, constricted at septa or otherwise irregular in width, not geniculate, small spore scars at the bluntly rounded tips, 4-7 x 10-50$\mu$ or even as long as 200$\mu$; conidia similar in color, cylindric, slightly curved, 1-9 septate, constricted at septa, ends bluntly rounded or base obconically truncate, frequently catenulate, 5-7.5 x 25-125$\mu$, mostly 1-5 septate and 25-65$\mu$ in length.

HOSTS: *Cyathula tomentosa* Moq., C. *achyranthoides* (Kunth.) Moq.

TYPE: Rajpur near Mussoorie, East India; *Cyathula tomentosa;* R. N. Tandon, No. 205; September 18, 1933; (*Ragnhildiana cyathulae*) Coverden, British Guiana; *Cyathula achyranthoides;* F. L. Stevens, No. 743; August 4, 1922.

DISTRIBUTION: British Guiana, India.

NOTE: Solheim and Stevens based the genus, Ragnhildiana on catenulate conidia. When the weather is ideal for fungus fruiting, many Cercospora species may briefly have catenulation. This would seem to make the character too variable to use for a generic difference.

**Cercospora gilbertii** Spegazzini
Anal. Soc. Cient. Argentina **10**: 38. 1880

Leaf spots pale tan to dingy gray, sometimes with narrow brown margin, 2-8 mm. in diameter, larger spots sometimes plainly zonate, the brown zonations being wavy or in scallops, making a rather pretty design; fruiting amphigenous but more prominent on lower surface; stromata dark brown, globular, 30-60$\mu$ in diameter; fascicles very dense; conidiophores in mass medium dark, singly pale olivaceous brown, tip sometimes hyaline, 0-2 abruptly geniculate, small spore scar at rounded tip, slightly attenuated, not branched, septa indistinct or lacking, 4-5 x 20-40$\mu$; conidia cylindric, hyaline to subhyaline, 1-4 septate, straight to slightly curved, sometimes catenulate, long obconic base, tip similar when catenulate or bluntly rounded, 3-5 x 20-60$\mu$.

HOSTS: *Iresine celosioides* L. (*I. celosia* L.), *I. paniculata* (L.) O. & I.

TYPE: Montevideo, Uruguay; *Iresine celosia;* G. Gilbert, No. 908; 1876.

DISTRIBUTION: In South America, Central America, and West Indies. Appears to be common in Puerto Rico.

NOTE: See also *C. gonatoclada* for differences between the two species on this host genus.

CERCOSPORAE ON GOMPHRENA

A. Conidia colored, cylindric, mostly 1-septate, 5-8 x 20-60$\mu$; leaf spots indistinct; fruiting effuse; conidiophores sometimes branched, 4-7 x 25-70$\mu$. *C. gomphrenicola*

AA. Conidia hyaline, multiseptate, 2-4$\mu$ in width; leaf spots distinct; fruiting not effuse; conidiophores not branched.

B. Conidia acicular, 30-135$\mu$ in length; fascicles 4-20 divergent stalks; conidiophores straight to slightly curved, 4-5.5 x 30-135$\mu$. *C. gomphrenae*

BB. Conidia cylindric to almost acicular, 30-70$\mu$ in length; fascicles dense to very dense; conidiophores tortuous, 3-5 x 10-55$\mu$. *C. pretoriensis*

**Cercospora gomphrenae** Ray

Mycologia **36**: 172. 1944

Leaf spots circular, 0.5-4 mm. in diameter, tan to dingy gray, bordered by a wide red to purplish zone; fruiting amphigenous; stromata small, irregular, dark fuligenous, ranging from a few cells to 35$\mu$ in length; fascicles 4-20 diverging stalks; conidiophores in mass fairly dark, singly pale fuligenous, paler and more narrow toward the tip, indistinctly multiseptate, not branched, straight to variously curved, mostly not geniculate, medium spore scar at the subtruncate tip, 4-5.5 x 30-150$\mu$, mostly 50-90$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 30-135$\mu$.

TYPE: Ray's yard, Stillwater, Oklahoma; *Gomphrena globosa* L.; W. W. Ray; August 18, 1942.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. gomphrenicola* and *C. pretoriensis* and key above for differences among the species on Gomphrena. Sawada (Formosa Agr. Res. Inst. Rept. **85**: 107. 1943) partly describes a *Cercospora gomphrenae* Sawada on *Gomphrena globosa* from Formosa. His description is too meager to determine whether it is the same as Ray's species or a new one.

**Cercospora gomphrenicola** Spegazzini

Anal. Soc. Cient. Argentina **13**: 29. 1882

Leaf spots none or indistinct yellowish areas on the upper surface; effuse olivaceous fruiting, 1-5 mm. in extent, on the corresponding lower surface; stromata slight; fascicles dense to very dense; conidiophores singly very pale olivaceous brown, in mass golden brown, uniform in color, very irregular in width and degree of undulation, septate, often constricted at septa, not geniculate, sometimes branched, bluntly rounded tip, 4-7 x 25-70$\mu$; conidia pale olivaceous to olivaceous brown, cylindric, 1-5 septate, mostly 1 septate, constricted at septa, ends bluntly rounded or base obconically truncate, 5-8 x 20-60$\mu$.

HOSTS: *Gomphrena glauca* Moq. (*Pfaffia glauca* Spreng.), *Gomphrena iresinoides* Moq. (*Pfaffia iresinoides* Spreng.).

TYPE: Collected at Palermo, Buenos Aires, Argentine; *Mogiphanes glauca* Griseb.; C. Spegazzini, No. 914; February, 1881.

DISTRIBUTION: Argentine, Venezuela, Brazil.

NOTE: The type packet has the name, *Cercospora gomphrenicola* on *Mogiph-*

*anes glauca,* but the printed description gives it on Gomphrena. See also *C. pretoriensis* and *C. Gomphrenae* and key, page 34 for differences among the species on Gomphrena. This could be classed also as a Didymaria or Piricularia.

**Cercospora gonatoclada** Sydow

Ann. Mycol. 23: 425. 1925

Leaf spots indefinite yellowish areas on the upper surface, effuse fruiting of the fungus slightly darkening corresponding lower surface; stromata lacking; non-fasciculate; conidiophores subhyaline to pale olivaceous brown or fuligenous, short branches spaced at very short intervals on procumbent threads, sometimes two or three threads intertwined giving the effect of an elongated fascicle, branches not septate, 0-5 mild geniculations very near tip, or 1-5 minute spore scars at or near tip, not attenuated, uniform in color, 4-5 x 10-30$\mu$; conidia cylindric, subhyaline to pale olivaceous, straight or nearly so, often catenulate, 1-5, mostly three septate, base medium to long sharply obconic, tip bluntly rounded or when catenulate similar to base, 3.5-7 x 15-60$\mu$.

HOSTS: *Iresine calea, I. paniculata* (L.) O. & I.

TYPE: La Caja near San José, Costa Rica; *Iresine calea* (Iban.) Standl.; H. Sydow, No. 12; January 5, 1925. No. 11; January 7, 1925.

DISTRIBUTION: Puerto Rico and Costa Rica.

NOTE: See also *C. gilbertii* for differences between the two species found on Iresine. Solheim and Stevens (Mycologia 23: 403. 1931) seeing the prominently catenulate conidia suggested the name *Ragnhildiana gonatoclada* for the species.

**Cercospora pfaffiae** sp. nov.

Maculae orbiculares vel irregulares, 1-6 mm., pallide griseo-brunneolae; caespituli amphigeni; stromata magna, globosa; conidiophora stipata, pallide olivacea, 0-3 septata, simplicia, recta vel curvata, 4-5.5 x 10-45$\mu$; conidia pallide olivacea, obclavato-filiformia, 1-7 septata, ad basim subtruncata, 3.5-5 x 30-85$\mu$.

Leaf spots circular to slightly irregular, 1-6 mm. in diameter, pale grayish brown to dingy gray, with narrow raised line border; fruiting amphigenous; stromata prominent, subglobular to elongate, dark brown to almost black, 40-75$\mu$ in length; fascicles dense, divergent; conidiophores pale olivaceous to olivaceous brown, 0-3 septate, not branched, straight to curved or sharply bent, 0-1 geniculate, mostly uniform in width, bluntly rounded tip, 4-5.5 x 10-45$\mu$; conidia pale to medium olivaceous, obclavato-cylindric, straight to mildly curved, 1-7 septate, ends bluntly rounded or base obconically truncate, 3.5-5 x 30-85$\mu$.

HOST: *Pfaffia sericea* (Mart.) Spreng.

TYPE: Parque Apicola, Taquari, Brazil; *Pfaffia sericea;* J. P. Da Costa Neto, No. 2224; Dec. 31, 1946.

DISTRIBUTION: Brazil

NOTE: See also *C. gomphrenicola.*

**Cercospora pretoriensis** Chupp & Doidge

Bothalia 4: 890. 1948

Leaf spots subcircular, 2-6 mm. in diameter, pale tan to dingy gray center, red to reddish brown margin; fruiting mostly epiphyllous, appearing as closely aggregated black pustules; stromata dark brown, slightly irregular in shape, 15-65$\mu$ in diameter; fascicles dense to very dense; conidiophores in mass dark colored,

singly pale olivaceous brown, paler and more narrow toward the tip or irregular in width, indistinctly septate, not branched, variously curved to tortuous, rarely once abruptly geniculate, tip bluntly rounded or conic, 3-5 x 10-55$\mu$, mostly 10-30$\mu$; conidia hyaline, cylindric to almost acicular, straight to slightly curved, indistinctly multiseptate, base subtruncate, tip subobtuse, 2-4 x 30-75$\mu$ or possibly longer.

TYPE: Vrede, Arcadia, Pretoria, Transvaal; *Gomphrena globosa* L.; No. 6593; April 16, 1913. (Co-type) Wonderboom, Pretoria; E. M. Doidge and A. M. Bottomley, No. 32789; November 30, 1936. (Co-type) Arcadia, Pretoria; E. M. Doidge, No. 775; December, 1909.

DISTRIBUTION: Known only from the type localities.

NOTE: See also *C. gomphrenicola* and *C. gomphrenae* and key, page 34 for differences among the species on this host genus.

## CERCOSPORAE ON AMARYLLIDACEAE

A. Conidia colored, 2-4 x 20-80$\mu$ or longer, base obconically truncate.
  B. Fruiting mostly epiphyllous; 3-6 spore scars on minute geniculations near the tip of the conidiophore; conidia with short obconically truncate base, pale to medium olivaceous.
    AMARYLLIS, VALLOTA — *C. amaryllidis*
  BB. Fruiting amphigenous; 1-2 spore scars at and near the tip of the conidiophore; conidia with long obconically truncate base, pale to very pale olivaceous.
    PANCRATIUM, CRINUM, HYMENOCALLIS — *C. pancratii* (*C. hymenocallidis*)

AA. Conidia hyaline, 4-6 x 20-80$\mu$ or longer, base truncate to subtruncate.
  B. Conidia acicular, at least the longest ones; conidiophores 4.5-7 x 25-150$\mu$, nearly straight.
    HAEMANTHUS — *C. haemanthi*
  BB. Conidia cylindric; conidiophores 5-7.5 x 15-350$\mu$, occasionally much curved.
    FOURCROYA — *C. fourcroyae*

### **Cercospora amaryllidis** Ellis & Everhart

Jour. Mycol. 3: 14. 1887

The leaf spots are rather indefinite, especially on dried brown leaves, sometimes with a reddish margin and tan or gray center, 2-4 mm. in diameter, or including a large portion of the leaf; fruiting mostly epiphyllous; stromata usually filling opening of the stomata; fascicles usually dense (8-30); conidiophores subhyaline to very pale fuligenous or olivaceous brown, slightly paler toward the tip, rarely attenuated, septa rare, small numerous geniculations near the tip, spore scars lacking or small, not branched, 3-4 x 10-40$\mu$; conidia linear or narrowly obclavate, pale to medium olivaceous, straight to slightly curved, base short obconically truncate, tip subobtuse, 2.5-4 x 35-120$\mu$.

HOST: Amaryllis sp., *Amaryllis purpurea* Ait. (*Vallota purpurea* Herb.).

TYPE: Louisiana; cultivated Amaryllis; A. B. Langlois, No. 589; July 26, 1886.

DISTRIBUTION: Specimens were examined from Louisiana, Puerto Rico, Bermuda, Italy, and Germany. Reported also from Alabama.

NOTE: An examination of different mounts made from the Langlois No. 589

specimen would indicate that Alternaria, Gloeosporium, and possibly two species of Cercospora are present. Ellis describes the conidia as being hyaline and the conidiophores 4-6$\mu$ wide. I have not found such a fungus. *C. amaryllidis* has been reported also on Pancratium and Hymenocallis, but the study of exsiccati material leads me to believe that the species on these hosts is distinct. See *C. pancratii* for differences.

**Cercospora fourcroyae** Obregon-Botero
Caldasia **3**: 49. 1941

Leaf spots circular to elliptic, 6-35 mm. in length, brown or with alternating zones of green and brown, center gray and often darkened by fruiting on both surfaces; stromata large, dark, loosely woven masses, up to 125$\mu$ in length; nonfasciculate to dense fascicles; conidiophores pale fuligenous or yellowish brown, closely and plainly septate, constricted at septa or otherwise irregular in width, not branched, not geniculate, straight or undulate to much curved, rarely forming an almost complete circle, medium spore scar at the bluntly rounded tip, 5.5-7.5 x 15-350$\mu$, the shortest ones often adjoining the longest ones in the fascicles; conidia hyaline to subhyaline, cylindric or only slightly attenuated, straight or nearly so, mostly 4-7 plainly septate, base subtruncate, tip bluntly rounded, 4-5.5 x 50-80$\mu$.

HOST: *Fourcroya gigantea* Engl. (=*Furcraea gigantea* Vent.).
TYPE: San José de Suaita, Dep. de Santandeo, Colombia; *Fourcroya gigantea;* Barrios-Ferrer; December 5, 1937.
DISTRIBUTION: Colombia, Brazil (Rodriguésia **9**: 25. 1945).

**Cercospora haemanthi** Kalchbrenner
Grevillea **9**: 24. 1881

Leaf spots circular, large, 5-12 mm. in diameter, pale tan to dark olivaceous, with or without a narrow reddish border; fruiting amphigenous, visible under the hand lens as numerous minute black pustules; stromata medium dark brown, globular to somewhat flattened, 30-75$\mu$ in length; fascicles mostly dense, sometimes coremoid; conidiophores pale to medium olivaceous brown, uniform in color, slightly attenuated, 0-2 geniculate, rarely branched, large spore scar at the subtruncate tip, 4.5-7 x 25-150$\mu$; conidia hyaline, acicular to cylindric, straight to slightly curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse, 4-6 x 20-220$\mu$.

HOSTS: *Haemanthus puniceus* L., *H. magnificus* Herb., *H. natalensis* Hook.
TYPE: Cape Colony, Africa; *Haemanthus puniceus;* MacOwan (No. 1020).
DISTRIBUTION: Natal, Transvaal, and Cape Provinces, South Africa.

**Cercospora pancratii** Ellis & Everhart
Jour. Mycol. **3**: 15. 1887

*Cercospora hymenocallidis* Patouillard, Bul. Soc. Mycol. France **28**: 142. 1912

Leaf spots circular to elongate, 2-20 mm. in length, pale tan to various shades of brown or red, dark to black margin; fruiting amphigenous, when abundant producing effuse dark gray layers; stromata pale reddish brown to almost black, filling stomatal opening to as large as 125$\mu$ in diameter; fascicles dense to extremely dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, septa indistinct, rarely branched or geniculate, 1 or 2 spore scars

at or near the subtruncate tip, 2.5-5 x 10-30$\mu$; conidia pale to very pale olivaceous, linear or very narrowly obclavate, straight to mildly curved, indistinctly multiseptate, base long obconically truncate, tip obtuse or conic, 2-4 x 20-125$\mu$, often persistent on the conidiophores.

HOSTS: *Hymenocallis crassifolia* Herb. (*Pancratium coronarium* Le Conte), *H. littoralis* Salisb., (*H. expansa* Herb. App.) *H. caribaea* Herb. (*H. declinata* M. Roem.) Hymenocallis sp., and possibly *Crinum americanum* L. and C. *asiaticum* L. var. *japonicum* Bak.

TYPES: Louisiana; *Pancratium coronarium;* A. B. Langlois, No. 656; June 1886. (*C. hymenocallidis*) Au Jardin du Musée a San José, Costa Rica; *Hymenocallis littoralis;* No. 11; July 1908.

DISTRIBUTION: Studied material from Costa Rica, Bermuda, Barbados, Louisiana, Mississippi, and Japan. It also is reported from India (Mundkur & Thirumalachar, Mycol. Paper 16. 1946) and Alabama.

NOTE: Solheim and Stevens (Mycologia 23: 379. 1931) also gave *C. hymenocallidis* as a synonym. *C. amaryllidis*, which somewhat resembles these species, has darker conidiophores and conidia, numerous minute spore scars near and at the conidiophore tip, and conidia with short obconically truncate base. *C. hemerocallidis* is sometimes confused with these species but it has hyaline acicular conidia.

**Cercospora anacardii** Muller & Chupp

Arquiv. Inst. Biol. Veg. Rio de Janeiro 1: 214. 1935

Leaf spots at first none, later irregularly shaped reddish brown spots, 1-4 mm. in diameter appear on the upper surface; on the corresponding lower surface is an effuse layer of fruiting, which at first is gray and then turns brown to almost black; stromata absent or slight; fascicles mostly not dense, but so closely crowded together that they make a continuous layer; conidiophores medium dark brown, uniform in color, somewhat irregular in width, closely and plainly septate, branched, 0-2 geniculate, straight to variously curved, small spore scar at bluntly rounded tip, 4-5 x 40-125$\mu$; conidia pale olivaceous, obclavate, nearly straight, multiseptate, base obconically truncate, tip subobtuse, 3-4.5 x 50-125$\mu$.

HOST: *Anacardium occidentale* L. (Cashew nut)

TYPE: Ponte Nova, Minas Geraes, Brazil; *Anacardium occidentale;* A. S. Muller, No. 218; Aug. 15, 1930.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. rhinocarpi* for differences between the two species on this host genus.

**Cercospora caffra** H. & P. Sydow

Ann. Mycol. 12: 267. 1914

Leaf spots subcircular, 1-4 mm. in length, reddish brown to almost black, immarginate, difficult to distinguish on a brown dried leaf; fruiting amphigenous but more abundant on the lower leaf surface, appearing under the hand lens as numerous minute black pustules; stromata globular, dark olivaceous, 20-85$\mu$ in diameter; fascicles dense to very dense; conidiophores in mass dark olivaceous, singly pale to very pale olivaceous, the tip being almost hyaline, irregular in width, not septate, not geniculate, not branched, straight or nearly so, rounded to conic tip, 3-5.5 x 8-25$\mu$, appearing longer when the conidia remain attached;

conidia pale to medium dark olivaceous, cylindric to obclavato-cylindric, straight to curved, 1-3 septate, base obconically truncate, tip obtuse, 3.5-6 x 10-55$\mu$.

TYPE: Nelspruit, Transvaal; *Sclerocarya caffra* Sond.; F. Hall, No. 6618; May 1913.

DISTRIBUTION: In various localities of Transvaal.

NOTE: Four collections from Transvaal were studied. Three were much alike and belonged to the genus Exosporium or possibly Coryneum. These included the type. But one collected June 1931 by L. C. C. Liebenberg (No. 2309) No. 26020, at the Research Station, Nelspruit, East Transvaal, had dark colored, thick walled conidia, plainly and closely septate. This would place the fungus in the genus Helminthosporium. It is possible that this last collection represents some other fungus, but my only mount is not conclusive enough to draw a final conclusion regarding it. I studied the rather meager type of this at Stockholm, Sweden.

**Cercospora chandleri** Hansford

Proc. Linnean Soc. London **1942-3**: 55. 1943

Apparently no definite spots, but effuse, olivaceous fruiting on the lower leaf surface, mixed with leaf hairs and mycelium of Asterina; stromata lacking; non-fasciculate; conidiophores arising as branches from procumbent threads, occasionally irregularly branched, dark brown, flexuose, multiseptate, pale and nodulose toward the tip, 3-4 x 300$\mu$; conidia cylindro-obclavate, pale olivaceous brown, base rounded to subtruncate, 2-10 septate, tip obtuse, 3-4 x 25-200$\mu$.

HOST: *Pseudospondias microcarpa* Engl. Hansford suggests that it may be pathogenic on Asterina, which also is present. It has never been definitely proved that any Cercospora is ever parasitic on another fungus. My work with the genus leads me to believe that it infects only chlorophyll-bearing plants.

TYPE: Kampala, Uganda; *Pseudospondias microcarpa;* Hansford, 2532 (P. Chandler, 2534).

DISTRIBUTION: Uganda.

NOTE: I regret not having studied this species.

**Cercospora comocladiae** Petrak & Ciferri

Ann. Mycol. **30**: 308. 1932

Leaf spots circular to irregular, 1-5 mm. in diameter, brown to black, with or without a raised line border; fruiting mostly epiphyllous; stromata subglobular, 25-50$\mu$; fascicles dense; conidiophores pale olivaceous brown, straight to slightly curved, not septate, not branched, rarely once geniculate, 3-4 x 8-12$\mu$; conidia cylindro-obclavate, subhyaline to very pale olivaceous, base obconically truncate, tip blunt, 3-7 septate, straight to curved, 2-3 x 28-52$\mu$.

HOST: *Comocladia ilicifolia* Sw. (*C. dodonaea* Britton, *Ilex dodonaea* L.).

TYPE: Near Santiago, prov. Santiago, San Domingo; *Comocladia dodonaea;* E. I. Ekman, No. 3880; Dec. 9, 1930.

DISTRIBUTION: Known only from the type locality.

NOTE: I was unable to procure a specimen of this species.

**Cercospora mangiferae** Koorders

Verh. K. Akad. Wetensch. II. **13**: 236. 1907

Leaf spots minute black, circular to angular specks, 0.5-1.5 mm. in diameter,

surrounded by a wide greenish to burnt sienna zone, making the entire spot 3-6 mm. in extent; fruiting in the black areas, hypophyllous; stromata dark fuligenous, subglobular, 25-55$\mu$ in diameter; most fascicles dense; conidiophores dark fuligenous, paler more narrow tip, not geniculate, not branched, not septate, spore scars not visible, 3-5 x 5-20$\mu$, when conidia are persistent, appearing much longer; conidia dark olivaceous, cylindric or spindle shaped to plainly obclavate, 3-7 distinctly septate, base short to long obconically truncate, tip subobtuse, 4-5.5 x 20-65$\mu$.

TYPE: Purworedjo, Prov. Kedu, Java; *Mangifera indica* L.; S. H. Koorders, No. 6, Serie 5; Sept. 21, 1905.

DISTRIBUTION: Mexico, Northern South America, San Domingo, Uganda, Java, Formosa, and Philippines.

NOTE: Dr. Lee Bonar sent me a collection from Mexico collected by Reed in 1939.

## CERCOSPORAE ON RHUS

A. Conidia hyaline, acicular, 2.5-5 x 35-175$\mu$; conidiophores 4-5.5 x 25-150$\mu$.
R. VERNICIFERA — *C. verniciferae*

AA. Conidia subhyaline to pale olivaceous, not acicular.

B. Conidia mostly 1-septate, cylindric, 2.5-4 x 20-50$\mu$; conidiophores pale to very pale, not branched, 3-5 x 10-40$\mu$.
R. CORIARIA, R. GLUTINOSA, R. VILLOSA — *C. marmorata*

BB. Conidia more than 3-septate.

C. Stromata prominent, 20-125$\mu$ in diameter; fascicles dense to very dense; conidiophores pale to medium in color, not bulbous at the base, slightly branched, 2.5-5 x 5-40$\mu$; conidia 3-5.5 x 20-120$\mu$, base long obconically truncate.
All Rhus species other than of the Toxicodendron group — *C. rhoina*

CC. Stromata slight or none; fascicles none to fairly dense; conidiophores medium dark in color, somewhat bulbous at the base, not branched, 3-6 x 15-50$\mu$; conidia 2.5-5 x 20-180$\mu$, base subtruncate to short obconic.
All Rhus species of the Toxicodendron group — *C. toxicodendri*

### **Cercospora marmorata** W. Tranzsch.

Index Sheet of Fasc. V, Mycotheca Rossica No. 250. 1911

*Cercosporina marmorata* (Tranzsch.) Sacc., Syll. Fung. 25: 895. 1931
*Cercospora rhoiscoriariae* Kuhnholtz-Lordat, Annales des Epiphytes. 13: 53. 1947
*Cercospora rhois* E. Castellani, Nuov. Giorn. Bot. Ital. 49: 29. 1942

Leaf spots angular, vein limited, 3-6 mm. in diameter, pale brown to ocher; fruiting hypophyllous; stromata slight; some fascicles dense; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, rarely septate or geniculate, not branched, minute spore scar at rounded tip, 3-5 x 10-40$\mu$; conidia cylindric, the longest ones slightly attenuated, subhyaline to pale olivaceous, straight, 0-1 septate, rarely catenulate, base obconic, tip blunt, 2.5-4 x 20-50$\mu$.

HOSTS: *Rhus coriaria* L., *R. glutinosa* Hochst. (*R. petitiana* A. Rich.), *R. villosa* L.

TYPES: Collected near Simeis, Tauria, Russia; *Rhus coriaria;* Schirajewsky; June 1, 1910. Co-type distributed as Mycot. Ross. 250. (*C. rhoiscoriariae*) Var, France; *Rhus coriaria;* M. Kuhnholtz-Lordat.

DISTRIBUTION: Russia, France, Ethiopia.

NOTE: See key above for differences among the species on Rhus. This is not a Cercospora, but not having seen the types, I cannot be sure that it is a Didymaria.

**Cercospora mombin** Petrak & Ciferri

Ann. Mycol. **30**: 322. 1932

Leaf spots subcircular, 3-6 mm. in diameter, olivaceous to grayish brown; fruiting amphigenous, but more abundant on the lower surface; stromata dark brown, 30-50$\mu$ in diameter; fascicles dense; conidiophores in mass dark, singly pale olivaceous brown, paler and more narrow toward the tip, not geniculate, not branched, slightly undulate, rarely septate, minute spore scar at rounded to conic tip, 3-4 x 5-30$\mu$; conidia subhyaline to very pale olivaceous, obclavato-cylindric, slightly curved, indistinctly septate, base long obconically truncate, tip subacute to subobtuse, 2-3.5 x 20-85$\mu$.

HOST: *Spondias purpurea* L. (*S. mombin* L.).

TYPE: Valle de Cibao, prov. Santiago, Hato del Yaque, ravine, San Domingo; *Spondias mombin;* R. Ciferri, No. 4018; May 1, 1931.

DISTRIBUTION: San Domingo and Venezuela.

**Cercospora phaeochlora** Speg.

Anal. Mus. Nac. Buenos Aires. **20**: 441. 1910;

Mycologia **33**: 87. 1941

Leaf spots at first none or watersoaked areas, which gradually change to dark reddish brown, irregular in shape, 2-7 mm. in length, without distinct margin; fruiting hypophyllous, sparingly effuse olivaceous patches on the less plainly colored spots; stromata small, olivaceous; fascicles dense; conidiophores pale olivaceous, uniform in color, irregular in width, undulate to tortuous, seldom geniculate, branched, sparingly septate, small spore scar at rounded to conic tip, 3-5 x 10-60$\mu$; conidia pale to medium yellowish olivaceous, cylindric, or slightly attenuated, straight to curved, 2-7 septate, sometimes constricted at septa, rarely catenulate, base rounded to long obconically truncate, tip rounded bluntly or short conic, 3-5.5 x 20-90$\mu$ or even 150$\mu$.

HOSTS: *Lithraea brasiliensis* March., *L. venenosa* Miers, (*L. caustica* Hook & Arn.).

TYPE: Jardin Botánico, Buenos Aires; *Lithraea brasiliensis;* C. Spegazzini (No. 947); April 28, 1906.

DISTRIBUTION: Chile, Argentine.

NOTE: The type which Spegazzini had was so sparse that he was not sure whether it was a Cercospora. He describes it with a question mark after the genus. Miss Anna E. Jenkins in 1940 procured a specimen from Chile, which appeared identical with the type which was sent me from Argentine for study.

**Cercospora pistaciae** sp. nov.

Maculae numerosae, minutae vel plus minus confluentes et saepe multo ma-

jores; caespituli laxe vel densiuscule sparsi, amphigeni; stromata parva; conidiophora subhyalina vel pallide olivacea, brevissima, 1.5-3 x 5-15$\mu$; conidia anguste obclavata, subhyalina vel pallidissime chlorinula, recta vel leniter curvata, 1.5-3 x 20-65$\mu$.

Leaf spots numerous, irregular in shape, 0. 5-3 mm. in diameter, or coalescing into large areas, grayish brown to brown, often bordered by a very narrow dark line; fruiting amphigenous; very small pale stromata; fascicles mostly dense; conidiophores subhyaline to very pale olivaceous, attenuated, septation, geniculation, branching and spore scars not evident, 1.5-3 x 5-15$\mu$; conidia narrowly obclavate or almost linear, subhyaline to faintly olivaceous, slightly curved, septa indistinct, base sharply obconic to subtruncate, tip blunt, 1.5-3 x 20-65$\mu$.

TYPE: San Antonio, Texas; *Pistacia vera* L.; George T. Ratliffe; Sept. 1931.

DISTRIBUTION: Known only from the type locality. May also have been collected in Maryland (Plant Dis. Rept. **25**: 541. 1941).

**Cercospora rhinocarpi** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8(52): 54. 1942

Leaf spots irregular, 2-8 mm. in extent, brown or grayish brown, with or without a raised line border; fruiting amphigenous; stromata dark brown, subglobular, 15-30$\mu$ in diameter; most fascicles dense; conidiophores in mass dark, singly pale brown, paler and more narrow toward the tip, not septate, rarely once geniculate, not branched, minute spore scar at narrowly rounded tip, 2-3.5 x 5-25$\mu$; conidia cylindro-obclavate, subhyaline to pale olivaceous, straight to slightly curved, indistinctly septate, base obconically truncate, tip blunt, 2-3.5 x 20-45$\mu$.

TYPE: Venezuela; *Anacardium rhinocarpus* DC.; A. S. Muller, No. 2047; Nov. 26, 1937.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. anacardii* for differences between the species on this host genus.

**Cercospora rhoina (rhuina)** Cooke & Ellis

Grevillea **6**: 89. 1878

*Cercospora copallina* Cooke, Grevillea **12**: 31. 1883

*Cercospora rhoina* var. *nigromaculans* Peck, N. Y. State Mus. Nat. Hist. Ann. Rept. **42**: 129. 1889

Leaf spots subcircular to irregular, 1-6 mm. in diameter, dark reddish brown to black, sometimes with a raised line border; fruiting amphigenous, on some host species chiefly on the upper leaf surface and with large, black, globular stromata, 50-125$\mu$ in diameter, on other species mostly on the lower surface and with stromata 20-80$\mu$ in diameter or rarely nonfasciculate without stromata; fascicles dense to very dense, compact to divergent; conidiophores pale to medium olivaceous brown, paler and more narrow toward the tip or uniform in width, sparingly septate, rarely branched or geniculate, longer ones undulate, tip rounded to conic, 2.5-5 x 5-40$\mu$, or occasionally as long as 85$\mu$; conidia subhyaline to pale olivaceous, cylindro-obclavate, straight to mildly curved, 3-7 septate, base long obconically truncate, tip subobtuse, 3-5.5 x 20-80$\mu$ or rarely as long as 120$\mu$.

HOSTS: Probably all the Rhus species other than the Toxicodendron group.

*Rhus glabra* L., *Rhus copallina* L., *Rhus typhina* L., *Rhus pumila* Michx., *Rhus canadensis* Mill., *R. aromatica* Ait. (*R. canadensis* Marsh.), *R. cotinus* L., *Rhus michauxii* Sarg., *Rhus lanceolata* (Gray) Britton. Apparently it includes all the species that Small lists under the genus, Schmaltzia.

TYPES: Newfield, N.J.; *Rhus glabra;* J. B. Ellis, No. 2656; June 7, 1877. (*C. copallina*) Aiken, S. Carolina; *Rhus copallina;* H. W. Ravenel, No. 586. (var. *nigromaculans*) Manor, Long Island; *Rhus copallina;* C. H. Peck; August.

DISTRIBUTION: Eastern United States and Southern Canada, as far west as western Kansas and Wisconsin; and as far south as Mississippi.

NOTE: Saccardo (Nuovo Giorn. Bot. Ital. n.s. **23**: 196. 1916) stated that *C. coppallina* was the same as *C. rhoina.* Ellis (Amer. Nat. **16**: 811. 1882 and Jour. Mycol. **1**: 34, 1885) suggested the same thing. See key, page 40 for differences among the species on Rhus.

**Cercospora schini** H. & P. Sydow

Mem. Herb. Boiss. 8 (4): 2. 1900

Leaf spots none or indistinct yellowish areas on the upper leaf surface; fruiting in olivaceous effuse layers on the corresponding lower surface; stromata lacking; nonfasciculate; conidiophores branches from procumbent intertwining threads, 4$\mu$ in diameter; conidia olivaceous, cylindric, straight to curved, mostly 3-septate, bluntly rounded ends, 4 x 30-55$\mu$.

TYPE: Cordoba, Argentine; *Schinus dependens* Orteg.; T. Stuckert; April 1899.

DISTRIBUTION: Known only from the type locality.

NOTE: The type material at Stockholm—at least the sample sent me for study—did not have a Cercospora present.

**Cercospora toxicodendri** Ellis

Amer. Nat. **16**: 811. 1882

*Cercospora bartholomei* Ellis & Kellerm., Jour. Mycol. **5**: 144. 1889

*Cercospora infuscans* Ellis & Ev., Proc. Acad. Nat. Sci. Phila. Part 1. **43**: 90. 1891

Leaf spots on upper surface indistinct, irregular, greenish to brownish areas, 2-5 mm. in extent, indistinctly aggregated fruit pustules in corresponding smoky colored patches on lower surface; stromata slight or none; fascicles none to fairly dense; conidiophores medium dark fuligenous brown, slightly branched, 0-2 geniculate, mostly one septate and that often near base, sometimes irregular in width or slightly bulbous near base, 3-6 x 15-50$\mu$ or longer; conidia subhyaline to very pale olivaceous, cylindric or slightly attenuated, almost vermicular, base short obconic to almost subtruncate, tip subobtuse, straight or mildly curved, multiseptate, 2.5-5 x 20-180$\mu$.

HOSTS: Probably all the Rhus species belonging to the Toxicodendron group. *Rhus toxicodendron* L., *R. rydbergii* Small, *R. venenata* DC. (*Rhus vernix* L.), *Rhus diversiloba* Torr. & Gr.

TYPE: Newfield, N.J.; *Rhus toxicodendron;* J. B. Ellis, No. 1347a; July 1882. (*C. bartholomei*) Rooks County, Kansas; *Rhus toxicodendron;* E. Bartholomew; Sept. 22, 1888. (*C. infuscans*) Porter's Station, Del.; *Rhus venenata;* A. Commons, No. 1621; Oct. 9, 1890.

DISTRIBUTION: Specimens examined represented the United States from Kansas eastward, and from Alabama to lower Ontario, Canada. Also reported from Japan.

NOTE: See key, page 40 for differences among the species on Rhus.

**Cercospora verniciferae** Chupp & Viégas
Bol. da Soc. Brasil de Agron. 8: 56. 1945

Leaf spots at first circular and 2-10 mm. in diameter but soon coalescing into large irregular areas, yellowish brown to almost black, often convex on the upper surface; fruiting hypophyllous; stromata slight, a few dark brown to almost black cells; fascicles 2-12 spreading stalks; conidiophores dark brown, paler and slightly more narrow toward the tip, multiseptate, not branched, straight to slightly curved, rarely geniculate, small to medium spore scar at the rounded to subtruncate tip, 4-5.5 x 25-150$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute, 2.5-5 x 35-175$\mu$.

TYPE: Santa Elisa Farm, Instituto Agronomico, Campinas, Est. Sao Paulo, Brasil; *Rhus vernicifera* DC.; A. S. Costa, No. 1518; April 28, 1936.

DISTRIBUTION: Known only from the type locality.

NOTE: This is the first species with hyaline acicular conidia to be reported on the Anacardiaceae. See key, page 40 for differences among the species on Rhus.

CERCOSPORAE ON ANONACEAE

A. Conidia hyaline, cylindro-obclavate.
  B. Conidia 4-10 x 40-80$\mu$; stromata lacking; mostly nonfasciculate, hypophyllous.
    ASIMINA — *C. asiminae*
  BB. Conidia 2-4 x 20-65$\mu$; stromata present; fasciculate, amphigenous.
    XYLOPIA — *C. xylopiae*
AA. Conidia colored; stromata usually present; mostly fasciculate.
  B. Conidiophores long, 4-6 x 60-220$\mu$; fascicles 2-15 stalks; conidia 5-8 x 50-110$\mu$.
    ANONA SENEGALENSIS — *C. scitula*
  BB. Conidiophores rarely as long as 100$\mu$; fascicles dense to very dense; conidia rarely wider than 6$\mu$.
    C. Conidia often much curved, 5-6 x 50-150$\mu$, sharply conic tip; conidiophores 3-4.5 x 20-110$\mu$; fruiting mostly hypophyllous.
      ANONA SQUAMOSA — *C. anonae*
    CC. Conidia straight to slightly curved, tip not acute; fruiting mostly epiphyllous.
      D. Conidiophores 3-5 x 10-60$\mu$; conidia 4-5.5 x 40-120$\mu$; stromata 40-90$\mu$.
        ANONA SENEGALENSIS — *C. oblecta*
      DD. Conidiophores 2-3.5 x 5-20$\mu$; conidia 2.5-5 x 15-75$\mu$; stromata 15-40$\mu$.
        ANONA PURPUREA — *C. caracasensis*

**Cercospora anonaceae** P. Hennings
Hedwigia 48: 18. 1909

HOSTS: Anonaceae, *Anona cherimolia* Mill., *Anona squamosa* L.

TYPE: Agua Branca, Sao Paulo; Anonaceae; A. Puttemans, No. 738; May 10-(16?), 1903.

NOTE: Although the type studied in Berlin did not show all the conidiophores in stilbaceous fascicles, most of the other collections from Mexico, Venezuela, and Ecuador did show closely appressed fascicles, often with short branches at right angles of the main conidiophores. This is considered a character of the Stilbaceae.

**Cercospora anonae** Muller & Chupp

Arquiv. Inst. Biol. Veg. Rio de Janeiro 1: 214. 1935

Leaf spots angular, vein limited, 0.5-4 mm. in length, narrow, black, immarginate, rarely a yellowish halo about the spot; fruiting amphigenous but chiefly hypophyllous; stromata small, dark; fascicles dense; conidiophores pale olivaceous, uniform in color and width, longest ones undulate to curved, slightly branched, not geniculate, sparingly septate, small spore scar at rounded tip, 3-4.5 x 20-110$\mu$; conidia obclavato-cylindric, pale to medium olivaceous, plainly and closely septate, almost straight to much curved, occasionally almost horseshoe shaped, base subtruncate, tip long conic, oftentimes giving a distinct obclavate appearance, 5-6 x 50-150$\mu$.

TYPE: Vicosa-Escola, Minas Geraes, Brazil; *Anona squamosa* L.; A. S. Muller (No. 335); April 7, 1932.

DISTRIBUTION: Specimen examined only from the type locality. Also reported from India.

NOTE: See key above for differences among the species on this host genus.

**Cercospora asiminae** Ellis & Kellerman

Jour. Mycol. 3: 103. 1887

Leaf spots angular, reddish brown to almost black, fading gradually into the healthy tissue, 1-10 mm. in diameter; fruiting mostly hypophyllous; stromata lacking; conidiophores rarely in fascicles, borne usually as single branches from procumbent threads, subhyaline to pale olivaceous or olivaceous brown, tip bluntly rounded, 6-8 x 10-35$\mu$; conidia cylindro-obclavate or spindle-shaped, hyaline, base long obconically truncate, straight to much curved, plainly and closely septate, 4-10 x 40-80$\mu$, fresh conidia often strongly guttulate, or the walls invisible and only the cell contents evident.

HOSTS: *Asimina triloba* Dunal, *A. parviflora* (Michx.) Dunal, *A. obovata* Nash.

TYPE: Mound City, Iowa; *Asimina triloba;* W. A. Kellerman; July, 1887.

DISTRIBUTION: Iowa, Florida, Georgia, Alabama, Mississippi, and Kansas.

**Cercospora caracasensis** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8(52): 39. 1942

Leaf spots dark reddish brown to almost black, angular, vein-limited; fruiting mostly epiphyllous; stromata pale olivaceous brown, subspherical to irregular, 15-40$\mu$ in diameter; fascicles dense; conidiophores pale to very pale olivaceous, paler and more narrow toward the tip, septation, geniculation, and branching not present, longest ones slightly curved, minute spore scar at narrowly rounded tip, 2-3.5 x 5-20$\mu$; conidia narrowly obclavate, sometimes almost linear, subhyaline to very pale olivaceous, straight to mildly curved, indistinctly septate, base mostly short obconic, tip subobtuse, 2.5-5 x 15-75$\mu$.

TYPE: Caracas, Venezuela; *Anona purpurea* Moc. & Sesse; A. S. Muller, No. 2111; March 1, 1938.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 44 for differences among the variety on this host genus.

**Cercospora oblecta** Sydow

Ann. Mycol. 33: 235. 1935

Leaf spots subcircular to irregular, 2-5 mm. in diameter, reddish brown, with-

out distinct border, the oldest spots may gradually turn grayish brown or dull gray; fruiting epiphyllous; stromata globular, almost black, 40-90$\mu$ in diameter; fascicles very dense; conidiophores pale to medium olivaceous, uniform in color, crooked or undulate, irregular in width, rarely clavate, not geniculate, not branched, sparingly septate, small spore scar at rounded tip, 3-5 x 10-60$\mu$; conidia pale to medium olivaceous, cylindro-obclavate or longest ones obclavate, plainly and sometimes closely septate, straight to mildly curved, base obconically truncate to subtruncate, tip subobtuse, 4-5.5 x 40-120$\mu$.

TYPE: Nelspruit, East Transvaal; *Anona senegalensis* Pers.; L. C. C. Liebenberg, No. 26043; April, 1931.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 44 for differences among the species on this host genus.

**Cercospora scitula** Sydow

Ann. Mycol. 33: 236. 1935

Leaf spots large dark brown blotches; fruiting in sooty effuse layers, hypophyllous; stromata lacking or only a few brown cells; fascicles 2-15 stalks; conidiophores medium dark olivaceous brown, uniform in color, often wider near the tip, plainly multiseptate, upper third undulate, not distinctly geniculate, not branched, small spore scar at the bluntly rounded tip, 4-6 x 60-220$\mu$; conidia concolorous, obclavate, plainly 3-8 septate, nearly straight, base long obconically truncate, tip obtuse, 5-8 x 50-110$\mu$.

TYPE: Research Station, Nelspruit, Transvaal; *Anona senegalensis* Pers.; L. C. C. Liebenberg, No. 26027; April, 1931.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 44 for differences among the species on this host genus.

**Cercospora xylopiae** Viégas & Chupp

Bol. da Soc. Brasil. de Agron. 8: 58. 1945

Leaf spots subcircular to irregular, 4-8$\mu$ in diameter or extending between side veins from midrib to leaf margin, dark brown to almost grayish brown, wide dark line margin; fruiting amphigenous, somewhat effuse on the lower surface; stromata small, brown, 15-30$\mu$ in diameter; fascicles 2-15 divergent stalks; conidiophores subhyaline to very pale fuligenous, somewhat attenuated toward the hyaline tip, indistinctly septate, not branched, rarely once geniculate, straight to mildly curved, medium spore scar at the subtruncate tip, 2.5-4 x 30-150$\mu$; conidia hyaline to subhyaline, cylindric to cylindro-obclavate, often catenulate, straight, indistinctly 1-5 septate, ends subtruncate or tip rounded, 2-4 x 20-65$\mu$. Detached conidiophores may resemble long pale colored conidia.

TYPE: Ribeirao Preto Exp. Sta., Ribeirao Preto, Sao Paulo, Brasil; *Xylopia grandiflora* A. St. Hil.; A. S. Costa and H. P. Krug, No. 690; May 30, 1935.

DISTRIBUTION: Known only from the type locality.

NOTE: The only other hyaline spored species on the Anonaceae is *C. asiminae*, the conidia of which measure 4-10 x 40-80$\mu$.

**Cercospora apocyni** Ellis & Kellerman

Bul. Torrey Bot. Club 11: 121. 1884

Leaf spots circular to angular, uniformly reddish brown or with gray center and dark red border, 1-4 mm. in diameter; fruiting amphigenous; stroma small,

pale brown, sometimes almost hyaline; fascicles usually dense; conidiophores hyaline to very pale brown in lower half, sometimes attenuated toward tip, not or rarely septate or geniculate, not branched, no spore scars present or very small, 2.5-4 x 10-25$\mu$; conidia obclavate or rarely cylindric, hyaline, straight or curved, mostly 3-6 septate, base obconic to rounded, tip obtuse to subacute, 2.5-5 x 20-60$\mu$.

HOSTS: Apocynum sp., *A. cannabinum* L., (*A. hypericifolium* Ait.), *A. andrasaemifolium* L., *A. sibiricum* Jacq.

TYPE: Manhattan, Kansas; Apocynum sp.; W. A. Kellerman No. 601; Aug. 1884.

DISTRIBUTION: Reported from Kansas, Nebraska, Iowa, Wisconsin, in Canada along Lake Huron, and Trinidad.

NOTE: This could just as well be classed as a Cercosporella. In some collections the conidiophores are perfectly hyaline. Ellis has stated that "it stands ambiguously between Cercospora and Ramularia" (Jour. Mycol. 1: 62. 1885). Trelease has named it *Cercosporella Apocyni* (E. & K.) (Wisc. Acad. Sci. Arts & Lett. 6: 14. 1884).

**Cercospora byliana** Sydow

Ann. Mycol. 22: 433. 1924

Leaf spots irregular or angular, 2-8 mm. in diameter, gray with reddish tinge, narrow reddish brown line border; fruiting amphigenous; stromata globular to irregular, 50-85$\mu$ in length; pale olivaceous brown; fascicles dense to very dense; conidiophores mostly elongated peripherial cells of the stromata, pale to very pale olivaceous, paler and more narrow toward the tip, not septate, not geniculate, not branched, minute spore scar at the tip, 3-4.5 x 5-30$\mu$; conidia obclavate, pale to very pale olivaceous, straight to slightly curved, indistinctly multiseptate, base subtruncate to obconically truncate, tip subobtuse, 3.5-5 x 40-120$\mu$.

HOST: *Allamanda cathartica* L.

TYPE: Tzaneen, Transvaal; *Allamanda cathartica;* P. A. van der Byl, No. 1508; July, 1924.

DISTRIBUTION: Known only from the type locality.

NOTE: Mr. van der Byl sent me the co-type from South Africa.

**Cercospora holarrhenae** Thirumalachar & Chupp

Mycologia 40: 355. 1948

Leaf spots dark reddish brown to almost black, angular, bounded by the leaf veins, 2-8 mm. in diameter or coalescing into large areas; fruiting chiefly epiphyllous; stromata dark brown to black, subglobular, 20-60$\mu$ in diameter; fascicles very dense, slightly divergent; conidiophores pale to very pale fuligenous, paler and more narrow toward the rounded tip, rarely septate, not branched, not geniculate, straight to undulant, 2-4 x 10-40$\mu$; conidia subhyaline to very pale olivaceous, narrowly obclavate or sometimes cylindric, straight to curved, indistinctly multiseptate, base short obconically truncate, tip subacute or conic, 2-4 x 20-75$\mu$.

HOST: *Holarrhena antidysenterica* Wall.

TYPE: Balehonnur, Mysore, India; *H. antidysenterica;* M. J. Thirumalachar; April 29, 1945.

DISTRIBUTION: Known only from the type locality.

**Cercospora liebenbergii** Sydow
Ann. Mycol. 33: 235. 1935

Leaf spots subcircular to irregular, single or confluent, 5-10 mm. in diameter, at first uniformly red to reddish brown, after which the center gradually becomes dingy gray; fruiting amphigenous but more abundant on the upper leaf surface; stromata dark brown, globular to elongate, 30-50$\mu$; fascicles dense to very dense; conidiophores in mass dark brown, singly pale to very pale olivaceous brown, paler and more narrow toward the tip which occasionally is bifurcate, seldom septate, 0-1 geniculate, small spore scar at the narrowly rounded tip, 3-5 x 5-35$\mu$, base sometimes wider; conidia subhyaline to pale olivaceous, cylindro-obclavate, shortest ones may be distinctly cylindric, straight to curved, indistinctly multiseptate, base long obconically truncate, tip obtuse to conically acute, 2.5-4 x 25-70$\mu$.

HOST: Rauwolfia sp., *R. caffra* Sond.

TYPE: Schagen, distr. Nelspruit, Transvaal; *Rauwolfia* (cfr.) *caffra;* L. C. C. Liebenberg, No. 26177; March, 1932.

DISTRIBUTION: Transvaal and Venezuela.

NOTE: This has paler, more sharply tipped conidia than does *C. byliana.* The two species differ in other minor characters. See also *C. rauwolfiae* for differences between the species on this host genus.

**Cercospora neriella** Saccardo
Michelia 2: 294. 1881

Leaf spots subcircular or when coalescing irregular in outline, 3-10 mm. in diameter, small gray center, wide reddish brown border; fruiting chiefly epiphyllous; stromata olivaceous to dark olivaceous brown, 25-125$\mu$ in diameter; fascicles mostly very dense; conidiophores pale to very pale olivaceous, almost hyaline near the tip, irregular in width, 0-3 septate, not branched, rarely geniculate, minute spore scar at the tip, 3-5 x 5-35$\mu$; conidia hyaline, cylindric, nearly straight, indistinctly 1-5 septate, tip bluntly rounded, base subtruncate to fairly sharply obconic, 3-5 x 15-50$\mu$.

HOST: *Nerium oleander* L.

TYPE: Padova, Italy; *Nerium oleander;* O. Penzig; summer, 1880.

DISTRIBUTION: Italy, India, Formosa, Tanganyika, Argentine, Palestine, Cyprus, Tunis, and Southern Russia. The species has been reported from North America (Flora Ludoviciana No. 1155; U. S. Dept. Agr. Bul. 1366: 67. 1926). No. 1155 showed only a Colletotrichum and some pycnidial form. All the Cercosporae collected in North America on Nerium appear to be *C. nerii-indici,* which is mostly nonfasciculate and has colored conidia.

**Cercospora nerii-indici** Yamamoto
Jour. Soc. Trop. Agr. 6: 605. 1934

Leaf spots indefinite, finally a slight yellowing on upper surface; on corresponding lower surface are slightly darkened irregular areas resulting from the very scantily effuse olivaceous fruiting layer; stromata lacking or small; nonfasciculate to slightly fasciculate; conidiophores subhyaline to pale olivaceous brown, very short branches from procumbent threads among the leaf hairs, branches not septate, not geniculate, spore scars slight or none, 3-4.5 x 5-25$\mu$, or sometimes of indeterminate length; conidia subhyaline to very pale olivaceous,

cylindric to cylindro-obclavate, longest ones usually prominently curved, base long obconically truncate, tip blunt, indistinctly pluriseptate, 3-4.5 x 20-100$\mu$.

HOSTS: *Nerium oleander* L., *N. odorum* Ait. (*N. indicum* Mill.)

TYPE: Taihoku, Formosa; *Nerium indicum;* W. Yamamoto; Febr. 28, 1934.

DISTRIBUTION: Formosa, Japan, India, and Florida.

NOTE: *C. neriella* Sacc. which apparently has mistakenly been reported from North America has hyaline cylindric conidia, 3-5 x 15-50$\mu$, and dense fascicles.

**Cercospora peregrina** sp. nov.

Maculae orbiculares, 5-15 mm., pallidissime brunneolae, centro atro-brunneae; caespituli amphigeni, laxe vel densiuscule sparse; stromata globosa, fusca, 20-35$\mu$; conidiophora pallide olivaceo-brunnea, in superiore parte attenuata et fere hyalina, recta vel leniter undulata, 3-6 x 15-80$\mu$; conidia hyalina, obclavata, ad basim truncata, ad apicem acuta, recta vel curvata, 2-4 x 30-120$\mu$.

Leaf spots circular, 5-15 mm. in diameter, wide grayish to pale tan margin, small dark center which has one or more zones of tan and darker colors, spots frequently dehiscent leaving large holes in the leaf blade; fruiting amphigenous but more easily observed on the upper surface; stromata globular, brown, 20-35$\mu$ in diameter; fascicles 5-25 widely spreading stalks; conidiophores pale to very pale olivaceous brown, attenuated and almost hyaline toward the tip, sparingly septate, rarely branched or geniculate, straight to mildly curved or undulate, subtruncate tip, 3-6 x 15-80$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-4 x 30-120$\mu$.

TYPE: Intercepted by U. S. Quarantine Inspector at Brownsville, Texas; *Tabernaemontana coronaria* Willd.; Jan. 11, 1944.

DISTRIBUTION: Probably from Mexico.

NOTE: See also *C. tabernaemontanae.* The name is derived from the word indicating "foreign."

**Cercospora plumeriae** sp. nov.

Maculae epiphyllae, orbiculares vel irregulares, olivaceo-fuscae vel griseae, 2-15 mm.; caespituli plerumque epiphylli, subfasciculati vel densiuscule sparsi; stromata ca. 15-40$\mu$ diam. metiente; conidiophora fusca, in superiore parte dilutiora ibique subinde fere subhyaline, evidenter geniculata, simplicia, 3-5 x 30-80$\mu$; conidia obclavato-cylindracea, recta vel leniter curvata, pallide olivacea, 1-5 septata, 2-4 x 20-65$\mu$.

Leaf spots on upper surface evident, subcircular to irregular, 2-15 mm. in diameter, olive brown when young and ashy gray with a thin brownish margin when mature, on lower surface indistinct, dull brown; fruiting chiefly epiphyllous, on upper surface consisting of fairly compact fascicles on medium sized stromata, and when hypophyllous, subfasciculate or single branches from procumbent threads; conidiophores pale to medium brown, subhyaline and slightly attenuated toward the tip, subflexuous to plainly geniculate, 0-2 septate, not branched, 3-5 x 30-80$\mu$; conidia obclavato-cylindric, straight to mildly curved, pale olivaceous to almost subhyaline, distinct scar of attachment at the base, tip subobtuse, 1-5 septate, 2-4 x 20-65$\mu$.

HOST: *Plumeria acutifolia* Poiret (*P. acuminata* Ait.)

TYPE: Dacca Farm, Tejgaon, Dacca, Bengal, India; *Plumeria acutifolia* Poiret; D. Ganguly; Nov. 4, 1946.

DISTRIBUTION: Known only from the type locality.

**Cercospora punjabensis** Sydow
Ann. Crypt. Exot. 2: 268. 1929

Leaf spots circular, 2-4 mm. in diameter, gray, with dingy brown border; fruiting hypophyllous; stromata small; some fascicles dense; conidiophores pale to medium brown, septate, slightly geniculate, rarely branched, 3-5.5 x 40-85$\mu$; conidia hyaline to very pale olivaceous, obclavate, indistinctly multiseptate, 3.5-5 x 45-85$\mu$.

TYPE: Naganwari, Pathankot, Punjab, India; *Vallarus heynii* Spreng.; J. H. Mitter, No. 2280; Aug. 1910.

DISTRIBUTION: Known only from the type locality.

NOTE: I was unable to get any type material or other specimens for examination.

**Cercospora rauwolfiae** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 54. 1942

Leaf spots indistinct or none; fruiting in irregular, olivaceous, effuse patches on the lower leaf surface, minute to large areas; stromata lacking or a few dark brown cells; fascicles mostly dense; conidiophores pale to medium dark brown, paler and more narrow toward the tip, multiseptate, rarely branched, variously curved or crooked to slightly geniculate, numerous minute spore scars at and near the tip, 3-4.5 x 10-75$\mu$; conidia pale olivaceous, cylindric, straight to mildly curved, 1-5 septate, base subtruncate to long obconically truncate, tip obtuse, 3-5.5 x 15-45$\mu$.

HOST: *Rauwolfia canescens* L. (*R. hirsuta* Jacq.)

TYPE: Ocumare de la Costa, near beach, Aragua, Venezuela; *Rauwolfia hirsuta;* H. H. Whetzel and A. S. Muller, No. 3228; March 29, 1939.

DISTRIBUTION: Several collections sent from Venezuela.

NOTE: See also *C. liebenbergii* for differences between the two species on this host genus.

**Cercospora repens** Ellis & Everhart
Jour. Mycol. 3: 14. 1887

Leaf spots circular to irregular, large, reddish brown to dark brown, sometimes with a slightly darker margin, difficult to distinguish on old dried specimens; fruiting sparse, indistinctly effuse on lower leaf surface; stromata lacking; non-fasciculate; conidiophores interlacing, branched, septate threads, pale to very pale olivaceous brown, uniform in color and width, not geniculate, spore scars not evident, 2-3$\mu$ wide and of indeterminate length; conidia obclavate to cylindro-obclavate, pale olivaceous, curved, indistinctly multiseptate, base long obconically truncate, tip subobtuse, 2-3.5 x 40-110$\mu$.

TYPE: Louisiana; *Trachelospermum difforme* Gray; Langlois, No. 512; Sept. 2, 1886.

DISTRIBUTION: Known only from the type locality.

NOTE: The host was spelled wrongly, Brachylospermum.

**Cercospora tabernaemontanae** H. & P. Sydow
Philipp. Jour. Sci. (Bot.) 8: 507. 1913

Leaf spots circular, 3-10 mm. in diameter, pale tan to dingy gray with a narrow brown border; fruiting amphigenous; stromata globular to elongate, dark brown, 20-50$\mu$; fascicles dense to very dense; conidiophores in mass dark brown,

singly pale to very pale olivaceous brown, almost hyaline tip, fairly uniform in width, curved or crooked, not geniculate, rarely branched or septate, minute spore scar at rounded to conic tip, 2-4 x 10-35$\mu$; conidia subhyaline to pale olivaceous, cylindro-obclavate, straight to slightly curved, indistinctly multiseptate, base obconic, tip subobtuse to conic, 2-3.5 x 15-65$\mu$.

TYPE: Luzon, Province of Laguna, Los Banos, Philippines; *Tabernaemontana pandacaqui* Poir.; Baker, No. 1027; April 20, 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: This resembles *C. liebenbergii* and *C. byliana* but the three can be distinguished by the shape, septation and color of the conidia. See also *C. peregrina*.

**Cercospora wrightiae** Thirumalachar & Chupp

Mycologia **40**: 362. 1948

Leaf spots circular, pale brown to dingy white, narrow dark reddish brown margin, 0.5-4 mm. in diameter; fruiting amphigenous; stromata subglobular, dark brown, 25-60$\mu$; fascicles dense, fairly compact; conidiophores pale to medium olivaceous brown, paler and more narrow toward the bluntly rounded tip, sparingly septate, not branched, rarely geniculate, straight to curved or bent, 4-6 x 10-35$\mu$; conidia pale to medium olivaceous, obclavate, straight to mildly curved, 1-9 septate, long obconically truncate base, obtuse tip, 3-5.5 x 20-65$\mu$.

HOST: *Wrightia tinctoria* R. Br.

TYPE: Bangalore, India; *W. tinctoria;* M. J. Thirumalachar; Dec. 26, 1945.

DISTRIBUTION: Known only from the type locality.

## CERCOSPORAE ON AQUIFOLIACEAE (ILEX)

A. Conidia hyaline, acicular or obclavate; leaf spots white or gray with purple border.
  B. Conidia acicular, 3-5 x 25-90$\mu$; conidiophores branched, clavate, tortuous, 4-6.5 x 40-175$\mu$.
    ILEX OPACA — *C. ilicis-opacae*
  BB. Conidia obclavate; conidiophores not branched, not clavate, nearly straight.
    C. Fruiting chiefly epiphyllous; stromata 30-150$\mu$ in diameter; conidiophores 3-4 x 5-40$\mu$; conidia 3-4 x 20-60$\mu$.
      ILEX PARAGUENSIS — *C. mate*
    CC. Fruiting amphigenous; stromata 10-50$\mu$; conidiophores 4-6 x 15-100$\mu$; conidia 2-3.5 x 35-120$\mu$.
      ILEX PARAGUENSIS — *C. ilicicola*

AA. Conidia colored; leaf spots not white nor gray; conidiophores not branched.
  B. Stromata prominent, 20-120$\mu$ or larger; fascicles very dense; conidiophores 3-5 x 10-50$\mu$.
    C. Conidia 2-4 x 20-100$\mu$, cylindric to cylindro-obclavate.
      ILEX QUERCIFOLIA (I. OPACA), I. CASSINE — *C. pulvinula*
    CC. Conidia 4-6 x 15-60$\mu$, obclavato-cylindric.
      ILEX AMARA — *C. yerbae*
  BB. Stromata small, 15-50$\mu$ or less; conidia cylindro-obclavate.
    C. Conidiophores short, 2-3.5 x 5-30$\mu$; conidia 2.5-5 x 20-100$\mu$.
      ILEX OLDHAMI — *C. naitoi*

CC. Conidiophores long, 4-5 x 20-160$\mu$.
D. Fruiting chiefly epiphyllous; conidia 2-4 x 25-75$\mu$.
ILEX GLABRA — *C. ilicis*
DD. Fruiting amphigenous; conidia 4-5 x 40-160$\mu$.
ILEX MICROCOCA — *C. ilicis-microccocae*

**Cercospora cheonis** Chupp & Linder

Mycologia **29**: 27. 1937

Leaf spots circular, 1-5 mm. in diameter, at first dark to black and then gradually becoming tan to gray, bordered by a prominently raised line, many are dehiscent giving a shot-hole effect; fruiting hypophyllous; stromata dark, globular, 25-50$\mu$ in diameter; fascicles dense; conidiophores medium to dark brown, uniform in color, slightly irregular in width, multiseptate, sparingly branched, curved to tortuous, rarely geniculate, spore scars not visible at the bluntly rounded tips, 3-5 x 40-100$\mu$; conidia subhyaline to pale olivaceous, cylindric, straight or nearly so, 1-septate, catenulate, ends rounded bluntly, 3-4 x 15-30$\mu$.

HOST: Ilex sp.

TYPE: Huang Yen Ssu, Hsing Tzu Hsien, China; Ilex sp.; S. Y. Cheo (No. 922); Sept. 13, 1932.

DISTRIBUTION: Known only from the type locality.

NOTE: The cylindric, once septate conidia show this species to be a Didymaria rather than a Cercospora.

**Cercospora ilicicola** Maublanc

Bol. Agr. Sao Paulo, Serie 16A. **4**: 321. 1915; Bul. Soc. Mycol. de France. **36**: 41. 1920

*Cercosporina ilicicola* (Maubl.) Sacc., Syll. Fung. **25**: 896. 1931

Leaf spots circular, 1-3 mm. in diameter, dingy gray, purple border; fruiting amphigenous; stromata brown, globular, a few cells to 50$\mu$ in diameter; most fascicles dense; conidiophores pale to medium brown, paler and more narrow toward the tip, plainly multiseptate, not branched, straight or 1-3 geniculate, medium sized spore scar at the bluntly rounded tip, 4-6 x 15-100$\mu$; conidia hyaline, obclavate, straight to mildly curved, indistinctly multiseptate, base short obconically truncate, tip subacute, 2-3.5 x 35-75$\mu$, rarely 120$\mu$.

HOST: *Ilex paraguensis* A. St. Hil.

TYPE: Paraná, Brazil; *Ilex paraguensis;* Eugenio Rangel (No. 552) July, 1912.

DISTRIBUTION: Brazil. Has been reported also from Florida (P. Dis. Reporter Suppl. 148: 272. 1944) but this was *C. ilicis-opacae.* It also was reported from South Carolina and Georgia (Plant Disease Reporter **28**: 969. 1944). These collections may also have been the other species on Ilex, especially since they were collections of *Ilex opaca.*

NOTE: The hyaline conidia and long, wide conidiophores separate this species from the others on Ilex. *C. ilicicola* has been reported present in Texas (U.S.D.A. Bul. 1366: 54. 1926) but I believe this also was *C. ilicis-opacae.* Naito (Mem. Coll. Agr. Kyoto, Imp. Univ. **47**: 50. 1940) reported *C. ilicicola* in Japan, but finding that the Japanese collection had colored conidia and showed other differences, Togashi named the Japanese species, *C. naitoi.*

**Cercospora ilicis** Ellis

Bul. Torrey Bot. Club 8: 65. 1881

Leaf spots circular, 3-5 mm. in diameter, brown, usually with black raised border; fruiting sometimes amphigenous, often only epiphyllous; stromata small, black, 20-35$\mu$ in diameter; fascicles mostly dense, 3-25 stalks; conidiophores medium to dark brown, plainly multiseptate, undulate, rarely 1-2 mildly geniculate, not branched, subhyaline conic tip with small spore scar, 4-5 x 20-125$\mu$, some collections show only short ones which are not septate; conidia cylindro-obclavate, subhyaline to pale olivaceous, straight to mildly curved, base obconic to subtruncate, tip subobtuse, septa indistinct, 2-4 x 25-75$\mu$.

TYPE: Newfield, New Jersey; *Ilex glabra* (L.) Gray; J.B. Ellis No. 1345a; Sept., 1880; cotype distributed as N. Amer. Fungi No. 548.

DISTRIBUTION: Southern states and as far north as New Jersey.

NOTE: The obclavate, subhyaline to faintly colored conidia separate this species from the others on Ilex. Some herbarium collections also record it on *Ilex opaca,* but on the latter host the Cercospora in each instance proved to be *C. pulvinula.* Tharp (Mycologia 9: 110. 1917) records it as *C. illicis* Maublanc.

**Cercospora ilicis-micrococcae** Sawada

Formosa Agr. Res. Inst. Rept. 85: 109. 1943

NOTE: This is reported on *Ilex micrococca* Maxim. from Formosa (Taiwan), but the description is too brief to determine if it is new. Sawada says: Leaf spots brown, 1-3 mm. in diameter; fascicles mostly 3-4 stalks, sometimes as many as 10-12; fruiting amphigenous; conidiophores brown, 3-9 septate, 4.5-5 x 47-157$\mu$; conidia pale olive, 3-9 septate, 4.5-5 x 47-157$\mu$.

**Cercospora ilicis-opacae** sp. nov.

Maculae rotundae, 1-3 mm. diam., albae, lata purpurea cinctae; caespituli amphigeni, laxe vel densiuscule sparsi; conidiophora aequabiliter olivaceo-fusca, multiseptati, tortuosi, ramulis 1-3 praedita, 4-6.5 x 40-175$\mu$; conidia hyalina, obclavata, spurie multiseptata, recta vel leniter curvata, ad basim truncata, 3-5 x 25-90$\mu$.

Leaf spots circular, 1-3 mm. in diameter, white, with wide purple border; fruiting amphigenous; stromata small, brown; fascicles divergent, 3-20 stalks; conidiophores medium olivaceous brown, uniform in color, irregular in width, occasionally distinctly clavate, multiseptate, tortuous, abruptly multigeniculate, plainly branched, conic to subtruncate tip, 4-6.5 x 40-175$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to mildly curved, base truncate, tip subacute, 3-5 x 25-90$\mu$.

TYPE: Georgetown, S. Car; *Ilex opaca* Ait.; Blizzard (Carter No. 754); Oct. 14, 1943. (Cotype) St. Simon, Georgia; *Ilex opaca;* Blizzard, No. 764; Nov. 25, 1943.

DISTRIBUTION: Georgia, South Carolina.

NOTE: See the key for differentiation among the species on Ilex.

**Cercospora mate** (Spegazzini) Marchionatto

Inst. de Sanidad Vegetal Argentina 2(21): 7. 1946

*Cercosporina mate* Speg., Anal. Mus. Nac. Buenos Aires 20: 426. 1910

Leaf spots circular, 5-10 mm. in diameter, gray, purple border; fruiting epi-

phyllous; stromata black, 30-150$\mu$ in length, irregular in shape; conidiophores in mass fairly dark, singly pale brown, tip almost hyaline, sparingly septate, straight to slightly flexuous, not distinctly geniculate, not branched, 3-4 x 5-40$\mu$; conidia hyaline, obclavate, straight to slightly curved, indistinctly multiseptate, base subtruncate to long obconically truncate, tip subacute, 3-4 x 20-60$\mu$.

HOST: *Ilex paraguensis* A. St. Hil.

TYPE: Near San Ignacio, Argentine; *Ilex paraguensis;* J. Torre, July 1908; also B. Zamboni, June 1909.

DISTRIBUTION: Collected a few times in Argentine.

NOTE: The hyaline conidia and the short conidiophores arising from large stromata, separate this species from the others on *Ilex*. See key, page 51.

**Cercospora naitoi** Togashi

Trans. Sapporo Nat. Hist. Soc. **17**: 101. 1942

*Cercospora mate* Naito, Mem. Coll. Agr. Kyoto Imp. Univ. No. 47: 49. 1940

Leaf spots subcircular, 1.5-10 mm. in diameter, dark reddish brown, immarginate; fruiting mostly epiphyllous; stromata globular, dark brown, 15-30$\mu$ in diameter; most fascicles dense; conidiophores in mass dark, singly pale olivaceous, uniform in color and width, septation, geniculation and branching not evident, minute spore scar at rounded tip, 2-3.5 x 5-30$\mu$ (Naito's measurements 4.5-5 x 25-50$\mu$); conidia pale olivaceous, cylindro-obclavate, straight to curved, indistinctly multiseptate, base subtruncate to long obconically truncate, tip subacute, 2.5-5 x 20-100$\mu$.

HOSTS: *Ilex oldhami* Miq., *Ilex serrata* Thunb.

TYPE: Pref. Kyoto: Mukomachi; *Ilex oldhami;* N. Naito; Oct. 10, Oct. 23, and Dec. 3, 1935.

DISTRIBUTION: Collections received from Kyoto, Japan and Mori, Oita, Japan.

NOTE: Dr. Togashi sent me a collection made Sept. 20, 1924, and suggested the name and synonym for the species, although Naito really had written it *Cercospora mate* Speg. So far as my studies go, each species of Ilex has its own species of Cercospora, but this particular observation does not seem to hold in this instance.

**Cercospora pulvinula** Cooke & Ellis

Grevillea **7**: 40. 1878

Leaf spots not present or large indistinct brownish blotches on upper surface; fruiting closely aggregated minute black pustules on the corresponding lower surface or when distinct brown spots, 2-5 mm. in diameter are present, fruiting is epiphyllous; dark brown to almost black globular stromata, 30-120$\mu$ in diameter; fascicles very dense or single branches from procumbent threads; conidiophores pale fuligenous or olivaceous brown, uniform in color, usually slightly attenuated, 0-1 septate, not branched, not geniculate, straight to curved or undulate, minute spore scar at rounded tip, 3-4 x 10-40$\mu$, rarely 75$\mu$; conidia subhyaline to pale olivaceous, cylindric to cylindro-obclavate, indistinctly 1-5 septate, rounded ends or base short obconic, straight to slightly curved, 2-4 x 20-70$\mu$, rarely 100$\mu$.

HOSTS: *Ilex opaca* Ait. (=*I. quercifolia* Meerb.). *I. cassine* Walt.

TYPE: Newfield, N. Jersey, on Holly leaves; J. B. Ellis (No. 3042).

DISTRIBUTION: New Jersey, Florida, Mississippi, and Texas.

NOTE: Delicate conidiophores, large stromata; and colored narrow conidia separate this species from the others on Ilex. The species on this host genus have sometimes been confused so that the distribution is not known definitely. See key, page 51.

**Cercospora yerbae** Spegazzini

Anal. Mus. Nac. Buenos Aires Ser. III **10**: 140. 1909

Leaf spots circular, 2-5 mm. in diameter, tan to almost black, a raised grayish line border; fruiting hypophyllous; stromata black, irregular in shape, 75-200$\mu$ in length; fascicles very dense; conidiophores very dark in mass, singly pale to medium olivaceous brown, paler tip, slightly irregularly in width, 1-3 septate, almost straight, not branched, not geniculate, small spore scar at the bluntly rounded tip, 3-5 x 10-50$\mu$; conidia obclavato-cylindric, pale olivaceous, straight to curved, 1-5 septate, base obconic to almost subtruncate, tip obtuse, 4-6 x 15-60$\mu$.

HOST: *Ilex amara* Bonpl.

TYPE: Villa Encarnación, Misiones, Argentine; *Ilex amara;* C. Spegazzini (No. 956); Jan. 1907.

DISTRIBUTION: Known only from the type locality.

NOTE: The very large stromata, colored conidia, and medium dark conidiophores separate this species from the others on Ilex. Index Kewensis makes this host a synonym of *Symplocos lanceolata* A. DC. (Styraceae). See key, page 51.

**Cercospora alocasiae** Sawada

Taiwan (Formosa) Agr. Rev. **38**: 693. 1942;

also Taiwan Agr. Res. Inst. Rept. **85**: 98. 1943

Leaf spots indistinct or distinct, and then dingy gray to pale tan, circular to irregular, 10-50 mm. in extent; fruiting in faintly effuse dark colored patches, amphigenous, sometimes accompanied by a perithecial stage; stromata none or a few dark cells; fascicles 2-6 divergent stalks; conidiophores pale fuligenous, uniform in color and width, 1-5 septate, usually straight, not branched, sparingly geniculate, subtruncate tip, 4-5 x 25-145$\mu$; conidia hyaline, acicular, shortest ones cylindric, indistinctly multiseptate, straight to mildly curved, base truncate, tip subacute, 2-4 x 40-200$\mu$.

HOST: *Alocasia macrorrhiza* Schott.

TYPE: Kaohsiung, Taiwan (Formosa); *Alocasia macrorrhiza;* K. Sawada; June 29, 1910.

DISTRIBUTION: Known only from the type locality.

NOTE: A portion of the Sawada collection is deposited in the U.S.D.A. Mycological Herbarium.

## CERCOSPORAE ON AMORPHOPHALLUS

A. Conidia pale olivaceous brown, cylindric, 4-4.5 x 40-80$\mu$; fruiting effuse, hypophyllous; no definite leaf spots; conidiophores mostly nonfasciculate, branched, 3-4 x 300$\mu$. *C. protensa*

AA. Conidia hyaline, mostly acicular; fruiting not effuse; leaf spots distinct; conidiophores fasciculate, not branched.

B. Conidia 3-4.5 x 20-80$\mu$, acicular; conidiophores 4-6 x 15-125$\mu$. *C. amorphophalli*

BB. Conidia 4.5-7 x 50-125$\mu$, acicular to obclavate or cylindric; conidiophores 4-6.5 x 50-125$\mu$. *C. chevalieri*

**Cercospora amorphophalli** P. Hennings

Hedwigia 41: 147. 1902

Leaf spots circular to subcircular, 2-4 mm. in diameter, dingy gray to white center, brown to reddish brown margin, sometimes dehiscent; fruiting amphigenous; stromata small, brown; fascicles 3-20 stalks; conidiophores brown to very pale olivaceous brown, paler and more narrow toward the tip, 0-4 septate, not branched, 0-3 geniculate, mostly about once, medium spore scar at subtruncate tip, 4-6 x 15-125$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip subacute, 3-4.5 x 20-80$\mu$.

HOSTS: Amorphophallus sp., *A. rivieri* (*Hydrosome rivieri*), *A. konjac* K. Koch.
TYPE: Buitenzorg, Java; Amorphophallus sp.; Prof. Zimmerman; Dec. 1901.
DISTRIBUTION: Java, Japan, China, and the Philippines.
NOTE: See key above for the differences among the species on this host genus.

**Cercospora aricola** Saccardo

Ann. Mycol. 11: 548. 1913

Leaf spots visible on both surfaces, but more evident on the lower leaf surface, 2-4 mm. in diameter, white with an ochre to brown margin; fruiting hypophyllous; stromata present; fascicles mostly dense; conidiophores brown, inclined to be straight, toward the tip slightly but closely denticulate, mostly 1-septate, 5-6 x 50-90$\mu$; conidia subhyaline, obclavate, 8-12 septate, not constricted at the septa, often curved, tip acute, 4.5-5 x 40-75$\mu$.

TYPE: Vera Cruz, Mexico; an Araceae; S. Bonansea, Fungi Mexicani No. 14.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not had an opportunity to study the type. Saccardo states that it resembles closely *C. chevalieri*. His description, however, follows closely that of *C. symplocarpi*.

**Cercospora arisaemae** Tai

Chinese Bot. Soc. Bul. 2: 47. 1936; Science Rept. Nat. Tsing Hua Univ. Ser. B. 2: 426. 1937

Leaf spots suborbicular, 1-5 mm. in diameter, pale tan to dingy gray, border darker; fruiting amphigenous; stromata slight, brown; fascicles mostly 2-8 stalks; conidiophores pale to very pale olivaceous, paler and more narrow toward the tip or irregular in width, not branched, multiseptate, not geniculate, small to medium spore scar at subtruncate to narrowly rounded tip, 4-6 x 10-100$\mu$, often when conidia are persistent appearing much longer; conidia hyaline, acicular to obclavate, nearly straight, indistinctly multiseptate, base subtruncate to obconically truncate, tip subobtuse to subacute, 2.5-5 x 60-130$\mu$. In mounts scraped from the lesions, many conidia are broken into two, so that the upper half may appear like an extremely narrow (1-2$\mu$) conidium with truncate base, or part of the conidiophore may still cling, and give the base of the conidium the appearance of being subhyaline or slightly colored.

HOSTS: Arisaema sp., *A. ambigum* Engl.
TYPE: Nanking, China; *Arisaema ambigum;* T. F. Yu; Sept. 27, 1925 (Univ. Nanking Path. Herb. No. 179).
DISTRIBUTION: China, Uganda.

## CERCOSPORAE ON CALADIUM

A. Conidia pale olivaceous, cylindric, 3-6 x 10-50$\mu$; stromata lacking; conidiophores single or in groups of 2-5, 3-5 x 10-25$\mu$, rarely 7 x 85$\mu$. *C. caladicola*

AA. Conidia hyaline; stromata present; most fascicles dense.

B. Conidia acicular, multiseptate, base truncate, tip acute, 3-5 x 25-125$\mu$; conidiophores rarely geniculate, 4-6 x 20-125$\mu$. *C. caladii*

BB. Conidia cylindric, 2-6 septate, base rounded, tip obtuse, 5-8 x 15-70$\mu$; conidiophores often strongly geniculate, 3-5.5 x 30-250$\mu$. *C. verruculosa*

### **Cercospora caladicola** new comb.

*Cercospora caladii* P. Henn., Hedwigia 48: 17. 1909

Leaf spots minute dark brown to black specks, 0.5-1.5 mm. in diameter; fruiting possibly only hypophyllous; stromata lacking; conidiophores nonfasciculate or in groups of 2-3, pale olivaceous brown, when long paler and more narrow toward the tip, mostly short branches from procumbent threads, not geniculate, irregular in outline, small spore scars at bluntly rounded tips, 3-5 x 10-25$\mu$ or even as large as 7 x 85$\mu$; conidia cylindric, pale olivaceous, rounded ends, often catenulate, 1-5 septate, 3-6 x 10-50$\mu$.

TYPE: Capital of Sao Paula, Brazil; Caladium sp.; A. Puttemans, No. 476; March 14, 1902.

DISTRIBUTION: Known only from the type locality.

NOTE: See key above for differences among the species on this host genus.

### **Cercospora caladii** Cooke

Grevillea 8: 95. 1879

Leaf spots circular, 0.5-4 mm. in diameter, dingy gray to brown, reddish brown border; fruiting amphigenous; stromata slight to medium in size, brown; most fascicles dense; conidiophores pale to medium brown, paler and more narrow toward the tip, sparingly septate, not branched, occasionally once geniculate, medium spore scar at the subtruncate tip, 4-6 x 20-125$\mu$; conidia hyaline, acicular, straight or nearly so, indistinctly multiseptate, base truncate, tip subacute, 3-5 x 25-125$\mu$.

TYPE: Belgaum, India; Caladium sp.; J. Hobson; 1879. The type is labelled *Cercospora calladii* on Calladium.

DISTRIBUTION: Known only from the type locality.

NOTE: See key above for differences among the species on this host genus. Von Höhnel described *C. caladii* Cooke var. *colocasiae* on Colocasia. Since it has nothing in common with Cooke's species it is renamed *C. colocasiae*.

### **Cercospora callae** Peck & Clinton

N.Y. State Mus. Nat. Hist. Rept. 29: 52. 1876

*Cercospora pachyspora* Ellis & Ev., Proc. Acad. Nat. Sci. Phila. Part 1. 43: 88. 1891

Leaf spots often elongated between parallel veins, sometimes extending from mid-rib to margin of the leaf, pale brown, tan, or more rarely dingy gray; fruiting amphigenous, more plentiful on lower surface, when dense appearing as a mouse-colored fuzz; stromata not large; fascicles dense or very dense; conidio-

phores pale olivaceous to olivaceous brown, paler near the tip, multiseptate, medium to much geniculation or closely sinuous, not branched, 4.5-5.5 x 55-135$\mu$; conidia obclavate, hyaline, straight to slightly curved, base obconic to subtruncate, tip obtuse, 2-9 septate, 5-8 x 25-110$\mu$; conidiophores and conidia rarely 1 to 2$\mu$ wider.

HOSTS: *Calla palustris* L., *Peltandra virginica* (L.) Kunth., *P. alba* Rafin, *Alisma plantago* L. (N. Y. Bot. Garden, *Alisma subcordatum* Raf.)

TYPES: Buffalo, N. Y.; *Calla palustris;* G. W. Clinton; (*C. pachyspora*) Wilmington, Del.; *Alisma plantago;* A. Commons, No. 1014; and *Peltandra virginica,* No. 1013; Oct. 4, 1889.

DISTRIBUTION: Reported as present in Manitoba, Nova Scotia, Wisconsin, New York, New Hampshire, Delaware, and Alabama.

NOTE: *C. xanthosomae* on Xanthosoma has colored cylindric conidia which may be as long as 200$\mu$. This differs from *C. verruculosa* in having more septate, more nearly obclavate conidia.

**Cercospora chevalieri** P. Saccardo
Syll. Fung. 22: 1431. 1913

*Cercospora amorphophalli* Pat. & Har., Bul. Soc. Mycol. de France 24: 15. 1909

Leaf spots subcircular to angular, small, brown to gray center, brown border; fruiting amphigenous, but mostly on lower leaf surface; stromata dark brown, globular, 20-40$\mu$ in diameter; fascicles 3-20 stalks; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, pluriseptate, not branched, straight, curved, or 1-5 abruptly geniculate, medium spore scar at rounded to subtruncate tip, 4-6.5 x 50-125$\mu$; conidia hyaline, acicular to obclavate or cylindric, curved, indistinctly multiseptate, base subtruncate to long obconically truncate, tip blunt, 4.5-7 x 50-125$\mu$.

TYPE: Territoire de L'Oubangui, at Mission Chari, Lake Tchad in the Sudan; Amorphophallus sp.; Aug. Chevalier, No. 5744; Oct. 15, 1902.

DISTRIBUTION: In the Sudan, Uganda, and in Sierra Leone.

NOTE: See also *C. amorphophalli* Henn. and *C. protensa* for differences among the species on this host genus.

**Cercospora colocasiae** new comb.

*Cercospora caladii* Cooke var. *colocasiae* v. Höhnel, Sitzungsber. Math.-Naturwissensch. Klasse Kaiserliche Akad. Wissensch. I. 116: 150. 1907

Leaf spots circular, 3-7 mm. in diameter, brown, zonate, dark margin; fruiting amphigenous (mixed with the perithecia of a Mycosphaerella); stromata dark brown, globular, 20-60$\mu$; fascicles mostly dense; conidiophores pale olivaceous, uniform in color, attenuated, straight to curved, not geniculate, not branched, spore scar minute at conic tip, 2-3.5 x 5-30$\mu$; conidia pale olivaceous, obclavato-cylindric, nearly straight, indistinctly multiseptate, base obconic, tip conic, 2-4 x 25-100$\mu$.

HOST: Colocasia sp.

TYPE: Samoa; Colocasia sp.; Rechinger, No. 2297; 1905.

DISTRIBUTION: Known only from the type locality.

NOTE: This is in no way connected with Cooke's species, which has hyaline acicular conidia.

**Cercospora extremorum** Sydow
Ann. Mycol. 15: 264. 1917

Leaf spots circular to elliptic, 2-6 mm. in diameter, pale tan to gray center surrounded by a pale brown zone which is bordered by a black zone or line; fruiting hypophyllous; stromata usually filling stomatal opening, brown; fascicles 3-20 stalks; conidiophores pale to medium brown, paler tip, uniform in diameter, rarely branched, septate, 0-1 geniculate, medium spore scar at bluntly rounded tip, 3-5 x 30-110$\mu$; conidia pale to very pale olivaceous, vermicular, straight to variously curved, indistinctly multiseptate, base rounded to obconically truncate, tip blunt, 3-4 x 100-350$\mu$.

HOST: *Homalonema philippinensis* Engl.
TYPE: Los Banos, Province Laguna, Luzon, Philippines; *Homalonema philippinensis;* C. F. Baker, No. 521; Febr. 1914.
DISTRIBUTION: Known only from the type locality.

**Cercospora montrichardiae** P. Hennings
Hedwigia 48: 115. 1909

Leaf spots circular, 0.5-2 mm. in diameter, at first dull brown, and then with minute gray center and pale to medium dark brown margin; fruiting probably amphigenous; stromata globular, dark brown, 20-50$\mu$; fascicles dense; conidiophores pale to very pale olivaceous brown, paler and wider near tip, curved to sinuous, not septate, not branched, not geniculate, spore scars indistinct, 2-3.5 x 5-20$\mu$; conidia cylindric, pale to very pale olivaceous, straight to curved, indistinctly 3-5 septate, base obconically truncate, tip bluntly rounded, 3-5.5 x 15-70$\mu$.

HOST: *Montrichardia arborescens* Schott. (*M. aculeatum* Crueg.)
TYPE: Para, Brazil, Ilha das Oncas; *Montrichardia arborescens;* Huber, No. 96; Oct. 1903.
DISTRIBUTION: Known only from the type locality.
NOTE: Both the type at Berlin and the co-type at Stockholm had so little fruiting that it was impossible to study the species in detail.

**Cercospora protensa** Sydow
Ann. Mycol. 28: 446. 1930

Leaf spots lacking or indistinct yellowish areas on the upper leaf surface, with a dark olivaceous effuse fruiting layer on the corresponding lower surface, 3-10 mm. in extent, but often coalescing into large areas; stromata lacking; conidiophores nonfasciculate to slightly fasciculate, pale yellow to olivaceous brown, somewhat paler and more narrow toward the tip, closely and plainly septate, branched, variously curved, not geniculate, small spore scar at rounded tip, 3-4 x 300$\mu$; conidia similar in color, cylindric, rounded or obconic ends, straight to curved, 4-9 septate, slightly constricted at septa, 4-4.5 x 40-80$\mu$.

HOST: *Amorphophallus campanulatus* Blume.
TYPE: Los Banos, Philippines; *Amorphophallus campanulatus;* C. F. Baker, No. 322; Oct. 1, 1912.
DISTRIBUTION: Known only from the type locality.
NOTE: The very minute specimen I was able to bring from Stockholm did not have sufficient fruiting for careful study. See also *C. amorphophalli* Henn. and *C. chevalieri* for differences among the species on this host genus.

**Cercospora richardiaecola** Atkinson

Jour. Elisha Mitchell Sci. Soc. 8: 51. 1892

Leaf spots circular to subcircular, 2-20 mm. in diameter, brown or tan to gray, larger ones may be zonate, sometimes with narrow brown to purple line margin; fruiting mostly epiphyllous; stromata a few brown cells; fascicles usually dense, divergent; conidiophores pale olivaceous brown, fairly uniform in color and width, multiseptate, not branched, 1-5 abruptly geniculate, medium spore scar at subtruncate tip, 3.5-5.5 x 20-400$\mu$; conidia hyaline, acicular, variously curved, indistinctly multiseptate, base truncate, tip obtuse, 2.5-4 x 50-300$\mu$. Some collections show only relatively short conidiophores and conidia.

HOSTS: *Zantedeschia aethiopica* Spreng. (*Richardia africana* Kunth.) (*Calla aethiopica* L.), *R. rehmannii* N. E. Br., *R. angustiloba* Schott., Zantedeschia sp.

TYPE: Auburn, Ala.; *Richardia africana;* Geo. F. Atkinson; Sept. 7, 1891.

DISTRIBUTION: Studied collections from Alabama, Mississippi, Puerto Rico, Guatemala, and South Africa.

NOTE: See also *C. callae* on *Calla palustris* for differences between the two species.

**Cercospora symplocarpi** Peck

N. Y. State Mus. Rept. 30: 55. 1878

Leaf spots subcircular to irregular, 3-7 mm. in diameter, dark olivaceous to dark reddish brown, sometimes with slightly paler center; fruiting amphigenous; stromata lacking or filling stomatal opening, pale to medium brown; fascicles usually dense; conidiophores pale olivaceous, uniform in color, medium dark brown in mass, often slightly clavate, not or rarely septate, not branched, straight or 1-2 mildly geniculate, small to medium spore scar at conic tip, 4-7 x 10-50$\mu$, rarely 70$\mu$; conidia obclavate, pale olivaceous, nearly straight, indistinctly multiseptate, base long obconically truncate, tip subobtuse, 4-5.5 x 50-150$\mu$.

HOST: *Symplocarpus foetidus* (L.) Nutt., Symplocarpus sp.

TYPE: West Albany, N. Y.; Symplocarpus sp.; C. H. Peck; July, 1877.

DISTRIBUTION: Studied material from New Jersey, Pennsylvania, New York, and Wisconsin. Also reported from Delaware.

**Cercospora verruculosa** Stevens & Solheim

Mycologia 23: 397. 1931

Leaf spots tan or gray to fairly dark brown, darker border, 2-10 mm. in diameter, circular to angular, sometimes zonate; fruiting mostly hypophyllous; stromata globular, brown, 30-50$\mu$ in diameter; fascicles dense to very dense; conidiophores pale to very pale olivaceous brown, paler tip, straight to rachis-like with geniculations, not branched, sparingly septate, small to medium spore scar at bluntly rounded to subtruncate tip, 3.5-5.5 x 30-135$\mu$ or rarely 250$\mu$; conidia hyaline, cylindric, 2-6 septate, base rounded to obconically truncate, tip rounded bluntly, 5-8 x 15-55$\mu$ or even 70$\mu$.

HOSTS: Caladium sp., Xanthosoma sp.

TYPE: St. Augustine, Trinidad; Caladium sp.; F. L. Stevens, No. 829; Aug. 13, 1922.

DISTRIBUTION: Trinidad, Venezuela, and Puerto Rico.

NOTE: See also *C. caladii* and *C. caladicola* for differences among the species on Caladium, and *C. xanthosomae* for those between the species on Xanthosoma.

**Cercospora xanthosomae** Fragosa & Ciferri
Est. Agr. de Moca, Rep. Dominicana, Bul. Ser. B. (Bot.)
11: 53. 1928

Leaf spots circular to irregular, 1-4 mm. in diameter, pale brown to almost black, or almost no leaf spots with minute patches of black fruiting on both surfaces; stromata brown, 15-35$\mu$ in diameter; fascicles mostly 2-7 stalks; conidiophores pale olivaceous brown, paler and more narrow toward the tip, multiseptate, not branched, not geniculate, small spore scar at narrowly rounded tip, 4-7.5 x 40-300$\mu$; conidia subhyaline to very pale olivaceous brown, cylindric, nearly straight, indistinctly multiseptate, ends bluntly rounded, base rarely subtruncate, 2.5-5 x 50-250$\mu$.

HOST: *Xanthosoma violaceum* Schott.
TYPE: Moca, San Domingo; *Xanthosoma violaceum;* R. Ciferri; April, 1927.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. verruculosa* for differences between the two species on this host genus.

CERCOSPORAE ON ARALIACEAE

A. Conidia hyaline, acicular, 3-4.5 x 75-120$\mu$; fascicles 2-3 spreading stalks; conidiophores 4-5 x 75-200$\mu$.
ARALIA CORDATA — *C. araliae-cordatae*

AA. Conidia colored, not acicular.
B. Conidia 8-15 x 70-200$\mu$, often spindle-shaped; conidiophores borne singly as short branches, 4-6 x 10-25$\mu$.
FATSIA (ECHINOPANAX, OPLOPANAX) — *C. daemonicola*

BB. Conidia less than 8$\mu$ wide, not spindle-shaped.
C. Leaf spots distinct; fruiting not effuse; stromata present; fasciculate.
D. Conidia 2-3.5 x 15-65$\mu$; fascicles mostly dense; conidiophores 2-3.5 x 10-30$\mu$.
PANAX — *C. panacis*

DD. Conidia 3-5.5 x 40-130$\mu$; fascicles not dense; conidiophores 3-5.5 x 20-75$\mu$.
FATSIA — *C. ueharae*

CC. Leaf spots not distinct; fruiting effuse; stromata not present; mostly not fasciculate.
D. Conidia and conidiophores 2-3.5$\mu$ in width.
E. Conidia obclavate, 20-70$\mu$ long; conidiophores mostly 10-35$\mu$ long.
ARALIA SPINOSA — *C. spinosae*

EE. Conidia cylindric, 15-50$\mu$ long; conidiophores 20-100$\mu$.
HEDERA — *C. hederae*

DD. Conidia 4$\mu$ or more in width, cylindric; conidiophores 70-180$\mu$ or longer.
E. Conidia 4-5 x 35-145$\mu$; conidiophores 3-4.5 x 70-180$\mu$.
OREOPANAX — *C. holophaea*

EE. Conidia 4-6.5 x 30-70$\mu$; conidiophores 4-5.5 x 75-500$\mu$.
ARALIA spp. — *C. araliae*

**Cercospora araliae** P. Hennings
Bot. Jahrbücher von Engler **31**: 742. 1902; also **37**: 165. 1906

Leaf spots none or indistinct; fruiting in effuse, olivaceous to sooty layer on

lower leaf surface, 1-3 mm. in extent or coalescing over a large part of the leaf surface; stromata lacking; nonfasciculate or occasionally 2-3 stalks in a fascicle; conidiophores pale to medium brown, uniform in color, irregular in width, branched, plainly multiseptate, rarely geniculate, small spore scar at the bluntly rounded tip, 4-5.5 x 75-500$\mu$; conidia olivaceous to olivaceous brown, cylindric or slightly attenuated, straight to slightly curved, plainly 2-9 septate, mostly 4-6, base long obconically truncate, tip rounded bluntly, 4.5-6.5 x 30-70$\mu$.

HOSTS: *Aralia spinosa* L. var. *glabrescens* Fr. & Sav., *A. chinensis* Linn., *A. chinensis* var. *canescens* Matsum., *A. elata* Seem.

TYPE: Ushive-yama, Tola, Japan; *Aralia spinosa* var. *glabrescens;* Yoshinaga, No. 62; Aug. 1901.

DISTRIBUTION: A number of specimens were sent me from China, Japan, and Formosa.

NOTE: The long nonfasciculate conidiophores and the shape, size and color of the conidia separate this species from others on Aralia. See also the following species and *C. spinosae.*

**Cercospora araliae-cordatae** Hori

Chosen Sakumotsu Byogai Mokuroku (Nakata & Takimoto, A list of crop diseases in Korea) p. 31. 1928

Leaf spots 3-6 mm. in diameter, irregular to angular, limited by leaf veins, gray to white, often frayed; stromata small; fascicles 2-3 spreading stalks; conidiophores pale brown, straight to curved, not branched, multiseptate, tip subtruncate, 4-5 x 75-200$\mu$; conidia hyaline, acicular, straight to curved, multiseptate, base truncate, tip acute, 3-4.5 x 75-120$\mu$.

HOST: *Aralia cordata* Thunb.

TYPE: Not recorded.

DISTRIBUTION: Formosa.

NOTE: I have not seen this specimen. Dr. Togashi kindly sent me a description. See also *C. spinosae* and *C. araliae.*

**Cercospora clavigera** Ellis & Everhart in Herb.

Leaf spots large brown blotches, 10-15 mm. in diameter, usually surrounded by a yellowish zone; fruiting a scanty black effuse hypophyllous layer; stromata sometimes present and difficult to distinguish from immature pycnidia or perithecia in the mount; fascicles sometimes dense, and then so compact that they resemble stromata; conidiophores in mass dark colored, singly pale olivaceous brown, not branched, longer ones distinctly and abruptly geniculate, shorter ones may have 2-4 crowded geniculations near the tip, small spore scars present, uniform in color, but sometimes irregular in width, longer ones septate, 5-8 x 25-65$\mu$; conidia obclavate or more nearly wedge-shaped, rounded base, tip fairly blunt to acute, straight, mostly one septate, subhyaline to pale olivaceous 6-8 x 30-50$\mu$.

HOST: *Aralia racemosa* L.

TYPE: London, Canada; *Aralia racemosa;* John Dearness, No. 329; July, 1889.

DISTRIBUTION: Known only from the type locality.

NOTE: A description of *C. clavigera* has not been published but Ellis wrote the description on the packet which now is in the herbarium of the New York Botanic Garden. Dearness considers it a synonym of *Fusicladium depressum* (The Fungi of Manitoba and Saskatchewan p. 119. 1938). It does not seem to

resemble a Fusicladium, especially since many of the conidiophores are borne singly. It certainly does not resemble the co-type of *F. depressum.* It also is not a Cercospora. *C. leptosperma* has been described on this host, but no doubt is a Cylindrosporium. J. J. Davis named it Cercosporella (Wisc. Acad. Trans. **19**: 706. 1919).

**Cercospora daemonicola** Sprague

Mycologia **29**: 432. 1937

Leaf spots dark brown, mostly irregular, sometimes slightly zonate, 2-14 mm. in extent, sometimes center of spot paler than margin, or with a narrow black margin; fruiting epiphyllous; stromata none to few brown cells; fascicles not dense, conidiophores may be borne singly; conidiophores pale olivaceous or olivaceous brown, not branched, not geniculate, seldom septate, 4-6 x 10-25$\mu$; conidia subhyaline to very pale olivaceous, obclavate or often spindle-shaped, broad truncate base, subobtuse tip, 3-10 septate, straight, 8-15 x 70-200$\mu$.

HOST: *Fatsia horrida* Benth. + Hook. (*Echinopanax horridus* Decne. + Planch., *Oplopanax horridum* Miq.)

TYPE: Middle fork of South fork of the Santiam River, Linn Co., Oregon; *Oplopanax horridum;* R. Sprague and F. D. Bailey; July 18, 1936.

DISTRIBUTION: Known only from the type locality.

NOTE: I made a dozen or more macerated mounts of the limited type material kindly sent me by Dr. Sprague, but could not determine definitely how the conidia were borne, even though conidia like those described were present in these mounts. Judging from my experience with other named species, this wide-spored one is not a Cercospora.

**Cercospora hederae** Katsuki et Togashi

Bot. Magazine, Tokyo **65**: 21. 1952

Leaf spots indistinct; fruiting hypophyllous, effuse, dark olivaceous to almost black, minute areas to half the leaf surface; nonfasciculate; conidiophores single branches from procumbent threads, pale olivaceous brown, uniform in color and width, or slightly paler and more narrow near the conic tip, 0-5 septate, straight or undulate to once sharply bent, rarely geniculate, 2-4 x 20-100$\mu$; conidia hyaline to faintly olivaceous, cylindric, mostly straight, base obconic, tip conic, 1-5 septate, 2-3.5 x 15-50$\mu$.

HOST: *Hedera rhombea* Sieb. et Zucc.

TYPE: Shikaneshima, Kasuya, Pref. Fukuoka, Japan; *Hedera rhombea;* S. Katsuki; May 1, 1949.

DISTRIBUTION: Japan.

**Cercospora holophaea** Sydow

Ann. Mycol. **37**: 429. 1939

Leaf spots lacking or indistinct, a slight yellowish discoloration on the upper leaf surface; fruiting in effuse olivaceous or olivaceous brown layers, hypophyllous, 3-10 mm. in extent or coalescing into large areas; stromata lacking; mostly nonfasciculate; conidiophores dark olivaceous brown, uniform in color, irregular in width, plainly multiseptate, sparingly branched, not geniculate, curved to tortuous, small spore scar at bluntly rounded end, 3.5-4.5 x 70-180$\mu$; conidia narrowly cylindric, sometimes slightly attenuated, pale colored, straight to slightly curved, 2-5 septate, base obconically truncate, tip obtuse, 4-5 x 35-145$\mu$.

HOST: *Oreopanax mucronulatus* Harms.
TYPE: Ad declivitates montis Pichincha pr. Quito, Ecuador; *Oreopanax mucronulatus;* H. Sydow, No. 114; Sept. 22, 1937.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen specimens of this species. Fortunately, Dr. Sydow always gives an excellent description of the Cercospora species which he names.

**Cercospora leptosperma** Peck
N. Y. State Mus. Ann. Rept. **30**: 55. 1878

HOST: *Aralia nudicaulis* L.
TYPE: Iowa; *Aralia nudicaulis;* Holway.
NOTE: I could not find the type of this, but I examined a collection which Peck made at Jayville, N. Y. and found it to be a hyaline fungus. Peck later named this species a Cylindrosporium, while J. J. Davis at first considered it a Cercosporella (Wisc. Acad. Trans. **19**: 706. 1919), and then transferred it to Septoriopsis.

**Cercospora panacis** Thirumalachar & Chupp
Mycologia **40**: 358. 1948

Leaf spots circular, up to 20 mm. in diameter, tan to medium dark brown, usually with a darker margin which is separated from the remainder of the lesion by a narrow raised line; fruiting chiefly hypophyllous; stromata dark brown, subglobular, 15-40$\mu$ in diameter; fascicles mostly dense, fairly compact; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the rounded to conic tip, rarely septate, not geniculate, not branched, 2-3.5 x 10-30$\mu$; conidia subhyaline to pale olivaceous, narrowly obclavate to linear, straight to mildly curved, indistinctly 1-5 septate, base obconically truncate, tip obtuse to conic, 2-3.5 x 15-65$\mu$.

HOST: *Panax fruticosum* L.
TYPE: Bangalore, India; *Panax fruticosum;* M. J. Thirumalachar; Aug. 5, 1944.
DISTRIBUTION: Known only from the type locality.

**Cercospora spinosae** sp. nov.

Leaf spots mostly indistinct, sometimes a brown discoloration on upper surface, 2-6 mm. in extent; fruiting barely visible in very scantily effuse, irregular patches on lower leaf surface; stromata lacking, sometimes a pycnidial form present with immature pycnidia resembling stromata; mostly nonfasciculate; conidiophores branch from procumbent threads, subhyaline to pale olivaceous brown, slightly irregular in width, longest ones septate and occasionally constricted at septa, undulate to tortuous, not geniculate, minute spore scars at rounded to conic tip, 2-3.5 x 10-35$\mu$, rarely as long as 75$\mu$; conidia subhyaline to pale olivaceous, obclavate to almost linear, straight to curved, indistinctly septate, base medium to long obconically truncate, tip subacute, 2-3.5 x 20-70$\mu$.

Maculae typicae nullae, sed decolorationes epiphyllas indeterminatas flavidas efficiens; caespituli hypophylli, irregulariter dispersi, indistincte effusi; haud stromata; conidiophora plerumque unica, ramosa, subhyalina vel pallide olivaceo-brunnea, septata, vix constricta, plus minus toruloso-curvata, haud geniculata, ad apicem obtuse rotundata vel conica, 2-3.5 x 10-35$\mu$, raro 75$\mu$ longa; conidia subhyalina vel pallide chlorinula, obclavata vel anguste cylindracea, recta vel curvata, spurie septata, ad basim subtruncata, ad apicem subacuta, 2-3.5 x 20-70$\mu$.

HOST: *Aralia spinosa* L.
TYPE: Selbyville, Delaware; *Aralia spinosa;* H. S. Jackson; Oct. 4, 1907.
DISTRIBUTION: Known only from the type locality.
NOTE: The very narrow conidia separate this species from *C. araliae*. Ellis and Everhart (Jour. Mycol. 3: 17. 1887) report *C. atro-maculans* on *A. spinosa*. The previously described fungi on Aralia do not resemble this species. The type is in the herbarium of Dr. H. S. Jackson, Toronto, Canada.

**Cercospora ueharae** Fukui
Bul. Mie Agric. Coll. 3: 21. 1933

Leaf spots irregular to angular, usually vein limited, 0.5-5 mm. in diameter, indistinctly yellowish or orange to brown; fruiting hypophyllous; stromata brown, small, filling stomatal openings; fascicles 2-5 divergent stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, 1-5 septate, straight or flexuose to sharply bent, not branched, sparingly geniculate, 3.5-5.5 x 20-75$\mu$; conidia subhyaline to pale brown, obclavate, or shortest ones cylindric, straight to mildly curved, 1-7 septate, base subtruncate, tip subobtuse, 3.5-5.5 x 40-130$\mu$.
HOST: *Fatsia japonica* Decne et Planch.
TYPE: Ujiyamada, Mie Fref. Japan; *Fatsia japonica;* T. Fukui; Aug. 16, 1927.
DISTRIBUTION: Several collections in Japan.
NOTE: Dr. Togashi kindly sent me a specimen collected by S. Katsuki, Nov. 6, 1948.

## CERCOSPORAE ON ARISTOLOCHIACEAE

A. Conidia colored.
  B. Fascicles dense; stromata up to 70$\mu$ in diameter; conidiophores 3-4 x 50-100$\mu$, serpentine; conidia 3-4.5 x 30-80$\mu$.
    ARISTOLOCHIA sp. *C. serpentaria*
  BB. Fascicles 2-12 stalks; stromata slight or none; conidiophores 3-5 x 10-65$\mu$, almost straight; conidia 3-4.5 x 20-60$\mu$.
    ARISTOLOCHIA INDICA *C. bangalorensis*
AA. Conidia hyaline or possibly subhyaline.
  B. Conidiophores 4-5.5 x 50-200$\mu$; conidia cylindric to acicular, 4-5.5 x 35-150$\mu$.
    ARISTOLOCHIA spp. *C. olivascens*
  BB. Conidiophores 3-4 x 5-20$\mu$; conidia obclavate, 3-4.5 x 25-65$\mu$.
    ARISTOLOCHIA MACROPHYLLA *C. guttulata*

**Cercospora bangalorensis** Thirumalachar & Chupp
Mycologia 40: 353. 1948

Leaf spots dark to black, subcircular to irregular, 0.5-3 mm. in diameter, sometimes with a faintly yellowish margin; fruiting amphigenous; stromata lacking or composed of a few dark brown cells; fascicles 2-12 divergent stalks; conidiophores pale to very pale fuligenous, uniform in color, none to marked attenuation from base to tip, closely septate, at least near the base, not branched, straight or only slightly curved or bent, rarely geniculate, conic tip, 3-5 x 10-65$\mu$; conidia pale to very pale olivaceous, narrowly obclavate, straight to mildly curved, 1-5 septate, long obconic base, tip obtuse to subacute, 3-4.5 x 20-60$\mu$.
HOST: *Aristolochia indica* L.

TYPE: Bangalore, India; *Aristolochia indica;* M. J. Thirumalachar; Aug. 20, 1944.
DISTRIBUTION: Known only from the type locality.
NOTE: See key above.

**Cercospora guttulata** Ellis & Kellerman
Jour. Mycol. 9: 105. 1903

Leaf spots circular, 5-15 mm. in diameter, pale grayish brown to pale tan, with black or dark purplish border; fruiting amphigenous; stromata globular, dark brown, 20-60$\mu$; fascicles dense to very dense; conidiophores pale brown, paler and more narrow near tip, which is rounded and with minute spore scar, septa not visible, not branched, not geniculate, 3-4 x 5-20$\mu$; conidia subhyaline, obclavate, base rounded, tip obtuse, septa indistinct, somewhat curved, 3-4.5 x 25-65$\mu$ (Ellis says 80$\mu$).

HOST: *Aristolochia macrophylla* Lam., *A. tomentosa* Sims
TYPE: Marlington, West Virginia; *Aristolochia macrophylla;* W. A. Kellerman; Aug. 1902.
DISTRIBUTION: West Virginia, Missouri.
NOTE: The subhyaline conidia with rounded base separate this from the other species on Aristolochia. See key above.

**Cercospora olivascens** Saccardo
Michelia 1: 268. 1879

*Cercospora propinqua* Massal., Malp. 25: 59. 1912
*Cercospora aristolochiae* Roum. mscr. in Fungi Gall. 757. 1880
*Cercospora olivascens* var. *minor* Serebr., Magyar. Virág. Nov. Onat. Köxleminyek 1: 313. 1927

Leaf spots angular, vein-limited, 1-10 mm. in diameter, dark brown; fruiting hypophyllous; stromata slight, brown; some fascicles dense, 2-15 stalks; conidiophores pale fuligenous or olivaceous brown, uniform in color and width or slightly attenuated, not branched, multiseptate, 0-5 geniculate, medium sized spore scar at the subtruncate tip, 4-5.5 x 50-200$\mu$; conidia hyaline, cylindric to obclavate, rarely acicular, plainly 3-9 septate, straight to slightly curved, base truncate to obconically truncate, tip obtuse, 4-5.5 x 35-150$\mu$.

HOSTS: *Aristolochia clematitis* Linn., *A. fimbriata* Cham., *A. longa* Linn., *A. pallida* Willd.
TYPES: Selva, Italy; *Aristolochia clematis;* Aug. 1877; cotype distributed as Mycoth. Veneta 1251; (*Cercospora propinqua*) "Bosco dei Socchi," Italy; *Aristolochia pallida;* summer, 1911; (*Cercospora olivascens* var. *minor*) *Aristolochia clematis;* Mycot. Ross 197.
DISTRIBUTION: Montenegro, Lombardy, France, Hungary, Roumania, Portugal, Caucasus.
NOTE: This species was wrongly reported on *Phaseolus vulgaris* by Saccardo (Syll. Fung. 4: 453. 1886). The drawing which Saccardo had made (Fungi Ital. No. 664) shows both conidia and conidiophores much too narrow for their length. I was unable to procure a specimen of *C. propinqua,* but the description fits closely that of *C. olivascens.* This species differs from the others on Aristolochia in having long conidiophores with hyaline conidia. See key, page 65.

**Cercospora serpentaria** Ellis & Everhart
Jour. Mycol. **3**: 13. 1887

Leaf spots circular to subcircular, 1-4 mm. in diameter, center pale tan to dingy gray, then a narrow black line surrounded by a pale brown zone and a second black line; fruiting amphigenous, but chiefly hypophyllous; stromata a few brown cells to as large as 70$\mu$ in diameter; fascicles dense; conidiophores pale yellowish olivaceous, uniform in color, slightly attenuated, multiseptate, branched, rarely 1-2 mildly geniculate, straight to variously curved or serpentine, small spore scar at subconic tip, 3-4 x 50-100$\mu$; conidia pale yellowish olivaceous, obclavate to obclavato-cylindric, straight to mildly curved, indistinctly 3-9 septate, base long obconic, tip subobtuse, 3-4.5 x 30-80$\mu$, or longer.

HOSTS: *Aristolochia serpentaria* Linn., *A. bilobata* Linn., Aristolochia sp.
TYPE: Faulkland, Del.; *Aristolochia serpentaria;* A. Commons, No. 337; Sept. 11, 1886.
DISTRIBUTION: Studied material from Alabama, Delaware, and San Domingo. It has been reported also from Sao Paulo, Brazil.
NOTE: Fragosa and Ciferri (Rep. Dom. Est. Agr. Haina, Ser. D-Bot. **5**: 10. 1926) have described the variety *aristolochiae-bilobatae,* but their material and description seem to be identical with the Ellis type. The colored conidia separate this species from others on Aristolochia.

## CERCOSPORAE ON ASCLEPIAS

A. Conidia hyaline, obclavate to acicular, truncate base, 2-4 x 40-120$\mu$; leaf spots gray to dark; fruiting not effuse.
ASCLEPIAS spp. — *C. asclepiadis* (*C. maculans*)

AA. Conidia colored, not acicular, rounded to obconic base, mostly wider than 4$\mu$.
B. Conidiophores chiefly nonfasciculate, arising singly from procumbent threads.
C. Conidiophores relatively short branches, 4-5.5 x 15-50$\mu$, not clavate; conidia 3.5-5 x 30-100$\mu$.
ASCLEPIAS *sp.* — *C. asclepiadicola* (*C. asclepiadis* Henn.)

CC. Conidiophores long, 4-6 x 50-250$\mu$, often clavate; conidia 4-6.5 x 20-80$\mu$.
A. SYRIACA (A. CORNUTI) — *C. venturioides* (*C. illinoensis*)

BB. Conidiophores chiefly fasciculate.
C. Leaf spots definite; fruiting not effuse, more abundant on upper leaf surface; conidia 4.5-6 x 40-130$\mu$; conidiophores 5-7.5 x 10-35$\mu$; fascicles dense to very dense.
A. SCHINZIANA — *C. pachycarpi*

CC. Leaf spots indistinct; fruiting effuse, usually hypophyllous; fascicles mostly 3-10 stalks, rarely dense.
D. Conidiophores long, 3-6.5 x 30-130$\mu$.
E. Conidiophores medium to dark in color; conidia 3.5-5 x 30-125$\mu$; multiseptate.
An ASCLEPIADACEAE — *C. peronosporoidea*

EE. Conidiophores pale to medium in color; conidia 4-6.5 x 20-90$\mu$; 1-7 septate.
A. SPECIOSA, A. AMPLEXICAULIS — *C. elaeochroma*

DD. Conidiophores relatively short, 4-6.5 x 10-70$\mu$.
E. Conidia mostly cylindric, 5-8 x 25-70$\mu$.
A. SPECIOSA, A. SYRIACA — *C. hanseni*
EE. Conidia mostly obclavate, 4-6 x 20-100$\mu$.
ASCLEPIAS spp. — *C. clavata* (*C. incarnata*)

**Cercospora asclepiadicola** new comb.

*Cercospora asclepiadis* P. Henn., Hedwigia **41**: 309. 1902

Leaf spots none or indistinct yellowish areas on the upper surface; fruiting effuse, sooty, hypophyllous; stromata lacking; nonfasciculate; conidiophores pale brown, short branches arising from procumbent threads, not geniculate, branches rarely septate, bluntly rounded tips, 4-5.5 x 15-50$\mu$; conidia very pale olivaceous, obclavato-cylindric, straight to slightly curved, indistinctly multiseptate, base long obconic, tip subobtuse, 3.5-5 x 30-100$\mu$.

HOST: Asclepias sp.

TYPE: Botanical Garden, Sao Paulo, Brazil; Asclepias sp.; Puttemans, No. 67; March 20, 1900.

DISTRIBUTION: Known only from the type locality.

NOTE: The nonfasciculate conidiophores which are short branches separate this species from the others on this host genus. *C. asclepiadis* Ellis was described in 1882. See key above.

**Cercospora asclepiadis** Ellis

Amer. Naturalist **16**: 810. 1882

*Cercospora maculans* Pat., Expl. Scien. Tunisie impr. National, p. 132. 1897

Leaf spots subcircular, frequently coalescing, uniformly black or with a gray center and a black margin, 0.5-5 mm. in diameter, when on the fruit are elongated, 3-15 x 8-50 mm.; fruiting mostly epiphyllous; stromata slight to 75$\mu$ in diameter; fascicles not dense to very dense, compact; conidiophores pale olivaceous brown, straight or nearly so, sparingly septate, slightly geniculate, not branched, rounded to subtruncate tip with evident spore scar, 4-5 x 20-60$\mu$; conidia hyaline, acicular, base truncate, tip subacute to subobtuse, usually curved, 2-4 x 40-120$\mu$.

HOSTS: *Asclepias syriaca* L. (*A. cornuti* Dec.), Asclepias sp., Asclepiadaceae, *A. tuberosa* L.

TYPE: Lexington, Kentucky; *Asclepias cornuti;* W. A. Kellerman; July, 1882; (*C. maculans*) Tunisia; on fruits of an Asclepiadaceae; Tozzer.

DISTRIBUTION: Material examined from Wisconsin, Kansas, Delaware, and Kentucky. Patouillard specimen found in Tunisia. Apparently it occurs also in Alabama.

NOTE: Saccardo (Syll. Fung. **15**: 84) lists this species as a synonym of *C. venturioides*. With its acicular conidia, it is quite distinct. There is another packet in the Ellis collection labeled *C. asclepiadis* Ellis on *Acerates viridiflora*. This has colored conidia and short conidiophores which resemble those

of *C. briareus*. It plainly is not *C. asclepiadis*. The type of *C. maculans* has not been seen. Even though Patouillard gives the width of the conidia as 5-6$\mu$, his species is considered at present a synonym. Hennings (Hedwigia **41**: 309. 1902) has also described a *C. asclepiadis*, but this is distinct from the Ellis type, and is being referred to *C. asclepiadicola*. In the Ellis collection, No. 2327A is a packet labeled *Cercospora asclepiadis* var. *caulicola*. It was collected in 1895 by John Dearness on the dead stems of milkweed. The collection undoubtedly is *C. clavata*. Since the herbarium specimens of Cercospora on Asclepias have so often been labeled wrongly, it is impossible to give an exact host range or geographical distribution. See key, page 67.

**Cercospora asclepiodorae** Ellis & Kellerman
Jour. Mycol. **4**: 6. 1888

*Cercospora Fraxinea* Ellis & Ev., Jour. Mycol. **4**: 4. 1888

Leaf spots indefinite or none, at least at first; fruiting in small effuse black amphigenous patches, 1-10 mm. in extent, on dead leaves; stromata dark brown, globular to elongated; fascicles dense to very dense; conidiophores dark fuligenous brown, septate, even when very short, sometimes constricted at septa, bluntly rounded tips, not geniculate, not branched, spore scars not present, sometimes attenuated toward tip, 4-6 x 5-35$\mu$; conidia pale olivaceous brown, obclavate, straight to slightly curved, rounded base, obtuse tip, septa distinct and rather close together, 3-5 x 25-100$\mu$.

HOST: *Asclepiodora viridis* Gray (*Acerates paniculata* Decne.)

TYPES: Manhattan, Kansas; *Acerates paniculata;* Kellerman and Swingle; 1887; (*C. Fraxinea*) Manhattan, Kansas; W. T. Swingle, No. 954; July, 1887.

DISTRIBUTION: Kansas, Alabama.

NOTE: This species has been reported also on Asclepias, but the examination of herbarium material does not verify the statement. Ellis mistook the host of *C. Fraxinea* for a Fraxinus, but a little later (Jour. Mycol. **4**: 83. 1888) made the correction, saying it was *C. asclepiodorae*. This species was reported on *Asclepias tuberosa* (Plant Dis. Reporter **32**: 207. 1948) and on *Asclepias jamesii* Torr. (Jour. Mycology **4**: 29. 1888) but in both instances it probably was *C. asclepiadis*.

CERCOSPORAE ON CYNANCHUM
(all conidia colored)

A. Conidia wide and short, 5-9 x 12-40$\mu$, mostly 1-septate; fruiting effuse; nonfasciculate to dense; conidiophores medium to dark in color, 4-6.5 x 30-200$\mu$.
C. CAUDATUM — *C. miurae*

AA. Conidia rarely as wide as 7$\mu$, usually more than 1-septate.

B. Leaf spots distinct; fruiting not effuse, amphigenous; stromata 20-75$\mu$; conidiophores 4-5.5 x 10-35$\mu$; conidia 3-5 x 20-100$\mu$.
CYNANCHUM spp. — *C. punctiformis*

BB. Leaf spots indistinct; fruiting effuse, hypophyllous; stromata none; conidiophores 4-7 x 20-125$\mu$; conidia 4-7 x 20-100$\mu$.
C. VINCETOXICUM — *C. bellynckii*

**Cercospora bellynckii** (Westendorp) Niessl
Hedwigia **15**: 1. 1876

*Cladosporium bellynckii* Westendorp, Bul. Acad. Roy. de Belgique. II. **21**: 240. 1854

*Cercospora vincetoxici* Sacc., Syll. Fung. **15**: 85. 1901
*Cercospora bellynckii* (West.) Sacc., Nuovo Giorn. Bot. Ital. **8**: 188. 1876

Leaf spots indistinct yellowish areas on the upper leaf surface to large brown blotches 6-15 mm. in diameter; fruiting effuse, hypophyllous, fuligenous or brown; mostly nonfasciculate, but sometimes dense fascicles; conidiophores pale to medium olivaceous brown, uniform in color, plainly and closely septate, constricted at septa or otherwise irregular in width, branched, slightly undulate, not geniculate, small spore scar at bluntly rounded tip, 4-7 x 20-125$\mu$; conidia concolorous, obclavato-cylindric, straight to slightly curved, 1-8 plainly septate, constricted at septa, end rounded bluntly or base may be obconically truncate, 4-7 x 20-100$\mu$.

HOST: *Cynanchum vincetoxicum* (L.) Pers. (*Vincetoxicum officinale* Moench.), Vincetoxicum sp.

TYPES: Bois de Dave, pres de Namur, Belgique; *Cynanchum vincetoxicum;* Prof. Bellynck; (*C. vincetoxici*) Bosco Montello, Italy; *C. vincetoxicum;* Treviso; Sept. 1874. Cotype distributed as Mycoth. Veneta 283.

DISTRIBUTION: Switzerland, France, Belgium, Italy, Poland, Germany, Serbia, Roumania, Southern Russia, and China. It has been reported incorrectly in America.

NOTE: Saccardo (Syll. Fung. **4**: 450. 1886) writes the name *C. bellynckii* (West.) Sacc., but Niessl had changed the name first. Saccardo's drawing (Fungi Ital. 649) shows much more nearly obclavate conidia than usually are found. See key above.

**Cercospora briareus** Ellis & Everhart
Proc. Acad. Nat. Sci. Phila. **46**: 381. 1894

Leaf spots indefinite or none; fruiting grayish to purplish black effuse layers on both leaf surfaces, 0.5-5 mm. in extent; stromata dark olivaceous; fascicles dense to very dense; conidiophores plainly septate, sometimes branched, not geniculate, fairly dark olivaceous brown, irregular in width, tip often conic and with small spore scar, 4.5-6 x 10-75$\mu$; conidia narrowly obclavate, olivaceous, base sharply obconic, tip subacute, straight to curved, multiseptate, 4-5.5 x 35-150$\mu$.

HOSTS: *Acerates viridiflora* Ell., *A. lanuginosa* Decne.

TYPE: Elkton, Maryland; *Acerates viridiflora;* A. Commons, No. 2537; Aug. 25, 1894.

DISTRIBUTION: Delaware, Maryland, Wisconsin.

NOTE: The relatively short conidiophores in dense fascicles and the narrowly obclavate long conidia separate this from the species on Asclepias.

**Cercospora calotropidis** Ellis & Everhart
Missouri Bot. Gard. Ann. Rept. **9**: 120. 1898

*Cercospora microsora* Pat., Duss, R.P., Enum. Meth. Champ. Guadeloupe, p. 91. 1903
*Cercospora patouillardi* Sacc., Syll. Fung. **18**: 608. 1906
*Cercospora calotropidis* Lingelsh., Engl. Bot. Jahrb. **39**: 605. 1907
*Cercospora inconspicua* Pat. + Har., Bul. Soc. Mycol. de France **24**: 16. 1909
*Cercospora domingensis* Frag. + Cif., Rep. Dom. Est. Agr. Moca. Serie B-Bot. Bul. **11**: 64. 1927
*Cercospora lingelsheimi* Savul. + Rayss., Ann. Crypt. Exot. **8**: 49. 1935

Leaf spots indefinite or large circular to irregular blotches, 5-15 mm. in diameter, greenish to tan, or sometimes dark brown, and occasionally bulging upward; fruiting amphigenous, in effuse olivaceous patches when spots are indefinite; stromata usually filling stomatal opening; conidiophores in fascicles of 3 to 20, pale to medium dark olivaceous or fuligenous, uniform in color, somewhat irregular in width, sparingly septate, often variously curved, sometimes once mildly geniculate near tip, rarely branched, small spore scar at bluntly rounded or conic tip, 4-7 x 10-55$\mu$; conidia cylindric to cylindro-obclavate, pale to medium dark olivaceous brown, straight or nearly so, 1-5 septate, sometimes constricted at septa, obconic base, bluntly rounded tip, 4-8 x 20-75$\mu$.

HOSTS: *Calotropis procera* (Ait.) R. Br., Calotropis sp., *Calotropis gigantea* Dryand. in Ait.

TYPES: Fortune Island, Brit. W. Indies; *Calotropis procera;* A. S. Hitchcock; Nov. 1890; (*C. microsora* Pat.) Baillif, Guadeloupe; Duss, No. 742; Febr. 25, 1903 (West Indies); (*C. calotropidis* Lingelsh.) Prov. Djibouti, Abyssinia (Französische Kolonie) im Regierungsgarten; Felix Rosen; Jan. 6, 1900; (*C. inconspicua*) Bas Bahr el Ghazal (Tchad) Manacori (Territoire du Chari); A. Chevalier, No. 10038; Sept. 18-22, 1903; (*C. domingensis*) prope Haina, Republica Dominicana; R. Ciferri; Aug. 12, 1925.

DISTRIBUTION: West Indies, Central America, northern South America, Egypt, and India.

NOTE: Sydow and McRae (Ann. Crypt. Exot. **2**: 262. 1929) as well as Nattrass state that *C. calotropidis, C. inconspicua* and *C. patouillardi* are synonymous. Nattrass (Min. Agr. Egypt, Tech. + Scien. Serv. Bul. 106: 1. 1932) adds that *Napicladium calotropidis* Morstatt also is a synonym. I have not seen Lingelsheim's species, but his description fits *C. calotropidis.* Apparently there is only one species on the host genus.

**Cercospora clavata** (Gerard) Cooke
Grevillea **4**: 69. 1875

*Helminthosporium clavatum* Gerard, Bul. Torrey Bot. Club **5**: 27. 1874
*Virgasporium clavatum* (Gerard) Cooke, Grevillea **3**: 182. 1874
*Cercospora clavata* (Gerard) Peck, N. Y. State Mus. Nat. Hist. Ann. Rept. **34**: 48. 1881
*Cercospora incarnata* Ellis and Everhart, Bul. Torrey Bot. Club **24**: 474. 1897

Leaf spots indefinite or none to distinct; fruiting mostly scantily effuse on lower leaf surface, dark olivaceous to almost black, indistinct on upper leaf surface; stromata few large cells or on upper leaf surface distinct; fascicles 3-20, mostly 3-10, when hypophyllous, and dense when epiphyllous; conidiophores pale to medium olivaceous or olivaceous brown, in mass sometimes appearing dark, 0-5 but mostly 1-2 septate, rarely constricted at the septa, 0-2 mildly geniculate, sometimes branched, small spore scar at rounded tip, uniform in color, irregular in width, 4-6 x 20-60$\mu$ (rarely as long as 85$\mu$); conidia cylindro- obclavate, longest ones distinctly obclavate, short obconic or rounded base, pale olivaceous, tip bluntly rounded, 1-11 septate, nearly straight, 3-6 x 20-80$\mu$ (rarely 135$\mu$).

HOSTS: *Asclepias incarnata* Linn., *A. arenaria* Torr., *A. curassavica* L., *A. meadii* Torr., *A. obtusifolia* Michx., *A. speciosa* Torr., *A. purpurascens* L., *A. syriaca* L. (*A. cornuti* Dec.), *A. tuberosa* L., *A. verticillata* Linn.

TYPES: Poughkeepsie, N. Y.; *Asclepias incarnata;* W. R. Gerard; autumn; (*C. incarnata*) Oberlin, Ohio; *A. incarnata;* F. D. Kelsey, No. 880; Aug. 5, 1895.

DISTRIBUTION: Since most of the herbarium material of Cercospora species on this host genus is in a state of confusion, it is difficult to know how widespread this species may be. It has been reported from Manitoba and Utah to Mississippi and eastward.

NOTE: In 1875 Cooke referred this to Cercospora. In 1881 Peck also gave the same name. In the N. Y. State Museum Herbarium is a specimen labeled by Peck *Cercospora asclepiadis* Peck (Albany, N. Y., Sept. 1880). This was never published, but according to his notes is the specimen on which he based the changing of the genus from *Helminthosporium clavatum* to *Cercospora clavata.* Ellis (Jour. Mycol. **1**: 55. 1885) reports *C. clavata* on *Gerardia quercifolia* and distributed a specimen collected at Newfield, N. J., as N. Amer. Fungi No. 823B. The fungus, however, is *C. gerardiae. C. incarnata* E.+E. should not be confused with *C. incarnata* Hennings described later and on a different host. In the State Museum, Albany, N. Y. is a packet labeled *Cercospora clavata* var. *amsoniae.* The collection was made July 28, 1891 by C. S. Sheldon (No. 224) at Quanah Parker Ranch, Indian Territory, on *Amsonia angustifolia* Michx. It is not a Cercospora. The spores are 0-2 septate, so should be listed as a Didymaria. See key, page 68.

**Cercospora cryptostegiae** Yamamoto

Trans. Nat. Hist. Soc. Formosa **26**: 281. 1936

Leaf spots none or indistinct yellowing on the upper leaf surface; fruiting in dark olivaceous effuse patches, hypophyllous, vein-limited, 1-6 mm. in extent or confluent and covering much of the leaf surface; stromata none or slight; nonfasciculate to loosely fasciculate, fascicles rarely dense; conidiophores olivaceous brown, irregular in width, plainly multiseptate, undulate, sinuous or geniculate, branched, small spore scar at the blunt to conic tip, 3.5-6 x 35-130$\mu$; conidia cylindric, longest ones may be slightly attenuated, straight to variously curved, olivaceous, 2-12 septate, base obconically truncate, tip obtuse, 4-7 x 20-85$\mu$.

TYPE: Botanical Garden, Taihoku, Formosa; *Cryptostegia* sp.; W. Yamamoto; Dec. 11, 1933. (The packet gives the date as Nov. 11.).

DISTRIBUTION: Known only from the type locality.

NOTE: A packet of this species is deposited in the U. S. Dept. Agr. Mycological herbarium.

**Cercospora elaeochroma** Saccardo

Nuov. Giorn. Bot. Ital. II. **23**: 220. 1916

Leaf spots none or indistinct; fruiting effuse olivaceous patches on both leaf surfaces, often covering large part of leaf; stromata lacking or small; mostly fasciculate, 2-15 or more stalks in fascicle; conidiophores pale to medium dark olivaceous brown, slightly paler near tip, not clavate, septa 5-15$\mu$ apart, constricted at septa or otherwise irregular in width, sparingly branched, upper half undulate or multigeniculate, small spore scar at conic tip, 3.5-5.5 x 30-125$\mu$; conidia obclavate to obclavato-cylindric, pale olivaceous, mostly 1-7 septate, straight to slightly curved, base mostly short obconic, tip obtuse, 4-6.5 x 20-90$\mu$.

HOSTS: *Asclepias speciosa* Torr., *A. amplexicaulis* Michx.

TYPE: Bismarck, N. Dak.; *Asclepias speciosa;* J. F. Brenckle, No. 354; Aug. 23, 1915.
DISTRIBUTION: North Dakota, New York, Delaware, Wisconsin.
NOTE: At first glance this resembles *C. venturioides,* but can readily be recognized by its closely septate conidiophores, which usually are in fascicles, and are not clavate. It is distinguished from the other species on Asclepias by being fasciculate, and having conidiophores long and pale to medium in color. See key, page 68.

**Cercospora fumosa** Spegazzini
Anal. Soc. Cient. Argentina 9: 191. 1880

Leaf spots indistinct yellowish areas on the upper surface, on the corresponding lower surface scantily effuse, olivaceous or fumous fruiting layers; stromata lacking or small, pale brown; fascicles mostly not dense; conidiophores very pale brown, subhyaline and narrow toward the tip, indistinctly septate, undulate or mildly geniculate, rarely branched, minute spore scar at the narrow tip, 3-5 x 20-50$\mu$; conidia pale olivaceous, obclavato-cylindric, straight to slightly curved, 2-5 septate, obconic base, blunt tip, 3-5 x 20-50$\mu$.

HOST: *Araujia albens* G. Don. (*A. sericifera* Brot.)
TYPE: San José de Flores, Buenos Aires, Argentine; *Araujia albens;* C. Spegazzini; March, 1880.
DISTRIBUTION: Known only from the type locality.
NOTE: Penzig in 1883 described a *C. fumosa.* This later was changed to *C. penzigii* Sacc.

**Cercospora gillesii** Spegazzini
Anal. Soc. Cient. Argentina 13: 29. 1882

Leaf spots none or indistinct yellowish areas on the upper surface; fruiting effuse, mostly hypophyllous, olivaceous; stromata globular, dark brown, 15-50$\mu$ in diameter; most fascicles dense; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, straight to slightly curved, branched, sparingly septate, not geniculate, minute spore scar at the narrowly rounded tip, 2.5-5 x 25-110$\mu$; conidia subhyaline to very pale yellowish olivaceous, obclavato-cylindric, straight or nearly so, indistinctly septate, ends rounded bluntly or subconic, catenulate, 4-6 x 35-120$\mu$.

HOST: *Philibertia gilliesii* Hook. & Arn.
TYPE: Ajo (General Lavalle), Buenos Aires, Argentine; *Philibertia gilliesii;* C. Spegazzini; Dec. 1880.
DISTRIBUTION: Known only from the type locality.
NOTE: The types of Spegazzini's Cercosporae were kindly sent me from Argentine. I made a permanent mount of each, in which the material was plentiful. Spegazzini spelled the species name of both the host and Cercospora without the second "i".

**Cercospora gonolobi** Ray
Mycologia 36: 173. 1944

Leaf spots irregular olivaceous to gray or dark brown to black blotches, 2-14 mm. in extent or sometimes coalescing into large areas, no distinct border; fruiting amphigenous but more abundant on the upper surface; stromata dark brown, globular, 20-40$\mu$ or rarely elongated to 75$\mu$; most fascicles dense, rarely very

dense; conidiophores pale to medium olivaceous brown, tip somewhat paler and often slightly swollen, with one or two small spore scars, 1-6 septate, sparingly branched, undulate or 1-3 geniculate, 3-4.5 x 10-80$\mu$; conidia obclavate to cylindro-obclavate, straight to nearly so, subhyaline to pale olivaceous, septa not distinct, base obconically truncate to rounded, tip obtuse, 4-5 x 30-80$\mu$.

HOST: *Gonolobus laevis* Michx.

TYPE: Stillwater, Oklahoma; *Gonolobus laevis;* W. W. Ray; Aug. 18, 1942.

DISTRIBUTION: Missouri, Oklahoma.

NOTE: I found this specimen also in the herbarium of Dr. J. J. Davis, Wisconsin. His reason for not publishing a description was that he was too busy to concern himself with out-of-state material.

**Cercospora gymnemae** Togashi & Onuma

Trans. Sapporo Nat. Hist. Soc. **17**: 99. 1942

Leaf spots none or indistinct, on upper surface circular to irregular yellowish areas, on corresponding lower surface scantily effuse grayish to olivaceous fruiting; stromata lacking; nonfasciculate; conidiophores single branches arising from procumbent intertwining hyphae, very pale olivaceous brown, uniform in color, irregular in width, straight to tortuous, not geniculate, 2.5-5 x 10-60$\mu$; conidia very pale olivaceous brown, narrowly obclavate, indistinctly multiseptate, straight to mildly curved, base sharply obconic to obconically truncate, tip subacute, 2.5-4 x 25-85$\mu$. (Togashi says 4-6$\mu$ wide).

HOST: *Gymnema affine* Decne.

TYPE: Shinsha, Formosa; *Gymnema affine;* F. Onuma; June, 1931.

DISTRIBUTION: Formosa.

NOTE: Dr. Togashi sent me type material in 1941.

**Cercospora hanseni** Ellis & Everhart

Erythea **1**: 147. 1893

No definite leaf spots formed; fruiting in olivaceous effuse patches on lower leaf surface; stromata lacking to prominent; nonfasciculate to dense fascicles; conidiophores medium dark olivaceous brown, plainly multiseptate, sometimes constricted at the septa, irregular in width, sometimes once abruptly geniculate, bluntly rounded tips, nonfasciculate ones branched and of indefinite length, others not branched and 4-6 x 10-70$\mu$; conidia pale to medium olivaceous brown, cylindric or obclavato-cylindric, straight to slightly curved, obconic base, obtuse tip, plainly 1-7 septate, often constricted at septa, 5-8 x 25-70$\mu$.

HOSTS: *Asclepias syriaca* L. (*A. cornuti* Dec.), *A. speciosa* Torr.

TYPE: Jackson, Amador Co., Calif.; *Asclepias cornuti;* Geo. Hansen.

DISTRIBUTION: Material studied from California, Missouri, and Delaware.

NOTE: Apparently not all of the collections made by Hansen and labeled *C. hanseni* are identical species. This species is recognized from all others on Asclepias by its wide, cylindric, fairly deeply colored conidia. It is possible sometimes to have a long-spored Cercospora present in the same mount. See key, page 68.

**Cercospora ibatiae** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 47. 1942

Leaf spots none or indistinct; fruiting effuse, hypophyllous, olivaceous, 2-6

mm. in extent; stromata lacking; nonfasciculate; conidiophores short branches from procumbent threads, uniformly pale to medium olivaceous brown, slightly irregular in width, sparingly septate, not geniculate, small spore scars at the bluntly rounded tip, 3-5 x 10-55$\mu$; conidia concolorous, cylindric, rarely attenuated, straight or nearly so, often catenulate, 1-5 plainly septate, occasionally constricted at the septa, ends rounded bluntly or base may be obconic, 4-6 x 20-50$\mu$.

HOST: *Ibatia maritima* (L.) Decne. (*Lachnostoma maritimum* Nichols)
TYPE: Road Guayus–Los Teques, Venezuela; *Ibatia maritima;* A. S. Muller and H. H. Whetzel, No. 2944; Mar. 9, 1939.
DISTRIBUTION: Known only from the type locality.

**Cercospora marsdeniae** Hansford
Proc. Linn. Soc. London **158**: 50. 1947

Leaf spots 1-3 mm. in diameter, scattered, angular, dark purple with paler purple border, on the lower surface dark brown; stromata substomatal, dark olivaceous, 40 x 50$\mu$; fascicles divergent; conidiophores pale olivaceous, straight to curved, 0-2 septate, not or rarely branched, cylindric, about 4 x 60$\mu$; conidia very pale olivaceous, cylindric, straight to curved, 2-7 septate, not or only slightly constricted, base subtruncate, tip obtuse, 3.5-5 x 30-90$\mu$.

HOST: *Marsdenia angolensis* N.E. Br.
TYPE: Entebbe Road, Uganda; *Marsdenia angolensis;* C. G. Hansford, No. 3543.
DISTRIBUTION: Uganda
NOTE: I have not seen this species.

**Cercospora miurae** H. & P. Sydow
Ann. Mycol. **11**: 117. 1913

Leaf spots none or indistinct yellowing on the upper leaf surface; fruiting heavily effuse, hypophyllous, dark olivaceous or fuligenous, angular areas 1-4 mm. in diameter or coalescing into large areas; stromata lacking or a few brown cells; nonfasciculate to fascicles of 2-20 stalks; conidiophores medium to rather dark brown, uniform in color, plainly multiseptate, constricted at septa or otherwise irregular in width, occasionally widest near the tip, branched, sinuous or tortuous to multigeniculate, small spore scar at the rounded to conic tip, 4-6.5 x 30-200$\mu$; conidia pale to very pale fuligenous, cylindric, straight to sharply curved, 1-3 septate, both ends rounded bluntly or base may be long obconic, 5-9 x 12-40$\mu$.

HOST: *Cynanchum caudatum* Max.
TYPE: Yamahana, Hokkaida, Japan; *Cynanchum caudatum;* M. Miura, No. 282; Sept. 15, 1907.
DISTRIBUTION: China, Japan, and several close-by islands.
NOTE: The effuse fruiting, and the wide, short cylindric conidia separate this species from the others on this host genus. Katsuki (Bul. Agr. Impr. Sect. Econ. Dept. Kukuoka Pref. Japan **1**: 17. 1949) reported the species on *Metaplexis japonica* Makino. I consider this a Cladosporium.

**Cercospora pachycarpi** Chupp & Doidge
Bothalia **4**: 889. 1948

Leaf spots angular, vein bound, small to large part of the leaf surface, dull brown; fruiting amphigenous but more abundant on the upper leaf surface;

stromata slight to 60$\mu$ in diameter, globular, dark brown to almost black; fascicles dense to very dense; conidiophores in mass dark to almost black, singly pale to medium brown, uniform in color, irregular in width or occasionally clavate, straight to tortuous, sparingly septate, rarely geniculate, one to numerous small spore scars at or near the tip, 5-7.5 x 10-35$\mu$; conidia pale olivaceous, obclavate, straight to slightly curved, indistinctly multiseptate, base obconically truncate, tip subobtuse, 4.5-6 x 40-130$\mu$.

HOST: *Pachycarpus schinzianus* N.E. Br. (*Asclepias schinziana*)

TYPE: Wonderboom, Pretoria, Transvaal; *Pachycarpus schinzianus;* P. v. d. Byl, No. 2208; March 22, 1912.

DISTRIBUTION: Known only from the type locality.

NOTE: The host is considered to be an Asclepias. This species resembles *C. incarnata,* excepting that the conidiophores are noticeably darker, shorter and wider. Engler and Prantl list the genus of the host as Gomphocarpus.

**Cercospora peronosporoidea** Patouillard & Hariot
Bul. Soc. Mycol. de France **24**: 16. 1909

Leaf spots none or slight yellowing on the upper surface; fruiting effuse, dark olivaceous, hypophyllous, 1-3 mm. in extent; stromata lacking to 50$\mu$ in diameter, dark brown; fascicles mostly 3-8 stalks, but occasionally dense; conidiophores medium to rather dark brown, paler and sometimes wider tip, plainly multiseptate, constricted at septa or otherwise irregular in width, branched, sinuous or 1-4 geniculate, small spore scar at conic tip, 4-6.5 x 30-125$\mu$; conidia obclavate, olivaceous, mildly curved, indistinctly multiseptate, base obconic, tip subacute, 3.5-5 x 30-125$\mu$.

HOST: An Asclepiadaceae

TYPE: Fort Lamy, Afr. Occid, Chari inferieur; an Asclepiadaceae; A. Chevalier, No. 11328; Oct. 1, 1903.

DISTRIBUTION: Known only from the type locality.

**Cercospora punctiformis** Saccardo & Roumeguere
Rev. Mycol. **3**: 29. 1881

*Cercospora vincetoxici* Ellis & Ev., Jour. Mycol. **8**: 70. 1902

Leaf spots circular, 4-6 mm. in diameter, pale tan to gray, often with yellow to brown margin; fruiting amphigenous, when abundant darkening pale area of spots; stromata globular, dark brown to almost black, 20-75$\mu$ in diameter; fascicles dense; conidiophores pale to medium olivaceous or olivaceous brown, fairly uniform in color and width, longest ones septate, not branched, rarely geniculate, small spore scar at conic tip, 4-5.5 x 10-35$\mu$; conidia obclavate to cylindric, olivaceous, straight to curved, 1-5 septate, base rounded to long obconic, tip obtuse, 3-5 x 20-100$\mu$.

HOSTS: *Cynanchum* (*Vincetoxicum*) *acutum* L. (*C. natalitum* Schl.) *Vincetoxicum hirsutum* (Michx.) Brit., *C. formosanum* Hemsl.

TYPES: Algeria, Africa; *Cynanchum acutum;* No. 100; (*C. Vincetoxici*) Tuskegee, Ala.; *Vincetoxicum hirsutum;* G. W. Carver, No. 122; Oct. 1899.

DISTRIBUTION: Studied material from Algeria, Roumania, Italy, Formosa, and Alabama.

NOTE: The definite leaf spots, the lack of effuse fruiting, the prominent stromata and dense fascicles separate this species from the others on Cynanchum. Sac-

cardo (Syll. Fung. 4: 450. 1886; 15: 85. 1901) states that *C. vincetoxici* Sacc. is a synonym of *C. bellynckii*. This seems correct. A specimen was collected by Miss E. M. Doidge at Isipingo, Natal, Union of South Africa, on *Cynanchum natalitum*, May 13, 1913 (No. 6642) which resembles this species closely. See key, page 69.

**Cercospora tylophorae** Ramakrishnan, T. S. & K.
Proc. Indian Acad. Sci. Sect. B. 32: 108. 1950

Leaf spots none or indistinct yellowish areas on the upper leaf surface; fruiting effuse, hypophyllous or rarely amphigenous, olivaceous; stromata lacking on lower leaf surface; nonfasciculate to slightly fasciculate; conidiophores pale to medium olivaceous brown, uniform in color, plainly multiseptate, constricted at septa or otherwise irregular in width, occasionally clavate, branched copiously, sinuous to multigeniculate, small spore scar at the conic tip, 4-6 x 40-200$\mu$; conidia obclavato-cylindric, pale olivaceous, straight to slightly curved, 3-8 plainly septate, ends rounded bluntly or base obconically truncate, 4-7 x 20-120$\mu$.

HOSTS: *Tylophora asthmatica* W. & A., Tylophora sp.
TYPE: Walayar, Madras, India; *Tylophora asthmatica;* T. S. and K. Ramakrishnan; Aug. 28, 1948.
DISTRIBUTION: Uganda, India.
NOTE: I examined the collections sent by Hansford to the Kew Herbarium, but did not see the material from India.

**Cercospora venturioides** Peck
N. Y. State Mus. Nat. Hist. Ann. Rept. 34: 47. 1881

*Cercospora illinoensis* Bartholomew, (F. Col. 2611) Syll. Fung. 22: 1428. 1913

Leaf spots none or indistinct; fruiting in dark to olivaceous effuse patches, amphigenous but mostly on lower leaf surface; stromata lacking; nonfasciculate or sometimes pseudo-fasciculate; conidiophores pale olivaceous or olivaceous brown, uniform in color, often wider near tip, septa 15-20 apart, much branched, upper half sinuous or multigeniculate, small spore scar at bluntly rounded tip, 4-6 x 50-250$\mu$; conidia cylindric to cylindro-obclavate, pale olivaceous, straight to slightly curved, 1-5 septate, long sharply obconic base, obtuse tip, 4-6.5 x 20-80$\mu$.

HOST: *Asclepias syriaca* L. (*A. cornuti* Decn.)
TYPES: Albany, N. Y.; *Asclepias cornuti;* C. H. Peck; Sept., 1880; (*C. illinoensis*) Illinois; *A. syriaca;* Elam Bartholomew.
DISTRIBUTION: Apparently common from New York to Wisconsin and as far south as North Carolina, Illinois and Kansas. Also reported from Puerto Rico and Ontario, Canada.
NOTE: The colored cylindric conidia, 4-6.5$\mu$ wide, and the long clavate conidiophores separate this species from the others on Asclepias. See key, page 67.

**Cercospora campi-silii** Spegazzini
Michelia 2: 171. 1880

*Cercospora impatientis* Bäumler, Zool.-Bot. Ges. Wien. Verhandl. 38: 717. 1888

Leaf spots subcircular to irregular, 2-5 mm. in diameter, pale brown to reddish margin and gray to white center; fruiting mostly epiphyllous; stromata lacking or a few brown cells; conidiophores borne singly or in fascicles of 2-12, very pale olivaceous brown near the base, almost hyaline tip, irregular in width, tortuous

to much geniculate, sparingly septate, rarely branched, small to medium spore scar at the subtruncate tip, 3-6 x 20-100$\mu$; conidia hyaline, cylindric, straight or nearly so, 1-5 septate, base truncate, tip obtuse, 4-6 x 20-60$\mu$.

HOSTS: *Impatiens noli-tangere* L., *I. parviflora* DC.

TYPES: Sylva Alpina, Cansiglio, Italy; *Impatiens noli-tangere;* C. Spegazzini; Aug. 1879. Cotype distributed as Decades Myc. Italicae No. 109. (*C. impatientis*) Beluj, prope Prencow, Hungary, *Impatiens noli-tangere;* Bäumler; Sept. 1887.

DISTRIBUTION: Germany, Belgium, Poland, Hungary, Italy, Moravia, Roumania, Lower Russia, Japan, China, and Minas Geraes.

NOTE: Pénzes (Magyar, Virág. Növ. vonat. Közlem. **1**: 298. 1928) also states that *C. impatientis* is a synonym. *C. campi-silii* differs from *C. fukushiana* in having plainly cylindric conidia, 1-5 septate, and irregularly geniculate conidiophores which may be almost hyaline.

**Cercospora fukushiana** (Matsuura) Yamamoto
Jour. Plant Prot. **14**: 699. 1927

*Cercospora balsaminae* Kel. & Sw. in litt.

*Cercosporina fukushiana* Matsuura, Trans. Tattori Soc. Agr. Sci. Japan **1**: 83. 1928

*Cercospora balsaminae* Mendoza, Philipp. Jour. Sci. **75**: 166. 1941

Leaf spots circular to subcircular, 1-5 mm. in diameter, at first uniformly brown, then with dingy gray center and brown margin; fruiting amphigenous; stromata slight; fasciculate, mostly not in dense fascicles; conidiophores pale brown, slightly paler and more narrow toward the tip, longest ones septate, rarely branched, straight to undulate or 1-3 abruptly geniculate, medium spore scar at subtruncate tip, 4-6 x 10-120$\mu$ (reported as long as 270$\mu$); conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute to subacute, 3-4.5 x 30-140$\mu$ (reported as long as 233$\mu$).

HOST: *Impatiens balsamina* Linn.

TYPE: Matsuura merely says the species is widely distributed but does not seem to give an exact type. The Yamamoto collection is from Taihoku, Formosa, Nov. 8, 1933, on *Impatiens balsamina.* (*C. Balsaminae*) Luzon, Laguna Prov., Los Banos, Philipp.; *Impatiens balsamina;* Mendoza, No. 55508.

DISTRIBUTION: Formosa, Philippines, Southern Rhodesia, South Africa, Guatemala, and Kansas. Kellerman and Swingle's No. 2457, on the same host, is in the Bureau of Plant Industry herbarium at Washington under the name *C. balsamina* K. et S.

NOTE: The other species with hyaline conidia on Impatiens is *C. campi-silii* Speg. (*C. impatientis* Bäumler). For a further description of *C. fukushiana,* see Jour. Soc. Trop. Agr. **6**: 599. 1934 or Taihoku Imp. Univ. Phytopath. Lab. Contr. **28**: 599. 1934. *C. nojimai* has colored obclavate conidia.

**Cercospora nojimai** Togashi & Katsuki
Sci. Repts. Yokohama Nat. Univ. Sect. II. **1**: 5. 1952

Leaf spots angular to irregular, vein-limited, 3-8 mm. in diameter, dark brown to violaceous brown, indefinite border, often confluent and then may include the total leaf; fruiting epiphyllous, grayish; stromata dark brown, consisting of a few cells or absent entirely; fascicles mostly not dense; conidiophores dark brown,

0-1 septate, not branched, 2.5-4 x 25-40$\mu$; conidia olivaceous, elongato-obclavate, curved or rarely straight, 3-9 septate, base obconically truncate, apex subacute, 2.5-4 x 50-90$\mu$.

HOST: *Impatiens textori* Miq.

TYPE: Nanao-mura, Minamitama-gun, Pref. Tokyo, Japan; *Impatiens textori;* E. Kurosawa; Oct. 7, 1951.

DISTRIBUTION: Several collections from Japan.

**Cercospora boussingaultiae** Roumeguere

Fungi Selecti Galliaei Exsiccati No. 60, 1879

Leaf spots circular, 1-4 mm. in diameter, papery in appearance, pale tan in color, indistinctly zonate, slightly raised line border; fruiting amphigenous; stromata lacking; conidiophores borne singly or in groups of 2-3, pale olivaceous brown, paler tip, uniform in width, septate, not geniculate, not branched, straight to slightly curved, medium spore scar at the subtruncate tip, 3-4 x 75-200$\mu$; conidia obclavato-cylindric, very pale olivaceous brown, indistinctly septate, straight to slightly curved, base subtruncate to obconic, tip subobtuse, 2.5-4 x 25-75$\mu$.

HOST: *Boussingaultia baselloides* H. B. & K.

TYPE: France; *Boussingaultia baselloides;* C. Roumeguere; 1878. Cotype distributed as Fungi Sel. Gall. Exs. 60.

DISTRIBUTION: Known only from the type locality.

NOTE: It was very difficult to find enough fruiting to describe the fungus. Numerous mounts were studied from material in the Herbaria of Harvard, New York Botanical Garden, and Cornell before sufficient fruiting could be found to determine the characteristics of the species. Saccardo (Michelia **2**: 128. 1882; and Syll. Fung. **4**: 479. 1886) and Lindau (Kryptogamen-Flora **9**: 96. 1910) say fruiting could not be found.

**Cercospora begoniae** Hori

Shokubutsu Byôgai Kôwa, p. 181. 10th ed. 1916

Leaf spots circular, 1.5-4 or even 8 mm. in diameter, small gray center and wide brown margin, occasionally falling out and leaving a shot-hole effect; fruiting amphigenous; stromata lacking or a few brown cells; conidiophores borne singly or in fascicles of 2-5, pale to very pale brown, paler and more narrow toward the tip, sparingly septate, not branched, straight or 1-5 geniculate, medium sized spore scar at the subtruncate tip, 3-5 x 30-175$\mu$, rarely 300$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 50-300$\mu$.

HOSTS: *Begonia rex* Putz., Begonia sp.

TYPE: Neither Hori nor Ideta in his Supplement to the Handbook of Plant Diseases **2**: 980. 1926 seems to refer to a type. Hori may have published a description before his "Lectures on Plant Diseases," but I did not succeed in finding any previously printed description.

DISTRIBUTION: Japan and Poland.

NOTE: Dr. Jaukowska sent me a fairly good specimen from his country.

**Cercospora caulophylli** Peck

N. Y. State Mus. Nat. Hist. Ann. Rept. **33**: 30. 1880

Leaf spots pale tan with a purplish or brown border, circular to irregular, 2-6

mm. in diameter; fruiting hypophyllous; stromata slight or none; fascicles mostly not dense, 3-15; conidiophores pale olivaceous brown, uniform in color and width, longer ones strongly geniculate, multiseptate, not branched, fairly large spore scar at the subtruncate tip, 3-4 x 10-125$\mu$ (often specimens found with only short conidiophores, 10-40$\mu$ and not much geniculate); conidia obclavato-cylindric, straight or nearly so, subtruncate base, obtuse tip, 2-5 septate, hyaline to subhyaline, 3-5 x 10-45$\mu$.

HOST: *Caulophyllum thalictroides* (L.) Michx. (Leontice)
TYPE: Helderberg Mts., N. Y.; Caulophyllum; C. H. Peck; July 1879.
DISTRIBUTION: Reported from eastern United States, as far west as Iowa and Missouri, and south as Mississippi. Also reported from Minas Geraes and Japan. It has been reported from Missouri also on *Anemonella thalictroides* (L.) Spach. (*Anemone thalictroides* L.) (Plant Dis. Reporter **32**: 531. 1948) but this apparently is incorrect.

**Cercospora nandinae** Nagatoma
Materials for Education, Kyoto Pref. No. 3. 1932
also Forsch. Geb. Pflanzenkr. K. Univ. Kyoto **3**: 109. 1937
*Cercospora nandinae* Fukui, Bull. Imp. Coll. Agr. and Forest. Mie **3**: 14. 1933

The upper leaf surface irregularly blotched with red, the centers of some of the older spots may be almost black; on the corresponding lower side the surface slightly darkened by a scantily effuse sooty or olivaceous fruiting layer; stromata almost or wholly lacking; fascicles usually not dense, nonfasciculate to 10 stalks; conidiophores pale olivaceous or olivaceous brown, uniform in color, plainly 1-3 septate, variously curved or bent, irregular in width or constricted at the septa, copiously branched, rarely once geniculate, small spore scar at rounded to conic tip, 3-5 x 15-50$\mu$; conidia pale olivaceous, obclavate, slightly curved, septa indistinct, base long obconic, tip subacute to subobtuse, 2-3.5 x 25-75$\mu$.

HOST: *Nandina domestica* Thunb.
TYPE: Maizuru, Prov. Tango, Japan; *Nandina domestica;* I. Nagatoma; Sept. 1930.
DISTRIBUTION: Japan, South Carolina, and Alabama.
NOTE: Nagatoma described it from Japan where he made a large number of collections from 1930 to 1935. J. A. Stevenson sent me a collection from Tuskegee, Ala., made by Geo. W. Carver (No. 88) Sept. 12, 1935. It seems identical with the Japanese material.

**Cercospora podophylli** Tehon & Daniels
Mycologia **19**: 128. 1927

Leaf spots slightly elongated, 2-3 x 3-5 mm., pale tan center, dark brown border; fruiting epiphyllous; stromata lacking; conidiophores mostly borne singly or in pairs, pale olivaceous brown, septate, bluntly rounded tip; conidia cylindric, sometimes catenulate, hyaline to subhyaline, base obconic, tip obtuse, 3-5 septate, 3-6 x 25-55$\mu$.

HOST: *Podophyllum peltatum* L.
TYPE: Jersey Co., Ill.; *Podophyllum peltatum;* C. O. Peake; Aug. 2, 1922.
DISTRIBUTION: Known only from the type locality.
NOTE: The type material was too scanty to study carefully.

**Cercospora alni** Chupp & Greene
Farlowia **1**: 580. 1944

*Passalora bacilligera* (Mont.) Fresenius, Beiträge zur Mycologie. Heft III. pp. 81-111. 1863

Leaf spots none or indistinct; fruiting hypophyllous, effuse, dark olivaceous, in small irregular patches 0.5-4 mm. in length; stromata lacking or composed of only a few dark brown cells; fascicles compact to spreading, 3-20 stalks; conidiophores in mass dark in color, singly pale to medium olivaceous brown, near the tip somewhat paler, irregular in width or clavate, indistinctly multiseptate, rarely branched, top half closely undulate or multigeniculate, tip rounded bluntly, 3-5.5 x 25-90$\mu$; conidia pale to very pale olivaceous, obclavato-cylindric, mostly 1- septate, often with bulging lower cell, straight to mildly curved, base long obconically truncate, tip obtuse, 3.5-5 x 20-60$\mu$.

HOSTS: *Alnus crispa* (Ait.) Pursh., *A. crispa* var. *mollis* Fern., *A. glutinosa* Medic.
TYPE: Winneboujou, Douglas Co., Wisc.; *Alnus crispa;* J. W. Thomson; Sept. 3, 1942.
DISTRIBUTION: Studied material from Wisconsin and Quebec, Canada. Also reported from all of western Europe, and in England.
NOTE: Normally this should not be considered a Cercospora, having only 1-septate conidia, but they are so long that in every other way the fungus resembles this genus. See Saccardo, Fungi Ital. No. 788 for a drawing of the fungus.

**Cercospora coryli** Montemartini
Riv. Patol. Vegetale **7**: 227. 1915

Leaf spots numerous, circular, 1-3 mm. in diameter, often confluent, center gray, border dark red; fruiting amphigenous, sparse; fasciculate; conidiophores brown, undulate, sparingly septate, short; conidia pale olivaceous, cylindric or slightly attenuated, 1-2 septate, 3-4.5 x 30-45$\mu$.

HOST: *Corylus avellana* Thunb.
TYPE: Reviera Gambarogna (Lacus Majoris); *Corylus avellana;* Montemartini.
DISTRIBUTION: Known only from the type locality.
NOTE: I was unable to procure specimens of this species. It probably is a Didymaria rather than a Cercospora. See also *C. corylina* for differences between the two species on this host genus.

**Cercospora corylina** Ray
Mycologia **34**: 560. 1942

Leaf spots numerous, angular, 0.5-5 mm. in diameter, vein limited, uniformly dark reddish brown; fruiting amphigenous; stromata lacking or a few brown cells; fascicles mostly 2-8 stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, sparingly septate, not branched, 0-3 geniculate, medium spore scar at the subtruncate tip, 3-4.5 x 40-250$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 3-4.5 x 40-150$\mu$.

HOSTS: *Corylus rostrata* Ait., and a hybrid between *Corylus americana* Walt. x *C. avellana* Thunb.
TYPE: College Nursery, Stillwater, Okla.; on above species; W. W. Ray; Sept. 17, 1940.
DISTRIBUTION: Known only from the type locality.

NOTE: I did not see a specimen of *C. coryli* but Montemartini describes it with short conidiophores and colored cylindric conidia. This seems quite distinct from the Oklahoma collections.

## CERCOSPORAE ON TECOMA

A. Conidia hyaline.
  B. Conidia acicular, base truncate, tip subobtuse, 3-5 x 25-80$\mu$; fascicles partly dense; conidiophores 4-5.5 x 20-80$\mu$.
    TECOMA sp. *C. tecomae*
  BB. Conidia cylindric to spindle shaped, base long obconically truncate, tip obtuse, 3-6 x 40-70$\mu$; conidiophores single or in fascicles of 2-5, 3-4 x 50-250$\mu$.
    T. STANS, T. SERRATIFOLIA *C. stenolobiicola*
AA. Conidia colored, mostly obclavate.
  B. Stromata when present very large, 300-500$\mu$ in length; fascicles dense to very dense; conidiophores 5-8 x 40-150$\mu$; conidia 3.5-6 x 30-80$\mu$.
    TECOMA sp. (tree) *C. leprosa*
  BB. Stromata a few cells to 50$\mu$ in diameter.
    C. Leaf spots indistinct; fruiting effuse, olivaceous, hypophyllous; conidia pale to medium dark, 3-5 x 20-200$\mu$; conidiophores branched, 3-5 x 20-120$\mu$.
      T. RADICANS *C. sordida*
    CC. Leaf spots distinct; fruiting not effuse; conidiophores not branched.
      D. Fruiting chiefly epiphyllous; conidiophores 2.5-4 x 5-25$\mu$; conidia fairly dark colored, 2-4.5 x 20-100$\mu$.
        T. RADICANS *C. duplicata*
      DD. Fruiting hypophyllous; conidiophores 3-5 x 10-40$\mu$; conidia very pale in color, 3-5 x 20-110$\mu$.
        T. PENTOPHYLLA *C. jahnii*

**Cercospora adenocalymmae** Muller & Chupp

Arq. do Inst. de Biol. Vegetal 1: 213. 1935

Leaf spots circular to subcircular, 0.5-3 mm. in diameter, gray with a purple margin; fruiting amphigenous; stromata globular to elongate, dark brown, 40-60$\mu$ in length; fascicles usually dense; conidiophores pale to medium olivaceous brown, slightly paler and more narrow toward the tip or irregular in width, longer ones sinuous, 0-2 septate, not geniculate, not branched, small spore scar at the rounded or conic tip, 4-5.5 x 20-65$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate, straight or slightly curved, base long obconically subtruncate to almost obconic, tip blunt, indistinctly multiseptate, sometimes guttulate, rarely catenulate, 3-4.5 x 35-150$\mu$.

HOST: *Adenocalymma bullatum* Bur., *A. bracteatum* DC.

TYPE: Vicosa-Escola, Minas Geraes; *Adenocalymma bullatum;* A. S. Muller, No. 288; Aug. 15, 1931.

DISTRIBUTION: E. Santos and Minas Geraes, Brazil.

**Cercospora arrabidaeae** Chupp & Viégas

Bol. da Soc. Brasil. de Agron. 8: 8. 1945

Leaf spots subcircular to irregular, 0.5-6 mm. in diameter, dark brown; fruiting amphigenous; stromata lacking or small, dark brown to almost black; nonfas-

ciculate to dense fascicles; conidiophores pale to medium dark brown, uniform in color, irregular in width, 1-5 septate, branched occasionally, rarely geniculate, rounded to conic tip, 4-6 x 10-75$\mu$; conidia pale to medium olivaceous, obclavate to almost linear, straight to mildly curved, 3-9 septate, base short obconically truncate, tip subobtuse to conic, 3.5-5 x 35-150$\mu$.

HOST: *Arrabidaea platyphylla* (Cham.) Bur. & Schum.
TYPE: Cerrado, Mogi-Mirim, Sao Paulo, Brazil; *Arrabidaea platyphylla;* A. P. Viégas and A. S. Costa, No. 3726; Febr. 27, 1941.
DISTRIBUTION: Known only from the type locality.

**Cercospora bignoniaecola** Spegazzini
Anal. Soc. Scient. Argent. **16**: 170. 1883

Leaf spots irregular, often confluent, gray, usually with a definite margin; fruiting amphigenous; stromata slight; conidiophores borne singly or in groups of 2-7, almost hyaline or very pale colored, septate, not geniculate, not branched, uniform in color and width, small spore scar at rounded to conic tip, 4-7 x 20-80$\mu$ (Spegazzini says 80-160$\mu$); conidia cylindric, straight or nearly so, very pale olivaceous, 3-5 septate, base long obconic or rounded, tip similar, 4-7 x 25-70$\mu$.

HOST: Bignonia sp.
TYPE: Caá-guazú, Paraguay; Bignonia sp.; B. Balansa, No. 3497; Jan. 1882.
DISTRIBUTION: Known only from the type locality.
NOTE: The type material was too meagre to study the fungus carefully. See also *C. duplicata* for differences between the species on Bignonia.

**Cercospora catalpae** Winter
Hedwigia **24**: 203. 1885
(Same in Jour. Mycol. **1**: 124. 1885)

Leaf spots brown to gray, circular to angular, 1-4 mm. in diameter, sometimes with a border darker than the center; fruiting mostly hypophyllous; stromata none to 50$\mu$ in diameter, globular, brown; fascicles sometimes dense; conidiophores pale olivaceous brown, rarely septate, 0-2 geniculate, medium spore scar

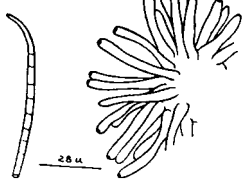



Fig. 8
*C. catalpae*

at tip, uniform in color, sometimes slightly attenuated toward the tip, 3-5.5 x 10-125$\mu$; conidia acicular, hyaline, truncate base, subobtuse to subacute tip, straight to slightly curved, septa indistinct, 2.5-4.5 x 40-120$\mu$. A specimen collected in China was similar to the type, except that the conidiophores and conidia were as long as 200$\mu$, large spore scars were present and the tip of the

conidia acute. In spite of these minor differences, it is considered the same species.

HOSTS: *Catalpa bignonioides* Wald., *C. kaempferi* Sieb. & Zucc. (*C. ovata* G. Don.), *C. speciosa* Warder.

TYPE: Perryville, Mo.; *Catalpa bignonioides;* C. H. Demetrio; Oct. 1883.

DISTRIBUTION: In the United States from Texas and Missouri, eastward. Also reported from Massachusetts and from China.

NOTE: A collection on Catalpa from San Domingo has colored conidia, and is listed as *Cercospora catalparum.*

**Cercospora catalparum** sp. nov.

Maculae typicae nullae, sed decolorationes epiphyllas indeterminatas flavidas efficiens; caespituli semper hypophylli, effusi, rubro-fusci, parvi; conidiophora vix fasciculata, subita curvata, simplicia, pallide olivaceobrunnea, 4-7.5 x 15-70$\mu$; conidia obclavata, pallide olivaceofusca, obscure multiseptata, leviter curvata, ad basim obtusa, 3.5-6 x 35-125$\mu$.

Leaf spots mostly indefinite; fruiting in small reddish or reddish brown patches on the lower leaf surface; a pseudostroma sometimes present and with the older mycelium may be carmine in color; conidiophores borne singly or rarely in pseudofascicles, mostly arising as short branches, pale to medium olivaceous brown or carmine, not geniculate, variously curved, bluntly rounded tips, 4-7.5 x 15-70$\mu$; conidia obclavate, pale olivaceous brown, indistinctly multiseptate, slightly curved, base rounded to obconic, tip subobtuse, 3.5-6 x 35-125$\mu$.

HOST: *Catalpa longissima* Sims.

TYPE: Santiago, San Domingo; *Catalpa longissima;* Kern and Toro, No. 273; March 21, 1926.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. Catalpae* for differences between the two species on this host genus.

**Cercospora cybistacis** P. Hennings

Hedwigia **48**: 17. 1909

Leaf spots circular, 3-7 mm. in diameter, grayish brown to almost black, sometimes with a slightly raised border; fruiting mostly epiphyllous; stromata globular, brown, 25-75$\mu$ in diameter; fascicles usually dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, crooked or once geniculate, not branched, septa rare, minute spore scar at the rounded tip, 2.5-4 x 10-35$\mu$; conidia very pale olivaceous brown, cylindro-obclavate, slightly curved, indistinctly pluriseptate, base long obconically truncate, tip blunt to conic, 2.5-4 x 20-70$\mu$.

HOST: *Cybistax antisyphilitica* Mart.

TYPE: Horto Botanico, Sao Paulo, Brazil; *Cybistax antisyphilitica;* A. Puttemans, No. 506; May 20, 1902.

DISTRIBUTION: Known only from the type locality.

NOTE: I was permitted to study all of Hennings' types in Berlin. The published date for the collection of this species is given as June, 1902, although the number of the specimen is given as 506, which agrees with the information on the packet.

**Cercospora dolichandrones** sp. nov.

Maculae 3-10 mm. diam., ambitu plus minus orbiculares, griseo-virides, centro tandem leniter expallentes; caespituli epiphylli; stromata minuta, fusca; conidiophora leviter fasciculata, aequabiliter pallidissime flavo-olivascea, simplicia, recta vel vix curvata, 2-3.5 x 10-30$\mu$; conidia subhyalina vel pallidissime flavo-olivascea, anguste obclavata, spurie multiseptata, utrinque obtuse rotundata, curvata, 1.5-3 x 40-100$\mu$.

Leaf spots subcircular, mostly large, 3-10 mm. in diameter, yellowish green at first, then becoming gray to tawny gray; fruiting epiphyllous; stromata small, brown; fascicles usually not dense, divergent; conidiophores subhyaline to very pale yellowish olivaceous, uniform in color and width, not geniculate, not branched, almost straight, conic tip, 2-3.5 x 10-30$\mu$; conidia subhyaline to very pale yellowish olivaceous, narrowly obclavate, indistinctly multiseptate, curved, base sharply obconic, tip acute, 1.5-3 x 40-100$\mu$.

HOST: *Dolichandrone platycalyx* Baker, (*Markhamia platycalyx* Sp.)

TYPE: Kampala, Uganda; *Dolichandrone platycalyx;* C. G. Hansford, No. 1810; May, 1936.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. hansfordii* for differences between the species on this host.

**Cercospora duplicata** Ellis & Everhart

Jour. Mycol. **5**: 70. 1889

*Cercospora pallida* E. + E., Jour. Mycol. **3**: 21. 1887

*Cercospora langloisii* Sacc., Syll. Fungorum **10**: 647. 1892

*Cercospora capreolata* E. + E., Jour. Mycol. **8**: 70. 1902

Leaf spots irregular, brown, no definite border, 3-10 mm. in diameter; fruiting mostly epiphyllous; stromata brown, globular, 20-40$\mu$ in diameter; fascicles mostly dense; conidiophores mostly slightly elongated brown cells on periphery of stroma, rarely as long as 25$\mu$, measuring 2.5-4 x 8-25$\mu$, no septation, geniculation, branching or spore scars visible; conidia obclavate, straight to slightly curved, pale olivaceous to pale olivaceous brown, septa mostly indistinct, but some of the oldest conidia fairly dark colored and septa distinct, base obconic, tip subobtuse, 2-4.5 x 20-100$\mu$.

HOSTS: *Campsis radicans* Seerman (*Bignonia radicans* L.) (*Tecoma radicans* [L.] Juss.), *Bignonia capreolata* L.

TYPES: Point a la Hache, La.; *Tecoma radicans;* A. B. Langlois, No. 1549; Oct. 13, 1888; (*C. pallida*) Plaq. Co., La.; *Tecoma radicans;* Rev. A. B. Langlois, No. 797; Sept. 1886; (*C. capreolata*) Tuskegee, Ala.; *Bignonia capreolata;* G. W. Carver, No. 920: Nov. 19, 1901.

DISTRIBUTION: Studied collections from Louisiana and Alabama. Also reported from Mississippi.

NOTE: This differs from the other species on Tecoma by its very short conidiophores. *C. pallida* was previously used for another species. *C. ampelopsidis* has wrongly been reported on *Tecoma radicans* (Mycologia **41**: 14. 1949). See key, page 82.

**Cercospora hansfordii** sp. nov.

Maculae orbiculares, 0.5-2 mm. diam., aequabiliter rubro-fuscae, centro griseae; caespituli hypophylli, late effusi, atro-olivacei vel fuliginei; stromata absunt vel

minuta; conidiophora laxe sparsa vel unica, aequabiliter atrofusca, evidenter multiseptata, vix ramosa, subito curvata, 5-6.5 x 60-300$\mu$; conidia subhyalina vel dilutissime olivacea, obclavata, leviter curvata, ad basim subtruncata, 3-5 septata, interdum constricta, 4-5.5 x 30-80$\mu$.

Leaf spots circular, 0.5-2 mm. in diameter, uniformly dark reddish brown or with minute gray center; fruiting hypophyllous, effuse, dark olivaceous to sooty in appearance; stromata lacking or a few dark brown cells; fascicles 2-12 spreading stalks or at times borne singly; conidiophores medium to dark brown, uniform in color and width, plainly multiseptate, rarely branched or geniculate, curved to tortuous, tip rounded to conic, 5-6.5 x 60-300$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate to obclavate, mildly curved, mostly 3-5 septate, occasionally constricted at septa, base long obconically truncate, tip obtuse to conic, 4-5.5 x 30-80$\mu$.

HOST: *Dolichandrone platycalyx* Baker, (*Markhamia platycalyx* Sprag.)

TYPE: Kampala, Uganda; *Dolichandrone platycalyx;* C. G. Hansford, No. 1261; Aug. 1930.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. dolichandrones* for differences between the two species on this host.

**Cercospora jahnii** Sydow

Ann. Mycol. **28**: 214. 1930

Leaf spots distinct, subcircular to irregular, 3-20 mm. in length, on upper surface gray to grayish brown and with a wide dark ferrugineous margin, on lower surface uniformly dull brown; fruiting hypophyllous; stromata slight to 50$\mu$ in diameter, brown; fascicles mostly dense; conidiophores pale to medium olivaceous brown, paler and more narrow toward the tip or irregular in width, variously curved, rarely once geniculate, sparingly septate, not branched, small spore scar at rounded or conic tip, 3-5 x 10-40$\mu$; conidia obclavate, very pale olivaceous, slightly curved, indistinctly 2-10 septate, base long obconically truncate, tip subobtuse to conic, 3-5 x 20-110$\mu$.

HOSTS: *Tabebuia rosea* DC., *T. pentophylla* Hemsl. (*Tecoma pentophylla* Juss.)

TYPE: La Victoria, Aragua, Venezuela; *Tabebuia rosea;* H. Sydow, No. 409a; Febr. 4, 1928.

DISTRIBUTION: Venezuela and Trinidad.

NOTE: See key, page 82 for differences among the species on Tecoma.

**Cercospora leprosa** Spegazzini

Anal. Soc. Scient. Argent. **16**: 167. 1883

Leaf spots indistinct; fruiting hypophyllous, sooty in appearance, 0.5-1.5 mm. in extent, partly effuse, and partly consisting of immense dark brown oval stromata, 300-500$\mu$ in diameter; fascicles dense to extremely dense; conidiophores medium dark brown, uniform in color, irregular in width or constricted at septa, plainly multiseptate, variously bent or curved, not branched, slightly geniculate, obtuse tip, 5-8 x 40-150$\mu$; conidia subhyaline to very pale olivaceous brown, obclavate, slightly curved, 1-5 septate, base subtruncate to long obconically truncate, tip obtuse, 3.5-6 x 30-80$\mu$.

HOST: Tecoma sp. (tree)

TYPE: Paraguarí and Peribebuy, Paraguay; Tecoma sp.; B. Balansa, Nos. 3509 and 3865 (Speg. Nos. 919 and 920); 1880 and 1883.

DISTRIBUTION: Known only from the type localities.
NOTE: See key, page 82 for differences among the species on this host genus. Hansford (Proc. Linn. Soc. London **1942-3**: 34. 1943) reports this species on *Markhamia platycalyx*. Compare *C. hansfordii* and *C. dolichandrones*.

**Cercospora polymera** Sydow
Ann. Mycol. **28**: 445. 1930

Leaf spots indistinct to yellowish or pale brown, 4-6 mm. in extent, frequently speckled with dark reddish spots 0.25-2 mm. in diameter over the indistinct areas; fruiting effuse on the corresponding lower surface; stromata none to large loosely aggregated cells, 30-130$\mu$ in extent; nonfasciculate to dense fascicles; conidiophores arising from stromata or as short branches from procumbent threads, medium to dark brown, at times wider and darker near the tip, not geniculate, multi-septate, rounded tip, 4-6.5 x 10-50$\mu$, rarely single ones as long as 120$\mu$; conidia medium to dark brown, cylindric, plainly and closely septate, nearly straight, base long obconically truncate, tip blunt, 4.5-6 x 40-110$\mu$.
HOST: *Cremastus sceptrum* (Cham.) Bur. & Schum. (*Bignonia sceptrum* Cham.)
TYPE: Chepada, Matto grosso, Brazil; *Cremastus sceptrum;* G. O. A. Malme, No. 3294; May 10, 1903.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. duplicata* and *C. bignoniaecola* for differences among the species on Bignonia.

**Cercospora pyrostegiae** Viégas
Bol. da Soc. Brasil. de Agron. **8**: 46. 1945

Leaf spots circular, 2-5 mm. in diameter, gray, usually with a purple border; fruiting amphigenous; stromata prominent, dark brown, globular to elliptic, 40-80$\mu$ in length, smaller on the lower leaf surface; fascicles dense to very dense; conidiophores pale olivaceous brown, almost hyaline tip, slightly attenuated, nearly straight, not geniculate, not branched, medium spore scar at the conic tip, 4-6 x 10-45$\mu$; conidia pale to very pale olivaceous, obclavato-cylindric, rarely obclavate, straight or slightly curved, base subtruncate to short obconically truncate, tip obtuse, 3-12 septate, 3-4.5 x 25-170$\mu$.
HOST: *Pyrostegia venusta* (Ker.) Miers.
TYPE: Campinas, Sao Paulo; *Pyrostegia venusta;* A. P. Viégas, No. 167; May 16, 1933.
DISTRIBUTION: Known only from the type locality.
NOTE: At first glance this resembles *C. adenocalymmae,* but it has denser fascicles, shorter conidiophores with paler tips, and differs in still other characters.

**Cercospora sordida** Saccardo
Michelia **2**: 149. 1880

Leaf spots none or indefinite, affected leaflet may turn purplish especially along the border; fruiting in sparingly effuse olivaceous to olive brown patches on lower surface, later turning dark and resembling somewhat clinging particles of soil; stromata lacking or a few brown cells in the stomatal openings; fascicles 3-20 stalks; conidiophores pale to medium olivaceous, uniform in color, irregular in width, septate, may be constricted at septa, branched, curved to undulate,

rarely 1-2 mildly geniculate, small spore scar at rounded to subconic tip, 3-5 x 20-120$\mu$; conidia pale to medium dark olivaceous, obclavate to obclavato-cylindric, straight to much curved, plainly multiseptate, base long obconic to obconically truncate, tip subobtuse, 3-5 x 20-200$\mu$.

HOST: *Tecoma radicans* (L.) Juss. (*Campsis radicans* Seerman)

TYPE: South Carolina; *Tecoma radicans;* Ravenal, No. 2179.

DISTRIBUTION: From New Jersey to Iowa and southward.

NOTE: Wolf (Mycologia **35:** 503. 1943) named the perfect stage, *Mycosphaerella tecomae.* See key, page 82.

**Cercospora stenolobiicola** n. comb.

*Cercosporina stenolobiicola* Speg., Anal. Mus. Nac. Buenos Aires **20:** 428. 1910

Leaf spots numerous, circular to irregular, 2-10 mm. in diameter, tan to pale brown, with a reddish tinge on the lower surface; fruiting amphigenous; stromata lacking; conidiophores borne singly or in groups of 2-3, pale to medium brown, paler toward the tip, uniform in width, curved or sinuous, not geniculate, not branched, indistinctly septate, bluntly rounded tip, 3-4 x 50-250$\mu$; conidia hyaline, cylindric to spindle-shaped, nearly straight, indistinctly multiseptate, base long obconically truncate, tip obtuse, 3-6 x 40-70$\mu$ (Spegazzini says 75-125$\mu$).

HOSTS: *Tecoma stans* Juss. (*Stenolobium stans* Seem.), *Tecoma serratifolia* G. Don.

TYPE: Tucumen, Argentine; *Stenolobium stans;* Spegazzini, No. 4045; 1906.

DISTRIBUTION: Argentine and Venezuela.

NOTE: See key, page 82.

**Cercospora tecomae** Chupp & Viégas

Bol. da Soc. Brasil. de Agron. **8:** 53. 1945

Leaf spots irregular in outline, minute to fourth of leaf blade, dark reddish brown, frequently flecked with minute gray spots; fruiting amphigenous but more abundant on the lower leaf surface; stromata slight, mostly only a few brown cells; fascicles partly dense, divergent; conidiophores pale to medium brown near the base, tip almost hyaline and attenuated, 1-5 septate, not branched, straight to curved or once abruptly geniculate, medium spore scar at the subtruncate tip, 4-5.5 x 20-80$\mu$; conidia hyaline, acicular, shortest ones may be almost cylindric or wedge-shaped, straight or nearly so, indistinctly 1-7 septate, base truncate, tip subobtuse, 3-5 x 25-50$\mu$, rarely 80$\mu$.

HOST: Tecoma sp.

TYPE: Sede, Instituto Agronomico, Campinas, Est. Sao Paulo, Brasil; Tecoma sp.; A. S. Costa, No. 1220; Sept. 16, 1935.

DISTRIBUTION: Known only from the type locality.

NOTE: The hyaline acicular conidia and fasciculate conidiophores separate this species from the others on Tecoma. See key, page 82.

**Cercospora zeyrae** P. Hennings

Hedwigia **48:** 18. 1909

Leaf spots indistinct or lacking; fruiting scantily effuse, olivaceous, hypophyllous; stromata none; nonfasciculate; conidiophores arising from threads twining among the leaf hairs, curved or bent, irregular in width, subhyaline to pale oli-

vaceous, not geniculate, sparingly septate, blunt tips, 3-7 x 20-150$\mu$; conidia subhyaline to very pale olivaceous, obclavato-cylindric, slightly curved, obconically truncate base, obtuse tip, 3-7 septate, 3.5-5.5 x 40-80$\mu$.

HOST: *Zeyra montana* Mart. (Zeyheria)

TYPE: Morro Pellado, Sao Paulo, Brazil; *Zeyra montana;* A. Puttemans, No. 1109; July, 1904.

DISTRIBUTION: Known only from the type locality.

**Cercospora bixae** Allescher & Noack

Bot. Inst. Agron. Est. Sao Paulo em Campinas 9: 85. 1898

Leaf spots large, circular to irregular, brown, tan or gray, sometimes with yellowish margin, 3-15 mm. in diameter; fruiting amphigenous but mostly hypophyllous; stromata globular, dark brown, 20-40$\mu$; some fascicles dense; conidiophores pale olivaceous, in mass medium dark fuligenous, slightly attenuated, septa and spore scars not evident, slightly branched, not or rarely geniculate, tip subacute, 2.5-3.5 x 15-60$\mu$; conidia pale olivaceous, obclavate, straight to mildly curved, obconic to obconically truncate base, tip subacute, septa inconspicuous, 2-4 x 25-130$\mu$.

TYPE: Jardim de Instituto Agronomico de Campinas, Brazil; *Bixa orellana* L.; F. Noack; September, 1897.

DISTRIBUTION: Reported from Brazil, Venezuela, Puerto Rico, Jamaica, Trinidad, San Domingo, Formosa.

NOTE: There is a species on *Vismia ferruginea* H.B.K. which at first glance appears identical with the one on Bixa. But a close study reveals a number of minor differences such as the width and shape of conidia, place of fruiting, density of stromata, etc.

**Cercospora cochlospermi** Baker & Dale

Mycol. Papers, Commonwealth Mycol. Inst. 33: 101. 1951

Leaf spots subcircular to irregular, 5-25 mm. in diameter, dark reddish brown, distinct; fruiting chiefly epiphyllous; stromata dark brown, irregular to ovoid, 20-50$\mu$ in length; fascicles dense, compact; conidiophores pale to medium olivaceous brown, longest ones paler and more narrow toward the tip, sparingly septate, straight to undulate, not branched, not geniculate, tip conic, often no more than slightly elongated cells on the stromatal periphery, the longest are 2-3.5 x 10-25$\mu$; conidia hyaline to subhyaline, narrowly linear to longest ones almost acicular, straight to much curved, indistinctly multiseptate, base subtruncate, tip subacute, 1.5-3 x 15-110$\mu$.

HOST: *Cochlospermum vitifolium* (Willd.) Spreng.

TYPE: St. Augustine, Trinidad; *Cochlospermum vitifolium;* R. E. D. Baker (I. C. T. A. 743); Oct. 31, 1945.

DISTRIBUTION: Trinidad, Venezuela.

NOTE: Mr. Baker kindly sent me a specimen of this species. M. F. Barrus collected the specimen in Venezuela.

**Cercospora ceibae** Chupp & Viégas

Bol. da Soc. Brasil. de Agron. 8: 17. 1945

Leaf spots subcircular to irregular, 2-5 mm. in diameter, dingy gray, with a narrow dark red to purple border; fruiting mostly epiphyllous; stromata sub-

globular, dark brown, 15-40$\mu$ in diameter; fascicles mostly dense; conidiophores pale to medium brown near the base, almost hyaline tip, slightly irregular in width, sparingly septate, rarely geniculate or branched, straight to curved, conic to subtruncate tip, 3-5 x 10-40$\mu$; conidia hyaline, acicular to almost obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute to obtuse, 2-4 x 20-95$\mu$.

HOST: *Eriodendron anfractuosum* DC. (*Ceiba pentandra* Gaertn.)
TYPE: Fazenda Sta. Elisa, I. A., Campinas, Sao Paulo; *Ceiba pentandra;* A. S. Costa, No. 2120; Sept. 10, 1937.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. italica* for differences between the species on this host.

**Cercospora italica** Curzi
Boll. R. Staz. Pat. Veget. **12**: 157. 1932

Leaf spots subcircular, 1-5 mm. in diameter, uniformly brown; fruiting hypophyllous; stromata slight to fairly prominent; fascicles dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, sparingly septate and geniculate, somewhat curved or bent, slightly branched, conidial scars small to medium laterally and terminally, 3-4 x 10-40$\mu$; conidia obclavato-cylindric, straight to curved, pale olivaceous, 3-6 septate, obconically truncate base, tip rounded to conic, 2.5-4 x 35-55$\mu$.

HOST: *Eriodendron anfractuosum* DC. (*Ceiba pentandra* Gaertn.)
TYPE: Prope "Genale" in Somalia italica; *Ceiba pentandra;* M. Curzi.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. ceibae* for differences between the two species on this host.

**Cercospora pachirae** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 52. 1942

Leaf spots circular to irregular, 2-5 mm. in diameter, white to dingy gray, dark purple border; fruiting amphigenous; stromata pale olivaceous, globular to elongate, 30-50$\mu$ in diameter or rarely elongated to 100$\mu$; fascicles dense to very dense; conidiophores pale olivaceous, tip almost hyaline, uniform in width, rounded tip, nearly straight, not septate, not geniculate, not branched, 2-3.5 x 5-25$\mu$; conidia hyaline to subhyaline, cylindro-obclavate, straight to slightly curved, indistinctly septate, base long obconically truncate, tip rounded to conic, 1.5-3 x 15-50$\mu$.

HOST: *Bombax insigne* (Sav.) K. Sch. (*Pachira insignis* Sav.)
TYPE: El Valle, Caracas, Venezuela; *Pachira insignis;* J. Camero Zamora, No. 3996; May 15, 1941.
DISTRIBUTION: Known only from the type locality.

**Cercospora agnostoica** Spegazzini
Rev. Mus. La Plata. **15**: 45. 1908

Leaf spots suborbicular, 1-10 mm. in diameter, pale brown, rarely with a small gray center; fruiting chiefly hypophyllous; stromata a few brown cells; fascicles 2-10 stalks; conidiophores medium brown, paler and more narrow toward the tip, plainly multiseptate, sparingly geniculate, straight to slightly curved, not branched, large spore scar at the subtruncate tip, 4.5-6 x 30-130$\mu$; conidia hyaline,

acicular, indistinctly multiseptate, straight to curved, base truncate, tip acute, 3-5 x 40-120$\mu$.

HOSTS: *Symphytum asperrimum*? Donn., *Borago officinale* L.

TYPE: Jardin Botánico, Sao Paulo, Brazil; *Symphytum asperrimum*?; A. Usteri, No. 51; September 1905.

DISTRIBUTION: Brazil, Venezuela.

NOTE: Spegazzini is not sure of the host. His determination may be incorrect, for it is not certain that this host species is present in Sao Paulo. Muller (No. 2167) sent apparently this same species on *Borago officinale* from Venezuela.

**Cercospora cynoglossi** Van Hook

Proc. Indiana Acad. Sci. **38**: 131. 1929

Leaf spots circular to irregular, 3-30 mm. in diameter, greenish brown above, grayish brown below; fruiting amphigenous; stromata none to small dark ones, up to 30$\mu$ in diameter; fascicles mostly 3-12 divergent stalks; conidiophores pale olivaceous brown, fairly uniform in color, slightly attenuated toward the tip, sparingly septate, not branched, 0-3 but mostly once abruptly geniculate, spore scar large at subtruncate base, 4-5.5 x 20-150$\mu$; conidia hyaline, acicular, truncate base, acute tip, straight to curved, indistinctly multiseptate, 2-4 x 20-155$\mu$.

HOSTS: *Cynoglossum officinale* L., *Lappula virginiana* Greene.

TYPES: Showers' Farm, Monroe Co., Indiana; *Cynoglossum officinale;* J. M. Van Hook, No. 3815; Aug. 28, 1920; also Deckard Creek; No. 3984; Sept. 30, 1923.

DISTRIBUTION: Indiana, Wisconsin.

**Cercospora echii** Winter

Hedwigia **23**: 190. 1884; also, Bol. Soc. Broter. Coimbra. V **2**: 32. 1884

Leaf spots circular, 2-4 mm. in diameter, either with dark purplish to almost black center and pale margin, or pale center and dark margin; fruiting amphigenous, but mostly on upper leaf surface; stromata lacking or a few brown cells; fascicles mostly 1-8 stalks; conidiophores pale to medium olivaceous brown, tip sometimes almost hyaline, often somewhat attenuated, multiseptate, rarely branched, 0-5 mildly or abruptly geniculate, 3-5 x 40-500$\mu$; conidia hyaline, acicular, truncate base, acute to subacute tip, straight to slightly curved, septa indistinct, 2-3.5 x 40-130$\mu$.

HOSTS: *Echium tuberculatum* Hoffm., *E. vulgare* L.

TYPE: Villa Franca, near Coimbra, Portugal; *Echium tuberculatum;* Moller.

DISTRIBUTION: Ontario, Wisconsin, Missouri, Mississippi, and Portugal.

NOTE: Maire (Bul. Soc. Hist. Nat. l'Afrique du Nord. **8**: 193. 1917) described *C. echiorum* on Echium with subcylindric conidia, ends obtuse, 4-5 x 20-52$\mu$, and short conidiophores.

**Cercospora echiorum** Maire

Bull. Soc. d'Hist. Nat. l'Afrique du Nord. **8**: 193. 1917

Leaf spots suborbicular, brown with gray center; fruiting hypophyllous; stromata small, brown; fascicles dense; conidiophores very pale brown, paler and more narrow toward the tip, not septate, slightly geniculate, not branched, small spore scar at rounded to conic tip, 4-6 x 15-30$\mu$; conidia hyaline to subhyaline, obclavato-cylindric, indistinctly septate, straight to slightly curved, base obconically truncate, tip obtuse to conic, 4-5 x 20-55$\mu$.

HOSTS: *Echium australe* Lam. (*E. grandiflorum* Desf.), *E. pininana* Webb & Berth.

TYPES: Algeria; *Echium australe;* R. Maire; Spring, 1915; Botanic Garden, Algeria; *Echium pininana.*

DISTRIBUTION: Algeria.

NOTE: I have not had an opportunity of studying the type of this species. See also *C. Echii* for differences between the two species on this host genus. Saccardo (Syll. Fung. **25**: 897. 1931) changed this to Cercosporina, but as pointed out elsewhere, the name includes the type species of Cercospora so is not tenable.

**Cercospora ehretiae** Togashi et Katsuki

Bot. Magazine, Tokyo **65**: 20. 1952

Leaf spots circular to irregular, 5-8 or even 15 mm. in diameter, above fuscous brown, below grayish, sometimes coalescing and covering a large part of the leaf; fruiting amphigenous; stromata subglobular, up to 100$\mu$ in diameter; fascicles 7-10 stalks; conidiophores very short, slightly colored, 0-3 septate, not branched, not geniculate, 2.5-3 x 10-25$\mu$; conidia pale olivaceous, cylindro-obclavate, straight to mildly curved, base rounded to subtruncate, 1-5 septate, 2-3 x 30-70$\mu$.

HOST: *Ehretia thyrsiflora* Nakai.

TYPE: Hojo, Takawa, Pref. Fukuoka, Japan; *Ehretia thyrsiflora;* S. Katsuki; Nov. 16, 1949.

DISTRIBUTION: Japan.

NOTE: Dr. Togashi sent me some of the type material.

CERCOSPORAE ON HELIOTROPIUM

(All conidia cylindric)

A. Conidia medium dark olivaceous, 4.5-7 x 20-65$\mu$; leaf spots indistinct; fruiting effuse; stromata lacking; fascicles dense; conidiophores 4-5.5 x 10-25$\mu$.
H. CURASSAVICUM — *C. heliotropii*

AA. Conidia hyaline; leaf spots distinct; fruiting not effuse; stromata slight.

B. Conidiophores pale olivaceous brown, 4-6 x 20-90$\mu$, crooked; conidia 5-7 x 20-75$\mu$.
H. BOCCONI, H. EUROPAEUM — *C. heliotropii-bocconi*

BB. Conidiophores medium brown, 3.5-5 x 50-300$\mu$, almost straight; conidia 4-6 x 25-90$\mu$.
H. EUROPAEUM — *C. taurica*

**Cercospora heliotropii** Ellis & Everhart

Jour. Mycol. **4**: 5. 1888

Leaf spots indefinite or none; fruiting dark to black scantily effuse patches on both leaf surfaces; stromata lacking; fascicles dense and often contiguous, covering several hundred square microns of leaf area; conidiophores pale olivaceous brown, uniform in color, attenuated toward the tip, which is rounded and with a medium sized spore scar, not septate, not geniculate, not branched, 4-5.5 x 10-25$\mu$; conidia cylindric, medium dark olivaceous, straight to slightly curved, 1-5 plainly septate, often constricted at the septa, base obconic to rounded, tip obtuse, 4.5-7 x 20-65$\mu$.

HOST: *Heliotropium curassavicum* L.

TYPE: Albuquerque, New Mexico; *Heliotropium curassavicum;* S. M. Tracy, No. 384; 1887.
DISTRIBUTION: Studied material from New Mexico, California and Oregon.
NOTE: This differs from *C. taurica* and *C. heliotropii-bocconi* in not having hyaline to subhyaline conidia and in having short conidiophores. See key above.

**Cercospora heliotropii-bocconi** Scalia
Atti d. Accad. Gioen. Sci. Nat. Catania. IV. **15**: 16. 1902

Leaf spots subcircular, 2-5 mm. in diameter, yellowish brown to brown or almost gray, indistinct on dried leaves; fruiting amphigenous, mostly hypophyllous; stromata slight, brown; fascicles sometimes dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, rarely branched, slightly geniculate, straight to curved, large spore scar at the subtruncate tip, 4-6 x 20-90$\mu$ (Scalia says 70-150$\mu$); conidia hyaline, cylindric, straight, plainly 3-7 septate, subtruncate base, bluntly rounded tip, 5-7 x 20-75$\mu$.
HOSTS: *Heliotropium bocconi* Guss., *H. europaeum* L.
TYPE: nel podere della R. Scuola Enologica e a Mascalucia, Sicily; *Heliotropium bocconi;* G. Scalia; Oct. 1900.
DISTRIBUTION: Sicily and Algeria.
NOTE: See key above for differences among the species on this host genus.

**Cercospora lithospermi** Chupp & Greene
The Amer. Midland Naturalist **41**: 724. 1949

Leaf spots irregular in shape and ranging in size from 1-3 mm. to half the leaflet, at first olivaceous or water-soaked in appearance, gradually turning dark reddish brown to almost black; fruiting chiefly hypophyllous; stromata filling the stomatal openings; fascicles dense, divergent; conidiophores pale to medium olivaceous brown, much attenuated and nearly hyaline toward the tip, 1-5 septate, not geniculate, not branched, straight to curved or undulate, conic tip, 3.5-6 x 15-50$\mu$; conidia hyaline, acicular to obclavate, indistinctly multiseptate, straight to strongly curved, base truncate, tip subacute, 2-4 x 25-200$\mu$.
HOST: *Lithospermum croceum* Fernald (the midwestern form of the general species, *L. carolinense*).
TYPE: Madison, Wisconsin; *Lithospermum carolinense* (Walt.) MacMill.; H. C. Greene; Sept. 27, 1945.
DISTRIBUTION: Known only from the type locality.
NOTE: Atkinson collected a fungus on Lithospermum sp. in England and filed it in his herbarium as *Cercospora lithospermi.* It was not published. An examination of the specimen shows it to be a Cylindrosporium.

**Cercospora myxa** Sydow
Ann. Mycol. **33**: 70. 1935

Leaf spots lacking; fruiting in effuse dark olivaceous to sooty irregular patches on the lower leaf surface; stromata none; nonfasciculate; conidiophores branches from procumbent threads, pale to medium dark brown, uniform in color, irregular in width or constricted at septa, not geniculate, bluntly rounded tips, 4.5-6 x 15-60$\mu$; conidia cylindric, pale to medium dark brown, plainly 2-12 septate, often constricted at septa, straight to slightly undulate, base rounded to long obconically truncate, tip obtuse, 4.5-6 x 20-90$\mu$.

HOST: *Cordia myxa* Clarke.
TYPE: Allahabad, India; *Cordia myxa;* Julian H. Mitter, Nos. 94 and 104.
DISTRIBUTION: Known only from the type locality.

**Cercospora taurica** Tranzschel

Trav. Mus. Bot. l'Acad. Imp. Sci. St. Petersburg. **1**: 74. 1902

Leaf spots circular, 4-6 mm. in diameter, brown to dark grayish brown, upper surface may be concave or convex; fruiting amphigenous, mostly hypophyllous; stromata lacking or a few large brown cells; fascicles 2-5 stalks, rarely dense; conidiophores medium brown, paler and more narrow toward the tip, straight or very slightly geniculate, plainly multiseptate, not branched, tip rounded to subtruncate, medium spore scar present, 3.5-5 x 50-300$\mu$; conidia cylindric, hyaline to subhyaline, straight, plainly 2-9 septate, subtruncate base, bluntly rounded tip, 4-6 x 25-90$\mu$.

HOST: *Heliotropium europaeum* L.
TYPE: Chorgun VII, Tauria Russia; *Heliotropium europaeum* var. *stevenianum* Andrz.
DISTRIBUTION: Russia, Serbia, Hungary, Cyprus, Palestine.
NOTE: See key, page 92 for differences among the species on this host genus.

**Cercospora campanulae** sp. nov.

Maculae a primo minutae, mox autem confluentes et saepe fere totam folii paginam omnino obtegentis, pallide vel atro-brunneae; stromata rubido-fusca, 20-30$\mu$; conidiophora rubido-fusca, dense fasciculata, recta vel leniter curvata, vix septata, simplicia, 3-5 x 15-45$\mu$; conidia subhyalina vel pallidissime chlorinula, obclavata, recta vel leviter curvata, 3-7 septata, ad basim subtruncata, 3-5 x 20-75$\mu$.

Leaf spots at first very small on the narrow leaflets, pale center and dark border, soon the entire leaflet from the original lesion to the tip turns pale to dark brown; stromata dark reddish brown, sometimes elongate vertically, 20-30$\mu$ wide; fascicles dense, fairly compact; conidiophores in mass dark reddish brown, singly very pale yellowish to yellowish brown, straight to slightly curved or undulate, rarely septate or geniculate, not branched, small spore scar at bluntly rounded tip, 3-5 x 15-45$\mu$; conidia subhyaline to faintly olivaceous, obclavate to cylindro-obclavate, straight to mildly curved, base long obconically truncate to subtruncate, mostly 3-7 septate, 3-5 x 20-75$\mu$.

HOST: *Campanula rotundifolia* L.
TYPE: Ruidosa, New Mexico; *Campanula rotundifolia;* J. M. Watkins, No. 7505; Sept. 28, 1929.
DISTRIBUTION: Known only from the type locality.

**Cercospora campanumaeae** Sawada

Formosa Agr. Res. Inst. Rept. **86**: 167. 1943.

NOTE: This was described on *Campanumaea javanica* Blume from Taiwan. Sawada gave too brief a description to make sure it is a new species: Leaf spots 2-6 mm. in diameter; conidiophores brown, 3-15 septate, 4-5.5 x 52-209$\mu$; conidia pale olivaceous, 3-7 septate, 4-4.5 x 27-55$\mu$.

**Cercospora minuta** comb. nov.

*Cercoseptoria minuta* Davis, Wisc. Acad. Trans. **22**: 174. 1926

Leaf spots tan to gray, usually extending from leaf margin to midrib, immarginate, 3-20 mm. in length; fruiting hypophyllous; stromata globular, 15-40$\mu$ in diameter, at first almost hyaline, but later dark brown; fascicles dense to very dense; conidiophores so short and delicate that it is difficult to distinguish septation, geniculation, spore scars, or branching, pale colored base, and apparently hyaline tip, 1-2 x 5-10$\mu$; conidia hyaline, also very minute, linear, straight to curved or bent, 1-2 x 15-60$\mu$.

HOST: *Campanula aparinoides* Pursh. (*C. uliginosa* Rydb.)

TYPE: Wyeville, Wisconsin; *Campanula aparinoides;* J. J. Davis; July 7, 1923.

DISTRIBUTION: Known only from the type locality.

NOTE: Saccardo (Syll. Fung. **4**: 434. 1886.) has listed a *C. minuta* C. + E. but this should have read *C. grisea* C. + E. Cercoseptoria is based on the characters of prominent stromata, dense fascicles, conidiophores very short, and conidia Septoria-like. If there were not so many interchangeable species, these characters might serve as a basis for a new genus. Another species of Cercospora has been seen on Campanula sp. but the material was too scant to be sure of a diagnosis.

**Cercospora phyteumatis** A. B. Frank

Krankheiten der Pflanzen, pp. 601, 602. 1880

HOST: *Phyteuma spicatum* L.

TYPE: I could find no definite type recorded. In the Berlin herbarium there is a specimen collected in February, 1905 by P. Hennings and bearing this species name. It is colorless and thus corroborating the statement of Saccardo (Syll. Fung. **10**: 565. 1892; **15**: 84. 1901) that it is a Cercosporella.

**Cercospora speculariae** Ellis & Langlois in litt.

Leaf spots circular, 0.5-2 mm. in diameter, gray center, narrow pale brown margin; fruiting amphigenous; stromata lacking or a few dark brown cells; fascicles 3-15 stalks; conidiophores medium dark brown, paler and more narrow toward the tip, sparingly septate, not branched, undulate, or 1-3 mildly to abruptly geniculate, spore scars often along sides without geniculation, medium spore scar at rounded to subtruncate tip, 3-5 x 15-65$\mu$; conidia hyaline, acicular to cylindro-obclavate, straight to slightly curved, septa indistinct, base truncate, tip subobtuse, 2-3.5 x 30-85$\mu$.

Maculae amphigenae, distinctae, 0.5-2 mm. diam., canae, angusta brunnea cinctae; non stromata; caespituli amphigeni, raro densi; conidiophora brunnea vel atro-brunnea, in superiore parte dilutiora ibique subinde fere subhyalina et angusta, vix septata, simplicia, leniter curvata, fere 1-3 geniculata, ad apicem obtuse rotundata, 3-5 x 15-65$\mu$; conidia hyalina, aciculina vel cylindraceo-obclavata, recta vel leniter curvata, spurie septata, ad basim truncata, ad apicem subobtusa, 2-3.5 x 30-85$\mu$.

HOST: *Specularia perfoliata* (L.) A.DC.

TYPE: St. Martinsville, Louisiana; *Specularia perfoliata;* A. B. Langlois, No. 1324; May 26, 1888.

DISTRIBUTION: Known only from the type locality.

NOTE: The type of this species is located in the New York Botanical Garden

Herbarium. The same collection was distributed to other herbaria, one being among the Atkinson collection at Cornell University.

## CERCOSPORAE ON CAPPARIDACEAE

A. Conidia colored; fruiting in effuse olivaceous patches.
  B. Conidia 2.5-4 x 20-60$\mu$, cylindro-obclavate; fruiting amphigenous; conidiophores pale, slightly branched, 2.5-4 x 10-40$\mu$.
    CLEOME — *C. conspicua*
  BB. Conidia and conidiophores wider than 4$\mu$; fruiting hypophyllous.
    C. Stromata slight to 30$\mu$ in diameter; sometimes fascicles dense; conidia cylindric, 5-7 x 15-50$\mu$; conidiophores 5-7 x 30-120$\mu$, medium dark in color.
      TOVARIA — *C. tovariae*
    CC. Stromata none or slight; mostly nonfasciculate; conidia cylindro-obclavate, 5-6 x 60-150$\mu$; conidiophores 4-7 x 30-50$\mu$, pale in color.
      CAPPARIS — *C. capparidicola*
AA. Conidia hyaline; fruiting not effuse.
  B. Conidia acicular, 2-3.5 x 20-125$\mu$; conidiophores 3-5 x 30-200$\mu$.
    CLEOME — *C. uramensis*
  BB. Conidia cylindro-obclavate to cylindric.
    C. Conidiophores pale to medium brown, 3.5-6 x 30-150$\mu$; conidia cylindro-obclavate, 2.5-4 x 20-100$\mu$.
      CLEOME — *C. cleomes*
    CC. Conidiophores pale to very pale, 4-5.5 x 10-65$\mu$; conidia cylindric, 3-5 x 20-85$\mu$.
      CAPPARIS — *C. capparidis*

### **Cercospora capparidicola** Hansford & Thirumalachar

Farlowia **3**: 307. 1948

Leaf spots indistinct; fruiting effuse, hypophyllous, dark, in irregular patches; stromata none or slight; conidiophores borne singly on procumbent threads or arising in small fascicles through the stomata, brown, 3-5 septate, not branched, straight to slightly flexuous, occasionally geniculate near the tip, 4-7 x 30-50$\mu$; conidia cylindro-obclavate, brown, blunt tip, obconically truncate base, straight to mildly curved, surface minutely granulose, 10-20 septate, 5-6 x 60-150$\mu$.

HOST: *Capparis sepiaria* L.

TYPE: Nandi, Mipore, India; *Capparis sepiaria;* M. J. Thirumalachar; Nov. 18, 1944.

DISTRIBUTION: South India.

NOTE: I have not seen this specimen. If the authors mean by "minutely granulose" that the surface of the spore is minutely echinulate, it is not a Cercospora. See also *C. capparidis,* and key above.

### **Cercospora capparidis** Saccardo

Nuovo Giorn. Bot. Ital. **8**: 189. 1876

Leaf spots circular, 0.5-2 mm. in diameter, gray to tan center, narrow brown raised line margin; fruiting amphigenous; stromata dark brown, globular to irregular, 30-70$\mu$ in diameter; fascicles dense or even very dense; conidiophores pale to very pale brown, paler and more narrow toward the tip, sparingly septate, rarely

branched, straight to much bent or geniculate, medium spore scar at the subtruncate tip, 4-5.5 x 10-65$\mu$; conidia hyaline, cylindric to cylindro-obclavate, straight or nearly so, 2-5 septate, base truncate, tip obtuse, 3-5 x 20-85$\mu$.

HOST: *Capparis spinosa* L. (*C. rupestris* Sibth. & Sm.).
TYPE: Susigana, Italy; *Capparis rupestris;* Treviso; September, 1875. Co-type distributed as Mycotheca Veneta No. 596.
DISTRIBUTION: Italy, Southern France, Sicily, Algeria, Crimea, Middle Asia, Turkestan.
NOTE: See also *C. capparidicola,* and key above.

**Cercospora cleomes** Ellis & Halsted
Jour. Mycol. **6**: 34. 1890

Leaf spots suborbicular to irregular, 2-4 mm. in diameter, gray to pale tan, sometimes with dark border; fruiting mostly epiphyllous; stromata lacking; 1-3 or rarely 7 conidiophores in fascicle; conidiophores medium brown, straight or nearly so, multiseptate, not branched, 0-3 mildly geniculate, small spore scars present at rounded tip, 3.5-6 x 30-150$\mu$; conidia hyaline to subhyaline, cylindro-obclavate, obconic or rounded base, tip subobtuse, straight to slightly curved, indistinctly multiseptate, 2.5-4 x 20-100$\mu$.

HOSTS: *Cleome pungens* Willd., *C. psoraleaefolia* DC., *C. spinosa* Jacq.
TYPE: New Brunswick, New Jersey; *Cleome pungens;* B. D. Halsted; October 5, 1889.
DISTRIBUTION: Studied material from New Jersey, Venezuela, and India.
NOTE: *C. conspicua,* the other species on Cleome may often be found in the same mount. It differs from *C. cleomes* in having shorter, more narrow, branched conidiophores, which are often in dense fascicles, and the fruiting is effuse. See also *C. uramensis* and key, page 96 for differences among the species on this host genus.

**Cercospora conspicua** Earle
N. Y. Bot. Gard. Bul. 3: 312. 1905

Leaf spots none; fruiting in small effuse olivaceous patches on both leaf surfaces, mostly 1-3 mm. in extent; stromata none or a few cells filling stomatal opening; some fascicles dense; conidiophores pale olivaceous brown, fairly uniform in color, sometimes attenuated toward the tip, rarely septate or geniculate, slightly branched, rounded tip, spore scars indistinct, 2.5-4 x 10-40$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate, nearly straight, septa indistinct, base short obconic, tip obtuse, 2.5-4 x 20-60$\mu$, rarely as long as 100$\mu$.

HOSTS: *Cleome pentaphylla* L. (*Gynandropsis pentaphylla* DC.), *C. gynandra* L., *C. spinosa* Jacq., *C. pungens* Willd.
TYPE: Ponce, Puerto Rico; *Cleome pentaphylla;* A. A. Heller No. 6152; November 28, 1902.
DISTRIBUTION: Apparently common in San Domingo and Puerto Rico.
NOTE: *C. cleomes,* another species on this host genus, may sometimes be present in the same mount. The conidia of the two are quite similar, but the broad, long, medium dark-colored conidiophores of *C. cleomes* cannot be mistaken for those of *C. conspicua.* See also *C. uramensis* and key, page 96 for differences among the species on this host genus.

**Cercospora pulchra** Sydow
Ann. Mycol. 35: 241. 1937

TYPE: Allahabad, East India; *Crataeva religiosa* Forst.; T. P. Blahragar, No. 252; October 11, 1933.

NOTE: This species having dark colored, thick walled conidia with septa distinct and closely together, it is considered as not being a true Cercospora, but an Helminthosporium.

**Cercospora tovariae** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 57. 1942

Leaf spots indefinite, slight discolorations on the upper surface; fruiting hypophyllous, effuse, olivaceous, in small angular patches bordered by the leaf veins, 0.5-4 mm. in extent; stromata none to 30$\mu$ in diameter, dark brown; nonfasciculate to dense fascicles; conidiophores medium dark brown, multiseptate, often constricted at septa or otherwise irregular in width, crooked, branched, rarely once geniculate, spore scar indistinct at the bluntly rounded tip, 5-7 x 30-120$\mu$; conidia pale to very pale olivaceous, cylindric, nearly straight, 1-5, mostly 3-septate, base rounded to sharply obconic, tip obtuse, 5-7 x 15-50$\mu$.

HOST: *Tovaria pendula* R. & P.

TYPE: Road Maracay a Choroni, Aragua, Venezuela; *Tovaria pendula;* H. H. Whetzel, No. 3183; March 26, 1939.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 96.

**Cercospora uramensis** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 58. 1942

Leaf spots circular to subcircular, 2-6 mm. in diameter, pale to medium brown, uniform in color or rarely with a slightly darker line margin, occasionally surrounded by a yellow zone; fruiting amphigenous; stromata a few brown cells to 30$\mu$ in diameter; fascicles 2-15 stalks; conidiophores very pale to pale olivaceous brown, slightly paler and more narrow toward the tip, multiseptate, not branched, straight or 1-3 abruptly geniculate, medium sized spore scar at the subtruncate tip, 3-5 x 30-200$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4 x 20-200$\mu$.

HOSTS: Cleome sp., *Cleome spinosa* Jacq., *Cl. gynandra* L.

TYPE: Urama, Edo. Cerabobo, Venezuela; Cleome sp.; M. F. Barrus, No. 3682; December 2, 1939.

DISTRIBUTION: Venezuela, Mona, Wisconsin.

NOTE: See key, page 96 for differences among the species on this host genus.

**Cercospora adoxae** Roumeguere
Fungi Gallici, No. 1871

TYPE: *Adoxa moschatellina* L.; Gallet; May 31, 1881.

NOTE: This apparently never was described. It is listed by Roumeguere (Rev. Mycol. 4: 22. 1882) and by Oudemans (Syst. Fung. 4: 853. 1923). I examined Specimen No. 1871 in each herbarium where I found Fungi Gallici but in no case could I discover fruiting of a fungus. Apparently it is not an authentic species.

## CERCOSPORAE ON LONICERA

All species have hyaline to faintly colored, obclavato-cylindric conidia

A. Leaf spots indistinct or lacking; fruiting effuse, hypophyllous; conidiophores very pale in color; conidia 2-4 x 20-120$\mu$.

B. Conidiophores nonfasciculate, 2-4 x 10-65$\mu$; stromata lacking.

*C. lonicericola*

BB. Conidiophores in dense fascicles, 2-3.5 x 5-25$\mu$; stromata prominent.

*C. lonicerae*

AA. Leaf spots distinct; fruiting not effuse, amphigenous; conidia rarely longer than 50$\mu$.

B. Conidiophores 3-4 x 20-120$\mu$, in fascicles of 3-15; stromata small; conidia 0-5 septate, 2-3.5 x 20-55$\mu$.

*C. antipus*

BB. Conidiophores 3-5 x 20-40$\mu$, in dense fascicles; stromata prominent; conidia mostly 1-septate, 2-5 x 15-40$\mu$.

Not a true Cercospora. Considered as a Didymaria.

*C. periclymeni*

**Cercospora antipus** Ellis & Holway

Jour. Mycol. **1**: 5. 1885

Leaf spots subcircular, 1-5 mm. in diameter, dark brown, sometimes center pale brown or almost gray; fruiting almost wholly hypophyllous; stromata none or a few large dark brown cells; fascicles 3-15 stalks; conidiophores medium dark olivaceous brown, uniform in color and width, multiseptate, branched occasionally, variously bent, sinuous, or multigeniculate, minute spore scar at the conic tip, 3-4 x 20-120$\mu$; conidia subhyaline or sometimes almost colored, cylindric to obclavato-cylindric, straight, indistinctly septate, base rounded to short obconically truncate, tip obtuse, 2-3.5 x 20-55$\mu$.

HOSTS: *Lonicera flava* Sims., *L. sempervirens* Ait., *L. glaucescens* Rydb., *L. dioica* L. (*L. glauca* Hill), *L. hirsuta* Eaton, *L. sullivantii* Gray.

TYPE: Decorah, Iowa; *Lonicera flava;* E. W. D. Holway; Aug. 1, 1884.

DISTRIBUTION: Nebraska, Iowa, Wisconsin, and Manitoba.

NOTE: *C. antipus* differs from the other species on Lonicera in having almost no stromata, fascicles usually not dense, and conidiophores as long as 125$\mu$. Ellis states that *Sphaerella clymeniae* occurs in the same lesions. See Key above.

## CERCOSPORAE ON SAMBUCUS

A. Fruiting not effuse; fascicles definite; stromata prominent; conidiophores 3-4.5 x 25-300$\mu$; conidia pale olivaceous, 3.5-6 x 30-120$\mu$.

*C. depazeoides*
(*C. ticinensis*)
(*C. sambucina*)
(*C. sambuci*)

AA. Fruiting effuse, on lower leaf surface; stromata none; fascicles mostly not present; conidia subhyaline to very pale olivaceous, 4-5.5 x 25-125$\mu$.

B. Fruiting dark olivaceous; fascicles sometimes present; conidiophores 4-5.5 x 40-150$\mu$.

*C. catenospora*
(*C. ebulicola*)

BB. Fruiting brick red; no definite fascicles; conidiophores 4-6 x 20-75$\mu$.

*C. lateritia*

**Cercospora catenospora** Atkinson

Jour. Elisha Mitchell Sci. Soc. 8: 66. 1892

*Cercospora ebulicola* Yamamoto, Trans. Sapporo Nat. Hist. Soc. 13: 139. 1934

Leaf spots indefinite; fruiting in effuse irregular patches on lower leaf surface, olivaceous to brownish in color; fascicles 3-10, loosely spreading; stromata lacking; conidiophores plainly and sometimes closely septate, medium reddish brown, branched, not geniculate, rounded or short obconic tip, straight to variously curved or sinuous, 4-5.5 x 40-150$\mu$; conidia cylindric, olivaceous, straight or nearly so, ends rounded or short obconic, often catenulate, 1-6 septate, 4-5.5 x 50-125$\mu$.

HOSTS: *Sambucus canadensis* L., *S. formosana* Nakai (*Ebulum formosana* Nakai).

TYPES: Auburn, Ala.: *Sambucus canadensis;* Geo. F. Atkinson, No. 2045; Aug. 27, 1891; (*Cercospora ebulicola*) Sozan, Formosa; *Ebulum formosana;* W. Yamamoto; Dec. 3, 1933.

DISTRIBUTION: In the southern states and as far north as Pennsylvania. Material was studied from Alabama, Mississippi, Texas, and Kansas, and from Formosa.

NOTE: See key above for differences among the species on Sambucus.

**Cercospora depazeoides** (Desmaziéres) Saccardo

Nuov. Giorn. Bot. Ital. 8: 187. 1876

*Exosporium depazeoides* Desm., Ann. Sci. Nat. Bot. Ser. 3, 11: 364. 1849

*Cercospora ticinensis* Cavara, Funghi parass. No. 336. 1900. (Syll. Fung. 22: 1425. 1913)

*Cercospora depazeoides* var. *amphigena* S. Camara, Rev. Agron. Portugal 1: 59. 1903

*Cercospora depazeoides* var. *gagrensis* Elenkin & Ohl., Bolienzni Rastenii p. 108. 1912

*Cercospora sambuci* Stev. & King, Ill. Biol. Monogr. 11: 59. 1927

*Cercospora sambucina* Ellis & Kell., Amer. Nat. 17: 1166. 1883

Leaf spots circular to angular, 1-8 mm. in diameter, gray to brown or a mosaic-like pattern of gray, tan and brown, parts usually separated from each other and from margin by dark line; fruiting amphigenous; stromata globular, dark brown to black, 20-80$\mu$; fascicles dense to very dense, sometimes almost coremium-like; conidiophores medium dark brown, sparingly septate, longer ones may be sinuous, not or rarely mildly 1-2 geniculate, rarely branched, rounded to subconic tip with minute spore scar, 3-4.5 x 25-300$\mu$, some collections show only short conidiophores or short ones on the upper leaf surface and long ones below; conidia pale olivaceous, obclavate to cylindro-obclavate, straight to slightly curved, base long obconic to obconically truncate, subobtuse tip, mostly 3-7 septate, 3.5-6 x 30-140$\mu$, some collections show only short conidia.

HOSTS: *Sambucus nigra* L. (*S. laciniata* Mill.), *S. canadensis* L., *S. racemosa* L., *S. mexicana* Presl., Sambucus sp.

TYPES: Vidór (Treviso); *Sambucus nigra;* Sept. 1874 (Cotype Mycotheca Veneta 280); (*C. depazeoides* var. *amphigena*) L. pr. Chaves (Traz-os-Montes); *Sambucus nigra;* Andrade Pereira; Dec. 1902; (*C. depazeoides* var. *gagrensis*) In the vicinity of Gagry, Caucasus; *Sambucus nigra;* A. Elenkin; 1912; (*C. ticinensis*) Royal Botanic Garden, Italy; *Sambucus nigra* (Cotype

Briosi & Cavara, I Funghi par. No. 336); (*C. Sambuci*) Cartago, Costa Rica; *Sambucus mexicana;* F. L. Stevens, No. 260; July 7, 1923; (*C. sambucina*) Ohio; *Sambucus canadensis;* W. A. Kellerman, No. 401; July 1883.

DISTRIBUTION: Mississippi, Kansas, Wisconsin and Ontario eastward. Also reported in southern Asia and in European countries as far north as Denmark. Moore (Trans. Brit. Mycol. Soc. **29**: 250. 1946) lists it as a new or interesting fungus in England.

NOTE: *C. depazeoides* sub sp. *sambucina* E. + K. has been mentioned in literature. This, however, is a mistake. Apparently someone translated wrongly Saccardo's statement that *C. sambucina* was a synonym of *C. depazeoides* (Syll. Fung. **15**: 85. 1901). I have not been able to procure material to study Elenkin's variety, so do not know if it is identical. Saccardo also states that *Passalora penicillata* Ces. is a synonym. This seems incorrect. Solheim and Stevens considered *C. ticinensis* as being closely related to or a variety of *C. depazeoides*. See key, page 99.

**Cercospora diervillae** Ellis & Everhart

Univ. Orono, Maine Studies **3**: 22. 1902

Leaf spots circular, 2-4 mm. in diameter, pale tan to dingy gray with reddish to lavender border; fruiting amphigenous; stromata globular, dark brown, 30-65$\mu$ in diameter; fascicles dense, flaring; conidiophores pale to medium dark olivaceous brown, uniform in color, mostly 1-3 septate, not branched, upper half slightly sinuous or 1-2 mildly geniculate, frequently guttulate and sometimes enlarged at guttula, medium sized spore scar at rounded to subtruncate tip, not attenuated, 4-6 x 75-125$\mu$; conidia medium olivaceous or olivaceous brown, obclavate, somewhat Alternaria-like in shape, long obconically truncate base, upper half may suddenly be attenuated, usually 2-5 septate, straight or nearly so, tip subacute, 5-6.5 x 40-100$\mu$.

HOST: *Diervilla (trifida) lonicera* Mill.

TYPE: Orono, Maine; *Diervilla trifida* Moench.; P. L. Ricker, No. 133; Oct. 1900.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. weigeliae* for differences between the two species on Diervilla. This species could as well be considered a Pseudocercospora.

**Cercospora kolkwitziae** Ray

Mycologia **34**: 559. 1942

Leaf spots circular to irregular, 0.5-12 mm. in length, one or more small white flecks in each reddish brown area which is immarginate; fruiting amphigenous; stromata few dark cells; fascicles 2-20 stalks; conidiophores medium dark fuligenous or olivaceous brown, slightly paler and more narrow toward the tip, multiseptate, not branched, straight to undulate or mildly to abruptly multigeniculate, medium spore scar at narrowly subtruncate tip, 3-4.5 x 40-300$\mu$; conidia hyaline, a mixture of acicular, obclavate and cylindric, straight to curved, indistinctly multiseptate, base truncate to obconic, tip subacute, 1.5-3 x 20-150$\mu$.

HOST: *Kolkwitzia amabilis* Graebn.

TYPE: Tuskegee, Macon Co., Alabama; *Kolkwitzia amabilis;* Geo. W. Carver; Aug. 12, 1935.

DISTRIBUTION: Alabama, Oklahoma.

**Cercospora lateritia** Ellis & Halsted
Jour. Mycol. 4: 7. 1888

Leaf spots indefinite or none; fruiting in ferruginous effuse patches on lower leaf surface; reddish stromata up to 50$\mu$ in diameter sometimes present; nonfasciculate to dense fascicles; conidiophores subhyaline to pale reddish brown, septate, branched, not geniculate, medium spore scar at rounded tip, 4-6 x 20-75$\mu$; conidia hyaline to very pale reddish brown, cylindric to obclavato-cylindric, straight to slightly curved, 2-6 septate, sometimes constricted at septa, base long sharply obconic, tip blunt, 4-5 x 25-60$\mu$, or rarely 80$\mu$.

HOST: *Sambucus racemosa* L. (*S. pubens* Michx.)
TYPE: Ames, Iowa; *Sambucus pubens;* B.D. Halsted; Sept. 1887.
DISTRIBUTION: Studied material from Kansas and Iowa.
NOTE: The ferruginous effuse fruiting and the reddish brown conidiophores separate this species from the others on Sambucus. See key, page 99.

**Cercospora lonicerae** sp. nov.

Maculae typicae nullae, sed discolorationes epiphyllas indeterminatas fuscas efficiens, plerumque venulis limitatae; caespituli hypophylla, olivacea vel fere atra; stromata rotunda, fusca, 15-60$\mu$ diam.; conidiophora dense fasciculata, pallidissime olivaceo-brunnea, continua, simplicia, recta vel curvata, 2-3.5 x 5-25$\mu$; conidia subhyalina vel pallidissime olivacea, recta vel curvata, spurie multiseptata, ad basim subtruncata, ad apicem acuta, 2-4 x 20-100$\mu$.

Leaf spots indistinct or later irregular brown areas bounded by the veins; fruiting effuse, olivaceous to almost black, in corresponding areas on lower leaf surface; stromata globular, pale to medium brown, 15-60$\mu$ in diameter; fascicles dense; conidiophores very pale olivaceous brown, tip almost hyaline, not septate, not geniculate, not branched, straight to curved, minute spore scar at the rounded to conic tip, 2-3.5 x 5-25$\mu$; conidia subhyaline to faintly olivaceous, obclavate to narrowly linear, straight to curved, indistinctly multiseptate, base subtruncate, tip acute, 2-4 x 20-100$\mu$.

HOST: *Lonicera japonica* Thunb.
TYPE: Bermuda; *Lonicera japonica;* L. Ogilvie; Jan. 1928.
*CO-TYPE:* State College, Miss.; *Lonicera japonica;* L. E. Miles; Oct. 1, 1934.
DISTRIBUTION: Bermuda, Mississippi.
NOTE: The very short pale conidiophores in dense fascicles and conidia with subtruncate base separate this species from the others on Lonicera. See key page 99.

**Cercospora lonicericola** Yamamoto
Jour. Soc. Trop. Agr. 6: 604. 1934

Leaf spots indistinct tan areas or none; fruiting scantily effuse, olivaceous, hypophyllous; stromata lacking; nonfasciculate; conidiophores short branches from very narrow procumbent threads, pale to very pale olivaceous brown, straight to curved, sparingly septate, rarely geniculate, spore scars not evident, 2-4 x 10-65$\mu$; conidia obclavato-cylindric, subhyaline to very pale olivaceous, straight to curved, indistinctly multiseptate, base subtruncate to long obconically truncate, tip subobtuse, 2-4 x 30-120$\mu$.

TYPE: Taihoku, Formosa; *Lonicera japonica* var. *sempervillosa* Hayata; W. Yamamoto; Nov. 3, 1933.

DISTRIBUTION: Formosa, Japan.
NOTE: The lack of stromata or fascicles separates this species from the others on Lonicera. See key, page 99.

CERCOSPORAE ON VIBURNUM

A. Conidia acicular, hyaline, 2-4 x 20-90$\mu$; conidiophores 4-6 x 25-175$\mu$, sometimes branched.
V. OPULUS *C. viburnicola*
AA. Conidia obclavate to cylindric, hyaline to subhyaline; conidiophores not branched.
B. Conidia 2-3.5 x 20-100$\mu$; conidiophores 2-4 x 10-50$\mu$; stromata 15-35$\mu$.
V. TINUS, V. TOMENTOSUM *C. tinea*
BB. Conidia and conidiophores 3-6$\mu$ wide; stromata 30-80$\mu$.
C. Conidia obclavate to obclavato-cylindric, 30-130$\mu$ in length, plainly multiseptate; conidiophores 10-45$\mu$, very pale in color; fascicles dense.
V. OPULUS *C. penicillata*
CC. Conidia cylindric to cylindro-obclavate, 15-75$\mu$ in length, 1-5 septate; conidiophores 10-60$\mu$, pale to medium brown; fascicles 2-9 diverging stalks.
VIBURNUM spp. (not V. OPULUS) *C. varia*

**Cercospora penicillata** (Cesati) Fresenius
Beitr. Z. Myk. p. 93. 1863

*Passalora penicillata* Ces., Klotz. Herb. Myc. 587
*Cercospora penicillata* var. *opuli* Fuckel, F. Rhen. 118
*Cercospora opuli* (Fuckel) Höhnel, Rabenhorst, Krypt.-Flora 9: 136. 1910
*Cercospora viburni* Sacc., Mycot. March 2773

Leaf spots circular to subcircular, 1-5 mm. in diameter, gray with a dark line margin; fruiting amphigenous; stromata globular to elongate, dark brown to almost black, 30-80$\mu$ in length; fascicles dense; conidiophores very pale fuligenous or olivaceous brown, younger ones almost hyaline, uniform in color, usually much attenuated toward tip, not septate, rarely once mildly geniculate, not branched, minute spore scar at conic tip, 4-6 x 10-45$\mu$; conidia hyaline to subhyaline, obclavate to distinctly cylindric, plainly multiseptate, usually curved, base sharply obconic, tip subobtuse to obtuse, 3-6 x 30-130$\mu$.

HOST: *Viburnum opulus* L.
TYPES: (*Passalora penicillata*) Klotzsch Herb. Myc. Second Ed. No. 587 (1857); *Viburnum opulus;* (*C. opuli*) in Sylva Hostrichiensi; summer, 1863 (F. Rhen. 118).
DISTRIBUTION: Apparently widely distributed in Europe from Italy to Siberia. I am not sure that this occurs in America, although it has been so reported. The host, *V. nudum* (Plant Dis. Reporter 32: 209. 1948) also has been given. I believe this too is wrong.
NOTE: The hyaline to subhyaline conidia 3-6 x 30-130$\mu$ and with sharply obconic base separate this species from others on Viburnum. Lindau (Rabenhorst, Krypt.-Flora 9: 135. 1910) gives *Passalora penicillata* and *Cercospora penicillata* as synonyms of *C. depazeoides.* Saccardo (Syll. Fung. 4: 469. 1886) makes a similar statement, but the two are quite distinct. All the species on Viburnum have hyaline to subhyaline conidia, and nearly always have pronounced stromata. Gilman and Archer (Iowa St. Col. Jour. of Sci. 3: 319.

1929) place all the species on Viburnum under *C. opuli.* Fuckel (Hedwigia **2:** 133. 1863) described the species on celery as *C. penicillata* var. *apii.* Under Fungi Rhenani, No. 119, he distributed *C. dubia* under the name, *C. penicillata* var. *chenopodii* Fuckel. W. W. Ray sent a specimen of *Viburnum opulus* from Oklahoma, and possibly having a new species of Cercospora. The conidia are hyaline, acicular, and narrow. See key above.

**Cercospora periclymeni** Winter

Hedwigia **23:** 190. 1884

Leaf spots subcircular to irregular, 2-8 mm. in diameter, dark brown, often with purplish raised border or purplish on the lower leaf surface; fruiting amphigenous, but more abundant on the lower surface; stromata distinct, dark brown, globular; fascicles dense; conidiophores medium dark brown, uniform in color and width, sparingly septate, not branched, straight to sinuous, rarely geniculate, small spore scar at rounded to conic tip, 3-5 x 20-40$\mu$; conidia subhyaline, or sometimes almost colored, cylindric, straight, 1-3 septate, bluntly rounded ends, 2-5 x 15-40$\mu$.

HOST: *Lonicera periclymenum* L., Lonicera sp., *L. albiflora*

TYPE: Prope Vidoeiro, Lusitanica; *Lonicera periclymenum;* Moller, No. 1727; Aug. 1883.

DISTRIBUTION: Portugal, Germany, Russia (Caucasus) and China. Dr. O. A. Plunkett sent me a specimen from San Jaceunto Mt. California on Lonicera sp., which apparently is identical with Winter's species. Texas (Tracy, 1902)

NOTE: The prominent stromata together with the dark conidiophores in dense fascicles and the cylindric conidia separate this species from the others on Lonicera. See key, page 99.

**Cercospora prolificans** Ellis & Holway

Bul. Lab. Nat. Hist. State Univ. Iowa. Part II. **3:** 42. 1896

TYPE: San Bernardino, Cal.; *Sambucus glauca* Benth.; S. S. Parish; Aug. 1893.

NOTE: Saccardo has shown that this species is *Cercosporella prolificans* Sacc. (Syll. Fung. **11:** 606. 1895; **15:** 84. 1901).

**Cercospora symphoricarpi** Ellis & Everhart

Jour. Mycol. **5:** 70. 1889

Leaf spots circular to angular, 1-3 mm. in diameter, uniformly brown or with tan center and brown margin; fruiting amphigenous; stromata dark brown to almost black, 15-35$\mu$ in diameter; fascicles dense; conidiophores medium dark brown, pale tip, sometimes attenuated, multiseptate, not branched, sinuous or rarely 1-3 geniculate, small spore scar at conic tip, 3-4.5 x 15-65$\mu$, or even 110$\mu$; conidia subhyaline to pale olivaceous, cylindro-obclavate, straight, 1-3 septate, base medium to long obconically truncate, tip obtuse, 2.5-4.5 x 20-40$\mu$.

HOSTS: *Symphoricarpos orbiculatus* Moench. (*Symphoricarpos vulgaris* Michx.), *S. occidentalis* Hook.

TYPE: Rooks Co., Kansas; *Symphoricarpos vulgaris;* E. Bartholomew, No. 227B (1293); June 20, 1888.

DISTRIBUTION: Studied material from Kansas, Montana, and Ontario. Also present in Nebraska, Manitoba, Wisconsin, and Iowa.

**Cercospora tinea** Saccardo

Michelia 1: 268. 1879

Leaf spots subcircular to angular, 4-7 mm. in diameter, uniformly dark brown or with dingy gray center; fruiting amphigenous; stromata small, dark brown, 15-35$\mu$ in diameter; fascicles dense, rarely very dense; conidiophores delicate, pale olivaceous brown, uniform in color and width, variously curved or undulate, septation, geniculation, branching, and spore scars absent or indistinct, tip bluntly rounded, or conic, 2-4 x 10-50$\mu$, mostly 10-30$\mu$; conidia hyaline to subhyaline, narrowly obclavate or almost linear, slightly curved, septa indistinct, base medium to long obconically truncate, tip subacute, 2-3.5 x 20-100$\mu$.

HOSTS: *Viburnum tinus* L., *V. tomentosum* Thunb. (*V. plicatum* Miq.)

TYPE: Padova, Italy; *Viburnum tinus;* Bizzozero; Oct. 1877 (Cotype distributed as Mycotheca Veneta No. 1252).

DISTRIBUTION: Apparently generally present in southern Europe. Langlois collected an authentic specimen in Louisiana on *Viburnum plicatum.*

NOTE: *C. tinea* is separated from the other species by the very narrow conidia, delicate conidiophores, and fairly dense fascicles. Lindau (Rabenhorst's Cryptog. Flora 9: 133. 1910) says that Sydow Myc. March 2773 labeled *C. viburni* Sacc. very plainly belongs to the above species. This statement seems incorrect. The conidia and conidiophores are wide, and appear identical with those of *C. penicillata.* T. L. Tai (Lloydia 11: 54. 1948) describes *Cercospora viburnicola* Tai on *Viburnum cylindricum.* This was collected by J. Hsu (No. 5929) at Kunming, Yunnan, China, July 1938. I have not seen the specimen. The description sounds somewhat like that of *C. tinea,* excepting that Tai mentions plainly colored spores. If it is a new species the name must be changed, for Ray used it in 1941. See key, page 103.

**Cercospora triostei** Chupp and Greene

Trans. Wisconsin Acad. Sci. Arts, Letters 38: 247. 1946 (1947)

Leaf spots subcircular to irregular, 2-4 mm. in diameter, uniformly dull brown or with a narrow dark margin; fruiting amphigenous, visible under the hand lens as minute black pustules; stromata a few dark brown cells or as large as 20$\mu$ in diameter; fascicles 2-12 divergent stalks; conidiophores pale to medium olivaceous brown, fairly uniform in color, sometimes more narrow near the tip, sparingly septate, not branched, 0-4 geniculate, straight to curved or tortuous, bluntly rounded to subtruncate tip, 3-5 x 30-120$\mu$; conidia pale to medium olivaceous, obclavato-cylindric, straight to mildly curved, 1-7 septate, base obconically truncate, tip short, conic, 3-5.5 x 30-70$\mu$.

HOST: *Triosteum perfoliatum* L.

TYPE: Pine Bluff, Dane Co., Wisc.; *Triosteum perfoliatum;* H. C. Greene; June 29, 1945.

DISTRIBUTION: Known only from the type locality.

**Cercospora varia** Peck

N. Y. State Mus. Ann. Rept. 35: 141. 1884

Leaf spots circular to subcircular, 2-4 mm. in diameter, pale to dark reddish brown, usually with a narrow black line margin; fruiting amphigenous; stromata a few brown cells filling stomatal opening to large, 30-80$\mu$ in diameter; conidiophores borne singly or in fascicles of 2-9, rarely dense, pale to medium dark

brown, shorter ones more narrow and paler toward the tip, sparingly septate, not branched, not or rarely geniculate, longer ones often undulate, small spore scar at conic tip, 4-6 x 10-60$\mu$, rarely 100$\mu$; conidia hyaline, cylindric to cylindro-obclavate, 1-5 septate, straight to slightly curved, base long obconically truncate, tip subobtuse, rarely catenulate, 3-6 x 15-75$\mu$.

HOSTS: *Viburnum acerifolium* L., *V. lentago* L., *V. cassinoides* L., *V. pubescens* Pursh., *V. trilobum* Marsh. (*V. opulus* var. *americanum* [Mill.] Ait.)

TYPE: East Berne, N. Y.; *Viburnum acerifolium;* C. H. Peck; August.

DISTRIBUTION: From Ottawa to Manitoba, and as far south as West Virginia and Kansas. I believe it was wrongly reported from Texas and Mississippi.

NOTE: The shape, size, and septation of the hyaline conidia separate this species from the others on Viburnum. See key, page 103.

**Cercospora viburnicola** Ray

Mycologia **33**: 174. 1941

Leaf spots angular to irregular, involving small to large portions of the leaf, reddish brown to grayish brown; fruiting amphigenous; fascicles mostly dense; conidiophores pale olivaceous brown, in mass medium dark, straight to slightly curved or undulate, occasionally once geniculate, rarely branched, tip slightly paler, attenuated or somewhat irregular in width, sparingly septate, medium spore scar at subtruncate tip, 4-6 x 25-175$\mu$; conidia hyaline, acicular to obclavate, straight or slightly curved, indistinctly multiseptate, base truncate, tip acute to subacute, 2-4 x 20-90$\mu$.

HOST: *Viburnum opulus* L.

TYPE: Stillwater, Oklahoma; *Viburnum opulus;* W. W. Ray, No. 286; Aug. 18, 1939 (Cornell Univ. 29236).

DISTRIBUTION: Known only from the type locality.

NOTE: The hyaline, acicular conidia 2-4 x 20-90$\mu$ separate this species from the others on Viburnum. See key, page 103.

**Cercospora weigeliae** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **45**: 170. 1893

Leaf spots circular, sometimes 1-2 mm. in diameter, but occasionally 4-10 mm., white with a wide purple border; fruiting amphigenous; stromata lacking or slight; fascicles mostly 3-12 stalks; conidiophores pale olivaceous brown, uniform in color, plainly attenuated, sparingly septate, not branched, upper half undulate or 1-4 mildly to abruptly geniculate, medium spore scar at narrowed subtruncate tip, 3.5-5 x 30-125$\mu$; conidia acicular to obclavate, hyaline, straight to slightly curved, indistinctly multiseptate, base truncate to subtruncate, tip acute to subacute, 2-3.5 x 35-125$\mu$.

HOST: Cultivated Weigelia (Diervilla), *D. florida* Sieb. & Zucc. (*W. florida* DC.)

TYPE: Washington, D.C.; cultivated Weigelia; E. A. Southworth; Sept. 1, 1887.

DISTRIBUTION: Studied material from Mississippi and District of Columbia.

NOTE: See also *C. diervillae* for differences between the two species on this host genus.

**Cercospora caricae** Spegazzini

Anal. Soc. Scient. Argentine **16**: 168. 1883

TYPE: Guarapi, Paraguay; *Carica papaya* L.; B. Balansa, No. 2739; Febr. 1881.

NOTE: The type shows spiny 2-celled, elliptic to pear-shaped conidia. It therefore is not a Cercospora. Spegazzini when he described it questioned the genus. Maublanc (Bol. Soc. Agr. Rio Janer. **16**: 212. 1913) named it *Asperisporium caricae* (Speg.) Maubl. Seaver and Chardon list it as *Pucciniopsis caricae* (Speg.) Seaver (N. Y. Acad. of Sciences **3** (1): 104. 1926). Seymour (Host Index, p 18, 1929) lists it on *Fusarium roseum* Lk. It is more likely that the fungi grew intermingled on the same host. Bender in referring to the Seymour list spelled the Cercospora, *C. carieae.*

**Cercospora mamaonis** Viégas & Chupp

*Cercospora papayae* Viégas & Chupp, Bol. da Soc. Brasil. de Agron. **8**: 42. 1945

Leaf spots small circular to large irregular blotches, yellowish to brown, finally with gray centers; fruiting amphigenous but chiefly epiphyllous; stromata pale brown, slight to 125$\mu$ in diameter; fascicles dense to very dense; conidiophores very pale olivaceous brown, almost hyaline and narrow tip, not or rarely septate, not branched, not geniculate, no visible spore scars, 2-3 x 5-25$\mu$ (Viégas says 4-4.5 x 80-100$\mu$); conidia hyaline to subhyaline, cylindric, straight, 1-5 septate, rounded to conic ends, 2-3 x 10-45$\mu$ (Viégas says 3.5-4 x 40-90$\mu$).

HOST: *Carica papaya* L.

TYPE: Inst. Agronomica do Estado, Campinas, Brazil; *Carica papaya;* A. S. Costa, No. 613; May 1, 1936.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. papayae* for differences between the species on Carica. The species name is derived from the Portuguese name of the fruit.

**Cercospora papayae** Hansford

Proc. Linn. Soc. London **1942-43**: 58. 1943

Leaf spots subcircular to irregular, 3-8 mm. in extent, ashen color on the upper surface, immarginate, indistinct on lower surface; fruiting epiphyllous; stromata a few dark brown cells; fascicles 3-30 stalks; conidiophores medium brown, somewhat paler and more narrow toward the tip, multiseptate, not branched, 0-4 geniculate, medium spore scar at the subtruncate tip, 3.5-6 x 50-200$\mu$; conidia hyaline, acicular, variously curved, indistinctly multiseptate, base truncate, tip subacute, shortest ones may be almost cylindric, 3-5 x 20-75$\mu$.

HOST: *Carica papaya* L.

TYPE: Kampala, Uganda; *Carica papaya;* C. G. Hansford, No. 1800.

DISTRIBUTION: Known only from the type locality. Possibly also present in China.

NOTE: Wm. T. H. Ho in "Fruit diseases of Kwangtung Province" Parts I and II described two Cercosporae on Carica. He named the two respective diseases "White Spot" and "Gray Brown" disease. His drawings show dense fascicles of long conidiophores and acicular conidia. His description of the former is, "Spot white, circular, brownish margin; conidiophores especially long, 2.5-7.25 x 50-205$\mu$; conidia colored, 2.5-5.5 x 26.3-86.3$\mu$." His description of the latter is, "Leaf spots grayish brown, darker margin, circular, elliptic, or angular, 6 mm. in diameter; fruiting amphigenous; conidiophores pale brown, 1-5 septate, 5-6 x 47.5-85$\mu$; conidia obclavate, 3-26 septate, 4.25-6.25 x 40-187.5$\mu$, granular, smooth, color paler than those of the white spot." Both of these descriptions fit fairly well the species from Uganda. His drawings are even more convincing.

**Cercospora vasconcelliae** Spegazzini

Anal. Soc. Scient. Argentine **16**: 168. 1883

HOST: *Vasconcellia quercifolia* St. Hil. (*Carica quercifolia* Solms.).

TYPE: Guarapi, Paraguay; *Carica quercifolia;* B. Balansa, No. 3857; June 1883.

NOTE: The type shows thick-walled, closely septate conidia, rarely appearing muriform, and broad, cumbersome appearing conidiophores. The species could better be classed as an Helminthosporium or some other related genus.

**Cercospora dianthi** Muller & Chupp

Arch. Inst. Biol. Veget. Rio Janeiro. 3 (1): 93. 1936

Leaf spots pale tan to brown or none; fruiting in black effuse patches on the dead stems, leaves, and floral parts; stromata lacking or small; fascicles 3-10 stalks, rarely 20; conidiophores medium to dark brown, plainly multiseptate, uniform in color and width, not branched, rarely geniculate, curved or bent, medium spore scar at the subtruncate tip, 4-6 x 75-250$\mu$; conidia hyaline, acicular, variously curved, indistinctly multiseptate, base truncate, tip acute, 2-4.5 x 75-300$\mu$.

HOST: Dianthus sp., *D. suberbus* L.

TYPE: Vicosa, Escola, Minas Geraes; Dianthus sp.; A. S. Muller, No. 658; Dec. 20, 1933.

DISTRIBUTION: Minas Geraes, Japan.

NOTE: Dr. Togashi sent a good specimen from Japan.

**Cercospora inquinans** Cooke

Grevillea **7**: 12. 1878

TYPE: California; Gymnocarpus sp.; H. W. Harkness. Harkness has another collection made at San Rafael, Cal., in 1881.

NOTE: The type shows conidia with thick walls and septa, and with rather coarse conidiophores. This is not considered a Cercospora and could probably be classed as an Helminthosporium.

*Cercosporella woronowii* Siemaszko on *Melandryum balansae* Boiss has wrongly been listed also as *Cercospora woronowii* in the literature.

**Cercospora destructiva** Ravenal

Jour. Mycol. **3**: 13. 1887

Leaf spots circular to irregular, small to almost half of leaflet, gray to rusty brown, sometimes showing 2 or 3 alternating zones, margins sometimes scalloped or marked with narrow dark raised line; fruiting amphigenous, but mostly on upper leaf surface; stromata globular to elongate, black, 50-150$\mu$ in diameter; fascicles extremely dense; conidiophores very delicate, hyaline to pale olivaceous brown, shortest ones attenuated, longest ones slightly wavy, septa not visible, not geniculate, not branched, rounded tip without visible spore scar, 2-3 x 5-25$\mu$; conidia cylindric to obclavato-cylindric, straight or nearly so, hyaline to subhyaline, 1-3 septate, obconic base, subobtuse tip, 2-3.5 x 15-55$\mu$.

HOST: *Evonymus japonica* Thunb.

TYPE: Aiken, S. Car.; *Evonymus japonica;* H. W. Ravenal; Sept. 1886.

DISTRIBUTION: S. Carolina, Mississippi, Japan, and China.

NOTE: This collection has been placed in some herbaria also as *C. japonica* Rav. *C. evonymi* (*euonymi*) Ellis is a Ramularia. I regard the Ravenal species as a Didymaria.

**Cercospora euonymi** Ellis
Amer. Nat. **16**: 810. 1882

HOSTS: *Evonymus americana* L., *E. atropurpureus* Jacq., *E. europaeus* L.
TYPE: Lexington, Ky.; *Euonymus americana* L.; W. A. Kellerman, No. 73; July 1882.
NOTE: I examined the type as well as a number of other collections. All these bear out the Davis (Wisc. Acad. Trans. **21**: 262. 1924; **22**: 157. 1926.) assertion that the fruiting is hyaline. Therefore the fungus is not a Cercospora. Since the conidia are cylindric, it may be a Ramularia. An occasional collection shows very pale colored stromata with hyaline conidiophores.

**Cercospora melanochaeta** Ellis & Everhart
Proc. Acad. Nat. Sci. Phila. **46**: 380. 1894

Leaf spots circular, 1-10 mm. in diameter, dark to almost black, usually with a gray center, and often with a water-soaked or yellowish halo; fruiting amphigenous, when plentiful may be effuse, black, often accompanying a pycnidial form; stromata dark, globular, slight to medium in size; fascicles dense to very dense; conidiophores medium dark brown, slightly paler tip, rather closely septate, irregular in width, variously curved or undulate, branched, rarely once geniculate, medium spore scar at rounded or subconic tip, 4-6 x 15-50$\mu$; conidia medium olivaceous or olivaceous brown, obclavate, straight or slightly curved, plainly multiseptate, long obconic base, subobtuse tip, 3.5-6 x 40-100$\mu$.

HOSTS: *Celastrus scandens* L., *C. buxifolius* Linn. (*Gymnosporia buxifolia* Szy.)
TYPE: Louisville, Kansas; *Celastrus scandens;* E. Bartholomew, No. 1210; Oct. 16, 1893.
DISTRIBUTION: Reported from North Dakota, Kansas, Iowa, Mississippi, Missouri, and Nebraska. An excellent specimen was sent from Natal, South Africa.

**Cercospora schreberae** Mahmud
Current Science **19**: 292. 1950

Spots minute yellow specks on the upper leaf surface, then later turn brown and become visible also on the lower surface, circular to irregularly angular, often coalescing, center dingy gray, slightly depressed, late in the season spots appear on petioles and twigs; fruiting amphigenous in the gray areas; stromata present; fruiting stalks single to dense fascicles; conidiophores brown, 0-5 septate, usually undulate, frequently nodulose or 1-2 geniculate, simple to sparingly branched, 2.5-6 x 10-55$\mu$; conidia subhyaline to pale olivaceous brown, cylindric to obclavate, branched occasionally, 1-10 septate, rarely constricted at the septa, 3-6 x 20-90$\mu$.

HOST: *Schrebera swietenioides* Roxb.
TYPE: Nagpur, India; *Schrebera swietenioides;* K. A. Mahmud; 1948 and following.
DISTRIBUTION: India.
NOTE: I have not seen the species.

## CERCOSPORAE ON CHENOPODIACEAE

A. Conidia acicular, tip acute, 2.5-4 x 50-400$\mu$; conidiophores sometimes strongly attenuated toward the tip, 3-5.5 x 10-100$\mu$, mostly 10-65$\mu$.

BETA, SPINACIA, CYCLOLOMA, ATRIPLEX, CHENOPODIUM ..... *C. beticola*

AA. Conidia cylindric, tip obtuse; conidiophores not strongly attenuated.

B. Conidia wide, 4-7 x 30-80$\mu$, base mostly long obconically truncate; conidiophores sometimes branched, occasionally rachis-like with geniculations, 4-6.5 x 30-100$\mu$.
ATRIPLEX, CHENOPODIUM ..... *C. dubia*

BB. Conidia 3-5.5 x 15-65$\mu$, base subtruncate; conidiophores not branched, rarely geniculate, 3-5.5 x 10-40$\mu$.
SPINACIA ..... *C. bertrandii*

**Cercospora bertrandii** sp. nov.

Maculae orbiculares vel angulatae, 0.5-3 mm. diam., atro-olivaceae vel rubido-fuscae; caespituli amphigeni; stromata minuta vel 40$\mu$; conidiophora dense fasciculata, pallide brunnea, apicem versus leniter attenuata, superne saepe pallidiora;

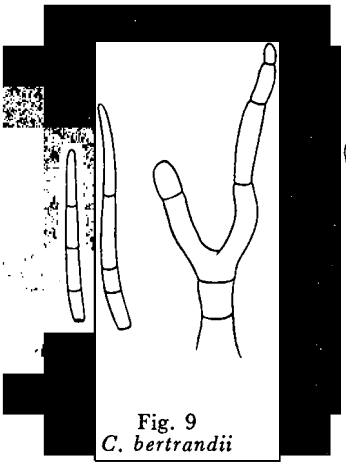


Fig. 9
*C. bertrandii*

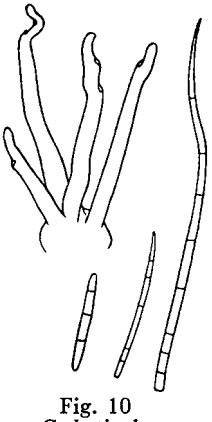


Fig. 10
*C. beticola*

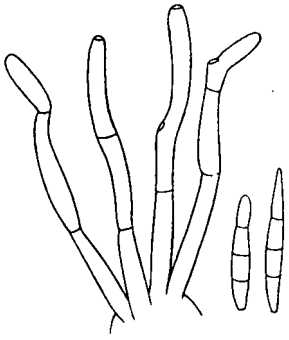


Fig. 11
*C. dubia*

vix septata, fere simplicia, recta vel curvata, ad apicem subtruncata, 3-5.5 x 10-40$\mu$; conidia hyalina, cylindracea, apicem versus haud attenuata, 3-7 septata, ad basim truncata vel subtruncata, ad apicem obtusa, 3-5.5 x 15-65$\mu$.

Leaf spots circular to angular, 0.5-3 mm. in diameter, dark olivaceous to grayish brown, occasionally with reddish brown margin; fruiting amphigenous; stromata slight to 40$\mu$ in diameter, pale to medium brown; fascicles mostly dense, compact to divergent; conidiophores pale to very pale brown, paler and more narrow toward the tip, rarely septate or branched, straight to curved, 0-1 abruptly geniculate, subtruncate tip, 3-5 x 10-40$\mu$; conidia hyaline, cylindric to almost cylindric, 3-7 septate, straight to mildly curved, truncate to subtruncate base, obtuse tip, 3-5.5 x 15-65$\mu$.

HOST: *Spinacia oleracea* L. var. Bloomsdale.

TYPE: Pied de la Montagne, Prov. Quebec; *Spinacia oleracea* L. var. Bloomsdale; Paul Bertrand; Sept. 1943.

DISTRIBUTION: Known only from the type locality.

NOTE: See key above for differences among the species on spinach.

**Cercospora beticola** Saccardo
Nuov. Giorn. Bot Ital. 8: 189. 1876

*Cercospora betae* Frank, Krankh. d. Pflanz. p. 601. 1880
*Fusarium betae* Sacc., Michelia 2: 132. 1880
*Cercospora flagelliformis* E. + H., N. Jer. Ann. Rept. 1890: 355. 1891
*Cercospora anthelmintica* Atkinson, Jour. Elisha Mitchell Scien. Soc. 8: 49. 1892
*Cercospora spinaciae* Oud., Nederl. Kruidk. Arch. III. 2: 314. 1900
*Cercospora chenopodiicola* Bresadola, Hedwigia 39: 328. 1900
*Cercosporina spinacicola* Sacc., Nuov. Giorn. Bot. Ital. N.S. 22: 73. 1915
*Fusisporium betae* Desm., Ann. Sci. Nat. 2 ser. 19: 434. 1843
*Pionnotes betae* Sacc., Syll. Fung. 4: 726. 1886
*Cercospora longissima* Cooke & Ellis, Grevillea 17: 65. 1889

Leaf spots circular, numerous, brown to ashen gray center, fuligenous brown, red or purple margin, 0.5-6 mm. in diameter; fruiting amphigenous or chiefly epiphyllous; stromata none to fairly prominent; some fascicles dense; conidiophores pale brown near the base, paler to perfectly hyaline near the tip, slightly to strongly attenuated, mildly geniculate, small spore scars at geniculations and at the tip, not branched, sparingly septate, 3-5.5 x 10-100$\mu$, mostly not longer than 65$\mu$; conidia hyaline, acicular, gradually attenuated from the base which is truncate, tip subacute to acute, indistinctly multiseptate, mildly to markedly curved, 2.5-4 x 50-200 (400)$\mu$.

HOSTS: *Beta vulgaris* L., *B. cicla* L., *B. maritima* L., *B. patellaris* Moq., *Spinacia oleracea* Mill., *Cycloloma atriplicifolium* (Spreng.) Coulter, *Atriplex argentea* Nutt., *A. canescens* James, *Chenopodium ambrosioides* var. *anthelminticum* Gray, *C. polyspermum* Linn., and possibly Amaranthus. A large number of widely separated hosts has been listed, but in very few instances have adequate cross-inoculations been made. Furthermore, the workers usually have not been familiar enough with the characters of Cercospora to distinguish the various species. For the most part, any specimen having hyaline acicular conidia was named *C. beticola* regardless of other characters or of host relationships. At present, it seems that the beet pathogen is limited to the Chenopodiaceae, with the possible exception where foliage may be injured by insects or weather, and then be infected by the fungus, in a more or less saprophytic manner. In the Plant Dis. Reporter 32: 419. 1948 the species is reported on *Proboscidea jussieui* Strud. H. C. Greene of Wisconsin records it on *Kochia scoparia* (1.) Roth.

TYPES: Vittoria, Italy; *Beta cicla;* Treviso; Oct., 1875; (*C. flagelliformis*) New Jersey; spinach; Halsted (*C. anthelmintica*) Auburn, Ala.; *Chenopodium ambrosioides* var. *anthelminticum;* B. M. Duggar, No. 2037; Aug. 27, 1891; (*C. chenopodiicola*) Königstein, Saxony, Germany; *Chenopodium polyspermum;* Krieger; (*C. spinaciae*) Nunspeet, Netherland; *Spinacia oleracea;* Mr. Beins; June 9, 1899; (*Cercosporina spinacicola*) Campi di C. Attard, Malta; *Spinacia sativa;* C. Attard.

DISTRIBUTION: As nearly worldwide as are the hosts.

NOTE: Herbarium specimens seem to indicate that more than one species of Cercospora may occur on beet leaves. *C. beticola* is characterized mainly by the moderately short, slightly attenuated conidiophores, the tops of which are almost, or fully, hyaline and with one to several mild geniculations near the tip. Swiss chard, mangel and sugar beet are somewhat more susceptible than is

the common garden beet. Dewey Stewart gave me a specimen on *Stellaria media* Smith which he believed was *Cercospora beticola.* It did resemble that species. McKay and Pool (Phytopath. **8**: 117. 1918) did not get infection on *Amaranthus retroflexus* nor on *Chenopodium album* and *Ch. quinoa,* but they did get numerous spots on *Martynia louisiana* Mill. See key, page 110.

**Cercospora dubia** (Riess) Winter

Syll. Fung. **4**: 456. 1886

*Ramularia dubia* Riess, Hedwigia **1**: Pl. IV, Fig. 9. 1854; Bot. Zeit. **12**: 190. 1854
*Cercospora dubia* Winter, Hedwigia **22**: 10. 1883
*Cercospora chenopodii* Cooke, Grevillea **12**: 22. 1883
*Cercospora dubia* (Riess) Bubák, Ann. Mycol. **6**: 29. 1908
*Cercospora chenopodii* Fresen., Beitr. Mycol. p. 92. 1863
*Cercospora chenopodii* var. *micromacula* Dearn., Mycologia **21**: 329. 1929
*Cercospora penicillata* var. *chenopodii* Fuckel (F. Rhen. 119)
*Cercospora dubia* var. *Urbica* Roum., Rev. Mycol. **15**: 15. 1893
*Cercospora chenopodii* var. *atriplicis patulae* Thüm., in Herb.
*Cercospora dubia* var. *Atriplicis* Bond., Acta Hort. Petro. **26**: 51. 1910
*Cercospora bondarzevi* P. Henn., in Herb. (see above)

Leaf spots circular, 3-5 mm. in diameter, lead colored to grayish tan centers and pale brown margins; fruiting amphigenous; stromata slight to 40$\mu$ in diameter, almost hyaline to medium brown, globular; most fascicles dense; conidiophores subhyaline to pale olivaceous brown, pale tip, sparingly septate, rarely branched, 0-1 rather abruptly geniculate, very rarely almost rachis-like in geniculation, large spore scar at subtruncate tip, 4.5-6.5 x 30-100$\mu$; conidia cylindric to obclavate, hyaline, 1-7 but mostly 3 septate, subtruncate to long obconically truncate base, bluntly rounded tip, straight or somewhat curved, may be catenulate, 4-7 x 30-80$\mu$.

HOSTS: *Atriplex hastata* Linn., *A. oblongifolia* Host., *A. patula* L., *A. nitens* Schkuhr., *A. tatarica* L., *Chenopodium album* L., *C. capitatum* Aschers, *C. hybridum* L., *C. boscianum* Moq., *C. polyspermum* L., *C. rubrum* L., *C. urbicum* L., *C. leptophyllum* Nutt., *C. bushianum* Aellen.

TYPES: Germany; *Atriplex patula;* Cassel (Klotzschii Herbarium, etc., Centuria XIX); (*Cercospora dubia* var. *Urbica*) France; *Chenopodium urbicum;* Fautrey; Sept. 1892; (*C. dubia* var. *Atriplicis*) Russia; *Atriplex nitens;* A. C. Bondarzew; (*C. chenopodii* Cke.) H. W. Ravenal, Fungi Amer. Exs. 591; (*C. chenopodii* Fresen.) No type given; (*C. chenopodii* var. *atriplicis patulae*) Herb. von Thümen; (*C. chenopodii* var. *micromacula*) Stockton, Kansas; *Chenopodium boscianum;* E. Bartholomew; (*C. penicillata* var. *chenopodii,* Fungi Rhenani No. 119) *Chenopodium album;* autumn, 1863.

DISTRIBUTION: From Manitoba eastward, and as far south as Missouri and Delaware. Also reported from San Domingo, in Europe from Italy to Poland, and in Asia from India to Japan.

NOTE: See key, page 110 for differences between the two species on Chenopodium. Because of the tendency of this species to be colorless at times and occurring on two hosts, its classification has been discussed almost more than any other Cercospora species. Brenckle (Mycologia **10**: 216) lists the name as *C. dubia* Fres.

**Cercospora chloranthi** Togashi et Katsuki
Trans. Sapporo Nat. Hist. Soc. **17**: 96. 1942

Leaf spots none or indistinct on upper surface; fruiting hypophyllous, in dark, effuse, olivaceous to almost black patches, ranging from minute flecks to large part of leaf surface; stromata small, dark to black, filling stomatal openings; fascicles dense, spreading or conidiophores borne singly from procumbent threads, medium dark fuligenous, uniform in color, irregular in width, copiously branched, tortuous, plainly multiseptate, rarely geniculate, small spore scar at conic tip, 4-5.5 x 20-90$\mu$; conidia olivaceous, obclavate or with almost no attenuation, variously curved, multiseptate, base short to long obconically truncate, tip subacute, 3-5 x 30-120$\mu$.

HOSTS: *Chloranthus japonicus* Sieb., *C. serratus* Roem. & Schult.
TYPE: Mt. Ehiko, Pref. Fukuoka, Japan; *Chloranthus japonicus;* K. Togashi; July 26, 1938.
DISTRIBUTION: Japan.
NOTE: Dr. Togashi sent me some of the type material.

**Cercospora hedyosmi** Petrak
Sydowia (Ann. Mycol.) **4**: 571. 1950

Leaf spots circular to irregular, 3-12 mm. in diameter, yellowish brown to dingy reddish brown; fruiting chiefly epiphyllous, punctiform, densely arranged in the center of the spot; stromata 30-70$\mu$ in diameter; fascicles dense to very dense; conidiophores olivaceous brown, paler toward the tip, torulose to strongly geniculate, sparingly septate, not branched, 3-6 x 40-90$\mu$; conidia subhyaline to pale olivaceous, obclavate, curved to undulate, 3-5 septate, base blunt, tip subacute, 3.5-5 x 35-60$\mu$.

HOST: *Hedyosmum pavonii.*
TYPE: Hacienda San Antonio near Banos, Prov. Tungurahua, Ecuador; *Hedyosmum pavonii;* H. Sydow, No. 710; Jan. 9, 1938.
DISTRIBUTION: Ecuador.
NOTE: I have not seen this species.

**Cercospora cistinearum** Saccardo
Michelia **1**: 268. 1879

Leaf spots circular, gray, with purplish border, indistinct on the lower leaf surface; stromata present; fascicles dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, not branched, rarely geniculate, almost straight, small spore scar at the rounded tip, 5 x 35-45$\mu$; conidia hyaline, cylindric to spindle shape, obconically truncate base, subobtuse tip, 0-3 septate, straight, 4 x 10-15$\mu$.

HOSTS: *Helianthemum chamaecistus* Mill. (*H. vulgare* Gaertn.)
TYPE: Botanical Garden, Pavia, Italy; *Helianthemum vulgare;* P. A. Saccardo; autumn.
DISTRIBUTION: Known only from the type locality.
NOTE: I did not have an opportunity of studying material of this species. For an illustration see Saccardo, Fungi Italici, No. 670. 1881. It is not a Cercospora. See also *C. helianthemi* for differences between the two species on this host genus.

**Cercospora helianthemi** Briosi & Cavara
Funghi parass No. 334. 1904

Leaf spots circular, 0.5-2.5 mm. in diameter, brown to leaden color; fruiting amphigenous; stromata small, dark brown; fascicles sometimes dense, mostly 3-15 stalks; conidiophores pale to medium brown, uniform in color and width, multiseptate, not branched, straight or upper third wavy to geniculate, small to medium spore scar at rounded to subtruncate tip, 4-6 x 20-110$\mu$; conidia hyaline, acicular to obclavate, slightly curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute, 2-3.5 x 40-130$\mu$.

HOSTS: *Helianthemum apenninum* var. *roseum* Grosser. (*H. polifolium* Pers. var. *roseum*).

TYPE: Botanical Garden, Pavia, Italy; *Helianthemum polifolium* var. *rosei;* G. B. Traverso and M. Turconi.

DISTRIBUTION: Known only from the type locality.

NOTE: A description was given on the packets which were distributed. See also *C. cistinearum* for differences between the two species on this host genus.

**Cercospora lecheae** Chupp and Greene
Trans. Wisc. Acad. Sci., Arts, Letters. 36: 264. 1946

Leaf spots minute, red to reddish brown, later entire leaflet may turn brown; fruiting hypophyllous; stromata small, a few brown cells below the stomatal openings; fascicles 2-12 spreading stalks; conidiophores pale to medium brown, fairly uniform in color and width, or with occasional swellings mostly near the apex, 0-3 septate, rarely branched, slightly curved to undulate or tortuous, not geniculate, conic tip, 3-5.5 x 15-80$\mu$; conidia very pale olivaceous, obclavate, shortest ones cylindric, straight to mildly curved, indistinctly 1-5 septate, base obconically truncate, tip subobtuse to conic, 2.5-5 x 15-70$\mu$.

HOSTS: *Lechea leggettii* Brit. & Hol. (*L. intermedia* Leggett), *L. tenuifolia* Michx.

TYPE: Madison, Wisc.; *Lechea intermedia;* H. C. Greene; Sept. 8, 1943.

DISTRIBUTION: Known only from the type locality.

**Combretaceae**

A. Conidia subhyaline to very pale olivaceous, obclavato-cylindric; conidiophores pale, short.
  B. Conidia 2-3.5 x 20-60$\mu$, obconically truncate base; conidiophores 2-3.5 x 5-15$\mu$.
    CONOCARPUS — *C. Conocarpi*
  BB. Conidia 3-5 x 30-100$\mu$, subtruncate base; conidiophores 3-4.5 x 5-35$\mu$.
    TERMINALIA — *C. catappae*
AA. Conidia hyaline, acicular, truncate base, 2-3.5 x 30-125$\mu$; conidiophores medium dark, 4-6.5 x 30-150$\mu$.
  TERMINALIA — *C. geraisensis*

**Cercospora catappae** P. Hennings
Bot. Jahrbücher von Engler 34: 56. 1905

*Cercospora terminaliae* Sawada, Formosa Agr. Rev. 38: 701. 1942

Leaf spots circular to irregular, 1.5-4 mm. in diameter, center pale brown to

dingy gray, margin wine-colored to black; fruiting hypophyllous; stromata dark brown, a few cells to 50$\mu$ in diameter; fascicles 3-20 stalks; conidiophores pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not branched, not geniculate, nearly straight, minute spore scar at the rounded tip, 3-4.5 x 5-35$\mu$; conidia obclavato-cylindric, subhyaline to very pale olivaceous, nearly straight, indistinctly multiseptate, base obconic to subtruncate, tip obtuse, 3-5 x 30-100$\mu$.

HOST: *Terminalia catappa* Linn.

TYPE: Sansibar, Dar-es-Salam, East Africa; *Terminalia catappa;* Stuhlmann; Oct. 26, 1901. Eichelbaum made another collection at the same place May, 1903 (38: 118. 1907).

DISTRIBUTION: East Africa, India, Formosa, Guam.

NOTE: I found only Septoria in the first Formosa material. See key above for differences between the species on this host. Sawada spells it *C. terminariae* on *Terminaria carappa* L. A part of his type material is deposited in the U.S. Dept. Agr. Mycological Herbarium.

**Cercospora conocarpi** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 42. 1942

Leaf spots circular to irregular, 2-6 mm. in diameter, or coalescing into large areas, brown, immarginate; fruiting mostly epiphyllous; stromata dark brown, globular, 15-40$\mu$ in diameter; fascicles dense; conidiophores singly very pale olivaceous, in mass medium dark brown, paler and more narrow toward the tip, not geniculate, longest ones may be slightly wavy, not branched, not septate, spore scars not visible at the rounded to conic tips, 2-3.5 x 5-15$\mu$; conidia subhyaline to very pale olivaceous, cylindric to obclavato-cylindric, straight to slightly curved, 2-6 septate, base mostly long obconically truncate, tip rounded to conic, 2-3.5 x 20-60$\mu$.

HOST: *Conocarpus erectus* L.

TYPE: Paraguaná Edo. Falcon, Venezuela; *Conocarpus erectus;* F. Tamayo, No. 2883 (No. A. 464).

DISTRIBUTION: Venezuela, Mona Island.

NOTE: Although the written description is similar to that of *C. catappae,* the two are distinct. This has more delicate conidiophores and conidia, and differs in other minor characters. See key, page 114.

**Cercospora geraisensis** sp. nov.

Maculae suborbiculares vel irregulares, 4-30 mm. diam., centro pallide fuscae vel griseae, in epiphyllo zonula lata purpurea cinctae, in hypophyllo aequabiliter obscure fuscae; caespituli hypophylli; stromata minuta, atro-brunnea; conidiophora laxe vel densiuscule fasciculata, castaneo-brunnea, superne saepe pallidiora, multiseptata, simplicia, leniter vel subito curvata, ad apicem subtruncata, 4-6.5 x 30-150$\mu$; conidia hyalina, anguste obclavata, recta vel leniter curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2-3.5 x 30-125$\mu$.

Leaf spots subcircular to irregular, 4-30 mm. in length, pale brown to gray center, purple to dark brown border, uniformly dull brown on lower surface; fruiting hypophyllous; stromata small, mostly a few large dark brown cells; fascicles 2-20 stalks; conidiophores medium dark brown, distinctly paler and more narrow toward the tip, multiseptate, not branched, upper fourth wavy to geniculate, more rarely abruptly geniculate near the center, numerous small spore

scars near and at the tip or with one large spore scar when the tip is subtruncate, 4-6.5 x 30-150$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 30-125$\mu$.

HOST: *Terminalia catappa* Linn.
TYPE: Vicosa-Escola, Minas Gerais, Brazil; *Terminalia catappa;* A. S. Muller, No. 334; April 23, 1934.
DISTRIBUTION: Known only from the type locality.
NOTE: See key, page 114 for differences between the species on this host.

**Cercospora terminaliae** Sydow

Ann. Crypt. Exot. 2: 270. 1929

HOST: *Terminalia bellerica* Roxb.
TYPE: Nagpur, C. P., East India; *Terminalia bellerica;* P. A. Pundit, No. 2361; Dec. 1908.
NOTE: Because of the wide conidiophores and the wide, thick walled, heavily septate, dark colored conidia, this is considered an Helminthosporium.

**Cercospora commelinicola** n. comb.

*Cercospora commelynae* Kalchbr. et Cooke (as described by Sydow, Ann. Mycol. 37: 425. 1939)

Leaf spots circular to oval, 4-6 mm. in length or sometimes coalescing into long streaks, pale to medium brown or ochre, occasionally with a narrow darker brown or reddish border; fruiting epiphyllous; stromata slight, brown; fascicles 3-12 stalks; conidiophores medium dark olivaceous brown, uniform in color, irregular in width or clavate, multiseptate, not branched, straight to curved, upper third wavy to geniculate, several minute spore scars at and near the tip, 4-6.5 x 20-100$\mu$; conidia hyaline, obclavate to distinctly cylindric, straight to mildly curved, base subtruncate, tip obtuse to subacute, indistinctly multiseptate, 3-5.5 x 40-100$\mu$.

HOST: *Commelina virginica* Linn., *C. communis* L.
TYPE: Mindo, Prov. Pichincha, Ecuador; *Commelina virginica;* H. Sydow, No. 345; Nov. 9, 1937.
DISTRIBUTION: Ecuador. S. Katsuki sent a collection on *C. communis* from Japan which apparently is the same.
NOTE: Sydow labeled this *C. commelynae* Kalchbr. & Cke. But the type in Kew shows the Kalchbrenner species to be a Septoria or other similar genus. Furthermore Cooke described it as having hyaline conidiophores. Consequently Sydow's collection is considered a new species. See also *C. nudiflorae* for differences between the species on this host genus.

**Cercospora commelynae** Kalchbrenner & Cooke

Grevillea 9: 24. 1881

HOST: *Commelyna bengalensis* Linn., Commelina sp.
TYPE: Cape Colony, Africa; *Commelyna bengalensis;* MacOwan, No. 1346.
NOTE: The type at Kew is not a Cercospora. It seems to be Septoria. Besides, Cooke described the fungus as having hyaline conidiophores. Therefore, the species must belong to some other genus.

**Cercospora forrestiae** Sawada

Formosa Agr. Res. Inst. Rept. **85**: 107. 1943

NOTE: Sawada described this species on *Forrestia chinensis* Br. too briefly to classify. Leaf spots 5-12 mm. in diameter; conidiophores olivaceous, 1-3 septate, in fascicles of 10-23, 4.5-5 x 28-89$\mu$; conidia pale olivaceous, 5-13 septate, 3-5 x 55-108$\mu$.

**Cercospora maracasensis** Baker and Dale

Mycol. Papers, Commonwealth Mycol. Inst. **33**: 103. 1951

Leaf spots distinct, subcircular, 4-30 mm. in length, at first greenish brown but gradually changing to yellowish tan or gray, bordered by a dark red to black line; fruiting chiefly hypophyllous, visible under the hand lens as minute black pustules; stromata subglobular, flattened on upper surface, yellowish brown, 30-60$\mu$ in diameter; fascicles dense, compact to divergent; conidiophores pale olivaceous brown, uniform in width and color or slightly paler near the tip, sparingly septate, not branched, not geniculate, straight or only mildly curved, tip rounded to conic, 3-5.5 x 30-135$\mu$; conidia subhyaline to pale olivaceous, obclavato-cylindric, straight to curved, indistinctly multiseptate, base obconically truncate, tip subobtuse, 3-5 x 35-110$\mu$.

HOST: *Commelina virginica* L. (*C. elegans* H.B.&K.)

TYPE: Maracas Valley, Trinidad; *Commelina elegans;* R. E. D. Baker, No. 226; Oct. 4, 1944.

DISTRIBUTION: Known only from the type locality.

NOTE: The other species on Commelina have hyaline conidia.

**Cercospora nudiflorae** sp. nov.

Frondes integre fuscae et marcidae; caespituli amphigeni; stromata minuta, atro-fusca; conidiophora olivaceo-brunnea, laxe fasciculata, apicem versus sensim attenuata et paullo dilutiora, leniter curvata, 3-5.5 x 15-80$\mu$; conidia hyalina, obclavata, fere recta, spurie multiseptata, ad basim subtruncata, ad apicem subacuta, 2-3.5 x 30-80$\mu$.

The entire leaflet, when affected turns brown and shrivels; fruiting amphigenous; stromata small, dark brown; fascicles sometimes dense; conidiophores medium olivaceous brown, somewhat paler and more narrow toward the tip, sparingly septate, not branched, upper third undulate to mildly geniculate, small spore scar at the rounded tip, 3-5.5 x 15-80$\mu$, mostly 15-50$\mu$; conidia hyaline, obclavate or almost acicular, nearly straight, indistinctly multiseptate, base subtruncate, tip subacute, 2-3.5 x 30-80$\mu$.

TYPE: Devonshire Marsh, Bermuda; *Commelina nudiflora* Linn. (*Commelina longicaulis* Jacq.); H. H. Whetzel; Jan. 12, 1926.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. commelinicola* for differences between the two species on this host genus.

**Cercospora polliae** Sawada

Formosa Agr. Res. Inst. Rept. **87**: 86. 1944

NOTE: This species is on *Pollia japonica* Thunb. It is too meagerly described to be sure how it compares with other forms on this host family. Leaf spots 10-15 mm.; fruiting hypophyllous; conidiophores brown, 0-3 septate, 4.5-5 x 21-55$\mu$;

conidia hyaline to pale colored, 5-13 septate, 3-4.5 x 60-125$\mu$. This species is reported also from Japan (Shigetaka Katsuki, Bul. of the Agr. Impr. Section Econ. Dept. Fukuoka Prefecture, Japan 1: 18. 1949).

## CERCOSPORAE ON EUPATORIUM

A. Conidia hyaline, 1.5-3 x 40-100$\mu$, narrowly obclavate; leaf spots indistinct; fruiting effuse, hypophyllous; fascicles dense; conidiophores 3-4 x 10-45$\mu$.
E. REPANDUM — *C. aciculina*

AA. Conidia colored, mostly wider than 1.5-3$\mu$; fascicles rarely dense.

B. Leaf spots distinct; fruiting not effuse, not wholly hypophyllous; small stromata present; fasciculate; conidiophores 3-4.5 x 10-45$\mu$.

C. Conidia narrowly obclavate, 2-3.5 x 50-190$\mu$; fruiting chiefly epiphyllous.
E. ALBUM — *C. eupatorii*

CC. Conidia obclavato-cylindric, 4-5 x 50-85$\mu$; fruiting amphigenous.
E. FORMOSANUM — *C. eupatorii-formosani*

BB. Leaf spots indistinct; fruiting effuse, hypophyllous; stromata lacking; conidia mostly cylindric.

C. Conidiophores subhyaline to pale colored, 3-5 x 10-70$\mu$; conidia hyaline to very pale, 1-4 septate, 2.5-5 x 20-50$\mu$.
EUPATORIUM spp. — *C. perfoliata*

CC. Conidiophores mostly medium to dark in color, 3.5-5.5 x 10-150$\mu$.

D. Conidia cylindric, mostly 1-septate, subhyaline to pale in color, 3.5-5 x 20-75$\mu$; fascicles sometimes dense.
EUPATORIUM spp. — *C. ageratoides*

DD. Conidia obclavato-cylindric, mostly 1-3 septate, pale olivaceous, 3-5.5 x 25-100$\mu$; nonfasciculate.
E. OERSTEDIANIUM — *C. costaricensis*
EUPATORIUM sp.

**Cercospora aciculina** sp. nov.

Maculae obscure fuscae, irregulares, inderdum flavida cinctae; caespituli hypophylli, atro-olivacei, effusi et saepe fere totam folii paginam omnino obtegentes; stromata minuta vel 50$\mu$ diam.; conidiophora laxe vel densiuscule fasciculata,

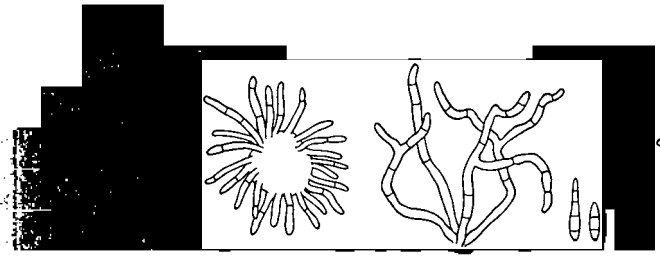


Fig. 12 *C. aciculina*



Fig. 13 *C. ageratoides*

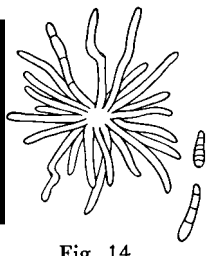


Fig. 14 *C. ambrosiae*

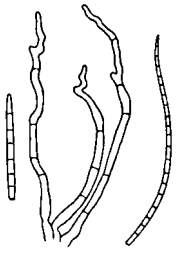


Fig. 15 *C. arcti-ambrosiae*

pallide olivaceo-brunnea, apicem versus leniter attenuata et saepe pallidiora, fere recta, simplicia, 3-4 x 10-45$\mu$; conidia hyalina, anguste obclavata, fere recta, spurie multiseptata, ad basim acuta vel subtruncata, ad apicem subacuta, 1.5-3 x 40-100$\mu$.

Leaf spots indefinite or irregular brown blotches, sometimes with yellowish margin; on corresponding lower surface an effuse, dark olivaceous or almost black fruiting layer, varying in size from mere points to large parts of the leaflet; stromata slight to 50$\mu$ in diameter; fascicles mostly dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, almost straight, not geniculate, not branched, minute spore scar at the conic tip, 3-4 x 10-35$\mu$; conidia hyaline, narrowly obclavate, base obconic to subtruncate, tip subacute, nearly straight, indistinctly multiseptate, 1.5-3 x 40-100$\mu$.

HOST: *Eupatorium repandum* Willd. (*Ageratum conyzoides*).

TYPE: Wailukii River, Hawaii; *Ageratum conyzoides;* F. L. Stevens, No. 750; July 8, 1921.

DISTRIBUTION: Known only from the type locality.

NOTE: The species, *Cercospora agerati* Stevens is based on collections 750 and 944. Stevens' description and No. 944 correspond, and are considered therefore as *C. agerati,* which is a synonym of *C. perfoliata.* But No. 750, which is distinct from the description of Stevens is listed as a new species. The hyaline, needle-like conidia, the effuse fruiting, and the dense fascicles separate this from the other species on Eupatorium. See key above.

**Cercospora adenostemmae** Togashi et Katsuki

Bot. Magazine, Tokyo **65**: 18. 1952

Leaf spots yellowish brown, vein-limited, 1-3 mm. in diameter, rarely confluent and covering the whole leaf surface; fruiting always hypophyllous, violaceous brown, more or less effuse; stromata slight or none; fascicles 4-10 stalks; conidiophores olivaceous brown, apex almost hyaline, not branched, 3-5 septate, straight to flexuous, near tip mildly geniculate, 4-5 x 30-95$\mu$; conidia subhyaline to faintly colored, obclavate to cylindric, 2-5 septate, straight to curved, 3.5-5 x 30-120$\mu$.

HOST: *Adenostemma viscosum* Forst.

TYPE: Yaku Island, Pref. Kagoshima, Japan; *Adenostemma viscosum;* S. Katsuki; Oct. 15, 1949.

DISTRIBUTION: Japan.

NOTE: Dr. Togashi sent me some of the type material.

**Cercospora aequatorialis** Winter

Hedwigia **25**: 103. 1886

Leaf spots none; fruiting effuse, hypophyllous, hoarfrost-like to dark brown, up to 7 mm. in extent; stromata probably not present or slight; fascicles dense, erect; conidiophores medium brown, remotely septate, branched, not geniculate, 4.5-6$\mu$ in width and of great length; conidia hyaline, cylindric to clavate, sparingly septate, 2 x 70$\mu$.

TYPE: Island of St. Thomas off western coast of Africa; Compositae.

DISTRIBUTION: Known only from the type locality.

NOTE: The type could not be found. The description presents a rather unusual form of Cercospora. The type of conidiophore should have colored conidia.

**Cercospora ageratoides** Ellis & Everhart

Jour. Mycol. **5**: 71. 1889

Leaf spots none or indefinite, at least at first; fruiting in effuse dark olivaceous

to almost ferruginous patches on the lower leaf surface, smaller patches angular, 1-3 mm. in diameter, larger ones cover the leaf surface; stromata none; nonfasciculate to dense fascicles; conidiophores plainly multiseptate, branched, dark fuligenous brown, sinuous, not or slightly geniculate, wide spreading in the fascicle, spore scars mostly none, 4-5.5 x 40-150$\mu$; conidia mostly cylindric and one septate, though some of the longest ones may be slightly attenuated and five septate, rounded to obconic base, obtuse tip, straight or nearly so, 3.5-5 x 20-75$\mu$, subhyaline to pale fuligenous brown especially in mass.

HOSTS: *Eupatorium ageratoides* Linn. (*E. urticaefolium* Reich.), *E. album* Linn., *E. japonicum* Thunb., *E. rotundifolium, E. teucrifolium* Willd. (*E. verbenifolium* Michx.).

TYPE: Newfield, New Jersey; *Eupatorium ageratoides;* J. B. Ellis; July 1885.

DISTRIBUTION: In the United States from Missouri eastward and at least as far north as New Jersey and West Virginia. Its exact range cannot be given because in reports and herbarium material *C. perfoliata* and *C. costaricensis* have often been mistaken for it. It has been reported also from China and Japan.

NOTE: This species is separated easily from all the others on Eupatorium by its long, dark colored conidiophores. See key, page 118.

## CERCOSPORAE ON AMBROSIA

A. Conidia hyaline, acicular, base truncate, 2-3.5 x 25-195$\mu$; fruiting amphigenous; conidiophores 4-6 x 25-220$\mu$.

A. TRIFIDA — *C. arcti-ambrosiae*

AA. Conidia colored, mostly cylindric, base not truncate; fruiting hypophyllous.

B. Conidia 6-10 x 20-95$\mu$; fascicles mostly dense; stromata present; conidiophores 4.5-6 x 15-80$\mu$; fruiting not effuse.

A. PERUVIANA — *C. ambrosiae*

BB. Conidia 3-5.5 x 15-65$\mu$; nonfasciculate; stromata absent; conidiophores 4-6 x 10-40$\mu$; fruiting effuse, ferrugineous.

AMBROSIA spp. — *C. trifidae*

### **Cercospora ambrosiae** Chupp

Jour. Dept. Agr. P. Rico **14**: 282. 1930

Leaf spots irregular or elongate, 0.5-5 mm., mostly dingy gray and for this reason differentiated from the dark brown spots caused by a Septoria usually found on the same leaves; fruiting hypophyllous; stromata none to 50$\mu$ in diameter, pale yellowish olivaceous or olivaceous brown; fascicles mostly dense; conidiophores pale yellowish olivaceous or olivaceous brown, 0-3 septate, rarely geniculate or branched, straight to slightly tortuous, 4.5-6 x 15-60$\mu$ (rarely 80$\mu$); conidia concolorous, obclavato-cylindric, straight or mildly curved, base rounded to obconic, tip bluntly rounded, 1-5 septate, often strongly constricted at the septa, 6-10 x 20-95$\mu$.

HOST: *Ambrosia peruviana* Willd.

TYPE: Ferrocarril de Girardot, Dept. Cundinamarca, Colombia; *Ambrosia peruviana;* C. E. Chardon & J. A. B. Nolla, No. 580; June 21, 1929.

DISTRIBUTION: Puerto Rico, Dominican Republic, Colombia, and Venezuela.

NOTE: See key above for differences among the species on Ambrosia.

**Cercospora anomala** Ellis & Halsted

Jour. Mycol. 4: 8. 1888

Leaf spots mostly indefinite, sometimes irregular yellowish to brownish areas on the upper leaf surface; effuse ferrugineous fruiting layer on the corresponding lower surface, 2-10 mm. in extent, or sometimes larger, fruiting sometimes on leaf hairs; stromata and fascicles absent; conidiophores short branches borne singly or in fairly close groups from procumbent mycelium, branches subhyaline to very pale yellowish olivaceous or yellowish brown, rarely septate, sometimes showing spore scars at tip or near tip, 3.5-5 x 10-60$\mu$; conidia concolorous, cylindric, obconic base, tip bluntly rounded or when conidium has been catenulate also with obconic tip, almost always one septate, but very rarely two or even three septate, straight or rarely slightly curved or bent, sometimes constricted at septa, 3-5.5 x 10-45$\mu$.

HOST: *Actinomeris squarrosa* (*A. alternifolia* [L.] DC).

TYPE: Ames, Iowa; *Actinomeris squarrosa;* A. S. Hitchcock; Aug. 1887.

DISTRIBUTION: Known only from the type locality.

NOTE: Because of the 0-3 septate conidia and nonfasciculate conidiophores, this is a Cladosporium rather than a Cercospora.

**Cercospora arcti-ambrosiae** Halsted

Description on packet, Sey. + Earle, Economic Fungi 296 and 297a

*Cercospora arctii* Stevens, Bernice P. Bishop Mus. Bul. 19: 154. 1925

*Cercosporina lappae* Watanabe & Tak., Usunomiya Agr. Coll. Bul. 1: 33. 1934

Leaf spots subcircular to irregular, 1-10 mm. in diameter, brown to dark brown, becoming gray to white centered, sometimes coalescing especially along the leaf border or dehiscing and leaving the foliage with a ragged appearance; fruiting amphigenous; stromata none or small; fascicles mostly not dense; conidiophores pale to medium dark olivaceous brown, multiseptate, slightly geniculate or crooked, short branches which may be knob-like, large spore scar at the subtruncate tip, 4-6 x 25-220$\mu$; conidia hyaline, narrowly acicular, truncate base, tip obtuse to acute, shorter ones may be almost cylindric, straight to variously curved, 1.5-3.5 x 25-195$\mu$.

HOSTS: *Arctium lappa* Linn., *A. minus, Ambrosia trifida* Linn.

TYPES: New Brunswick, New Jersey; *Arctium lappa,* No. 296, *Ambrosia trifida,* No. 297; B. D. Halsted; (*C. arctii*) Kukukaele, Hawaii; cultivated *Arctium lappa;* F. L. Stevens, No. 1096; Aug. 2, 1921.

DISTRIBUTION: Reported from New Jersey, Oklahoma, Wisconsin, Hawaii, and Japan.

NOTE: Type material of *Cercosporina lappae* is not available, but the published description corresponds very closely to the type of *C. arcti-ambrosiae* and *C. arctii.* Solheim and Stevens published a description of *C. arcti-ambrosiae* (Mycologia 23: 393. 1931). See key, page 120 for differences among the species on Ambrosia.

CERCOSPORAE ON ASTER

A. Conidia subhyaline to pale olivaceous.

B. Leaf spots indistinct; fruiting effuse, hypophyllous; stromata lacking; nonfasciculate; conidiophores 2.5-4 x 10-60$\mu$; conidia narrowly obclavate, 2-4 x 45-150$\mu$.

A. UMBELLATUS *C. quarta*

BB. Leaf spots distinct; fruiting not effuse, amphigenous; stromata small; fascicles dense; conidiophores 2-4 x 10-30$\mu$; conidia cylindric, 2-4 x 15-40$\mu$.
A. PTARMICOIDES — *C. tertia*

AA. Conidia hyaline, mostly cylindric; leaf spots distinct; fruiting amphigenous.
B. Conidia 3.5-6 x 20-65$\mu$; conidiophores 3-5 x 10-65$\mu$.
A. VIMINEUS — *C. viminei*
BB. Conidia 2-3.5 x 30-65$\mu$; conidiophores 4-5 x 50-120$\mu$.
ASTER sp., A. LUCIDULUS — *C. asterata*

**Cercospora asterata** Atkinson

Jour. Elisha Mitchell Scien. Soc. 8: 50. 1892

Leaf spots mostly along margin, dingy gray bordered by black, and exterior to this is a zone of effused reddish purple, 3-6 mm. in diameter; fruiting amphigenous; conidiophores fasciculate, dull reddish brown, tip pale, septate, geniculate to subflexuous or torulose, minutely guttulate, 4-5 x 50-120$\mu$; conidia hyaline, cylindric, tapering gradually toward each end, septate, 2-3.5 x 30-65$\mu$.

HOSTS: Aster sp., *A. lucidulus* (Gray) Wiegand (*A. puniceus* var. *lucidulus* Gray).
TYPE: Auburn, Ala.; Aster sp.; G. F. Atkinson, No. 2365; Nov. 25, 1891.
DISTRIBUTION: Alabama, Wisconsin.
NOTE: The type packet is labeled *Cercospora asheata.* There was not enough material to make a microscopic mount for examining the fungus. This species resembles closely another named species on Aster, *C. viminei,* excepting that the conidia of the latter are 4-6 x 30-65$\mu$ or even longer. At present, it is considered that the two species are distinct. *C. tertia* on *A. ptarmicoides* and *C. quarta* on *A. umbellatus* have colored conidia. See key above.

**Cercospora baccharidis** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **46**: 379. 1894

TYPE: Berkeley, Cal.; *Baccharis douglasii* DC.
NOTE: Ellis describes this fungus as having hyaline conidiophores. An examination of the type proves his statement. Therefore, this is a Cercosporella (or possibly a Ramularia). Rarely the fruiting has sufficient color so that it could then be considered a Cercospora.

## CERCOSPORAE ON BIDENS

A. Conidia colored; fruiting hypophyllous.
B. Fruiting effuse, olivaceous; stromata lacking; nonfasciculate to 2-15 divergent stalks; conidia obclavate, 3-5 x 20-80$\mu$; conidiophores 3-5 x 40-200$\mu$.
BIDENS spp. — *C. umbrata*
BB. Fruiting numerous minute black pustules; stromata 15-50$\mu$; fascicles 2-12 spreading stalks; conidia cylindric (only longest ones obclavate), 3-6 x 25-120$\mu$; conidiophores 3-5 x 20-100$\mu$.
B. BIPINNATA, B. PILOSA — *C. megalopotamica*

AA. Conidia hyaline or subhyaline; fasciculate.
B. Conidia acicular, hyaline, truncate base, 2.5-5 x 45-150$\mu$; conidiophores 3.5-6 x 50-120$\mu$; fascicles 3-20 stalks; fruiting chiefly epiphyllous, not ferrugineous.
BIDENS spp., COREOPSIS — *C. bidentis*

BB. Conidia mostly cylindric, hyaline to subhyaline, base rounded, 2-4 x 20-90$\mu$; conidiophores 3-5 x 10-60$\mu$; fascicles 2-12 stalks; fruiting hypophyllous, effuse, ferrugineous.
B. CYNAPIFOLIA *C. bidenticola*

**Cercospora bidenticola** sp. nov.

Maculae typicae nullae, sed decolorationes epiphyllas, indeterminatas, irregulariter ochraceas; caespituli hypophylli, ferruginei, effusi et saepe fere totam folii paginam omnino obtegentes; stromata deficiens; conidiophora non vel vix fas-

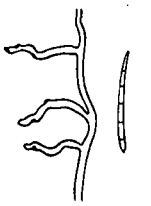


Fig. 16
*C. bidenticola*

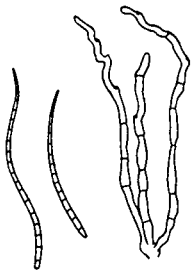


Fig. 17
*C. bidentis*

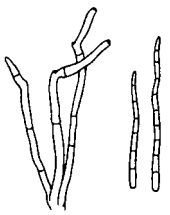


Fig. 18
*C. calendulae*

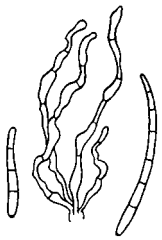


Fig. 19
*C. carlinae*

ciculata, pallide olivaceo-brunnea, interdum septata, ramosa, subito curvata, 3-5 x 10-60$\mu$; conidia hyalina vel subhyalina, cylindro-obclavata, recta vel leniter curvata, spurie multiseptata, ad basim subtruncata, ad apicem obtuse rotundata, 2-4 x 20-90$\mu$.

Leaf spots none or indistinct irregular brownish areas on the upper surface; fruiting on the corresponding lower surface in effuse ferrugineous to almost maroon layers, 1-4 mm. in extent or coalescing over a large part of the leaf area; stromata lacking; nonfasciculate to fascicles of 2-12 stalks; conidiophores pale olivaceous brown, fairly uniform in color and width, sparingly septate, branched, variously curved to tortuous, sometimes once geniculate, 1 to 4 small spore scars at or near the irregular tip, 3-5 x 10-60$\mu$; conidia hyaline to subhyaline, cylindric to cylindro-obclavate, straight to mildly curved, indistinctly septate, base rounded to subtruncate, tip bluntly rounded, occasionally catenulate, 2-4 x 20-90$\mu$.

TYPE: Ravine at Janico, Prov. Santiago, Dominican Republic; *Bidens cynapifolia* HBK.; C. E. Chardon, No. 940; Aug. 4, 1937.

DISTRIBUTION: Known only from the type locality.

NOTE: The only other hyaline-spored species on Bidens is *C. Bidentis*, which has long conidiophores, fruiting not effuse, and conidia plainly acicular. See key above.

**Cercospora bidentis** Tharp
Mycologia **9**: 108. 1917

*Cercospora bidentis* Marchal & Steyaert, Bul. Soc. Roy. Bot. Belgique **61**: 167. 1929

Leaf spots brown, difficult to distinguish on dried herbarium material, circular to irregular, sometimes with a dark margin, 3-8 mm. in diameter; fruiting epiphyllous or rarely hypophyllous; stromata slight or none; fascicles 3-20 stalks; conidiophores pale to medium olivaceous brown, paler and more narrow toward

the tip, septa mostly near base, about 25$\mu$ apart, straight to mildly or abruptly geniculate, rarely branched, large spore scar at the subtruncate tip, 3.5-6 x 50-120$\mu$; conidia acicular, hyaline, slightly to much curved, base truncate, tip subobtuse, indistinctly multiseptate, 2.5-5 x 45-150$\mu$.

HOSTS: *Bidens cernua* L., *Coreopsis coronata* Hook (*B. coronata* (L.) Fish.), *B. pilosa* L. (*B. leucantha* (L.) Willd.), *B. nashii* Small, *Coreopsis Drummondii* Torr. & Gray, *B. bipinnata* L.

TYPES: Palestine, Texas; *Bidens nashii;* Lewis & Tharp, No. 185; Oct. 30, 1914; (*C. bidentis* M. & St.) Loetja, Prov. Congo Kasai, Congo Belge; *Bidens pilosa;* J. Ghesquiere, No. 412; April, 1925.

DISTRIBUTION: Apparently widespread in the subtropics and tropics where the hosts are available. It extends as far north as Wisconsin. A specimen was sent from Japan by Dr. Togashi.

NOTE: There are very closely related species occurring also on Zinnia, Parthenium, Dahlia, Xanthium, Erechtites, Arctium, and Chrysanthemum, which differ from the one on Bidens only by minor characters. It may be necessary finally to make cross inoculations to prove definitely whether they are distinct. The one on Bidens seems to differ mostly from the other species in having slightly wider, more curved conidia with blunter tips, and the fact that most of the fruiting is chiefly on the upper leaf surface. There are other slight differences in width of conidiophores, mildness of geniculation, and placement of septa which indicate that the one on Bidens is a distinct species. The Belgian Congo collection has slightly narrower conidiophores and more nearly cylindric conidia, but it might have been immature or grown in drier weather than was the Tharp collection. See key, page 122.

**Cercospora bidentis-pilosae** Sawada

Formosa Agr. Res. Inst. Rept. **85**: 98. 1943

Leaf spots 1-2.5 mm. in diameter; conidiophores brown, 3-4 septate, 4.5-5 x 44-104$\mu$; conidia cylindric to obovate, 10-12 septate, 2-4.5 x 41-115$\mu$.

HOST: *Bidens pilosa* L.

TYPE: Unknown.

DISTRIBUTION: Formosa (Taiwan).

NOTE: Description not detailed enough to make sure how it differs from others on Bidens. See key, page 122.

**Cercospora blumeae** deThuemen

Revue Mycol. **2**: 38. 1880

*Cercospora blumeae-lacerae* Sawada, Taiwan (Formosa) Agr. Rev. **38**: 694. 1942. Also Taiwan Agr. Res. Inst. Rept. **85**: 99. 1943

Leaf spots none or indistinct yellowish areas on the upper surface; fruiting in effuse, olivaceous to almost black, irregular patches on the corresponding lower surface, sometimes covering much of the leaf area; stromata lacking; nonfasciculate to fairly dense divergent fascicles; conidiophores medium brown, uniform in color, irregular in width, rarely branched or geniculate, straight to variously curved, closely and plainly septate, 4-5.5 x 40-200$\mu$; conidia subhyaline to pale olivaceous brown, obclavate or shortest ones cylindric, straight to mildly curved, 3-7 septate, base obconically truncate, tip subobtuse, 4-6 x 30-75$\mu$.

HOSTS: *Blumea lacera* DC., *B. membranacea* DC. (*B. viscosula* DC.), (*Conyza viscosula* Wall.).
TYPES: Ceylon; *Blumea viscosula;* Thwaites. (Fung. Exot. No. 20); (*C. blumeae-lacerae*) Taitung, Taiwan (Formosa); *Blumea lacera;* K. Sawada; May 2, 1909.
DISTRIBUTION: Ceylon, Formosa.
NOTE: I have been unable to find the type of this species. The Sawada co-type is deposited in the U.S.D.A. Mycological Herbarium. See also the following species.

**Cercospora blumeae-balsamiferae** Sawada
Taiwan (Formosa) Agr. Res. Inst. Rept. **86**: 166. 1943

Leaf spots subcircular to angular, 2-10 mm. in diameter, reddish to yellowish brown, without any distinct border; fruiting chiefly epiphyllous; stromata 15-35 mm. in diameter, dark brown to almost black; fascicles usually dense, fairly compact; conidiophores pale to medium brown, uniform in color and width, 1-3 septate, not branched, straight to curved, sparingly geniculate, rounded tip, 4-5.5 x 15-75$\mu$ (Sawada says 117$\mu$); conidia pale olivaceous brown, mostly obclavate but many distinctly cylindric, straight to mildly curved, 3-11 septate, base subtruncate to long obconically truncate, tip subacute to obtuse, 4-5.5 x 35-125$\mu$.
HOST: *Blumea balsamifera* DC.
TYPE: Kaphsiung, Taiwan (Formosa); *Blumea balsamifera;* K. Sawada; Nov. 7, 1909.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. blumeae.* A portion of the Sawada collection is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora bomplandiana** Spegazzini
Anal. Mus. Nac. Buenos Aires **20**: 439. 1910

Leaf spots circular, 2-5 mm. in diameter, gray to grayish brown, sometimes with a narrow raised line border; fruiting amphigenous; stromata, when present, filling stomatal openings, dark brown; nonfasciculate from procumbent threads or 2-10 fasciculate from stromata, pale to medium brown, uniform in color and width, not geniculate, 0-3 septate, bluntly rounded tip, 5-7 x 20-50$\mu$; conidia medium to dark brown, cylindric, straight to curved or undulate, 3-7 septate, base obconic, tip obtuse, 5-6.5 x 60-210$\mu$.
HOST: *Baccharis genistelloides* Pers.
TYPE: Bompland, Missiones, Argentine; *Baccharis genistelloides;* P. Joergensen, No. 941; Sept. 1909.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. palustrium* for differences between the two species on this host genus.

**Cercospora calendulae** Saccardo
Michelia **1**: 267. 1879

Leaf spots circular to subcircular, 1-4 mm. in diameter, center pale tan, sometimes darkened on both surfaces by the fruiting fungus, margin almost black; stromata a few brown cells to 30$\mu$ in diameter, dark brown; conidiophores borne singly or in fascicles of 2-20, pale olivaceous brown, longest ones almost hyaline

near tip, shorter ones attenuated, multiseptate, not branched, straight or rarely once geniculate, medium to large spore scar at subtruncate tip, 4-6 x 40-125$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute to subacute, 2.5-5 x 40-200$\mu$.

HOSTS: *Calendula officinalis* Linn., Calendula sp.

TYPE: Conegliano, Italy; *Calendula officinalis;* C. Spegazzini; Oct., 1876; cotype distributed as Mycotheca Veneta No. 1054.

DISTRIBUTION: Harrar (Phytopath. 27: 130. 1937) lists it as present in Virginia. Also reported from Germany, Italy, Great Britain, Bermuda, and Minas Geraes.

**Cercospora cana** Saccardo

Nuov. Giorn. Bot. Ital. 8: 188. 1876

HOSTS: *Erigeron canadensis* Linn., *E. Bonariensis* L., *E. annuus* (L.) Pers.

TYPE: Italy; *Erigeron canadensis;* Aug. 1875; cotype distributed as Mycotheca Veneta No. 593.

NOTE: This has hyaline conidiophores and therefore is considered a Cercosporella. Saccardo placed it with Cercospora because it had obclavate conidia. The term *C. canadensis* Frank also has crept into the literature, but Frank (Bot. Zeit. 36: 625. 1878) was describing only *C. cana.* See also *C. griseëlla.* In the New York Botanical Garden Harbarium is a specimen collected by W. H. Kellerman in Ohio June, 1883 on *Erigeron canadensis* and labeled *Cercospora poliosa* E. & M. In the Riksmuseum Herbarium, Stockholm, Sweden is a similar collection to that Kellerman made at Manhattan, Kansas and labeled *Cercospora foliosa* E. & K. Neither was published. Both are the same as *C. cana.*

**Cercospora cardopatii** Bremer & Petrak

Sydowia 1: 260. 1947

Leaf spots circular to angular, scattered, 2-5 mm. in diameter, dull reddish brown, occasionally bordered by a raised black line; fruiting epiphyllous; stromata present; fasciculate; conidiophores olivaceous, paler and more narrow toward the tip, straight to slightly curved, 4-6 x 10-40$\mu$; conidia narrowly obclavate, subhyaline to pale olivaceous brown, 1-5 septate, base subtruncate, straight to mildly curved, 3.5-5 x 15-55$\mu$.

HOST: *Cardopatium corymbosum* Pers.

TYPE: Adana, Turkey; *Cardopatium corymbosum;* G. Karel; June 8, 1943.

DISTRIBUTION: Turkey.

NOTE: I have not seen this species.

**Cercospora carlinae** Saccardo

Michelia 1: 269. 1879

Leaf spots indistinct; fruiting effuse, olivaceous, hypophyllous or rarely amphigenous; stromata none or slight; fascicles dense; conidiophores medium dark brown, uniform in color, irregular in width, plainly multiseptate, not geniculate, not branched, undulate to tortuous, small spore scar at the bluntly rounded tip, 4-7 x 50-145$\mu$; conidia pale to very pale olivaceous brown, cylindro-obclavate, 4-12 septate, straight to curved, base obconically truncate, tip obtuse, 4-6.5 x 40-140$\mu$.

HOST: *Carlina vulgaris* L.

TYPE: Nervesa, northern Italy; *Carlina vulgaris;* P. Saccardo.
DISTRIBUTION: Italy, Germany, Denmark (Jutland).
NOTE: I did not see the type of this species, but studied Krieger's Fungi Saxonici, No. 1989, which resembles closely the drawings of Saccardo (Fungi Italici No. 647).

**Cercospora carthami** (H. & P. Sydow) Sundararaman & Ramakrishnan, n. comb.

*Cercosporina carthami* H. & P. Sydow, Ann. Mycol. **11**: 406. 1913
*Cercospora carthami* Sund. & Ramak., Agr. Jour. India **23**: 383. 1928
*Cercospora carthami* Mendoza, Philipp. Jour. Sci. **75**: 168. 1941

Leaf spots circular to subcircular, 3-10 mm. in diameter, grayish brown or center almost gray, sometimes zonate; fruiting amphigenous; stromata dark brown, a few cells to 40$\mu$ in diameter; fascicles 2-20 stalks; conidiophores me-

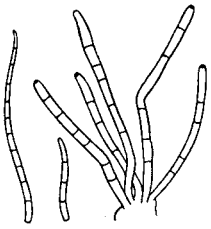


Fig. 20
*C. carthami*

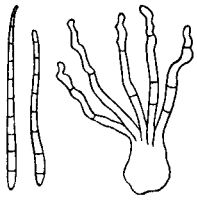


Fig. 21
*C. centaureae*

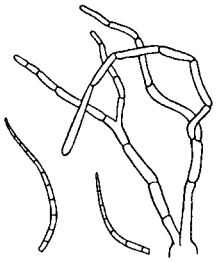


Fig. 22
*C. chrysanthemi*

dium brown, paler and more narrow toward the tip, multiseptate, not or rarely branched, straight or occasionally slightly geniculate, a large spore scar at the subtruncate tip, 4-6.5 x 40-320$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2.5-5 x 50-300$\mu$.

HOST: *Carthamus tinctorius* Linn.
TYPES: (*Cercosporina carthami*) Los Banos, Prov. Laguna, Philippines; *Carthamus tinctorius;* C. F. Baker, No. 1248; June 12, 1913. (Cotype, Baker, Fungi Malayana No. 125); (*C. carthami* S. & R.) Coimbatore, India; *Carthamus tinctorius;* (*C. carthami* Mendoza) Luzon, Rizal Prov., Mariquina, Philippines; *Carthamus tinctorius;* Mendoza, Nos. 55295, 55465.
DISTRIBUTION: Philippines, India, Caucasus, North Caucasus.
NOTE: I did not see the Mendoza type but his description fits the species fairly closely. The fungus occurs also on bracts and stems. The authors in India inoculated a large number of other Cercospora hosts but all of them gave negative results.

**Cercospora centaureae** Diedicke

Ann. Mycol. **2**: 514. 1904

Leaf spots streaks between side veins, brown or with brown margin and gray center; fruiting mostly hypophyllous; stromata slight, dark brown; fascicles mostly 2-12 stalks; conidiophores pale to medium brown, paler and more narrow toward the tip or irregular in width, multiseptate, not branched, straight to tortuous or geniculate, medium spore scar at the subtruncate tip, 4-6 x 15-120$\mu$; conidia hya-

line, cylindric to distinctly acicular, straight to curved, indistinctly multiseptate, base obconically truncate to truncate, tip subobtuse, 3-4 x 20-60$\mu$.

HOSTS: *Centaurea phrygia* Linn., Centaurea sp.

TYPE: Erfurt, Thuringia, Germany; *Centaurea phrygia;* Diedicke; summer.

DISTRIBUTION: Germany, Bermuda, Venezuela.

NOTE: The Venezuela specimen had longer conidia which were slightly more nearly acicular than were those of Bermuda. I have not studied the type, but the more recent collections in general agree with Diedicke's description.

**Cercospora chrysanthemi** Heald & Wolf

Mycologia **3**: 15. 1911

*Cercospora chrysanthemi* Puttemans, Bul. Soc. Roy. Bot. Belg. **48**: 244. 1911. (Published April 25, 1912)

*Cercospora chrysanthemi-coronarii* Sawada, Cat. Formosan Fungi **2**: 147. 1922

Leaf spots circular to irregular in shape, dingy gray center, bordered by brown raised line, 3-6 mm. in diameter; fruiting amphigenous; stromata slight; fascicles sometimes dense; conidiophores pale olivaceous brown, 0-2 mildly geniculate or sometimes once abruptly near the middle, uniform in color, at times slightly attenuated, rarely with slight enlargement at some point, large spore scar on subtruncate tip, straight or nearly so, 3.5-5 x 20-80$\mu$ (rarely up to 200$\mu$); conidia acicular, hyaline, truncate base, acute tip, straight to slightly curved, indistinctly multiseptate, 2-4 x 40-125$\mu$ (rarely 200$\mu$).

HOSTS: Chrysanthemum sp., *C. balsamita* L., *C. coronarium* L., *C. indicum, C. maximum* Ram. (Shasta Daisy), *C. segetum.*

TYPES: San Antonio, Texas; Chrysanthemum sp.; Heald and Wolf, No. 1659; July 29, 1909; (*C. chrysanthemi* Putt.) Rio de Janeiro, Brazil; *Chrysanthemum indicum;* A. Puttemans; (*C. chrysanthemi-coronarii*) Formosa; *Chrysanthemum coronarium;* Kaneyoshi Sawada; April 4, 1918.

DISTRIBUTION: In the United States as far north as Wisconsin; Bermuda, northern South America, Japan, Formosa, Philippines, China, and probably other countries where Chrysanthemum is grown intensively.

NOTE: Puttemans' collection has not been studied but the drawings are so nearly identical with this species that it is considered as a synonym. This species is so nearly identical to a number of other species described on Compositae that it is not certain—without making cross inoculations—whether they are distinct or all the same species. Heald and Wolf published in January 1911, and Puttemans in April of the same year. A Sawada collection is in the U.S. Dept. Agr. Mycological herbarium.

**Cercospora cichorii** Davis

Wisc. Acad. Trans. **19**: 715. 1919

*Cercospora cichorii-intybi* Woronichin, Trav. Mus. Bot. Acad. Sci. U. S. S. R **21**: 233. 1927

Leaf spots circular, or sometimes bounded by the veins and becoming irregular, brown, sometimes with pale to gray center, frequently with concentric rings, 1-12 mm. in diameter, mostly 2-6 mm.; fruiting mostly epiphyllous; stromata slight to none; fascicles 3-15; conidiophores pale olivaceous brown, longest ones septate and sometimes 1-3 mildly geniculate, not branched, prominent spore scar at the subtruncate tip, 4-6 x 10-50$\mu$ (rarely 200$\mu$ long); conidia acicular, hyaline,

shortest ones may be cylindric, truncate base, subobtuse to subacute tip, straight to slightly curved, septa indistinct, 3-5 x 50-175$\mu$ (usually 3-4$\mu$ wide).

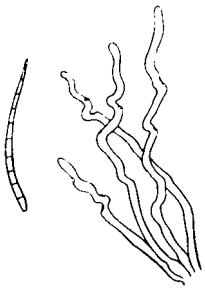


Fig. 23
*C. cichorii*

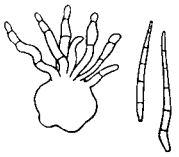


Fig. 24
*C. cirsii*

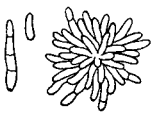


Fig. 25
*C. clavicarpa*

Fig. 26
*C. coleosanthi*

HOST: *Cichorium intybus* Linn.

TYPES: Madison, Wisc.; *Cichorium intybus;* J. J. Davis; Sept. 17, 1912; (*C. cichorii-intybi*) Nikolajevskoje, distr. Pjatigorsk, Guv. Tersk, Caucasus; *Cichorium intybus;* N. N. Woronichin; July 26, 1925.

DISTRIBUTION: Reported from the widely scattered areas of Wisconsin, New York, Bermuda, Argentine, and Russia.

NOTE: This species is very similar to almost 20 species recorded on Compositae. It differs from most of these in not having dense fascicles, and the conidiophores being mostly shorter than 50$\mu$. Khokhyakoff (Morbi Plantarum, Leningrad 19: 88. 1930) states that the Woronichin species is a synonym of the one named by Davis.

## CERCOSPORAE ON CNICUS

A. Conidiophores nonfasciculate, 200-500$\mu$ in length; conidia subhyaline to pale olivaceous brown. *C. kansensis*

AA. Conidiophores fasciculate, rarely longer than 50$\mu$: conidia hyaline to subhyaline.

B. Conidia 3-4.5 x 20-90$\mu$, cylindro-obclavate or rarely acicular. *C. cirsii*

BB. Conidia 4-6 x 30-80$\mu$, obclavato-cylindric. *C. obesa*

### **Cercospora cirsii** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **46**: 379. 1894

Leaf spots circular to subcircular, 3-5 mm. in diameter, dingy gray center bordered by a narrow pale brown line; fruiting amphigenous but mostly on the upper surface; stromata slight to 50$\mu$ in diameter; fascicles sometimes dense; conidiophores pale to medium brown, not geniculate, not branched, septa indistinct or absent, straight or nearly so, attenuated toward the tip or conic tip with medium sized spore scar, 4-6 x 10-25$\mu$ (rarely as long as 55$\mu$); conidia hyaline to subhyaline, cylindro-obclavate, rarely acicular, straight or slightly curved, base mostly subtruncate, tip obtuse, septa indistinct, 3-4.5 x 20-90$\mu$.

HOST: *Cnicus* (Cirsium) *remotifolius* Gray.

TYPE: Skamania Co., Wash.; *Cnicus remotifolius;* W. N. Suksdorf, No. 291; Aug. 25, 1886.

DISTRIBUTION: Known only from the type locality.

NOTE: This species is distinct from the others on Cnicus in having distinct fascicles, and narrow, obclavate conidia. See key above.

**Cercospora clavicarpa** Ellis & Everhart

Erythea 2: 26. 1894

Leaf spots large, dull brown blotches without distinct border, 10-20 mm. in extent; fruiting amphigenous; stromata filling stomatal opening; fascicles dense; conidiophores pale olivaceous brown, 0-1 mildly geniculate, rarely septate, uniform in color, usually much attenuated toward the tip or with swollen base, not branched, small spore scar at rounded tip, young attached conidia may seem a part of the conidiophore with a constriction at the septum, base 5-9$\mu$ wide, tip rarely wider than 5$\mu$, length 8-30$\mu$; conidia pale olivaceous, cylindro-obclavate, although immature ones usually are distinctly cylindric, nearly straight, base obconic to rounded, tip bluntly rounded, 1-5 septa, 4-8 x 20-100$\mu$.

HOST: *Stephanomeria virgata* Benth. (*Ptiloria virgata* Greene).

TYPE: Pasadena, Cal.; *Stephanomeria virgata;* A. J. McClatchie, No. 388; Sept. 8, 1893.

DISTRIBUTION: Known only from the type locality.

NOTE: Ellis and Everhart in their description spelled the species name, clavicapa, but corrected it on the type. Saccardo spells it clavicarpa and suggests that the host might be *Ptilosia virgata.* Fortunately the type gives the host name of Stephanomeria.

**Cercospora coleosanthi** Ellis & Everhart

Bul. Torrey Bot. Club 24: 474. 1897

Leaf spots subcircular, 2-4 mm. in diameter, uniformly brown or with grayish center and brown margin, sometimes cupped downward; fruiting chiefly epiphyllous; stromata globular, pale to dark brown, 20-60$\mu$ in diameter; fascicles dense; conidiophores sometimes only elongated cell on stromatal surface, pale brown, not septate, not geniculate, not branched, no spore scars visible, 3-4 x 5-25$\mu$; conidia acicular (shorter ones may be cylindric), hyaline, truncate base, subobtuse tip, nearly straight, septa not visible, 1.5-3 x 30-80$\mu$.

HOSTS: *Brickellia californica* (T. & G.) A. Gray (*Coleosanthus californicus* (T. & G.) Kuntze), *B. umbellata* (Greene) Rydb. (*Coleosanthus umbellatus* Greene).

TYPE: Jackson, Amador Co., Calif.; *Coleosanthus californicus;* Geo. Hansen, No. 1396; Oct. 1895.

DISTRIBUTION: California, Colorado.

CERCOSPORAE ON VERNONIA

A. Conidia hyaline to subhyaline, 2-4 x 25-100$\mu$, narrowly obclavate; conidiophores 3-6 x 5-40$\mu$. *C. vernoniae*

AA. Conidia subhyaline to dark colored, not narrowly obclavate.

B. Conidiophores mostly nonfasciculate; fruiting effuse; conidia more nearly obclavate.

C. Conidiophores long, 4-6 x 40-200$\mu$; conidia wide, 4-7 x 30-60$\mu$; fruiting dark olivaceous. *C. consimilis*

CC. Conidiophores short, 4-6 x 10-25$\mu$; conidia 3-5 x 30-100$\mu$; fruiting ferrugineous. *C. sublateritia*

BB. Conidiophores mostly fasciculate; conidia more nearly cylindric.
C. Conidiophores mostly long, 4-5 x 50-150$\mu$, medium dark brown; conidia 4-5.5 x 20-90$\mu$. *C. noveboracensis*
CC. Conidiophores mostly short, 3-5 x 10-65$\mu$, pale brown; conidia 3-4.5 x 30-75$\mu$. *C. oculata*

**Cercospora consimilis** Sydow

Ann. Mycol. 23: 423. 1925

Leaf spots at first indefinite or none, later large irregular areas on the upper leaf surface turn yellowish, then brown; fruiting dark olivaceous, effuse on corresponding lower surface, fruiting rarely amphigenous; stromata none; nonfasciculate to 10 in fascicle; conidiophores medium dark olivaceous brown (oldest ones

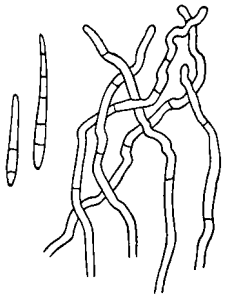


Fig. 27
*C. consimilis*

Fig. 28
*C. coreopsidis*

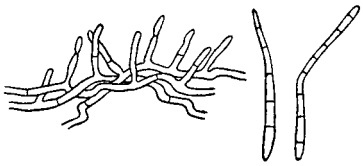


Fig. 29
*C. costaricensis*

may be quite dark), plainly multiseptate, not branched, uniform in color and diameter, upper third sinuous or mildly geniculate, rarely once abruptly geniculate, tip bluntly rounded, with small spore scar, 4-6 x 40-200$\mu$; conidia cylindro-obclavate, olivaceous, slightly curved, both ends rounded bluntly, 1-7 septate (mostly 2-3), 4-7 x 30-60$\mu$.

HOSTS: *Vernonia stellaris* LaL., *V. mollis* HBK., Vernonia sp.
TYPE: San José, Costa Rica; Vernonia sp. (*V. mollis* ?); H. Sydow, No. 31; Jan. 3, 1925.
DISTRIBUTION: Costa Rica, Minas Geraes, and India.
NOTE: This should probably be considered as an Helminthosporium, all the older spores having thick walls. See key above for differences among the species on this host genus.

**Cercospora conyzae** Sawada

Taiwan (Formosa) Agr. Res. Inst. Rept. 86: 168. 1943

HOST: *Conyza japonica* Less.
TYPE: Taichung, Taiwan (Formosa); *Conyza japonica;* K. Sawada; May 9, 1919.
Note: A part of the Sawada type has been deposited in the U.S.D.A. Mycological Herbarium. An examination of this type showed only a Septoria with the narrow hyaline conidia Sawada described for his species of Cercospora.

**Cercospora coreopsidis** Ray

Mycologia **33**: 174. 1941

Leaf spots circular, 2-5 mm. in diameter, center gray to tan, pale brown raised margin; fruiting mostly epiphyllous; stromata a few cells to 40$\mu$ in diameter, dark fuligenous; most fascicles dense, rarely very dense; conidiophores in mass dark, singly pale fuligenous, somewhat paler and more narrow toward the tip, 1-3 septate, not branched, straight to variously curved or tortuous, rarely once geniculate, medium sized spore scar at the subtruncate tip, 4-6 x 15-75$\mu$; conidia hyaline, obclavate to cylindric or even acicular, straight to slightly curved, indistinctly multiseptate, subtruncate to truncate base, subacute tip, 2-4 x 15-100$\mu$.

HOST: *Coreopsis grandiflora* Nutt.

TYPE: Stillwater, Oklahoma; *Coreopsis grandiflora;* W. W. Ray; July 5, 1940.

DISTRIBUTION: Known only from the type locality.

NOTE: Dr. Geo. Weber sent me a Cercospora on Coreopsis from Florida. It is distinct from the Ray species, and at present is considered identical with *C. bidentis.*

**Cercospora costaricensis** Sydow

Ann. Mycol. **23**: 423. 1925

Leaf spots none at first, later there may be an indefinite brown on the upper leaf surface; fruiting in dark olivaceous corresponding patches on lower leaf surface, 2-20 mm. in extent; stromata none; nonfasciculate to pseudofasciculate; conidiophores branches from procumbent threads, plainly multiseptate, pale to medium dark olivaceous brown or fuligenous, 0-2 mildly or abruptly geniculate, often sinuous, several small spore scars may be near or at the rounded tip, 3.5-5 x 10-60$\mu$, rarely as long as 100$\mu$; conidia pale olivaceous, obclavato-cylindric, straight to slightly curved, base long obconic to subtruncate, tip obtuse, 1-7 but mostly 1-3 septate, 3.5-5.5 x 25-100$\mu$.

HOSTS: *Eupatorium oerstedianium* Benth., Eupatorium sp.

TYPE: Grecia, Costa Rica; *Eupatorium oerstedianium;* H. Sydow, No. 305; Jan. 19, 1925.

DISTRIBUTION: Costa Rica and China.

NOTE: It differs from *C. aciculina* and *C. perfoliata* in having darker conidiophores and from *C. eupatorii* in not causing definite leaf spots. *C. costaricensis* might sometimes be confused with *C. ageratoides,* but the latter has more definite fascicles, longer, wider, darker conidiophores, and somewhat shorter conidia, See key, page 118.

**Cercospora crassa** var. **eupatorii** Saccardo

Michelia **2**: 557. 1882; Syll. Fungorum **4**: 449. 1886

HOST: *Eupatorium cannabinum* Linn.

TYPE: Zurich, Switzerland; *Eupatorium cannabinum;* Winter.

NOTE: *Cercospora crassa* is an Alternaria. I have been unable to procure a specimen of the variety on Eupatorium, and as Saccardo gives only the shape of the conidia, I must for the present consider it as doubtful.

**Cercospora crassa** var. **sonchi** Woronichin

Monit. Jard. Bot. Tiflis **12**: 120. 1917

HOST: Sonchus sp.

TYPE: Sochi Exp. Sta.; Sonchus sp.; N. N. Woronichin; Sept. 2, 1916.

NOTE: *C. crassa* has been proved an Alternaria although having only an occasional vertical septum. Since Woronichin gives the width of the conidia as 13.5-15$\mu$, the variety also is considered an Alternaria even though the type has not been studied. In nearly all instances of such wide conidia, the fungus has proved not to be a Cercospora.

**Cercospora dichrocephalae** Yamamoto

The Phytopath. Lab. Taihoku Imp. Univ. Contr. 28: 599. 1934

Jour. Soc. Trop. Agr. 6: 599. 1934

Leaf spots none, or indistinct yellowish areas on the upper leaf surface; fruiting in effuse brownish to grayish patches on the corresponding lower surface, 2-7 mm. in extent; stromata a few dark brown cells in the stomatal openings; fascicles sometimes dense; conidiophores pale ferrugineous, uniform in color, irregular in width, sparingly septate, branched, undulate to crooked or slightly geniculate, tip rounded to conic, 3-4 x 10-60$\mu$; conidia subhyaline to very pale olivaceous, narrowly obclavate or even acicular, straight to curved, indistinctly multiseptate, base truncate, tip subacute, 2.5-4 x 35-125$\mu$.

Fig. 30
*C. dichrocephalae*

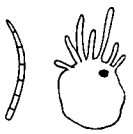


Fig. 31
*C. doronici*

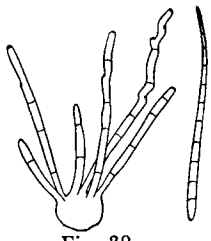


Fig. 32
*C. eclyptae*

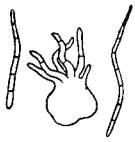


Fig. 33
*C. elephantopi*

HOST: *Dichrocephala latifolia* (L.) DC.

TYPE: Taihoku, Formosa; *Dichrocephala latifolia;* W. Yamamoto; Febr. 11, 1934.

DISTRIBUTION: Known only from the type locality.

NOTE: Dr. Yamamoto kindly sent me excellent material for a permanent mount.

**Cercospora doronici** Passerini

Fungi Gallici, Exsiccati No. 1872

Leaf spots circular, 3-6 mm. in diameter, almost invisible on the dried brown leaf; fruiting possibly amphigenous; stromata dark brown, irregular in shape, 30-80$\mu$ in diameter; fascicles dense; conidiophores pale to very pale olivaceous brown, paler toward the tip, irregular in width, not septate, not branched, not geniculate, longest ones may be tortuous, 3-4 x 5-20$\mu$; conidia subhyaline, cylindric, straight, often catenulate, 0-3 septate, ends rounded to subtruncate, 3-4 x 15-40$\mu$, or possibly longer.

HOST: *Doronicum pardalianches* L.

TYPE: Lyon (Rhone) France; *Doronicum pardalianches;* T. Therry, No. 3769; autumn, 1881.

DISTRIBUTION: Known only from the type locality.

NOTE: Most of the fruiting is a pycnidial or perithecial form, with the fruit body about the same size as are the Cercospora stromata, only more nearly globose.

It was necessary to study mounts from four herbaria before a Cercospora-like fungus really was found. It should not be classed as a Cercospora.

**Cercospora eclyptae sp. nov.**

Maculae suborbiculares, 0.5-4 mm. diam., purpureae, centro tandem leniter expallentes; caespituli potissime epiphylli; stromata deficientia; conidiophora laxe fasciculata, pallide vel moderate fusca, vix septata, simplicia, 0-3 geniculata, ad apicem dilutiora et subtruncata, 4-5.5 x 30-125$\mu$; conidia hyalina, anguste obclavata, spurie multiseptata, recta vel leniter curvata, ad basim truncata, ad apicem obtuse rotundata, 2-4.5 x 20-125$\mu$.

Leaf spots subcircular, 0.5-4 mm. in diameter, pale brown to gray center, raised purplish border; fruiting chiefly epiphyllous; stromata lacking or a few brown cells; fascicles 2-12 spreading stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, sparingly septate, not branched, 0-3 abruptly geniculate, tip subtruncate, 4-5.5 x 30-125$\mu$; conidia hyaline, acicular, indistinctly septate, straight to mildly curved, base truncate, tip fairly blunt, 2-4.5 x 20-125$\mu$.

HOST: *Eclypta alba* (L.) Hassk.

TYPE: Lucinda, Cdo. Yaracuy, Venezuela; *Eclypta alba;* M. F. Barrus, No. 3713; Dec. 3, 1939.

DISTRIBUTION: Known only from the type locality.

**Cercospora elephantopi** Ellis & Everhart

Jour. Mycol. 3: 15. 1887

Leaf spots circular, 2-4 mm. in diameter, without definite border, sometimes slightly darker in the center; fruiting mostly hypophyllous; stromata filling stomatal openings; fascicles mostly 2-12 stalks; conidiophores very pale olivaceous, rarely once septate near base, not or rarely 1-2 mildly geniculate, not branched, no spore scar visible at rounded tip, 2-3.5 x 10-35$\mu$; conidia narrowly linear to obclavate, straight to sinuous or slightly curved, subhyaline to very pale olivaceous, base subtruncate to obconically truncate, tip almost acute, septa not visible, 2-3.5 x 30-150$\mu$.

HOSTS: *Elephantopus carolinianus* Willd., *E. scaber* L (*E. mollis* HBK), *E. nudatus* Gray, *E. tomentosus* L.

TYPE: Columbia, Missouri; *Elephantopus carolinianus;* B. T. Galloway, No. 140; Aug. 1886.

DISTRIBUTION: Apparently rare, but distributed in southern states as far north as Delaware and Missouri, and in San Domingo, Puerto Rico, and Minas Geraes.

NOTE: The type bears the name *C. elephantopodis,* but the shorter name was used in the printed description. Viégas (Bol. Soc. Brasileira Agron. 8: 161. 1945) reports it on *Eremanthus scapigerus* Baker in Brazil.

**Cercospora erechtitis** Atkinson

Jour. Elisha Mitchell Sci. Soc. 8: 66. 1892

*Cercospora erechthiticola* Sawada, literature unknown.

Leaf spots circular to subcircular, 1-4 mm. in diameter, brown or brown margin and gray center; fruiting amphigenous, but chiefly on upper surface; stromata none or a few brown cells; conidiophores borne singly or in fascicles of 2-5,

pale to medium brown, plainly multiseptate, not branched, straight to slightly sinuous or 1-7 mildly geniculate, slightly paler tip, which is subtruncate and with

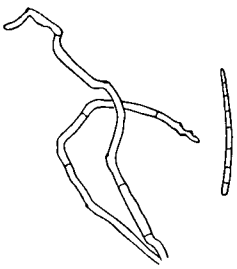


Fig. 34
*C. erechtitis*

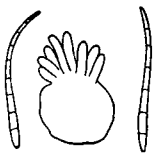


Fig. 35
*C. Eupatorii*

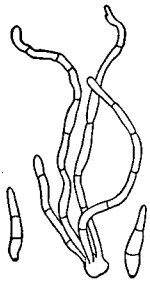


Fig. 36
*C. ferruginea*

medium sized spore scar, 3.5-5 x 30-300$\mu$; conidia hyaline, acicular to acicular-obclavate, straight to curved, truncate base, acute tip, indistinctly multiseptate, 2-4 x 45-230$\mu$.

HOSTS: *Erechtites praealta* Raf. (*E. hieracifolia* [L.] Raf.), *E. valerianaefolia* (Wolf) DC.

TYPES: Auburn, Ala.; *Erechtites hieracifolia;* B. M. Duggar, No. 2303; Nov. 5, 1891; (*C. erechthiticola*) Taitung, Taiwan (Formosa); *Erechtites valerianaefolia;* K. Sawada; Mar. 17, 1944.

DISTRIBUTION: Collected in southern United States, Central America, West Indies, Colombia and Formosa.

NOTE: For a further description see also Mycologia **23**: 391. 1931. A part of the Sawada type is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora espeletiae** Chupp

Monogr. Univ. Puerto Rico, B. 2: 247. 1934

HOST: *Espeletia shultzii* Wedd.

TYPE: Near Almorzaderos, Paramo de Timotes, Merida, Venezuela; *Espeletia shultzii;* C. E. Chardon, Nos. 1001, 1002; Aug. 30, 1932.

NOTE: I have made a number of mounts since the 1934 publication, but have not again met with the hyaline conidia. At present I am considering the species doubtful, especially since several other fungi also are present.

**Cercospora eupatorii** Peck

N. Y. State Mus. Nat. Hist. Ann. Rept. **33**: 29. 1880

Leaf spots circular to subcircular, 2-4 mm. in diameter, medium brown, with a narrow raised purplish to almost black border; fruiting amphigenous but mostly on upper leaf surface; stromata slight or sometimes filling stomatal openings, brown; fascicles 2-20 stalks; conidiophores medium brown or olivaceous brown, sometimes branched, rarely septate, not geniculate, tips conic to bluntly rounded, sometimes with minute spore scar, 3.5-4.5 x 10-35$\mu$; conidia pale olivaceous, narrowly obclavate, straight or nearly so, base subtruncate to long obconic, near tip usually a sudden attenuation making it subacute, 2.5-3.5 x 50-190$\mu$.

HOSTS: Eupatorium sp., possibly only on *E. album* L. Peck mentions also *E. rotundifolium* L.

TYPE: Long Island; *Eupatorium album;* Miller; 1879.
DISTRIBUTION: Long Island, Alabama, New Jersey, Indiana.
NOTE: This species is the only one on Eupatorium causing definite leaf spots, the fruiting not being effuse, and occurring on both leaf surfaces. N. Amer. Fungi No. 1508 is labeled *C. eupatorii* but apparently is *C. ageratoides.* Saccardo (Syll. Fung. 4: 449. 1886) mentions *C. Eupatorii* Sacc., (*C. crassa* var. *Eupatorii* Sacc.) but I have been unable to find a description or see specimens. See key, page 118.

**Cercospora eupatorii-formosani** Sawada,
Taiwan (Formosa) Agr. Res. Inst. Rept. 86: 169. 1943

Leaf spots 0.8-2.5 mm. in diameter; fruiting amphigenous; conidiophores olivaceous, 0-3 septate, 3-4.5 x 20-44$\mu$; conidia pale fuligenous, 7-11 septate, 4.5-5 x 49-86$\mu$.

HOST: *Eupatorium formosanum* Haz.
TYPE: Unknown.
DISTRIBUTION: Formosa (Taiwan).
NOTE: Description not detailed enough to make sure that it differs from other species on Eupatorium. See key, page 118.

**Cercospora ferruginea** Fuckel
*In* Fresenius, Beiträge zur Mykologie p. 93. 1863
Also Hedwigia 2: 134. 1863

Leaf spots indefinite or lacking; fruiting in hypophyllous effuse reddish or ferruginous to dark olivaceous layers, sometimes including the larger part of the leaf surface; stromata not present; conidiophores nonfasciculate, medium dark brown, plainly multiseptate, branched, variously curved or bent but rarely geniculate, often widened near the tip, which is conic and has a medium sized spore scar, 4-6 x 50-250$\mu$, the widest part near tip ranging from 5 to 9$\mu$; conidia cylindro-obclavate, the shortest ones being distinctly cylindric, pale to medium olivaceous brown, 0-5 but mostly 1-3 septate, straight or nearly so, base rounded to obconic, tip blunt, 5-8 x 15-60$\mu$, rarely as long as 90$\mu$.

HOSTS: *Artemisia vulgaris* L. Among other hosts which have been reported are *A. absinthium* L., Ambrosia spp., *Erigeron tomentosus, Teucrium canadense* L., *Tanacetum uliginosum* Sibth. & Sm., *Franseria chamissonis* Less., *Lobelia puberula* Michx., and other unrelated hosts. A close study of these specimens shows that this Cercospora species occurs only on Artemisia, and seemingly only on *A. vulgaris.*
TYPE: Altersand versus Hostrichiam; *Artemisia vulgaris;* autumn, 1863. Cotype distributed as Fungi Rhenani No. 120.
DISTRIBUTION: Herbarium specimens indicate that the species is common in many countries and states; but the apparent confusion of hosts makes it difficult to state the distribution with any certainty. I have specimens from Germany, Poland, China, and Ontario (Canada).
NOTE: Many collections in herbaria in different countries and states are labeled *C. ferruginea* but are likely to be *C. olivacea* Otth., *C. racemosa,* or *C. racemosa* var. *ambrosiae,* all of which are distinct from the fungus on *Artemisia vulgaris. C. ferruginea* differs from *C. olivacea* Otth., the other species on Artemisia, in being nonfasciculate, having conidiophores swollen near the tips,

branched, and with longer, more nearly obclavate conidia. Fuckel, Jahrb. Nassau. Ver. f. Naturk. 27: 20. 1873, connects the conidial stage with *Sphaerella ferruginea.* The Cercospora could well be classed in some other genus. Mr. and Mrs. E. Bartholomew collected a fungus on *Franseria chamissonis* Less. in Golden Gate Park, California, Aug. 16, 1915, and he distributed it as Fungi Columbiana No. 4902 under the name, *C. ferruginea.* It seems distinct and probably is an Helminthosporium.

**Cercospora fulvella** Heald & Wolf

Mycologia 3: 17. 1911

Leaf spots circular to irregular, 4-10 mm. in diameter, grayish brown or lead colored, with yellowish to burnt sienna margin, indefinite on lower leaf surface; fruiting epiphyllous; small globular brown stromata; some fascicles dense; co-

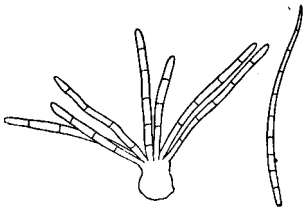


Fig. 37
*C. fulvella*

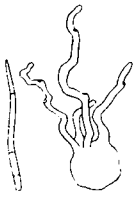


Fig. 38
*C. gerberae*

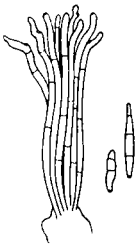


Fig. 39
*C. gnaphaliacea*

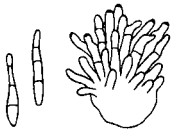


Fig. 40
*C. gnaphalii*

nidiophores pale olivaceous brown, straight to 1-2 geniculate, uniform in color and width, not branched, septa and spore scars indistinct, rounded tip, 3-4 x 50-150$\mu$, rarely irregular in width and widest part up to 6$\mu$; conidia obclavate, pale olivaceous, straight to curved, septa mostly indistinct, base obconic, tip subacute, 3.5-5 x 40-60$\mu$.

HOST: *Verbesina virginica* L. (*Verbesina texana* Buckl.)

TYPE: Austin, Texas; *Verbesina texana;* Heald and Wolf, No. 406; Oct. 31, 1904.

DISTRIBUTION: Known only from the type locality.

**Cercospora fulvescens** Saccardo

Nuov. Giorn. Bot. Ital. 8: 189. 1876

HOST: *Solidago virgaurea* L.

TYPE: In Montello woods, northern Italy; *Solidago virgaurea;* P. A. Saccardo; late summer.

NOTE: I have not had an opportunity to study the type of this species, nor to compare European collections with those made in the United States. But all of the North American specimens labeled as *C. fulvescens* and which I examined undoubtedly were *Ramularia virgaureae* Thüm. I do not believe there is a *Cercospora fulvescens* in this country. It would be interesting to prove whether the Saccardo collection were not also a Ramularia, especially since Lindau (Rabenhorst's Cryptogamenflora 9: 140. 1910) says it is closely related to *Cercosporella virgaureae,* and may be merely a young collection of this species. Saccardo's drawings resemble Ramularia.

**Cercospora gerberae** Chupp & Viégas
Bol. da Soc. Brasil. de Agron. 8: 27. 1945

Spots subcircular to irregular, ranging in size from 3 mm. to large blotches covering much of the leaf surface, at first olivaceous, then turning dark until the spots are almost black, occasionally with brown center, or the dead tissue may drop out leaving the leaf with a ragged appearance; fruiting amphigenous but chiefly hypophyllous; stromata a few brown cells; fascicles 2-8 stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, sparingly septate, rarely branched, straight, sinuous or 1-3 geniculate, medium spore scar at the subtruncate tip, 4-5 x 30-110$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 30-140$\mu$.

HOSTS: Gerbera sp., *G. jamesonii* Hook

TYPE: Est. Exp. de Agriculture, Belo Horizonte, Minas Geraes, Brazil; *Gerbera jamesonii;* Carlos Tomas de Almeida, 3958; April 14, 1939.

DISTRIBUTION: Bermuda, Sierra Leone, Brazil, New South Wales. (Agr. Gaz. N.S.Wales (1938) 49: 210. 1939), Florida.

NOTE: The first mount made showed a few conidia with appendages, like those of Centrospora on Carum, Viola, and Apium, but such appendages later could not be found in fairly numerous mounts. It therefore is considered a Cercospora.

**Cercospora gnaphaliacea** Cooke
Jour. Linn. Soc. London (Bot.) 17: 142. 1880

Leaf spots circular to irregular, 2-4 mm. in diameter, brown, without distinct border; fruiting amphigenous but chiefly on upper surface; stromata dark brown, globular, 20-40$\mu$, rarely 80$\mu$ in diameter; fascicles very dense, often coremoid; conidiophores pale fuligenous or brown, in mass appearing dark, plainly multiseptate, branched, upper third undulate, 0-2 mildly or abruptly geniculate, tip subconic and with small spore scar, 4-5 x 75-160$\mu$; conidia cylindro-obclavate, shortest ones cylindric, pale olivaceous brown, straight or nearly so, 1-5 septate, base long sharply obconic, tip obtuse, 4.5-7 x 20-75$\mu$.

HOSTS: Gnaphalium sp. *G. decurrens* Ives, *G. luteo-album* L. (*G. multiceps* Wall.), *G. obtusifolium* L. (*G. polycephalum* Michx.), *G. purpureum* L., *G. spicatum, G. uliginosum*

TYPE: Houston, Texas; Gnaphalium sp.; H. W. Ravenel, No. 283; April 17, 1869.

DISTRIBUTION: Saw material from Canada, Wisconsin, Oklahoma, Texas, Alabama, Puerto Rico, Venezuela, Minas Geraes, and Japan. Also reported from Mississippi, Kansas, Delaware.

NOTE: See also *C. gnaphalii* for differences between the two species on this host genus.

**Cercospora gnaphalii** Harkness
Cal. Acad. Sci. Bul. 1: 38. 1884

Leaf spots yellowish brown irregular blotches, 3-10 mm. in length, or even 20 mm. when coalescing; fruiting epiphyllous, appearing as a black stipple; stromata dark brown, 20-50$\mu$; fascicles dense to very dense; conidiophores pale to medium dark olivaceous brown, 0-1 septate, rarely once mildly geniculate, not branched, straight to much curved, small spore scar at rounded tip, uniform in width but slightly paler near tip, 4-5 x 8-35$\mu$; conidia cylindric to obclavato-cylindric, subhyaline to very pale fuligenous, straight or nearly so, base long

sharply obconic, tip obtuse, 1-7 but mostly 1-3 septate, 5-7 x 20-55$\mu$ (Harkness says 16 x 120$\mu$).

HOSTS: *Gnaphalium decurrans* Ives, Gnaphalium sp.

TYPE: Golden Gate Park, San Francisco, Cal.; *Gnaphalium decurrans;* H. W. Harkness, No. 2601; May (June) 1881.

DISTRIBUTION: Aside from the type I received a specimen collected in southern California by Dr. O. A. Plunkett. It also has been reported from Texas.

NOTE: See also *C. gnaphaliacea* for differences between the two species on this host genus.

**Cercospora grandissima** Rangel

Bol. Agric. Sao Paulo, XVI A. **4**: 322. 1915

*Cercospora dahliae* Hara, Jour. Plant Protection **16**: 159. 1929

Leaf spots circular, 1-5 mm. in diameter, uniformly reddish brown or with a small gray center; fruiting amphigenous but sometimes chiefly epiphyllous; stromata mostly a few brown cells; fascicles 1-10 stalks; conidiophores pale to me-

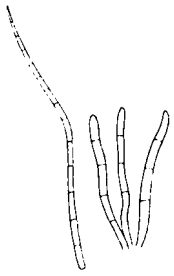


Fig. 41
*C. grandissima*

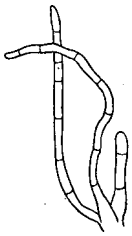


Fig. 42
*C. helenii*

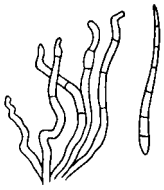


Fig. 43
*C. helianthi*

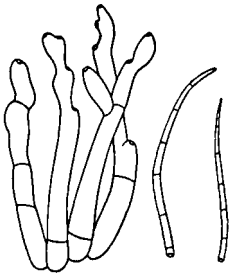


Fig. 44
*C. helianthicola*

dium brown, fairly uniform in color and width, multiseptate, not branched, straight or 1-3 geniculate, medium spore scar at the subtruncate tip, 4-5.5 x 40-160$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip acute, 2-4.5 x 40-350$\mu$.

HOSTS: *Dahlia variabilis* Desf. (*D. pinnata* Cav.), Dahlia sp.

TYPE: Paquetá, near Rio de Janeiro, Brazil; *Dahlia variabilis;* Eugenio Rangel, No. 691; Febr. 1913.

DISTRIBUTION: Guatemala, Brazil, Czechoslovakia, Formosa, Southern Rhodesia, China.

NOTE: I did not see Hara's species, but Yamamoto (Jour. Soc. Trop. Agr. Formosa **6**: 602. 1934) says it is a synonym.

**Cercospora grindeliae** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **47**: 439. 1895

HOSTS: Grindelia sp., *G. squarrosa* (Pursh) Dunal.

TYPE: Berkeley, Cal.; Grindelia sp.; W. C. Blasdale, No. 258; June 30, 1894.

NOTE: Ellis states that the fungus is subhyaline. I found no color in the type material, therefore suggest it be considered a Cercosporella.

**Cercospora griseëlla** Peck

N. Y. State Mus. Nat. Hist. Ann. Rept. **33**: 29. 1880

HOSTS: *Erigeron annuus* (L.) P., *E. superbum* (*E. speciosus* DC. var. *superbus* Bailey).

TYPE: Charlton, N. Y.; *Erigeron annuus.*

NOTE: This apparently is the same as *Cercospora cana,* and being hyaline to subhyaline is considered a Cercosporella. Some collections have almost enough color to be classed as a Cercospora. There always must be a few of these border line species in any kind of a classification.

**Cercospora guizotiae** Siemaszko

Mat. Mikol. i Fitopatol. Ross. **1** (3): 40. 1915

Leaf spots distinct, brown, often confluent; fruiting amphigenous; dark brown stromata, prominent; most fascicles dense; conidiophores medium brown, sparingly septate, not branched, straight to tortuous or geniculate, 5-7 x 30-100$\mu$; conidia acicular, hyaline, indistinctly multiseptate, base truncate, tip acute, 5-6.5 x 30-160$\mu$.

HOST: *Guizotia oleifera* DC. = *G. abyssinica* Cass.

TYPE: Suchum, Kale (Abchazia) Poland; *Guizotia oleifera;* W. Siemaszko.

DISTRIBUTION: Poland, Russia.

NOTE: I have not had an opportunity of studying this species. The author's description is meager, but his Fig. 17 helps somewhat.

**Cercospora helenii** Tharp

Mycologia **9**: 110. 1917

On leaves and flower pedicels; spots pale brown to gray, circular to irregular, 1-3 mm. in diameter, with brown border; fruiting amphigenous; stromata sometimes lacking, or rarely elongated to include two or more fascicles; fascicles mostly not dense; conidiophores pale olivaceous brown, uniform in color but slightly attenuated, rarely once geniculate, multiseptate, not branched, spore scars small, tip rounded, 3-5 x 20-90$\mu$; conidia cylindric, hyaline, straight to slightly curved, ends rounded, septa indistinct, 2-3.5 x 20-50$\mu$.

HOST: *Helenium microcephalum* DC.

TYPE: Austin, Texas; *Helenium microcephalum;* I. M. Lewis and B. C. Tharp.

DISTRIBUTION: Texas, Alabama.

NOTE: The material I studied was so overrun by Alternaria, and the Cercospora conidia so rare, that I am not sure about this species.

CERCOSPORAE ON HELIANTHUS

A. Conidia hyaline, acicular, truncate base, 1.5-3 x 30-125$\mu$; leaf spots distinct; fruiting not effuse; conidiophores 3-5 x 15-125$\mu$, pale to medium in color.
H. ANNUUS — *C. helianthicola*

AA. Conidia colored, not acicular, not with truncate base; leaf spots not distinct; fruiting effuse; conidiophores medium to dark in color.

B. Conidiophores 5-7 x 10-45$\mu$, basal cell may be 10$\mu$ wide; conidia mostly cylindric, usually 1-septate, 5-7 x 25-70$\mu$.
H. ANNUUS, H. PETIOLARIS — *C. pachypus*

BB. Conidiophores 4-6 x 20-200$\mu$; conidia obclavate, plainly multiseptate, 4-6 x 40-125$\mu$.
HELIANTHUS spp. — *C. helianthi*

**Cercospora helianthi** Ellis & Everhart
Jour. Mycol. 3: 20. 1887

Leaf spots none, at least at first, sometimes in advanced stages yellowing or browning of upper leaf surface; fruiting in dark faintly effuse patches on lower leaf surface; stromata lacking; nonfasciculate to dense fascicles; conidiophores dark fuligenous or olivaceous brown, plainly multiseptate, branched, sometimes once mildly or abruptly geniculate, tortuous, bluntly rounded tips, spore scars indistinct, fairly uniform in color and width, 4-6 x 20-50$\mu$ when fasciculate and as long as 200$\mu$ when nonfasciculate; conidia pale to medium fuligenous or olivaceous brown, obclavate, straight or nearly so, plainly multiseptate, long obconic base, tip subobtuse to subacute, 4-6 x 40-125$\mu$.

HOSTS: Helianthus sp., *H. doronicoides* Lam., *H. hirsutus* Raf., *H. maximiliana* Schrad., *H. occidentalis* Riddell, *H. rigidus* Desf. (*H. scaberrimus* Ell.), *H. strumosus* L., *H. tuberosus* L.

TYPE: Columbia, Missouri; Helianthus sp.; S. M. Tracy, No. 208; Oct. 1886.

DISTRIBUTION: Studied material from New Jersey, Ohio, Missouri, Iowa, Wisconsin and Kansas. Also reported from Russia, Texas and Illinois.

NOTE: See key above for comparison among the species on this host genus. *C. helianthicola* has hyaline, acicular conidia.

**Cercospora helianthicola** Chupp & Viégas
Bol. da Soc. Brasil. de Agron. 8: 29. 1945

Leaf spots irregular, minute to large part of leaf surface, very dark reddish brown; fruiting amphigenous; stromata lacking or a few brown cells; fascicles 1-12 stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, longer ones tortuous to multigeniculate, rarely branched, subtruncate tip, 3-5 x 15-125$\mu$, some fascicles have only short conidiophores; conidia hyaline, acicular, variously curved, indistinctly multiseptate, base truncate, tip acute, 1.5-3 x 30-125$\mu$.

HOST: *Helianthus annuus* L. (*H. lenticularis* Dougl.)

TYPE: Est. Exp. de Agricultura, Belo Horizonte, Minas Geraes, Brazil; *Helianthus annuus;* Carlos Tomaz de Almeida, No. 3984; March 24, 1940.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 140 for differences among the species on Helianthus. The other two species have colored conidia.

**Cercospora helichrysi** sp. nov.

Maculae suborbiculares, 2-6 mm. diam., flavae vel brunneae, centro expallentes; caespituli amphigeni; stromata globosa, atro-fusca, 15-40$\mu$ diam.; conidiophora laxe vel densiuscule fasciculata, pallide fuliginea, evidenter multiseptata, vix ramosa, ad apicem subtruncata, 4-6 x 30-125$\mu$; conidia hyalina, anguste obclavata, recta vel leniter curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2-3.5 x 25-100$\mu$.

Leaf spots subcircular, 2-6 mm. in diameter, pale tan to gray center, wide yellow to brown or red margin; fruiting amphigenous, but mostly on the upper surface; stromata globular, dark brown to black, 15-40$\mu$ in diameter; fascicles 3-20 stalks; conidiophores pale to very pale fuligenous, in mass may appear fairly dark, paler and more narrow toward the tip, plainly multiseptate, rarely branched, 1-5 geniculate, medium sized spore scar at the rounded to subtruncate tip, 4-6

x 30-125$\mu$; conidia hyaline, acicular, straight or only slightly curved, indistinctly multiseptate, base truncate, tip subacute, 2-3.5 x 25-100$\mu$.

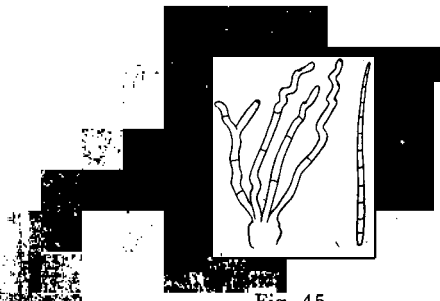


Fig. 45
*C. helichrysi*

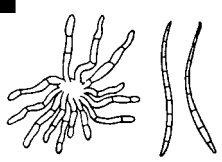


Fig. 46
*C. hieracii*

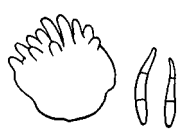


Fig. 47
*C. jacquiniana*

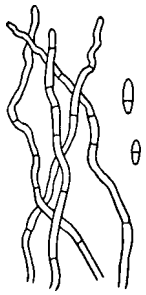


Fig. 48
*C. kansenis*

HOST: *Helichrysum orientale* Gaertn.
TYPE: Cantareira, Sao Paulo, Brazil; *Helichrysum orientale;* J. G. Carneiro, No. 2436; Mar. 2, 1937.
DISTRIBUTION: Known only from the type locality.

**Cercospora hieracii** Ellis & Everhart
Jour. Mycol. 8: 70. 1902

Leaf spots mostly indefinitely yellowish or brownish areas, with indistinct to mouse colored effuse fruiting on upper leaf surface; stromata filling stomatal openings; most fascicles dense; conidiophores pale olivaceous or olivaceous brown, 1-5 septate, constricted at septa or irregular in width, sinuous to sharply bent, not geniculate, branched, tip rounded obtusely, with small spore scar, 3-4 x 10-45$\mu$; conidia narrowly obclavate, subhyaline to pale olivaceous, straight to slightly curved, indistinctly multiseptate, base sharply obconic, tip subacute, 2-3.5 x 50-120$\mu$.

HOST: *Hieracium venosum* L.
TYPE: Tuskegee, Ala.; *Hieracium venosum;* Geo. W. Carver, No. 422; July 1901.
DISTRIBUTION: Studied material from North Carolina and Alabama.

**Cercospora inopina** Petrak
Sydowia, Ann. Mycol. 4: 570. 1950

Leaf spots indistinct yellowish areas; on the upper leaf surface fruiting in effuse layers from 60-150$\mu$ in diameter to large part of the leaf surface, dark brown to almost black; fascicles very dense; conidiophores pale olivaceous to dark brown, rarely with short branches, variously curved or bent, septate, 4-7 x 25-120$\mu$; conidia subhyaline to olivaceous brown, narrowly cylindric, sometimes attenuated near tip, 0-4 septate, 2.5-4.5 x 8-36$\mu$.

HOST: *Gynoxys hallii* (*Gynoxis hallii*).
TYPE: Near Quito, Ecuador; dead dropped leaves of *Gynoxis hallii;* H. Sydow, No. 105; Sept. 20, 1937.
DISTRIBUTION: Ecuador.
NOTE: According to the description this is not a Cercospora. It might be a Piricularia. I have not seen the collection.

**Cercospora jacquiniana** Thümen
Hedwigia **19**: 177. 1880

*Cercospora senecionis* Ellis & Ev., Proc. Acad. Nat. Sci. Phila. I. **43**: 90. 1891

Irregular or angular darkening of leaf areas, usually bounded by veinlets, sometimes olivaceous in color, 4-7 mm. in extent; fruiting amphigenous, but may be more common on lower leaf surface; stromata dark brown to black, globular, 30-100$\mu$ in diameter, often intermingled with similar appearing pycnidia or perithecia; fascicles dense; conidiophores often merely peripheral cells of stroma, at other times elongated, pale to medium dark fuligenous or brown, not septate, not branched, not geniculate, small spore scar at bluntly rounded or conic tip, 4-6 x 5-25$\mu$; conidia cylindric, hyaline to subhyaline, straight to slightly curved, 1-5 septate, base obconic to obconically truncate, tip obtuse, 5-7 x 25-60$\mu$, rarely as long as 120$\mu$.

HOSTS: *Senecio nemorensis* Linn. (*S. jacquinianus* Reichb.), *S. ameno* ? (On a packet collected by Ellis), *S. aureus* Linn., *S. cacaliaster* Lam., *S. hualtata* Bert.

TYPES: Near Cellerina, Graubünden (Grisons) Switzerland; *Senecio jacquinianus* Reichb.; Geo. Winter; (*C. senecionis*) Wilmington, Del.; *S. aureus* var. *obovata;* A. Commons, No. 978; Nov. 1, 1889.

DISTRIBUTION: Studied material from Delaware, New Jersey, and Switzerland. Also reported in Missouri, Argentine, Trinidad, Tyrol, and other Alpine districts.

NOTE: Although Ellis is quite certain his species is not the same as that collected by Winter, the Ellis type and the Winter collection made in 1885 seem to be identical. See also *C. senecionicola* for the differences between the two species on this host genus.

**Cercospora kansensis** H. & P. Sydow
Ann. Mycol. **5**: 340. 1907

Leaf spots indefinite or none; fruiting in olivaceous to ferrugineous small effuse patches on lower leaf surface; stromata absent; nonfasciculate; conidiophores medium golden brown, multiseptate, not branched, undulate to 2-3 times abruptly geniculate, small spore scar at rounded tip, 3-5 x 200-500$\mu$; conidia cylindric to obclavato-cylindric, straight, 1-3 plainly septate, subhyaline to pale olivaceous brown, base obconic to obconically truncate, tip blunt, 5-7 x 20-50$\mu$.

HOSTS: *Cnicus* (Carduus, Circium) *altissimus* Willd., *Cirsium flaccidum* (Small) Petrak.

TYPE: Lebanon, Kansas; *Carduus altissimus;* Elam Bartholomew; Aug. 10, 1906. Cotype distributed as Fungi Columbiani No. 2506.

NOTE: The long nonfasciculate conidiophores and colored 1-3 septate conidia place this into Cladosporium rather than Cercospora. Greene of Wisconsin sent me a collection from Texas. See key, page 129.

**Cercospora lactucae** P. Hennings
Bot. Jahrbücher von Engler **31**: 742. 1902

Leaf spots mostly lacking; fruiting effuse, amphigenous, chiefly hypophyllous, dark olivaceous to black, small patches to large part of leaf surface; stromata none (at least in type); nonfasciculate; conidiophores long intertwining branches, pale to medium dark brown, uniform in color, irregular in width, plainly multiseptate,

often constricted at septa, not geniculate, small spore scar at bluntly rounded tip, 3.5-5 x 20-500$\mu$; conidia pale fuligenous, obclavato-cylindric, straight or nearly so, mostly 1-3 septate, base rounded to obconically truncate, tip obtuse, 3.5-5 x 20-55$\mu$.

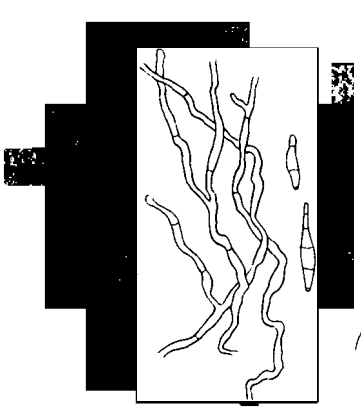


Fig. 49
*C. lactucae* Henn.

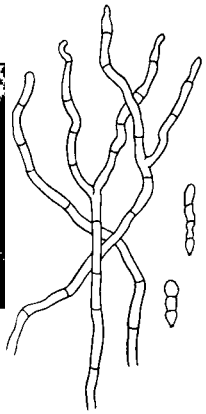


Fig. 50
*C. liabi*

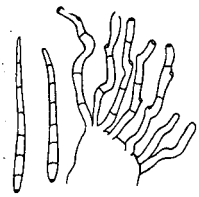


Fig. 51
*C. longissima*

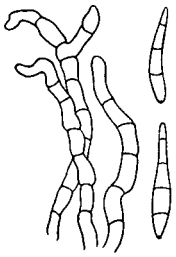


Fig. 52
*C. macroguttata*

HOSTS: *Lactuca raddiana* Max., Lactuca sp. *L. laciniata* Makino.
TYPE: Ushive-yama, Prov. Tosa, Japan; *Lactuca raddeana;* Yoshinaga, No. 59; Aug. 1901.
DISTRIBUTION: Japan, Venezuela.
NOTE: *C. lactucae* Stev. and *C. lactucae* Welles are synonyms of *C. longissima.* The collection from Venezuela had definite fascicles and stromata, but in other respects resembled Hennings' type. The Hennings species is not a Cercospora but a Cladosporium.

**Cercospora liabi** H. & P. Sydow
Mem. Soc. Neuchat. Sci. Nat. **5**: 440. 1912

Leaf spots none; fruiting in small, hypophyllous, olivaceous, effuse patches, 0.5-2 mm. in extent; stromata lacking; conidiophores borne singly as branches from procumbent threads or in pseudofascicles of 2-5, medium to dark brown, uniform in color and width, plainly multiseptate, not geniculate, bluntly rounded tip, straight to variously curved, 4-5.5 x 25-150$\mu$, or even 250$\mu$; conidia very pale olivaceous brown, cylindric to cylindro-obclavate, nearly straight, 1-4 septate, base obconic to rounded, tip obtuse, 4.5-6.5 x 20-50$\mu$.
HOST: *Liabum hastatum* (Wedd.) Britton.
TYPE: Cafetal La Camelia pres Angelopolis, Andes centrales (dep. Antioquia), Colombia; *Liabum hastatum;* E. Mayor, No. 345; Aug. 28, 1910.
DISTRIBUTION: Known only from the type locality—two collections.
NOTE: I should rather name this a Cladosporium.

**Cercospora longissima** (Cugini in Herb.) Saccardo
Syll. Fung. **18**: 607. 1906
*Cercospora longispora* (Cugini in Herb.) Traverso, Malpighia **17**: 217. 1902

*Cercospora lactucae* Stevenson, Jour. Dept. Agr. Puerto Rico **1**: 105. 1917
*Cercospora lactucae* Welles, Phytopath. **13**: 289. 1923
*Cercospora lactucae-sativae* Sawada, Formosa Agr. Res. Inst. Rept. **35**: 111. 1928
*Cercospora ixeridis-chinensis* Sawada, Formosa Agr. Res. Inst. Rept. **86**: 171. 1943
*Cercospora lactucae-indicae* Sawada, Formosa Agr. Res. Inst. Rept. **86**: 172. 1943

Leaf spots at first minute water-soaked specks, gradually enlarging and turning various shades of tan or brown, and in some instances even dingy gray, circular to irregular in shape, 2-10 mm. in diameter; fruiting amphigenous; stromata almost lacking or only a few brown cells; most fascicles less than ten stalks; conidiophores pale olivaceous brown, slightly paler and more narrow toward the tip, multiseptate, sparingly geniculate, not branched, medium spore scar at rounded to subtruncate tip, 4-6 x 25-80$\mu$, rarely as long as 200$\mu$; conidia hyaline, acicular to obclavate, straight to variously curved, indistinctly multiseptate, truncate to subtruncate base, subacute tip, 3-5 x 20-100$\mu$, rarely as large as 6 x 200$\mu$.

HOSTS: *Lactuca chinensis* Makino (*Ixeris chinensis* Naka.), *L. indica* L., *L. integrifolia* Bigel, *L. paradoxa, L. sativa* L., *L. scariola* L.

TYPES: Vaciglio, Modena, Northern Italy; *Lactuca sativa;* Cugini; August, 1891; (*C. lactucae* Stev.) Rio Piedras, Puerto Rico; *Lactuca sativa;* J. A. Stevenson, No. 6774 and 5613; Oct. 22, 1914, and 1916; (*C. lactucae* Welles) College of Agr., Los Banos, Philippines; *Lactuca sativa;* C. G. Welles. The Sawada types of *C. lactucae-indicae* and *C. ixeridis-chinensis* are not known. He changes the Welles name to *C. lactucae-sativae.*

DISTRIBUTION: Studied material from New Jersey, Wisconsin, Puerto Rico, San Domingo, Guatemala, Trinidad, Uganda, Venezuela, Brazil, Colombia, China, Formosa, and the Philippines. Also reported from Japan, Florida, Illinois, Indiana, Texas, Virginia, and Louisiana. Probably occurs in all tropical and subtropical countries.

NOTE: The other species, *C. lactucae* Henn. on lettuce has colored conidia. Fragoso has described a *C. longissima* var. *gigantea* on *Tamus communis* Linn. It, however, is not related to the lettuce species and apparently is identical with *C. scandens.* Cooke and Ellis (Grevillea **17**: 65. 1889) list a *Cercospora longissima* on beet, but add it is a synonym of *C. beticola.* Peck described a *Cercospora longispora* on Lupinus in 1881, and it is for this reason that Saccardo changed the name of the lettuce fungus. Sawada merely renames the fungus Welles had described. His description of the form on *L. indica* fits accurately the common one on lettuce. The same is true for the one on *Ixeris chinensis.* Toro (Phytopath. **19**: 973. 1929) already has shown that the Welles and Stevenson names are synonyms of *C. longissima* and that *C. lactucae* P. Hennings is distinct. McWhorter (Phytopath. **15**: 247. 1925) points out the similarity of the Welles and Stevenson fungi. Still other authors have mentioned the same or related facts.

### **Cercospora macroguttata** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 64. 1892

Leaf spots indefinite or none; fruiting in olivaceous to ferruginous effuse patches on lower leaf surface; stromata lacking; nonfasciculate; conidiophores

borne singly, golden brown to dark brown, closely and plainly septate, mostly with constrictions at the septa, often with large guttulae in cells, not branched, sometimes slightly undulate or mildly geniculate, spore scars indistinct, rounded tip, 5-6 x 50-250$\mu$; conidia pale olivaceous, cylindric to cylindro-obclavate, straight or nearly so, 3-8 septate, base rounded to obconic, tip mostly obtuse, 4.5-6.5 x 10-80$\mu$.

HOST: *Chrysopsis graminifolia* (Michx.) Nutt.

TYPE: Auburn, Ala.; *Chrysopsis graminifolia;* Geo. F. Atkinson, No. 2138; July 13, 1891.

DISTRIBUTION: Alabama and Mississippi.

NOTE: This resembles *C. mikaniae* in many respects, but a study of specimens shows that there are enough differences to consider them distinct.

**Cercospora megalopotamica** Spegazzini

Anal. Soc. Cien. Argent. **13**: 29. 1882

Leaf spots almost invisible on the old dried specimens, a slight greying of the affected tissue; fruiting hypophyllous, under the hand lens appearing as numerous minute black pustules; stromata subglobular, dark brown, 15-50$\mu$ in diameter; fascicles 2-12 spreading stalks; conidiophores pale to medium brown, fairly uniform in

Fig. 53
*C. megalopotamica*

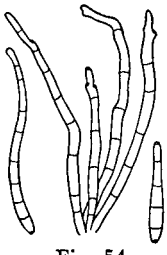


Fig. 54
*C. mikaniae*

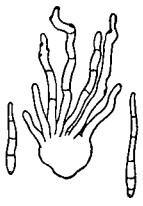


Fig. 55
*C. noveboracensis*

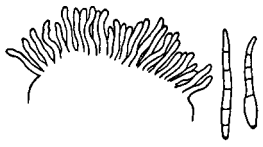


Fig. 56
*C. obesa*

color and width or slightly attenuated toward the tip, 1-5 septate, rarely branched, 0-3 geniculate, slightly curved or undulate, tip rounded to conic, 3-5 x 20-100$\mu$; conidia cylindric or longest ones bluntly obclavate, pale olivaceous, brown, straight to mildly curved, 1-5 (usually 2-3) septate, base rounded to long obconically truncate, tip obtuse, 3-6 x 25-90$\mu$ or even 120$\mu$.

HOST: *Bidens bipinnata* L. *B. pilosa* L.

TYPE: Palermo, Buenos Aires, Argentine; *Bidens bipinnata;* C. Spegazzini, No. 915; May 18, 1881.

DISTRIBUTION: Known definitely only from the type locality. Also reported from Hawaii, Uganda, and China.

NOTE: See key, page 122 for differences among the species on Bidens. Davis (Wisc. Acad. Trans. **16**: 758. 1910) has reported this species from Wisconsin. All of his collections show only *C. bidentis.*

**Cercospora mikaniacola** Stevens

Trans. Ill. Acad. Sci. **10**: 213. 1917

Leaf spots circular, 0.5-10 mm. in diameter, usually with a small white center, on the upper surface with a raised line border, on lower surface with a wide dark

area in which the fruiting is found; stromata lacking; conidiophores solitary or in fascicles of 2-5, pale to medium olivaceous brown, uniform in color and diameter, multiseptate, not branched, 1-10 abruptly geniculate, rarely near tip rachis-like, minute spore scar at small rounded tip, 4.5-6 x 75-150$\mu$; conidia cylindro-obclavate, subhyaline to very pale olivaceous, straight to slightly curved, multiseptate, long obconically truncate base, tip obtuse to subobtuse, sometimes catenulate, 4-5.5 x 30-70$\mu$. (Solheim reports them as large as 11 x 175$\mu$).

HOST: Mikania sp.

TYPE: Utuado, Puerto Rico; Mikania sp.; F. L. Stevens, No. 7923; July 7, 1915.

DISTRIBUTION: Known only from the type locality.

NOTE: Definite leaf spots and the long conidiophores separate this from the other species on Mikania. For a further description see Mycologia **23**: 397. 1931. Key, page 154.

**Cercospora mikaniae** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. Part I. **43**: 90. 1891

*Cercospora lemnischea* Ciferri, Ann. Mycol. **36**: 235. 1938

Leaf spots none or indistinct; fruiting in dark olivaceous to sooty effuse patches on lower leaf surface; stromata lacking; fascicles dense; conidiophores medium to dark fuligenous or brown, plainly and closely septate, uniform in color and width, branched, variously curved or crooked, occasionally 1-4 mild to abrupt geniculations, small spore scar at blunt tip, 4-5.5 x 75-200$\mu$; conidia obclavato-cylindric, pale to medium olivaceous, 1-6 septate, variously curved, base rounded to long obconically truncate, tip obtuse, 4.5-8 x 25-85$\mu$.

HOSTS: *Mikania scandens* (L.) Willd. (*M. micrantha* HBK.)

TYPES: Tupelo, Miss.; *Mikania scandens;* S. M. Tracy; Sept. 7, 1890; (*C. lemnischea*) Valle del Cibao, Santiago, Rep. Dom.; *Mikania micrantha;* R. Ciferri; July 14, 1931.

DISTRIBUTION: The West Indies and east of the Mississippi as far north as Connecticut.

NOTE: The indistinct leaf spots, effuse fruiting and the dark colored conidiophores separate this species from the others on Mikania. Ciferri distributed type material of *C. lemnischea,* but did not describe it. Key, page 154.

**Cercospora myriactidis** Sawada

Formosa Agr. Res. Inst. Rept. **85**: 117. 1943

Leaf spots 2-10 mm. in diameter; conidiophores reddish, 0-1 septate, 3.5-4 x 13-36$\mu$; conidia hyaline, 5-7 septate, 2.5-3 x 44-110$\mu$.

HOST: *Myriactis longepedunculata* Hay.

TYPE: Unknown.

DISTRIBUTION: Formosa (Taiwan).

NOTE: The description is too meager to identify the fungus properly.

**Cercospora noveboracensis** Ellis & Everhart

Jour. Mycol. **3**: 14. 1887

Leaf spots indefinite; fruiting in irregular, olivaceous, effuse patches on lower leaf surface; stromata lacking; nonfasciculate to dense fascicles; conidiophores medium brown, plainly multiseptate, uniform in color, sometimes wider near tip, branched, undulate to mildly geniculate or more rarely 1-2 abruptly geniculate,

spore scars indistinct, tip bluntly rounded, 3-5 x 30-150$\mu$; conidia cylindric or slightly attenuated, straight or mildly curved, often catenulate, subhyaline to pale olivaceous, 1-7 septate, base obconic, tip rounded or when catenulate, conic, 3-5.5 x 20-90$\mu$.

HOST: *Vernonia noveboracensis* Willd.

TYPE: Columbia, Mo.; *Vernonia noveboracensis;* B. T. Galloway, No. 163; Sept. 1886.

DISTRIBUTION: Missouri, Indiana, West Virginia, Delaware.

NOTE: Branched, partly fasciculate, fairly dark conidiophores, and conidia cylindric, 4-5.5 x 20-90$\mu$ separate this species from the others on Vernonia. At first glance it resembles *C. consimilis* but the latter does not have branches and the conidia are up to 7$\mu$ in diameter. See key, page 132.

**Cercospora obesa** Ellis & Everhart

Jour. Mycol. 4: 5. 1888

*Cercospora ditissima* Ellis & Ev., Proc. Acad. Nat. Sci. Phila. 45: 171. 1893

Leaf spots circular or irregular, 2-6 mm. in diameter, brown, difficult to distinguish on brown dried herbarium material; fruiting amphigenous; stromata reddish brown to black, globular, 30-90$\mu$ in diameter; fascicles very dense; conidiophores medium dark fuligenous or reddish brown, sparingly septate, not branched, sometimes once geniculate, undulate to variously curved, uniform in width but with slightly paler tip, which is bluntly rounded or conic and with small spore scar, 4-6 x 10-50$\mu$; conidia hyaline to subhyaline, obclavato-cylindric, straight to slightly curved, septa indistinct, base medium to long obconically truncate, tip blunt, 4-6 x 30-80$\mu$.

HOSTS: Cnicus (Cirsium) sp., *C. undulatus* Gray (*Circium undulatum* (Nutt.) Spreng.); possibly only on *C. undulatus* as co-type also gives this host species.

TYPES: Manhattan, Kansas; Cirsium; W. T. Swingle, No. 1026; July 26, 1887; co-type distributed as N. Am. Fungi 2nd Ser. No. 2296 and Kellerman and Swingle, Kansas Fungi No. 1026; (*C. ditissima*) Rockport, Kansas; *Cnicus undulatus* Gray; E. Bartholomew, No. 605; June 1892.

DISTRIBUTION: A number of collections from Kansas.

NOTE: *C. cirsii,* the other species on Cnicus with hyaline conidia and fasciculate conidiophores, has more nearly obclavate conidia, measuring 3-4.5 x 20-90$\mu$. Schwarze (N. J. Agr. Exp. Sta. Bul. 313: 140. 1917) reports this fungus in New Jersey, and adds that the original description probably was of immature material. Since *C. undulatus* does not occur in New Jersey, we doubt his identification. He did not leave a specimen in the herbarium there. See key, page 129.

**Cercospora obscura** Heald & Wolf

Mycologia 3: 19. 1911

Leaf spots circular, 1-3 mm. in diameter, dingy gray, faint brown border, on lower surface only a slight darkening of the gray pubescense; fruiting epiphyllous; stromata small, brown, or lacking; fascicles mostly 3-10 stalks; conidiophores pale to medium brown, fairly uniform in color and width, shortest ones slightly attenuated, multiseptate, not branched, rarely 1-2 geniculate, longest ones variously curved, medium spore scar at subtruncate tip, 4-5 x 25-150$\mu$, mostly 25-75$\mu$; conidia hyaline to subhyaline, in mass faintly colored, cylindric, straight to

slightly curved, multiseptate, base truncate, tip rounded, or when catenulate the tip also may be truncate, 2-3.5 x 25-75$\mu$.

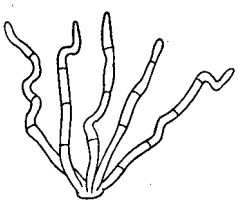


Fig. 57
*C. obscura*

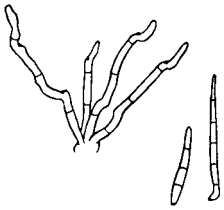


Fig. 58
*C. oculata*

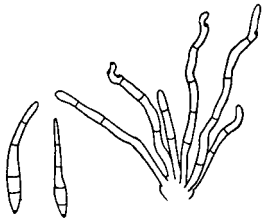


Fig. 59
*C. olivacea*

HOSTS: *C. cardunculus* L. (*Cynara scolymus* L.)
TYPE: Beeville, Texas; *Cynara scolymus;* Heald and Wolf, No. 1861; Aug. 4, 1909.
DISTRIBUTION: Texas and Venezuela.

**Cercospora oculata** Ellis & Kellerman
Bul. Torrey Bot. Club **11**: 116. 1884

Leaf spots circular to subcircular, 2-8 mm. in diameter, frequently zonate, brown to greenish brown, sometimes bordered by a narrow raised line or purple zone, at times coalescing into large blotches; fruiting amphigenous; stromata a few brown cells to 40$\mu$ in diameter, brown; most fascicles dense; conidiophores pale olivaceous brown, in mass dark, uniform in color, attenuated, rarely septate or once geniculate, not branched, medium spore scar at subtruncate tip, 3-5 x 10-65$\mu$; conidia mostly cylindric although some of the longest ones distinctly obclavate, pale olivaceous, straight or nearly so, mostly 1-5 septate, base subtruncate to long obconically truncate, tip rounded, or when spore catenulate, similar to base, 3-4.5 x 30-75$\mu$.

HOST: *Vernonia baldwinii* Torr.
TYPE: Manhattan, Kansas; *Vernonia Baldwinii;* W. A. Kellerman, No. 574; July 12, 1884.
DISTRIBUTION: Kansas, Oklahoma, and Iowa.
NOTE: Definite leaf spots, fasciculate, pale conidiophores 10-65$\mu$ in length, and cylindric, colored conidia separate this species from the others on Vernonia. This species has been reported on *V. noveboracensis* (Van Hook 2649) but the mount shows only *C. noveboracensis,* which has dark, crooked conidiophores and slightly wider conidia. See key, page 132.

**Cercospora oliganthidis** Baker and Dale
Mycol. Papers, Commonwealth Mycol. Inst. **33**: 104. 1951

Leaf spots at first indistinct, irregular yellowish areas on upper leaf surface; fruiting on the corresponding lower surface, visible only with the aid of a microscope, later the spots turn brown and many of them dehisce so that the affected foliage is ragged in appearance; stromata none; fascicles none; conidiophores single branches from procumbent threads, pale olivaceous to medium olivaceous brown, sparingly septate, sometimes wider near the rounded to conic tip when numerous minute spore scars are present, 3-4.5 x 10-70$\mu$, mostly 10-40$\mu$; conidia

very pale olivaceous, obclavato-cylindric, 1-5 septate, straight or almost so, base rounded to obconically truncate, tip obtuse, 3-4 x 25-55$\mu$.

HOST: *Oliganthes condensatus* Sch.

TYPE: Mt. Tabor, Trinidad; *Oliganthes condensatus;* R. E. D. Baker, No. 1793; Dec. 14, 1947.

DISTRIBUTION: Known only from the type locality.

**Cercospora olivacea** Otth

Mitt. Naturfor. Ges. Bern. **1868:** 65. 1869

*Helminthosporium absinthii* Peck, N. Y. State Mus. Nat. Hist. Rept. **30:** 54. 1878

*Cercospora absinthii* (Peck) Sacc., Syll. Fung. **4:** 444. 1886

No definite leaf spots, at least at first; fruiting in dark olivaceous to sooty effuse patches, in some instances mostly epiphyllous and in others hypophyllous; stromata none to fairly large, globular, dark, 20-60$\mu$ in diameter; nonfasciculate to very dense fascicles which are somewhat coremoid; conidiophores pale olivaceous brown or fuligenous, slightly paler tip, in mass medium dark, multiseptate, branched, undulate or 1-3 mildly to abruptly geniculate, small spore scar at subconic tip, 3.5-5.5 x 50-225$\mu$; conidia pale olivaceous, cylindric to obclavato-cylindric, mostly 1-5 septate, occasionally constricted at septa, straight, base medium to long obconic, tip obtuse, 5-8 x 20-75$\mu$.

HOSTS: *Artemisia absinthium* Linn., *A. ludoviciana* Nutt., *A. suksdorfii* Piper.

TYPES: Bern, Switzerland; *Artemisia absinthium;* G. Otth; autumn; (*C. absinthii*) Essex Co., N. Y.; *A. absinthium;* C. H. Peck; Aug., 1877.

DISTRIBUTION: Switzerland, New York, Wisconsin, and North Dakota.

NOTE: See also *C. ferruginea* for differences between the two species on Artemisia. *C. olivacea* is fasciculate, has more nearly olivaceous fruiting, and cylindric conidia. At first I considered the two species the same but now believe that each one can easily be distinguished from the other. It seems possible to separate them from host species alone. Solheim (Univ. Ill. Biol. Monogr. **12:** 61. 1929) gives *C. absinthii* as a synonym of *C. ferruginea.* Ellis (1885) also has used the name *Cercospora olivacea* (Berkeley and Ravenel) for a fungus on Gleditschia. This is being referred to *C. seymouriana.*

**Cercospora oyedaeae** Sydow

Ann. Mycol. **37:** 431. 1939

Leaf spots distinct, sparse, circular, 3-6 mm. in diameter, varying shades of brown or gray with a brown border, on the lower surface uniformly grayish brown; fruiting epiphyllous; stromata prominent, 30-70$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, not branched, not geniculate, straight to slightly undulate, 2-3 x 15-30$\mu$; conidia hyaline, narrowly obclavato-cylindric, straight to slightly curved, indistinctly 1-3 septate, base obconically truncate to subtruncate, tip subobtuse, 2-3.5 x 25-35$\mu$.

HOST: *Oyedaea buphthalmoides* DC.

TYPE: Prope Banos, Prov. Tungurahua, Ecuador; *Oyedaea buphthalmoides;* H. Sydow, No. 670; Jan. 4, 1938.

DISTRIBUTION: Known only from the type locality.

NOTE: Although Dr. Sydow sent me some of his Ecuador collections, I did not

get to study *C. oyedaeae.* Fortunately Dr. Sydow is accurate in his descriptions of Cercosporae, and mentions sufficient characters so that the fungus may be recognized without having had the type for comparison. According to this description the fungus is a Didymaria.

**Cercospora pachypus** Ellis & Kellerman

Jour. Mycol. 3: 104. 1887

Leaf spots indefinite; fruiting in small olivaceous effuse patches on lower leaf surface, 1-4 mm. in extent; stromata none or a few brown cells; fascicles 2-12 stalks; conidiophores medium to dark brown, uniform in color, very irregular in

Fig. 60
*C. pachypus*

Fig. 61
*C. palustrium*

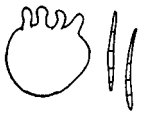


Fig. 62
*C. parthenii*

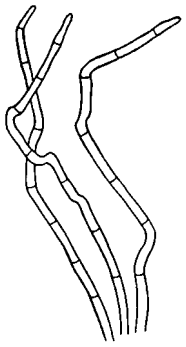


Fig. 63
*C. partheniphila*

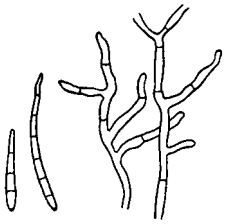


Fig. 64
*C. perfoliata*

width, crooked or tortuous, septate, not branched, rarely 1-2 geniculate, small spore scar at narrowly rounded tip, 5-7 x 10-45$\mu$, basal cell may be 10$\mu$ wide; conidia pale olivaceous, cylindric to cylindro-obclavate, mostly 1 septate, straight to slightly curved, base rounded to subtruncate, tip blunt, 5-7 x 25-70$\mu$.

HOST: *Helianthus annuus* L. (*H. lenticularis* Dougl.), *H. petiolaris* Nutt.

TYPE: Manhattan, Kansas; *Helianthus annuus;* W. T. Swingle; Aug. 20, 1887 (really dated 1888).

DISTRIBUTION: Kansas, Texas, Oklahoma, Alabama.

NOTE: This differs from *C. helianthi,* in having wide, irregularly shaped conidiophores, and short cylindric, pale conidia. Since the conidiophores of both species are dark in color, the two may be confused at first glance, but the obclavate rather dark colored long conidia of *C. helianthi* readily distinguish the two fungi. *C. helianthicola* has hyaline, acicular conidia. The reason *C. pachypus* with mostly 1-septate conidia is classed as a Cercospora is the fact that many conidia are more than 50$\mu$ in length. See key, page 140.

**Cercospora palustrium** sp. nov.

Maculae orbiculares, 1-4 mm. diam., purpureae vel fuscae, centro griseae; caespituli amphigeni; stromata globosa, atro-fusca, 20-50$\mu$ diam.; conidiophora fere densiuscule fasciculata, pallide brunnea vel atro-brunnea, vix septata, simplicia, ad apicem subtruncata, 3-4 x 10-40$\mu$; conidia subhyalina vel pallidissime olivacea, cylindracea, fere recta, ad basim subtruncata, ad apicem obtuse rotundata, 1.5-3 x 15-60$\mu$.

Leaf spots circular, 1-4 mm. in diameter, gray center, purplish to brown border; fruiting amphigenous; stromata globular, dark brown, 20-50$\mu$ in diameter; fascicles mostly dense; conidiophores pale to medium dark brown, paler and more narrow toward the tip, sparingly septate, not branched, rarely geniculate, small to medium spore scar at the subtruncate tip, 3-4 x 10-40$\mu$; conidia subhyaline to very pale olivaceous, cylindric, nearly straight, 1-5 septate, base subtruncate, tip blunt, 1.5-3 x 15-60$\mu$.

HOST: *Baccharis glomeruliflora* Pers.

TYPE: Devonshire Marsh, Bermuda; *Baccharis glomeruliflora;* H. H. Whetzel, No. 167; March 14, 1922.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. bomplandiana* for differences between the two species on this host genus.

**Cercospora parthenii** Chupp

Monogr. Univ. Puerto Rico B. 2: 250. 1934

Leaf spots irregular, 1-6 mm. in length, varying shades of brown, mostly without a definite margin; fruiting amphigenous; stromata very pale olivaceous brown, 15-40$\mu$ in diameter; fascicles sometimes dense; conidiophores so short as to be almost obsolete, very pale brown, a few as large as 3-4 x 10-25$\mu$, not branched, not septate, not geniculate, no spore scar visible at the colorless narrow tip; conidia hyaline, obclavate to almost cylindric, straight to slightly curved, indistinctly multiseptate, base obconic, subobtuse tip, 2-3.5 x 20-70$\mu$.

HOST: *Parthenium hysterophorus* L.

TYPE: Public Square, Antimano, Miranda, Venezuela; *Parthenium hysterophorus;* C. E. Chardon & R. A. Toro, No. 269; June 25, 1932.

DISTRIBUTION: Known from Venezuela where several collections were made, Bermuda, and from San Domingo.

NOTE: A collection on the same host was made in San Domingo and at first labeled *C. parthenii.* It has since been named *C. partheniphila.*

**Cercospora partheniphila** Chupp & Greene

Amer. Midland Nat. 34: 269. 1945

Leaf spots irregular, small or sometimes including the whole of a large leaf lobe, varying shades of brown, occasionally with a yellow halo; fruiting amphigenous; stromata small, brown; fascicles 2-12 stalks; conidiophores pale to medium brown, slightly paler and more narrow toward the tip, multiseptate, not branched, longest ones 1-3 geniculate or otherwise crooked, medium spore scar at the subtruncate tip, 3-5 x 20-100$\mu$, or even as long as 250$\mu$; conidia hyaline, acicular, curved or undulate, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 40-175$\mu$.

HOSTS: *Parthenium hysterophorus* L., *P. integrifolium* L.

TYPE: Madison, Wisc.; *Parthenium integrifolium;* H. C. Greene; Sept. 20, 1944.

DISTRIBUTION: San Domingo, Wisconsin.

NOTE: See also *C. parthenii* for differences between the two species on this host genus.

**Cercospora perfoliata** Ellis & Everhart

Jour. Mycol. 5: 71. 1889

*Cercospora agerati* Stevens (No. 944), Bern. P. Bishop Mus. Bul. 19: 154. 1925.

Leaf spots indefinite, finally becoming slightly yellowish on upper surface; fruiting on corresponding lower surface, indistinctly effuse, gray to olivaceous; stromata lacking; mostly nonfasciculate; conidiophores single branches from procumbent threads over leaf surface on leaf hairs, subhyaline to pale olivaceous or olivaceous brown, septate, not geniculate, spore scars indistinct or none, 3-5 x 10-70$\mu$; conidia cylindric, hyaline to very pale brownish in color, catenulate, straight, 1-4 septate, base obconic to rounded, tip obtuse, 2.5-5 x 20-50$\mu$.

HOSTS: *Eupatorium* (Ageratum) *perfoliatum* L., *E. repandum* Willd., *Ageratum conyzoides* L. (*E. conyzoides* E. H. L. Kr.), *E. purpureum* L. (*E. urticifolium* Reich.) *E. ageratoides* L.

TYPES: Cranes Woods, Wisc.; *Eupatorium perfoliatum;* J. J. Davis, No. 64; Sept. 12, 1888; (*C. Agerati,* No. 944) Kealakekua, Hawaii; *Eupatorium repandum;* F. L. Stevens, No. 944; July 23, 1921.

DISTRIBUTION: Material studied came from Hawaii, Puerto Rico, and Wisconsin, Illinois, Michigan.

NOTE: The effuse fruiting and the pale colored conidiophores and conidia, which are cylindric, separate this species from the others on Eupatorium. Solheim and Stevens (Mycologia **23**: 402. 1931) gave the name, *Ragnhildiana agerati,* to the Stevens' collection because of the catenulate conidia. Stevens had Numbers 750 and 944 of *C. agerati.* The two collections are entirely distinct. Collection 944 is a synonym of *C. perfoliata.* See key, page 118.

**Cercospora plucheae** Petrak & Ciferri
Ann. Mycol. **28**: 419. 1930

Leaf spots circular to irregular, sometimes including a large area of the leaf, brown, occasionally with yellowish margin on the upper surface; fruiting amphigenous; stromata pale brown, globular, 10-30$\mu$ in diameter; fascicles 15-40 stalks, at times almost coremoid; conidiophores pale to medium olivaceous brown,

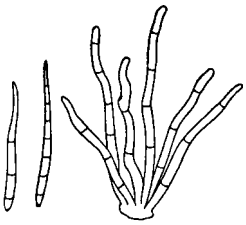


Fig. 65
*C. plucheae*

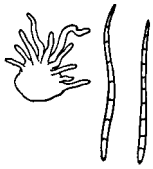


Fig. 66
*C. plunkettii*

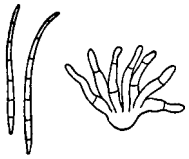


Fig. 67
*C. polymniae*

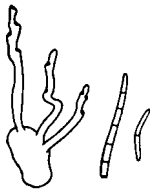


Fig. 68
*C. porophylli*

uniform in color and width, or sometimes slightly clavate, straight or mildly curved, indistinctly multiseptate, not branched, not geniculate, a medium spore scar at the conically truncate tip, 3-5.5 x 40-110$\mu$; conidia pale to medium olivaceous, obclavato-cylindric, straight to slightly curved, 3-11 septate, base subtruncate to long obconically truncate, tip obtuse, 4-5.5 x 30-120$\mu$.

HOSTS: *Pluchea odorata* Cass., *P. purpurascens* (Sw.) DC.

TYPE: Mao, Santiago Prov., San Domingo; *Pluchea odorata;* R. Ciferri, No. 2254; May, 1929.

DISTRIBUTION: San Domingo, Bermuda, Mona, and Venezuela.

**Cercospora plunkettii** sp. nov.

Leaf spots subcircular to irregular, 4-12 mm. in diameter, dark brown to black, sometimes with a narrow line margin; fruiting amphigenous; stromata dark brown, 20-40$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, uniform in color, attenuated, not septate, not branched, rarely once mildly geniculate, minute spore scar at small rounded tip, 2.5-4 x 10-30$\mu$; conidia subhyaline to very pale olivaceous, obclavate to cylindric, when the latter sometimes catenulate, straight to slightly curved, indistinctly multiseptate, base medium to long obconically truncate, tip rarely acute, mostly obtuse, 2-3.5 x 40-150$\mu$.

Maculae amphigenae, rotundae vel angulatae, 4-12 mm. diam.; atro-brunneae vel atrae, in epiphyllo interdum linea obscuriore limitatae; caespituli amphigeni; stromatica atro-brunnea, globosa, 20-40$\mu$ diam.; conidiophora totam hypostromatis superficiem dense obtegentia, pallide olivaceo-brunnea, attenuata, continua, simplicia, raro geniculata, 2.5-4 x 10-30$\mu$; conidia subhyalina vel pallidissime chlorinuta, obclavata vel cylindracea, vix catenulata, recta vel subrecta, spurie multiseptata, ad basim subtruncata, ad apicem plerumque obtusa, 2-3.5 x 40-150$\mu$.

HOST: *Mikania cordifolia* (L.F.) Willd.

TYPE: Jalapa, Vera Cruz, Mexico; *Mikania cordifolia;* O. A. Plunkett; July 18, 1932.

DISTRIBUTION: Known only from the type locality.

NOTE: Definite leaf spots, short conidiophores and narrow conidia separate this species from the others on Mikania.

CERCOSPORAE ON MIKANIA

A. Conidia hyaline, acicular, 1.5-3 x 35-150$\mu$; conidiophores 3-5 x 35-150$\mu$.
*C. viegasii* 1945

AA. Conidia colored, not acicular.

B. Leaf spots indefinite; fruiting effuse on lower leaf surface; conidiophores closely and plainly septate, dark brown; conidia 4.5-8 x 25-85$\mu$.
*C. mikaniae* E. and E. 1891
(*C. lemnischea* Cif. 1938)

BB. Leaf spots definite; fruiting not effuse; conidiophores not closely and plainly septate, pale to medium in color.

C. Conidiophores 10-30$\mu$ in length, rarely geniculate, pale colored; conidia 2-3.5 x 40-150$\mu$. *C. plunkettii*

CC. Conidiophores 75-150$\mu$ in length, repeatedly geniculate, medium brown; conidia 4-5.5 x 30-70$\mu$.
*C. mikaniacola* Stevens 1917

**Cercospora polymniae** sp. nov.

Maculae angulatae, 4-12 mm. diam., griseae vel pallidissime brunneae; caespituli amphigeni; stromata fere deficiens, interdum 15-40$\mu$, atro fuscae; conidiophora unica vel fasciculata, pallide olivaceo-brunnea, vix septata, 2-5 x 5-20$\mu$; conidia pallidissime obclavata, recta vel leniter curvata, spurie multiseptata, utrimque acuta, 2.5-4 x 20-110$\mu$.

Leaf spots large, angular, 4-12 mm. in diameter, gray to tan, sometimes with tan to yellowish brown margin; fruiting amphigenous; stromata none or 15-40$\mu$ in diameter, dark brown, globular; conidiophores short branches borne singly on

procumbent threads or in dense fascicles on the stromata, pale olivaceous brown, paler tip, irregular in width, rarely septate, not geniculate, not branched when fasciculate, minute spore scar at the bluntly rounded tip, 2-5 x 5-20$\mu$; conidia very pale olivaceous, obclavate, straight to slightly curved, indistinctly multiseptate, base long obconic, tip conic to obtuse, 2.5-4 x 20-110$\mu$.

HOST: Polymnia sp.

TYPE: Guateque (Boyacá) Colombia; Polymnia sp.; R. Obregon & G. Quintana, No. 620; Oct. 24, 1940.

DISTRIBUTION: Known only from the type locality.

**Cercospora porophylli** Stevens & Moore

Ill. Biol. Monogr. **11**: 58. 1927

Leaf spots circular to angular, more or less vein-limited, 1.5-6 mm. in diameter, pale brown to dingy gray, somewhat olivaceous on lower surface, bordered by a narrow raised ridge and a black or dark wine-colored zone; fruiting amphigenous; stromata lacking or only a few pale brown cells; fascicles not dense, 1-10 stalks; conidiophores pale olivaceous brown, uniform in color, slightly attenuated, multiseptate, rarely branched, sometimes 1-3 abruptly geniculate, medium spore scar at rounded to subtruncate tip, 3-5.5 x 30-120$\mu$; conidia obclavate (shorter ones cylindric), subhyaline to almost distinctly colored, straight to slightly curved, base subtruncate to long obconically truncate, tip subobtuse, 1-7 mostly 1-3 septate, 2-4.5 x 20-70$\mu$.

HOST: *Porophyllum ruderale* (L.) Cass.

TYPE: Siquirres, Costa Rica; *Porophyllum ruderale;* F. L. Stevens, No. 554; July 18, 1923.

DISTRIBUTION: Known only from the type locality.

**Cercospora prenanthis** Ellis & Kellerman

Jour. Mycol. **3**: 104. 1887

*Cercospora brunnea* Peck, Bul. Torrey Bot. Club **36**: 156. 1909

Leaf spots indefinite, slight yellowing or browning on upper surface; fruiting in indistinctly effuse, dark brown to olivaceous angular patches on lower leaf surface, 2-6 mm. in extent or coalescing into large areas; stromata lacking or dark reddish brown, globular, 20-40$\mu$ in diameter; nonfasciculate to dense fas-

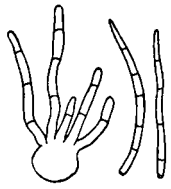


Fig. 69
*C. prenanthis*

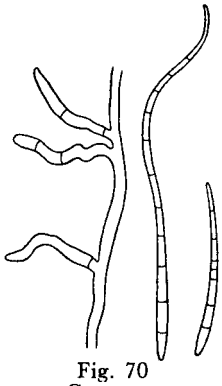


Fig. 70
*C. quarta*

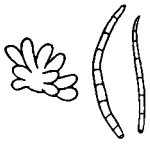


Fig. 71
*C. ratibidae*

Fig. 72
*C. rhagadioli*

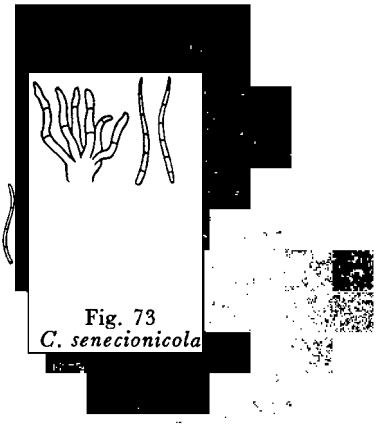


Fig. 73
*C. senecionicola*

cicles; conidiophores borne singly on procumbent threads or arising from the stroma, medium to dark brown, uniform in color, multiseptate, irregular in width or constricted at septa, mostly tortuous or multigeniculate, branched, small spore scar at tip narrowed by bevel on one side, 4-6 x 30-150$\mu$; conidia pale olivaceous, cylindro-obclavate, 1-5 septate, straight to curved, base rounded to obconically truncate, tip subobtuse, 3.5-5 x 25-100$\mu$.

HOSTS: *Prenanthes aspera* Michx., *P. alba* L., *P. altissima* L. (*Nabalus altissimus* Hook), *P. crepidinea* Michx., Prenanthes sp.

TYPES: Manhattan, Kansas; *Prenanthes aspera;* Kellerman & Swingle, No. 1054; Aug. 1887; (*C. brunnea*) Rogers, Arkansas; *Nabalus altissimus;* E. Bartholomew, No. 3936; Sept. 23, 1908.

DISTRIBUTION: Material studied came from Arkansas, Kansas, Alabama, Wisconsin and North Carolina.

NOTE: Peck states that his species differs from *C. prenanthis* in its brown hyphae and septate spores. Furthermore, Ellis says that the conidiophores of *C. prenanthis* are only 25-35$\mu$ long. The type material shows them to be alike. Davis (Wisc. Acad. Trans. 21: 289. 1924) reports *C. racemosa* on *Prenanthes alba.* His description fits *C. prenanthis* fairly closely, and probably is the latter species.

**Cercospora quarta** Chupp & Greene

Amer. Midland Nat. 34: 269. 1945

Leaf spots none or indistinct yellowing on the upper surface; fruiting hypophyllous, scantily effuse, sooty or sometimes almost indistinguishable from the dark green leaf surface, in minute patches to large areas; stromata lacking; nonfasciculate; conidiophores arising as single branches from procumbent threads, pale to very pale olivaceous brown or fuligenous, 0-5 septate, rarely geniculate, irregular in width, curved to tortuous, tip rounded to conic, 2.5-4 x 10-60$\mu$; conidia subhyaline to pale olivaceous, narrowly obclavate, straight to mildly curved, indistinctly multiseptate, base obconically truncate, tip acute, 2-4 x 45-150$\mu$.

HOST: *Aster umbellatus* Mill.

TYPE: Madison, Wisc.; *Aster umbellatus;* H. C. Greene; Aug. 15, 1944.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 122 for differences among the species on Aster.

**Cercospora rafinesquiae** Harkness

Cal. Acad. Sci. Bul. 1: 39. 1884

Leaf spots none or sometimes indistinct darkening of portions of upper surface; on corresponding lower surface a close stippling of minute black fruit bodies, a mixture of dark to black stromata, 25-75$\mu$ in diameter, and pycnidia or perithecia; fascicles dense; conidiophores medium dark brown, rarely septate, not geniculate, not branched, small spore scar at subconic tip, 4-5.5 x 5-25$\mu$; conidia medium dark olivaceous, cylindric, one septate, sometimes wider near ends than in center, base rounded to short obconic, tip obtuse, 5-6.5 x 15-40$\mu$.

HOST: *Rafinesquia californica* Nutt.

TYPE: Golden Gate Park, San Francisco, Cal.; *Rafinesquia californica;* H. W. Harkness, No. 2603; May.

DISTRIBUTION: Known only from the type locality.

NOTE: This is not a Cercospora. It resembles Coryneum as closely as any of the named genera.

**Cercospora ratibidae** Ellis & Bartholomew
Jour. Mycol. 8: 177. 1902

Leaf spots circular, 0.5-4 mm. in diameter, dingy gray center, pale brown margin; fruiting amphigenous but mostly on upper surface; stromata lacking or a few brown cells; fascicles mostly 2-7 stalks, rarely dense; conidiophores olivaceous brown, medium dark at base, pale tip, straight to once abruptly geniculate, sparingly septate, not branched, slightly attenuated, medium spore scar at subtruncate to rounded tip, 4-6 x 20-100$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip of longer ones acute, 3.5-5 x 40-120$\mu$.

HOSTS: *Lepachys* (Ratibida) *columnaris* (Sims) Torr. & Gray, *L. pinnatifida* Rafin. (*L. pinnata* (Vent) Torr. & Gray)

TYPE: Rooks Co., Kansas; *Ratibida columnaris* Rafin.; E. B. Bartholomew, No. 2976; July 19, 1902 (Cotype distributed as Fungi Columbiani No. 1713).

DISTRIBUTION: Material studied was collected in Kansas and Wisconsin.

NOTE: Before the description was published, Bartholomew (No. 2976) placed the type collection in various herbaria, under the name, *C. lepachydis* E.+B.

**Cercospora reticulata** Peck
N. Y. State Mus. Ann. Rept. 34: 47. 1881

HOST: *Solidago rugosa* Mill. (*S. altissima* T. + G.)

TYPE: Catskill Mts., N. Y.; *Solidago altissima;* C. H. Peck; Aug. 1880.

NOTE: Peck described this as *Cercosporella reticulata,* saying the condiophores were nearly colorless. Then Ellis and Everhart (Jour. Myc. 1: 61. 1885), without mentioning that it had been described as a Cercosporella, published it as *Cercospora reticulata* Peck. The type indicates that Peck's classification was correct.

{*Cercospora nivea* Ellis and Bartholomew
{*Cercosporella nivea* Ellis and Bartholomew
On *Solidago radula* Nutt.

This bracketed listing is made in Seymour's "Host Index" p. 648, 1929. The two authors really described it only as *Cercosporella nivea* with hyaline conidiophores (Erythea 4: 82. 1896). It may be identical with Peck's species above. Ellis states that outwardly it resembles *Cercosporella cana.*

**Cercospora rhagadioli** Bubák
Bul. L'Herb. Boissier, II. 6: 487. 1906

Leaf spots subcircular, 3-8 mm. in diameter, dark brown, frequently zonate; fruiting amphigenous; stromata a few large, pale brown cells; fascicles 2-20 stalks; conidiophores pale brown, paler and more narrow toward the tip, not septate, not branched, straight to tortuous or 1-3 closely geniculate, medium spore scar at the subtruncate tip, 3-5 x 5-30$\mu$, bulging base may be 6.5$\mu$ in width; conidia hyaline, cylindro-obclavate or the very longest ones distinctly acicular, straight to curved, indistinctly septate, base truncate, tip subobtuse or rarely acute, 1.5-3 x 15-65$\mu$, when acicular up to 90$\mu$ in length.

HOST: *Rhagadiolus edulis* Gaertn. (*Rh. stellatus* Gaertn.)

TYPE: Near Rijeka, Montenegro; *Rhagadiolus stellatus;* F. Bubák; April 10, 1905.

DISTRIBUTION: Known only from the type locality.

NOTE: Bubák's types now are in the Brooklyn Botanical Garden Herbarium.

**Cercospora senecionicola** J. J. Davis

Trans. Wisc. Acad. Sci., Arts & Letters. **30**: 10. 1937

Leaf spots indefinite; fruiting in scantily effuse brownish areas on lower leaf surface, 3-4 mm. in extent (on *S. balsamitae* fruiting epiphyllous, on definite spots); stromata slight, mostly in stomatal openings; fascicles mostly dense; conidiophores pale olivaceous brown, slightly paler and more narrow toward the tip, septate, branched, not geniculate, undulate to tortuous, small spore scar at narrowly rounded tip, 4-5 x 15-55$\mu$; conidia hyaline, acicular to obclavate, straight to much curved, septa indistinct, base truncate to subtruncate, tip acute, 2-3.5 x 30-80$\mu$.

HOSTS: *Senecio aureus* L., *S. aureus* var. *balsamitae* Torr. & Gray.
TYPE: Coon Valley, Wisconsin; *Senecio aureus;* J. J. Davis; Aug. 13, 1932.
DISTRIBUTION: Wisconsin.
NOTE: Some of this material was handed me by Mr. Davis with the remark that the first such material was collected about 1912, and I believe is now in the Wisconsin herbarium under the name *C. emaculata.* See also *C. jacquiniana* for the differences between the two species on Senecio.

**Cercospora siegesbeckiae** Katsuki

Bul. Agr. Impr. Sect. Econ. Dept. Fukuoka Pref. Japan **1**: 22. 1949

Leaf spots irregular to subcircular, often vein-limited, sometimes confluent and including the entire leaf, dark brown, finally grayish brown center; fruiting hypophyllous, sparse; fascicles 2-3 spreading stalks; conidiophores olivaceous brown, straight, cylindric, not branched, 0-3 geniculate, 3-4 septate, tip subtruncate, 4-5 x 91-140$\mu$; conidia hyaline, acicular, straight to mildly curved, 5-11 septate, base truncate, tip slightly narrowed to acute, 3-4 x 50-300$\mu$.

HOST: *Siegesbeckia pubescens* Makino
TYPE: Pref. Fukuoka, Japan; *Siegesbeckia pubescens;* S. Katsuki; Oct. 23, 1931.
DISTRIBUTION: Japan
NOTE: See also *C. sugimotoana.*

**Cercospora silphii** Ellis & Everhart

Jour. Mycol. **4**: 3. 1888

*Cercospora silphii* var. *laciniati* Tehon & Daniels, Mycologia **19**: 128. 1927

Leaf spots angular, 0.5-8 mm. in diameter, tan or various shades of brown to almost black, often stippling the entire leaflet, rarely large dull brown spots are formed; fruiting amphigenous; stromata dark brown to black, filling stomatal

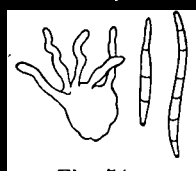


Fig. 74
*C. silphii*

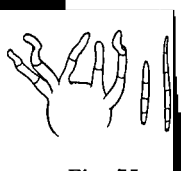


Fig. 75
*C. solidaginis*

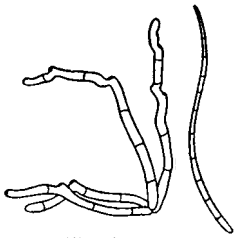


Fig. 76
*C. sonchi*

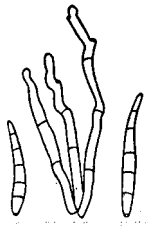


Fig. 77
*C. stomatica*

openings or up to 50$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous or olivaceous brown, uniform in color, shortest ones may be attenuated, longest ones variously curved or bent, septation, geniculation, spore scars and branching not evident, bluntly rounded tip, 3.5-5 x 10-55$\mu$; conidia cylindro-obclavate, subhyaline to pale olivaceous, straight to slightly curved, indistinctly multiseptate, base long obconically truncate, tip obtuse, 2.5-5 x 20-90$\mu$.

HOSTS: *Silphium integrifolium* Michx., *S. laciniatum* L., *S. terebinthinaceum* Jacq., *S. compositum* Michx.

TYPES: Manhattan, Kansas; *Silphium integrifolium;* W. T. Swingle, No. 1035; July, 1887; (var. *laciniati*) Bement, Piatt Co., Illinois; *S. laciniatum;* L. R. Tehon, No. 15262; July 6, 1925.

DISTRIBUTION: Studied material from Kansas, Illinois, Wisconsin, Alabama, and Mississippi. Also reported from West Virginia.

NOTE: Also spelled *C. sylphii.*

**Cercospora solidaginis** Chupp & Greene

Trans. Wisc. Acad. Sci., Arts & Letters **36**: 267. 1946

Leaf spots none; fruiting effuse, olivaceous, amphigenous, in numerous minute patches 0.5-2 mm. in extent; stromata lacking; nonfasciculate to dense compact fascicles; conidiophores medium to dark brown, uniform in color, somewhat irregular in width, 0-7 septate, when nonfasciculate arising as branches from procumbent threads, rarely geniculate, variously curved or bent, tip conic to obtuse, 3-5.5 x 10-50$\mu$; conidia pale to very pale olivaceous, longest ones obclavato-cylindric, shorter ones distinctly cylindric, straight to mildly curved, ends rounded bluntly or base short obconically truncate, 1-7 septate, 2.5-5 x 15-50$\mu$.

HOST: *Solidago juncea* Ait., *S. missouriensis* Nutt. var. *fasciculata, S. canadensis* L.

TYPE: Madison, Dane Co., Wisc.; *Solidago juncea;* H. C. Greene; Aug. 18, 1943.

DISTRIBUTION: Several places in Wisconsin; Japan.

NOTE: *C. stomatica,* the other species on Solidago, has wider conidia, nearly obclavate, and relatively long, wide conidiophores. It also has distinct leaf spots. In the New York Botanical Garden herbarium is a specimen labeled *C. solidaginis* E. & M. Ellis wrote on the packet: "= *C. cana*" Sacc. It is not a Cercospora, and apparently never was described as one.

**Cercospora sonchi** sp. nov.

Maculae suborbiculares vel irregulares, 2-6 mm. diam., obscure griseae, interdum zonula purpurea cinctae; caespituli amphigeni; stromata minuta; conidiophora laxe fasciculata, pallide brunnea, superne saepe palliodora et attenuata, simplicia, 1-5 septata, recta vel curvata, ad apicem subtruncata, 4-5.5 x 30-120$\mu$; conidia hyalina, anguste obclavata, spurie multiseptata, recta vel magnopere curvata, ad basim truncata, ad apicem acuta, 2-3.5 x 50-200$\mu$.

Leaf spots subcircular to irregular, 2-6 mm. in diameter, dingy gray, sometimes with reddish to purple border; fruiting amphigenous but chiefly epiphyllous; stromata slight, mostly a few brown cells; fascicles 2-15 spreading stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, 1-5 septate, not branched, straight to curved, 0-3 abrupt geniculations, apex subtruncate and with medium sized spore scar, 4-5.5 x 30-120$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to strongly curved, base truncate, tip acute, 2-3.5 x 50-200$\mu$.

HOST: *Sonchus oleraceus* L.
TYPE: Arlington Farm, Virginia; *Sonchus oleraceus;* Dewey Stewart; Oct. 5, 1934.
DISTRIBUTION: Known only from the type locality.

**Cercospora stomatica** Ellis & Davis

Proc. Acad. Nat. Sci. Phila. **47**: 438. 1895

*Cercospora parvimaculans* Davis, Wisc. Acad. Trans. **24**: 300. 1929

Leaf spots angular to irregular, 2-5 mm. in diameter or coalescing into large areas, dark brown to almost black, sometimes with a small white center and yellow or purple halo; fruiting amphigenous, but chiefly hypophyllous; stromata lacking or a few dark brown cells; fascicles 2-14 divergent stalks, conidiophores pale to medium brown or olivaceous brown, uniform in color, sometimes slightly attenuated, 1-7 septate, not branched, straight to tortuous or abruptly geniculate, small spore scar at subconic tip, 4.5-7 x 20-80$\mu$, rarely 180$\mu$; conidia subhyaline to pale olivaceous, distinctly obclavate to obclavato-cylindric, straight to mildly curved, multiseptate, base subtruncate or rounded to long obconically truncate, tip obtuse, 4.5-6 x 40-180$\mu$.

HOSTS: *Solidago confinis* Gray, *S. latifolia* L., *S. riddellii* Frank, *S. rigida* L., *S. rugosa* Mill. (*S. altissima* T. + G.), *S. serotina* Ait., *S. uliginosa* Nutt., Solidago sp.
TYPES: Somers, Wisc.; *Solidago latifolia;* J. J. Davis; June 24, 1894; (*C. parvimaculans*) Sauk City, Wisc.; *Solidago serotina;* J. J. Davis; Sept. 6, 1928.
DISTRIBUTION: Studied material from Wisconsin, California, and Brazil. Also reported from Iowa.
NOTE: Although three other species were recorded on Solidago, all of them apparently are Ramularia or Cercosporella. See also *C. solidaginis* for differences between the two species on this host genus. Clements (Cryptogamae Formationum Coloradensium No. 515) distributed to herbaria packets labeled *Cercospora stromatis* Clements, Sulfur Springs, Colorado, collected by F. E. and E. S. Clements on *Crepis acuminata* Nutt., July 23, 1907. So far as I know this was never described. It is not a Cercospora. It resembles a Fusicladium, excepting that it has hyaline conidia. Therefore, it here is classed as a Didymaria. The lesions of *C. stomatica* on some species of Solidago, like *S. serotina,* are numerous and small, while on others, like *S. latifolia,* they are few and relatively large.

**Cercospora sublateritia** P. Hennings

Fungi Ann. Mus. Congo (Bot.) V-A. Fasc. II. **2**: 104. 1907

Leaf spots lacking or indefinite yellowish spots on the upper leaf surface; fruiting minute, effuse, ferrugineous specks on the lower surface, 0.5-2.5 mm. in diameter; stromata none; nonfasciculate; conidiophores short thick upright branches from procumbent threads, pale to very pale ferrugineous or yellowish olivaceous, sparingly septate, rarely geniculate, one or more small spore scars at or near the bluntly rounded tips, 4-6 x 10-25$\mu$; conidia very pale ferrugineous, obclavate, straight to slightly curved, indistinctly multiseptate, base rounded to obconically truncate, tip subobtuse, 3-5 x 30-100$\mu$.

HOST: Vernonia sp.
TYPE: Congo-Sonso; Vernonia sp.; H. Vanderyst, No. 55; June 12, 1906.

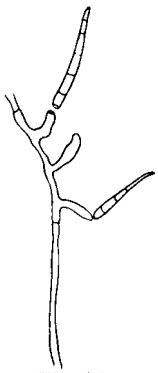


Fig. 78
*C. sublateritia*

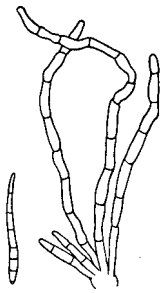


Fig. 79
*C. tabacina*

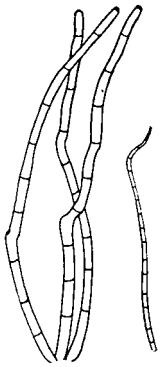


Fig. 80
*C. tageticola*

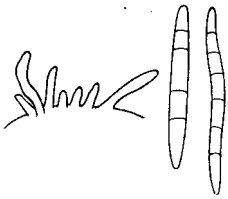


Fig. 81
*C. tertia*

DISTRIBUTION: Known only from the type locality.
NOTE: The species name is derived from the "brick-color." This color, together with wide short branches for conidiophores, separates this species from the others on this host genus. See key, page 131.

**Cercospora sugimotoana** Katsuki

Bul. Agr. Impr. Sect. Econ. Dept. Fukuoka Pref. Japan **1**: 23. 1949

Leaf spots angular, vein-limited, often confluent and occupying a large area of the leaf, fuligenous; fruiting hypophyllous, rarely densely effuse, grayish brown; stromata slight; fasciculate, 2-6 spreading stalks; conidiophores medium dark brown, paler and more narrow toward the rounded tip, straight to flexuous, not branched, not often geniculate, 2-7 septate, sometimes constricted at septa, 4-6 x 20-85$\mu$; conidia hyaline to subhyaline, clavato-cylindric, longest ones obclavate, straight to mildly curved, 2-6 septate, base long obconically truncate, tip slightly attenuated, 3-5 x 25-80$\mu$.
HOST: *Siegesbeckia glabrescens* Makino.
TYPE: Pref. Mt. Wakasugi, Fukuoka, Japan; *Siegesbeckia glabrescens;* S. Katsuki; Oct. 1, 1939.
DISTRIBUTION: Japan.
NOTE: See also *C. siegesbeckiae.*

**Cercospora tabacina** Ellis & Everhart

Jour. Mycol. **4**: 6. 1888

*Cercospora rudbeckiae* Peck, N. Y. State Mus. Bul. 131: 19. 1909

Leaf spots none or indefinite yellowish areas on upper surface; fruiting in dark olivaceous effuse angular patches on lower surface; stromata lacking or globular, dark brown, 15-30$\mu$ in diameter; nonfasciculate to dense fascicles; conidiophores medium dark brown, uniform in color, irregular in width, multiseptate, often constricted at septa, slightly branched, straight, sinuous, or 1-2 abruptly geniculate, small spore scar at conic tip, 4-6 x 30-150$\mu$; conidia cylindro-obclavate, pale olivaceous, straight to slightly curved, plainly multiseptate, base rounded to obconic, tip subobtuse, 4.5-6 x 30-75$\mu$.

HOSTS: *Rudbeckia hirta* L., *R. laciniata* L., *R. triloba* L., *R. purpurea* L. (*Echinacea purpurea* (L.) Moench.)
TYPES: Ames, Iowa; *Rudbeckia triloba;* A. S. Hitchcock; 1887; (*C. rudbeckiae*) Painted Post, N. Y.; *Rudbeckia laciniata;* C. H. Peck; Aug. 10.
DISTRIBUTION: Studied material from Iowa, Wisconsin, and New York. Reported also from Illinois.

**Cercospora tageticola** Ellis & Everhart
Jour. Mycol. 8: 72. 1902

Leaf spots indefinite; fruiting in black effuse patches on lower leaf surface; entire leaflet soon killed; stromata lacking or a few dark brown cells; conidiophores borne singly or in fascicles of 2-12, pale to medium brown, slightly paler and more narrow toward the tip, multiseptate, not branched, straight, curved or tortuous, rarely 1-2 abruptly geniculate, large spore scar at the subtruncate tip, 3.5-6 x 50-300$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute to subacute, 2-4 x 50-75-200$\mu$.
HOSTS: *Tagetes patula* L., Tagetes sp.
TYPE: Tuskegee, Ala.; *Tagetes patula;* G. W. Carver, No. 552; Sept. 1900.
DISTRIBUTION: Alabama and Sierra Leone. It has also been reported from Florida and possibly from Connecticut.

**Cercospora tertia** Chupp & Greene
Amer. Midland Nat. 34: 269. 1945

Leaf spots circular to elliptic, 0.5-2 mm. in length, on upper surface dark brown or with a rather prominent gray margin and minute brown center, on lower surface mostly dull brown; fruiting amphigenous; stromata subglobular, dark brown, from a few cells to 30$\mu$ in diameter; fascicles dense, compact; conidiophores pale to very pale olivaceous brown, in mass medium brown, paler and more narrow toward the tip, sparingly and indistinctly septate, not branched, not geniculate, straight to curved or undulate, narrowly rounded tip, 2-4 x 10-30$\mu$; conidia subhyaline to pale olivaceous, cylindric, straight to mildly curved, 1-6, mostly 3-septate, base obconic, tip obtuse, 2-4 x 15-40$\mu$.
HOST: *Aster ptarmicoides* Torr. & Gray.
TYPE: Madison, Wisc.; *Aster ptarmicoides;* H. C. Greene; Aug. 9, 1944.
DISTRIBUTION: Known only from the type locality.
NOTE: See key, page 123 for differences among the species on Aster. Since many of these conidia are 1-septate, the fungus could be considered also as Didymaria.

**Cercospora tithoniae** Baker and Dale
Mycol. Papers, C.-wealth Mycol. Inst. 33: 106. 1951

Leaf spots subcircular to irregular, 2-8 mm. in diameter, brown, with yellowish to orange margin; fruiting chiefly hypophyllous; stromata none or only a few brown cells; fascicles 2-8 diverging stalks; conidiophores pale olivaceous, uniform in color and width, usually straight, rarely septate, not geniculate, not branched, small spore scar at rounded to conic tip, 3-4 x 20-60$\mu$; conidia subhyaline to very pale olivaceous, obclavato-cylindric, 1-5 septate, occasionally catenulate, straight or very mildly curved, base obconically truncate, tip obtuse, 3-4 x 25-65$\mu$.
HOST: *Tithonia diversifolia* A. Gray.

Fig. 82
*C. tithoniae*

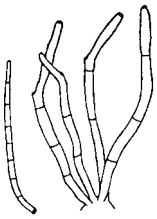


Fig. 83
*C. tragopogonis*

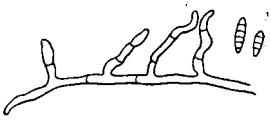


Fig. 84
*C. trichostemmatis*

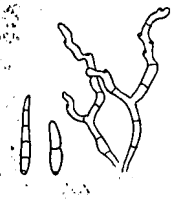


Fig. 85
*C. trifidae*

TYPE: Lopinot Valley, Trinidad; *Tithonia diversifolia;* W. T. Dale, No. 1727; Nov. 1, 1947.
DISTRIBUTION: Known only from the type locality.

**Cercospora tragopogonis** Ellis & Everhart
Bul. Torrey Bot. Club **24**: 474. 1897

Leaf spots circular to oval, 1-6 mm. in length, gray center, with brown to mouse-colored margin; fruiting amphigenous; stromata slight to 50$\mu$ in diameter, dark brown; most fascicles dense, sometimes almost coremoid; conidiophores pale to medium dark olivaceous brown, in mass dark, multiseptate, slightly paler and more narrow toward the tip, not branched, rarely or never geniculate, straight to slightly undulate, medium spore scar at subtruncate tip, 4-7 x 40-125$\mu$; conidia hyaline, acicular, variously curved, indistinctly multiseptate, base truncate, tip acute to subacute, 2-3.5 x 30-200$\mu$.

HOSTS: *Tragopogon porrifolius* L., *T. pratensis* L.
TYPE: Gardens, Emma, Mo.; *Tragopogon porrifolius;* C. H. Demetrio, No. 613; Sept. 22, 1897.
DISTRIBUTION: Missouri, Wisconsin, Montana, Oklahoma.

**Cercospora trichostemmatis** P. Hennings
Bot. Jahrb. von Engler **34**: 56. 1905

Leaf spots irregular in shape, bounded by the veins, small specks to large part of the leaf, yellowish white to almost pure white (resembling sulfur dioxide injury); fruiting plainly hypophyllous; stromata lacking; nonfasciculate; conidiophores short branches from procumbent threads, when threads are closely intertwined there may be pseudofascicles, pale olivaceous brown, uniform in color and width, variously curved or bent, septate, branched, rarely geniculate, minute spore scar at the rounded to conic tip, 4-5 x 10-45$\mu$; conidia cylindric, pale to very pale olivaceous brown, straight to mildly curved, 1-3 septate, sometimes constricted at septa, occasionally catenulate, base rounded to obconic, tip blunt, 4-5 x 15-30$\mu$.

HOST: *Trichostemma volkensii* Harms. = Wedelia.
TYPE: Ost-Usambara: in Schluchten between Anani and Kwamkoro, East Africa; *Trichostemma volkensii;* A. Engler, No. 806; Sept. 19, 1902.
DISTRIBUTION: Known only from the type locality.
NOTE: This species should be classed under Cladosporium. Saccardo (Syll. Fung. **18**: 605) spells the species *C. trichostematis* and the host genus, Trichostema. This would place the host in the Labiatae. I could not find the host

species listed in Kewensis or any other available literature. I placed it in the Compositae because Hennings uses the "mm" both in his publication and on the type at Berlin. Furthermore such Compositae are often listed as being present in Africa, while similar Labiatae are mostly in the Americas.

**Cercospora trifidae** Chupp

See H. C. Greene, The Amer. Midland Naturalist **41**: 725. 1949

*Cercospora racemosa* var. *ambrosiae* Seymour & Earle, Econ. Fung. 294a

*Cercospora ferruginea* var. *ambrosiae* (S. & E.) Davis, *In* Parasitic Fungi of Wisconsin, p. 124. 1942

Leaf spots none to indistinct yellowish or brownish areas on upper leaf surface; fruiting in effuse ferrugineous patches on corresponding lower leaf surface, 1-3 mm. in extent; stromata lacking; nonfasciculate; conidiophores short branches from procumbent threads, septate, pale to medium yellowish brown, irregular in width, rarely once geniculate, small spore scar at bluntly rounded tip, 4-6 x 10-40$\mu$; conidia cylindric, subhyaline to pale olivaceous, 1-8 septate, may be constricted at septa, mostly straight, sometimes catenulate, base rounded to medium obconically truncate, tip bluntly rounded, 3-5.5 x 15-65$\mu$.

HOST: *Ambrosia artemisiaefolia* L., *A. psilostachya* DC., *A. trifida* Linn.

TYPE: New Brunswick, New Jersey; *Ambrosia trifida;* B. D. Halsted.

DISTRIBUTION: Studied material from Georgia, New Jersey, Kansas, Missouri, Oklahoma, and Wisconsin. Also reported from Iowa and Delaware.

NOTE: Since this easily is differentiated from *C. racemosa* and occurs on a host in a different family, it is considered a distinct species. It differs almost as greatly also from *C. ferruginea.* See notes by J. J. Davis (Wisc. Acad. Trans. **24**: 274. 1929) and Gilman and Archer (Iowa State Coll. Jour. Sci. **3**: 321. 1929). See key, page 120 for differences among the species on Ambrosia.

**Cercospora umbrata** Ellis & Holway

Jour. Mycol. **2**: 2. 1886

*Cercospora umbrata* var. *maculata* Dearness, Mycologia **21**: 330. 1929

Leaf spots indefinite or occasionally definite, pale brown, 4-5 mm. in diameter; fruiting in effuse olivaceous to almost black patches, mostly hypophyllous; stromata lacking; conidiophores borne singly or in fascicles of 2-15, pale to medium dark brown, uniform in color and width, multiseptate, not branched, slightly un-

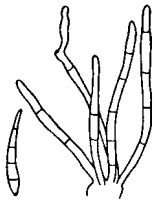


Fig. 86
*C. umbrata*

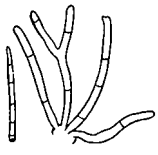


Fig. 87
*C. vernoniae*

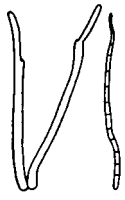


Fig. 88
*C. viegasii*

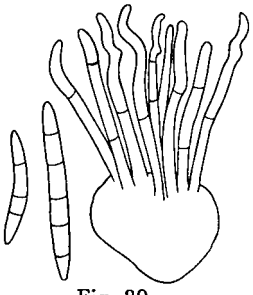


Fig. 89
*C. viminei*

dulate or 1-3 geniculate, small spore scar at conic tip, 3-5 x 40-200$\mu$; conidia pale to medium dark olivaceous brown, obclavate to cylindro-obclavate, shortest ones

almost wedge shaped, straight or slightly curved, 1-5 septate, base short obconic, tip subobtuse, 3-5 x 20-80$\mu$.

HOSTS: *Bidens connata* Muhl., *B. frondosa* L., *B. laevis* (L.) B.S.P., *B. vulgata* Greene, Bidens sp.

TYPES: Decorah, Iowa; Bidens sp.; E. W. D. Holway; Aug., 1885; (var. *maculata*) London, Ontario; *Bidens laevis;* John Dearness, No. 5370; Sept. 13, 1923.

DISTRIBUTION: From the eastern coast westward to Manitoba, and as far south as Kansas. It has also been reported from Mississippi.

NOTE: This differs from *C. megalopotamica* Speg., the other species with colored conidia on Bidens by having longer, wider conidiophores, more narrow, shorter conidia, and not having black fruiting pustules. Bartholomew collected a Cercospora on *Bidens connata* and distributed it to several herbaria under the name, *C. nubecula* Ellis & Barth. It is identical with *C. umbrata.* See key, page 122.

**Cercospora vernoniae** Ellis & Kellerman

Amer. Nat. 17: 1166. 1883

Leaf spots circular to irregular, 1-6 mm. in diameter, minute gray center, then a zone of black bordered by a narrow band of purple; fruiting epiphyllous in gray area; stromata a few brown cells to 50$\mu$ in diameter; most fascicles dense; conidiophores pale to medium dark brown, often with bulbous base and much attenuated toward the tip, not septate, not geniculate, not branched, minute spore scar at narrowly rounded or conic tip, 3-6 x 5-40$\mu$; conidia hyaline to subhyaline, straight, narrowly obclavate, indistinctly multiseptate, base subtruncate to long obconically truncate, tip acute to subacute, 2-4 x 25-100$\mu$, resembling somewhat needle-like crystals.

HOSTS: *Vernonia angustifolia* Michx., *V. baldwinii* Torr., *V. fasciculata* Michx., *V. altissima* Nutt., *V. missurica* Raf.

TYPE: Kansas; *Vernonia baldwinii;* W. A. Kellerman, No. 422; Aug., 1883.

DISTRIBUTION: The Gulf States and the Mississippi and Ohio Valleys from Texas to Wisconsin and West Virginia.

NOTE: See key, page 131 for differences among the species on this host genus.

**Cercospora vicoae** Sydow

Ann. Crypt. Exot. 2 (3-4): 270. 1929

Leaf spots none or indefinite yellowish areas on the upper leaf surface; fruiting in effuse, olivaceous brown patches on the corresponding lower surface; fasciculate; conidiophores brown, septate, 50-100$\mu$ long; conidia subhyaline to very pale olivaceous brown, cylindric to cylindro-obclavate, 2-7 septate, 4-6 x 40-90$\mu$.

HOST: *Vicoa auriculata* Cass. (*Inula auriculata* Wall.)

TYPE: Dehra Dun, U. P. East Indies; *Vicoa auriculata;* E. J. Butler, No. 2350; Nov. 1903.

DISTRIBUTION: Known only from the type locality.

NOTE: Sydow in Berlin had almost no material of this species, and when I wrote to India, Padwick replied that they too did not have sufficient to divide with me; consequently I was unable to study the species.

**Cercospora viegasii** Chupp

Bol. da Soc. Brasil. de Agron. 8: 57. 1945

Leaf spots circular, 0.5-2 mm. in diameter, white center, dark reddish brown

margin; fruiting amphigenous; stromata lacking or only a few brown cells; fascicles 3-12 diverging stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, rarely branched, sparingly septate, straight or 1-2 geniculate, subtruncate tip, 3-5 x 35-150$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 1.5-3 x 35-150$\mu$.

HOST: *Mikania hirsutissima* DC.

TYPE: Campinas, Sao Paulo, Brazil; *Mikania hirsutissima;* A. P. Viégas, No. 3909; Nov. 3, 1941.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 154 for differences among the species on this host genus. The other species have colored, fairly wide conidia.

**Cercospora viminei** Tehon

Mycologia **16:** 141. 1924

Leaf spots circular to subcircular, pale tan, 3-8 mm. in diameter, immarginate; fruiting amphigenous; stromata few pale brown to hyaline cells, usually in stomatal opening; some fascicles dense; conidiophores at base very pale brown and tip hyaline, septa indistinct or none, rarely slightly geniculate, not branched, 2 or more minute spore scars at and near bluntly rounded tip, 3-5 x 10-65$\mu$; conidia hyaline, obclavato-cylindric, slightly curved, mostly 3-5 septate, base subtruncate to long obconic, tip obtuse to subobtuse, 3.5-6 x 20-65$\mu$.

HOST: *Aster vimineus* Lam.

TYPE: Waltonville, Illinois; *Aster vimineus;* P. A. Young, No. 2600; June 23, 1922.

DISTRIBUTION: Illinois and Wisconsin.

NOTE: This could just as well be listed as a Ramularia, for many of the fascicles are entirely hyaline. Halsted in 1893 collected a Cercospora on *Aster macrophylla* L. in New Jersey. This is distinct from the Tehon species, but not enough of the material is available to justify making a new species. See key, page 123 for differences among the species on this host genus.

**Cercospora virgaureae** Allescher

Fungi Austriaci, No. 1072

HOSTS: *Solidago virgaurea* L., *S. nemoralis* Ait., *S. randii* Brit.

NOTE: This was described by de Thumen (Oest. Bot. Zeit. 1876) and by Ellis (Jour. Mycol. **1:** 80. 1885) as *Ramularia virgaureae* Thüm. Since the longest conidia may be obclavate, Allescher (Hedwigia **34:** 286. 1895) listed it as *Cercosporella virgaureae* (Thuemen) Allescher. I am not sure where it first was considered a Cercospora, but it probably was Oudemans (Nederl. Kruidk. Archief III. **2:** 315. 1900) who recorded it as *Cercospora virgaureae.* von Höhnel (Centralbl. f. Bakt. etc. II. **60:** 24. 1924) and Lorrain A. Smith (Brit. Mycol. Soc. Trans. **5:** 156. 1915) also transfer *Cercospora virgaureae* to Cercosporella.

**Cercospora wisconsinensis** Chupp & Greene

Trans. Wisc. Acad. Sci., Arts, Letters **36:** 267. 1946

Leaf spots circular to subcircular, 3-6 mm. in diameter, gray to white center, wide purple border; fruiting epiphyllous; stromata a few large brown cells; fascicles 4-15 diverging stalks; conidiophores pale to medium olivaceous brown,

paler and more narrow toward the tip, sparingly septate, not branched, upper half undulate to 1-3 geniculate, medium spore scar at the subtruncate tip, 3.5-5

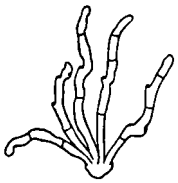


Fig. 90
*C. wisconsinensis*

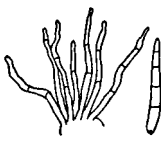


Fig. 91
*C. wulffiae*

Fig. 92
*C. xanthicola*

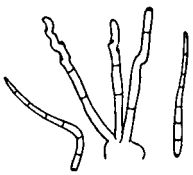


Fig. 93
*C. zinniae*

x 15-100$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip acute to subacute, 2.5-4 x 40-125$\mu$.

HOSTS: *Prenanthes alba* L., *P. racemosa* Michx.

TYPE: Eagleville, Waukesha Co., Wisc.; *Prenanthes alba;* H. C. Greene; Sept. 7, and Aug. 31, 1941.

DISTRIBUTION: Several collections from Wisconsin.

NOTE: See also *C. prenanthis* for differences between the two species on this host genus.

**Cercospora wulffiae** Muller & Chupp

Arch. Inst. Biol. Veget. Rio de Janeiro 3: 97. 1936

Leaf spots subcircular, 0.5-2 mm. in diameter, dirty gray with yellowish brown margin, (on Wedelia, larger and without the gray center); fruiting epiphyllous; stromata small, dark brown; fascicles dense, spreading to rather compact; conidiophores pale to very pale brown, paler and more narrow toward the tip, sparingly septate, sometimes branched, not geniculate, straight to variously curved, small spore scar at the rounded tip, 2.5-4 x 15-125$\mu$, or when conidia persist appearing as long as 200$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate, straight to curved, indistinctly septate, base long obconically truncate to subtruncate, tip blunt to conic, 2-3.5 x 35-100$\mu$.

HOSTS: Wulffia sp., Wedelia sp., (Trichostemma sp.)

TYPE: Coimbra, Minas Geraes, Brazil; Wulffia sp.; A. S. Muller, No. 774; Apr. 1934.

DISTRIBUTION: Brazil, San Domingo.

NOTE: A more detailed study may finally show that the two host genera do not have the same species; but at present they appear so nearly alike that they are considered identical.

**Cercospora xanthicola** Heald & Wolf

Mycologia 3: 20. 1911

Leaf spots circular to subcircular, 0.5-2 mm. in diameter, gray to grayish brown, darker brown margin; fruiting amphigenous; stromata lacking or a few brown cells; fascicles 2-12 stalks; conidiophores pale to medium dark olivaceous brown, slightly paler tip, fairly uniform in width, sparingly septate, not branched, straight, rarely once geniculate, medium spore scar at subtruncate tip, 4-5.5 x 40-150$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 40-200$\mu$.

HOST: Xanthium sp., *X. canadense* Mill.
TYPE: Georgetown, Texas; Xanthium sp.; Heald and Wolf, No. 2383; Aug. 27, 1909.
DISTRIBUTION: Known from the type locality. Also reported from Wisconsin.
NOTE: This resembles very closely the acicular species on Zinnia, Dahlia, Bidens, and Parthenium, so that all of them may be synonymous. Because of numerous slight morphologic differences they are considered distinct until some worker has the opportunity to make cross inoculations.

**Cercospora zinniae** Ellis & Martin
Jour. Mycol. **1**: 20. 1885

*Cercospora atricincta* Heald & Wolf, Mycologia **3**: 14. 1911

Leaf spots circular to irregular, 0.5-6 mm. in diameter, center white to gray, wide dull brown to red margin; fruiting amphigenous but more abundant on upper leaf surface; stromata lacking or a few dark brown cells; fascicles 2-20 divergent stalks; conidiophores pale to medium dark olivaceous brown, slightly paler and more narrow toward the tip, sometimes guttulate, sparingly septate, branched, straight to sinuous, one to numerous mild geniculations, usually 2-3 small spore scars at and near the tip, 4-6 x 10-120$\mu$, some collections show only short conidiophores; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute, 2-4 x 20-140$\mu$, some collections have only short conidia.

HOSTS: *Zinnia multiflora* L. (*Z. tenuiflora* Jacq.), *Z. pauciflora* L., *Z. elegans* Jacq. (*Crassina elegans* Kuntze), Zinnia sp. Possibly also on Coreopsis.
TYPES: Green Cove Springs, Fla.; *Zinnia multiflora;* Dr. Martin; Dec. 1, 1882; (*C. atricincta*) Victoria, Texas; *Crassina elegans;* Heald and Wolf, No. 2506; Sept. 2, 1909.
DISTRIBUTION: Studied material from Texas, Mississippi, Alabama, Florida, Puerto Rico, San Domingo, Guatemala, Trinidad, Southern Rhodesia, Brazil, Venezuela, Colombia, and Formosa. Also reported from Kansas, South Carolina, Colorado, Indiana, Pennsylvania, Uganda, Guam, Salvador, Japan, Mexico, and China.
NOTE: This resembles closely other named species on Dahlia, Xanthium, Bidens, and Parthenium.

**Cercospora balansae** Spegazzini
Anal. Soc. Scient. Argentine **16**: 167. 1883

Leaf spots indefinite or none; fruiting hypophyllous, effuse, olivaceous, extending over large area of the leaflet; stromata lacking (large opaque bodies present but could not determine their function); nonfasciculate to slightly fasciculate; conidiophores medium brown, uniform in color and width, intertwined, branched, multiseptate, tortuous, often repeatedly geniculate, small spore scar at conic tip, 4-5 x 50-300$\mu$; conidia very pale olivaceous, cylindric, straight to slightly curved, 1-5 septate, base rounded to conic, tip obtuse, 5-8 x 25-60$\mu$.

HOST: Evolvulus sp.
TYPE: Caá-guazú, Paraguay; Evolvulus sp. (Type labeled Convolvulaceae); B. Balansa, No. 3524; Jan. 1882.
DISTRIBUTION: Paraguay and possibly San Domingo.
NOTE: Ciferri and Fragoso (Bol. Real. Soc. Esp. Hist. Nat. de Madrid **25**: 443.

1925) describe *Cercospora balansae* var. *hainensis*. I have not seen their type, and their description is not in sufficient detail to be sure that it is distinct from the Spegazzini species. Presumably it has definite leaf spots, and short (30-60$\mu$) conidiophores.

## CERCOSPORAE ON IPOMOEA

A. Conidia colored, not acicular, not with truncate base.
  B. Conidiophores long, 3-5 x 40-140$\mu$, sometimes in coremoid-like fascicles; conidia cylindro-obclavate, 3-6 x 20-160$\mu$. *C. bataticola*
  BB. Conidiophores short, not in compact fascicles; conidia obclavato-cylindric, sometimes hyaline.
    C. Conidia 2-4 x 20-100$\mu$; fruiting mostly on lower leaf surface. *C. timorensis* (*C. ipomoeae-indicae*)
    CC. Conidia 4-6 x 35-110$\mu$; fruiting mostly on upper leaf surface. *C. cordobensis*
AA. Conidia hyaline, (see above for *C. timorensis* and *C. cordobensis* which at times are hyaline), acicular, truncate base, 2-4 x 20-200$\mu$; conidiophores 2.5-5 x 25-200$\mu$. *C. ipomoeae*

**Cercospora bataticola** Ciferri & Bruner
Phytopath. **21**: 93. 1931

Leaf spots circular to irregular, 2-8 mm. in diameter, dark purple border, pale brown to dingy gray center; fruiting mostly hypophyllous; stromata not prominent; fascicles dense, sometimes semi-coremium-like; conidiophores pale to medium dark brown, uniform in color, narrowly clavate, septate, slightly sinuous near tip, not branched, mostly standing straight upright, 3-5 x 40-140$\mu$; conidia pale olivaceous or olivaceous brown, cylindro-obclavate, usually straight or nearly so, subobconic base, blunt tip, 3-6 x 20-160$\mu$.

HOST: *Ipomoea batatas* Poir., Ipomoea sp.

TYPE: Wajay, Habana, Cuba; *Ipomoea batatas;* S. C. Bruner; Sept. 26, 1926; Colonia Jamao Moca, San Domingo; R. Ciferri; May 14, 1928.

DISTRIBUTION: Although herbarium specimens from various places have been labeled this species, only those from the West Indies proved distinctly to be *C. bataticola.*

NOTE: Dr. Weber kindly sent me some of the material he collected in Florida. This undoubtedly was *C. ipomoeae* with hyaline conidia having truncate base. I have not seen the other two types, but have studied San Domingo and Puerto Rico collections which fit the printed description, having colored conidia with subobconic base. In some herbaria is a B. T. Galloway collection (No. 69, Columbia, Mo., Aug. 1886) on *Ipomoea pandurata* G.F.W. and labeled *Cercospora ipomoeae* E. & E. Although the conidiophores and conidia are shorter and the fascicles not dense, it agrees in other respects with *C. bataticola* and possibly is the same. See key above.

**Cercospora calystegiae** Spegazzini
Anal. Mus. Nac. Buenos Aires II. **3**: 341. 1899

*Cercospora tuberculella* Davis, Wisc. Acad. Trans. **20**: 429. 1921

Leaf spots circular to slightly elongated, 2-7 mm. in diameter, tan to pale brown in color, sometimes with raised border; fruiting plainly amphigenous; stro-

mata globular, dark brown, 30-60$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, not branched, longer ones bent or slightly geniculate, minute spore scars at the rounded to conic tips, 3-6 x 10-60$\mu$; conidia obclavato-cylindric, subhyaline to pale olivaceous, straight or nearly so, 0-5 septate, base rounded to long obconically truncate, tip obtuse, 3-6 x 20-85$\mu$.

HOST: *Convolvulus saepium* Linn. (*Calystegia saepium*).

TYPES: Ensenada, cerca de La Plata, Buenos Aires; *Calystegia saepium;* C. Spegazzini, No. 940; April 1, 1888; (*C. tuberculella*) Madison, Wisc.; *Convolvulus saepium;* J. J. Davis; Sept. 16, 1919.

DISTRIBUTION: Argentine, Wisconsin.

**Cercospora convolvuli** Tracy & Earle
Bul. Torrey Bot. Club **28**: 187. 1901

*Cercospora elongata* Sorokine, Rev. Mycol. **12**: 54. 1890

Leaf spots indefinite or none; fruiting in effuse olivaceous patches on both leaf surfaces, 2-10 mm. in extent; stromata dark brown to almost black, 20-50$\mu$ in diameter; fascicles dense; conidiophores pale to medium olivaceous brown (in mass quite dark), 0-2 rather plainly septate, not geniculate, not branched, spore scars indistinct, tip bluntly rounded, 4-6 x 10-50$\mu$; conidia hyaline to subhyaline, obclavato-cylindric, straight to mildly curved, base short obconic or rounded, tip obtuse, septa 1-8, 3-4 x 30-70$\mu$, rarely as long as 100$\mu$.

HOSTS: *Convolvulus acetosaefolia* Steud., Convolvulus sp.

TYPES: Breton Island, La.; *Convolvulus acetosaefolia;* Tracy and Lloyd, No. 593; Aug. 18, 1900; (*C. elongata*) Le Jardin du Khan, a Kokan, Central Asia; Convolvulus sp.; N. Sorokine; Autumn, 1878.

DISTRIBUTION: Reported from Louisiana, Missouri, Wisconsin, Sardinia, and Central Asia.

NOTE: I have not seen Sorokine's type but his illustration resembles closely the type of *C. convolvuli.* The name *C. elongata* cannot be used for this species, since Peck ten years earlier used the same name for another form. See also *C. calystegiae* for differences between the species on Convolvulus.

**Cercospora cordobensis** Spegazzini
Anal. Soc. Cient. Argentina II. **10**: 32. 1880

*Cercosporina cordobensis* Speg., Bol. Acad. Nacion Cienc. Rep. Argentine **29**: 179. 1926

Leaf spots subcircular, 2-7 mm. in diameter, pale tan, wide dark brown to purplish border, barely visible on the lower surface; fruiting epiphyllous; stromata slight, brown; fascicles mostly dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, straight, rarely branched, rarely once geniculate, small to medium spore scar at the rounded to subtruncate tip, 4-6 x 10-30$\mu$; conidia subhyaline, obclavato-cylindric, 3-8 septate, straight to undulate, base subtruncate to long obconically truncate, tip obtuse, 4-6 x 35-110$\mu$.

HOST: *Ipomoea* (*Argyreia*) *megapotamica* Choisy.

TYPE: Córdoba, Argentine; *Ipomoea* (*Argyreia*) *megapotamica;* Lorentz, No. 926; no date.

DISTRIBUTION: Known only from the type locality.

NOTE: See *C. bataticola* for key separating the species on Ipomoea.

**Cercospora evolvuli** sp. nov.

Maculae sordide rubido-fuscae, 2-5 mm. diam.; caespituli epiphylli; stromata subglobosa, atro-fuscae, 30-60$\mu$; conidiophora densissime fasciculata, pallide olivaceo-brunnea, apicem versus leniter attenuata et dilutius colorata, vix septata, simplicia, 2-4 x 10-35$\mu$; conidia subhyalina, cylindrata, leniter curvata, spurie multiseptata, ad basim subtruncata, ad apicem acuta, 2.5-4 x 25-120$\mu$.

Leaf spots dull reddish brown, almost the same color as the dried herbarium leaf, 2-5 mm. in diameter; fruiting epiphyllous; stromata subglobose, brown to dark brown, 30-60$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, variously curved to undulate, rarely if ever septate or geniculate, not branched, minute spore scar at the narrowly rounded tip, 2-4 x 10-35$\mu$, or when conidia are attached, appearing much longer; conidia subhyaline, cylindric to obclavato-cylindric, slightly curved, indistinctly multiseptate, base mostly long obconically truncate, tip rather sharply conic, 2.5-4 x 25-120$\mu$.

HOST: Evolvulus sp.

TYPE: Horizonte, Serra do Cipo, Minas Geraes, Brazil; Evolvulus sp.; O. Drummond, No. 1291; Jan. 1940.

DISTRIBUTION: Known only from the type locality.

**Cercospora ipomoeae** Winter

Hedwigia **26**: 34. 1887

*Cercospora viridula* Ellis & Everh., Jour. Mycol. **5**: 70. 1889

*Cercospora alabamensis* Atkinson, Jour. Elisha Mitchell Scien. Soc. **8**: 51. 1892

*Cercospora stuckertiana* H. & P. Sydow, Mém. Herb. Boissier 8(4): 2. 1900

Leaf spots small to fairly large, 0.5-3 mm. in diameter and then with pale tan to gray center, or large blotches and then brown, reddish brown border; fruiting amphigenous, sometimes more prominent on the upper leaf surface; stromata mostly only a few brown cells; on lower leaf surface fascicles mostly 1-7 long stalks, on upper surface more nearly dense fascicles and shorter stalks; conidiophores pale yellowish olivaceous to medium brown, slightly paler and more narrow toward the tip, multiseptate, not branched, straight or 1-2 mildly to abruptly geniculate, large spore scar at the subtruncate tip, 4-6 x 25-200$\mu$ or even longer; conidia acicular to obclavate, straight to curved, indistinctly multiseptate, base truncate, tip subacute, 2-4 x 50-250$\mu$.

HOSTS: *Ipomoea coccinea* Linn., *I. biloba* Forsk. (*I. pes-caprae* [L.] Roth), *I. hederifolia* Linn., *I. fastigiata* Sweet (*I. pandurata* G.F.W.), *I.* (*Pharbitis*) *hederacea* (L.) Jacq., *I. lacunosa* Linn., *I. pes-tigridis* L., *I. triloba* L., *I. purpurea* (L.) Lam., *I. nil* Roth., *I. villosa* Meissn., *Ipomoea* sp., Convolvulus sp.

TYPES: Perryville, Missouri; *Ipomoea lacunosa;* C. H. Demetrio, No. 3585; Aug. 1885; (*C. alabamensis*) Uniontown, Alabama; *Ipomoea purpurea;* G. F. Atkinson; July 12, 1890; (*C. stuckertiana*) Cordoba, Argentine; Ipomoea sp.; T. Stuckert; April, 1899; (*C. viridula*) Concordia, Missouri; *Ipomoea purpurea;* C. H. Demetrio; Oct. 1888.

DISTRIBUTION: Reported from most southern states as far north as Kansas and New Jersey; in South America as far south as northern Argentine, and from nearly all other countries in similar latitudes, including Japan.

NOTE: In some herbaria are specimens labeled *C. ipomoeae* E. & E. These are

not the same as the Winter species, and may be *C. bataticola.* Solheim and Stevens (Mycologia **23**: 399. 1931) have already stated that *C. alabamensis* may prove to be *C. ipomoeae.* The hyaline acicular species separate this species from others on the host genus. I am assuming that the type of *C. viridula* is immature and therefore has shorter, paler conidiophores. The specimen sent by A. S. Muller from Guatemala on Convolvulus sp. had somewhat less attenuated conidia, but otherwise resembled the species. See key, page 169.

**Cercospora ipomoeae-indicae** Sawada

Formosa Agr. Res. Inst. Rept. **85**: 110. 1943

Fruiting epiphyllous; conidiophores olivaceous, 0-2 septate, 3.5-5 x 14-23$\mu$; conidia hyaline to pale colored, 3-11 septate, 2.5-4.5 x 48-104$\mu$.

HOST: *Ipomoea indica* (Burm.) Merr.

TYPE: Not known.

DISTRIBUTION: Formosa (Taiwan).

NOTE: Sawada states that W. Yamamoto (Trans. of Nat. Hist. Soc. of Formosa **26**: 285. 1936) first described this fungus as *C. viridula* E. & E., but that it was not the Ellis species. The description is too brief to be sure of the determination, but I believe that it is *C. timorensis* Cooke. See key, page 169.

**Cercospora lettsomiae** Thirumalachar & Chupp

Mycologia **40**: 356. 1948

Leaf spots angular, 2 mm. in diameter to large coalescing areas, no distinct border, fuligenous to almost black, somewhat paler on the lower surface; fruiting chiefly hypophyllous; stromata none or composed of a few yellowish brown cells; conidiophores in divergent fascicles of 5-20, pale to very pale olivaceous brown, uniform in color, irregular in width, 0-3 septate, variously curved or bent, rarely geniculate, occasionally branched, blunt to conic apex, 3-5 x 10-35$\mu$; conidia subhyaline to faintly olivaceous, cylindro-obclavate or shortest ones cylindric, straight to curved, 1-9 septate, base obconic, tip obtuse, 3-4.5 x 15-75$\mu$.

HOST: *Lettsomia elliptica* Wight.

TYPE: Bangalore, India; *Lettsomia elliptica;* M. J. Thirumalachar; Dec. 20, 1945.

DISTRIBUTION: Known only from the type locality.

**Cercospora merremiae** Mendoza

Philipp. Jour. Sci. **75**: 172. 1941

Leaf spots irregular, 3-10 mm. in diameter, dark brown to very dark brown, sunken at center and elevated at the margin; stromata present; fascicles mostly dense; conidiophores pale olivaceous, 0-1 septate, spore scars near and at the tip, 3-3.6 x 15-35$\mu$; conidia obclavate, concolorous, base obconically truncate, tip subobtuse, 3-4.5 x 30-80$\mu$.

HOST: *Merremia gemella* (Burm. f.) Hallier f.

TYPE: Manila, Luzon, Philipp.; *Merremia gemella;* Mendoza, No. 7122.

DISTRIBUTION: Known only from the type locality.

NOTE: I was unable to procure material for study.

**Cercospora operculinae** Mendoza

Philipp. Jour. Sci. **75**: 174. 1941

Leaf spots circular, 1-7 mm. in diameter, pale gray to greenish; fruiting amphigenous; stromata present; fascicles dense; conidiophores pale to medium

brown, paler and more narrow toward the tip, septate, nearly straight, not branched, 3-4.5 x 45-110$\mu$; conidia hyaline, acicular to obclavate, straight to curved, indistinctly multiseptate, base truncate to obconically truncate, tip subacute, 3-4.5 x 40-85$\mu$.

HOST: *Operculina bufalina* (Lour.) Hallier f.

TYPE: Fort Wm. McKinley, Rizal Province, Luzon, Philipp.; *Operculina bufalina;* Mendoza, No. 7125.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not had an opportunity of studying this species.

**Cercospora stylismae** Tracy & Earle

Bul. Torrey Bot. Club **23**: 206. 1896

Leaf spots circular, 1-3 mm. in diameter, pale brown to tan or rarely gray, border dark brown; fruiting amphigenous; stromata a few dark brown cells; fascicles mostly 2-12 stalks; conidiophores medium dark brown, slightly paler tip, may be irregular in width, sparingly septate, not branched, straight to once abruptly geniculate, medium sized spore scar at rounded to subtruncate tip, 4-5.5 x 20-75$\mu$; conidia hyaline, acicular, straight to moderately curved, indistinctly multiseptate, base truncate, tip subacute, 2.5-4 x 40-80$\mu$.

HOST: *Breweria* (*Stylisma*) *humistrata* (Walt.) Gray.

TYPE: Columbus, Miss.; *Stylisma humistrata;* S. M. Tracy; Oct. 16, 1895.

DISTRIBUTION: Mississippi and Alabama.

**Cercospora timorensis** Cooke

Grevillea **12**: 38. 1883

*Cercospora batatae* Zimmermann, Ber. Land.-Forstw. Deutsch. Ostafr. **2**: 28. 1904

*Cercospora batatae* P. Hennings, Bot. Jahrb. von Engler **38**: 118. 1907

Leaf spots circular to irregular, 2-8 mm. in diameter, often bordered by the smaller veins, occasionally with concave or convex surface, brown to dark brown, sometimes slightly paler center; fruiting mostly hypophyllous; stromata slight,

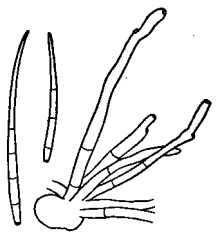


Fig. 94
*C. batatae*

filling the stomatal openings, brown; fascicles mostly dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, which may be hyaline, spore scars slight or indistinct, 0-2 septate, rarely branched, slightly geniculate, 2.5-5 x 5-50$\mu$, sometimes no more than elongated stromatal cells; conidia hyaline

to very pale olivaceous, obclavato-cylindric, straight to slightly curved, 0-5 septate, base subtruncate to long obconically truncate, tip obtuse, 2-4 x 20-100$\mu$.

HOSTS: *Ipomoea sidaefolia* Choisy (*I. cymosa* Lindl.), *I. batatas* Poir., *I. indica* (Burm.) Merr.

TYPES: Timor-laut; *Ipomoea cymosa;* Mr. Riedel (Com. Dr. A. B. Meyer); June 1883; (*C. batatae*) Ost-Usambara: Amani, East Africa; *Ipomoea batatas;* A. Zimmermann, No. 129; Jan. 1903.

DISTRIBUTION: All lands near the Equator, and apparently as far north as Panama and Japan.

NOTE: After Zimmermann described the species he sent material of the same collection to Hennings, who described it under the same name. The only difference between the Cooke species and *C. batatae* is that the latter has slightly darker wider conidiophores. The Cooke collection seems rather immature. The shape and size of the conidia of the two are identical. The fungus which Wataro Yamamoto (Trans. Nat. Hist. Soc. Formosa **26:** 285. 1936) describes as *C. viridula* E. & E. on *Ipomoea indica* (Burm.) Merr. probably is *C. timorensis.* See key, page 169.

**Cercospora turbinae** sp. nov.

Maculae typicae nullae, sed discolorationes epiphyllas indeterminatas ochraceo-flavidas efficiens; caespituli hypophylli, olivacei; stromata minuta, rubido-fusca; conidiophora dense fasciculata, olivaceo-brunnea, interdum septata et ramosa, 3-5.5 x 15-55$\mu$; conidia subhyalina vel pallide olivacea, cylindrata, 0-5 septata, interdum constricta, ad basim rotundata vel acuta, ad apicem obtuse rotundata, 3-5 x 15-60$\mu$.

Leaf spots indistinct yellowish irregular areas on the upper surface; fruiting olivaceous, effuse on the corresponding lower surface, 3-10 mm. in extent; stromata slight to 25$\mu$ in diameter, reddish brown; fascicles dense; conidiophores pale to medium olivaceous brown, tips almost hyaline, irregular in width, sparingly septate, slightly branched, occasionally once geniculate, small spore scar at the bluntly rounded tip, 3-5.5 x 15-55$\mu$; conidia subhyaline to pale olivaceous, cylindric, 0-4 septate, constriction at some septa, slightly catenulate, base rounded to obconic, tip blunt, 3-5 x 15-60$\mu$.

HOST: *Ipomoea burmanni* Choisy (*Turbina corymbosa* Rafin.)

TYPE: The Arches, Paget East, Bermuda; *Turbina corymbosa;* H. H. Whetzel; Jan. 29, 1926.

DISTRIBUTION: Known only from the type locality.

NOTE: See *C. bataticola* for key separating the species on Ipomoea.

**Cercospora coriariae** Chupp

Jour. Dept. Agr. Puerto Rico **14:** 285. 1930

*Cercospora coriariae* Tai, Lloydia **11:** 43. 1948

Leaf spots definite, circular, 0.5-5 mm. in diameter, dark brown above, paler below, sometimes zonate or with a slightly darker margin; fruiting amphigenous, chiefly epiphyllous; stromata globose, brown, medium to large; fascicles dense to very dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, indistinctly septate, not branched, not geniculate, undulate to tortuous, minute spore scar at the conic tip, 2.5-4 x 10-90$\mu$, or appearing much longer when conidia are persistent; conidia obclavate, subhyaline to very pale olivaceous,

straight to curved or once abruptly bent, indistinctly multiseptate, base subtruncate to obconically truncate, tip subobtuse, 3-5 x 30-100$\mu$.

HOSTS: *Coriaria sinica* Maxim., *C. thymifolia* H. & B.

TYPES: Slopes of Salto de Tequendama, Cundinamarca, Colombia; *Coriaria thymifolia;* Chardon and Toro, No. 655; June 6, 1929; (*C. coriariae* Tai) Kwanhsien, Szechuan, China; *Coriaria sinica;* T. K. Li, Ling No. 123; Dec. 4, 1941.

DISTRIBUTION: Colombia, China.

NOTE: When Dr. Tai sent me material, I wrongly informed him that the description had not yet been published. Therefore, the species really should be in his name.

**Cercospora camptothecae** Tai

Lloydia **11**: 39. 1948

Leaf spots distinct on both surfaces, subcircular to irregular, 1.5-8 mm. in diameter, center white to gray, surrounded by a dark brown zone; fruiting epiphyllous; stromata present, 25-45$\mu$ in diameter; conidiophores in dense fascicles, olivaceous brown, straight or occasionally slightly curved, not branched, subnodulose, subflexuous, usually attenuated toward the subtruncate tip, scars prominent, 0-4 septate, 3.5-4.5 x 35-60$\mu$; conidia clavato-cylindric, subhyaline, distinctly 3-6 septate, truncate base, 3-4 x 40-100$\mu$.

HOST: *Camptotheca acuminata* Decaisne.

TYPE: Chengtu Szechuan, China; *Camptotheca acuminata;* Lee Ling No. 222; Nov. 26, 1937.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen a specimen of this species.

**Cercospora corni** Davis

Wisc. Acad. Trans. **18**: 268. 1915

HOST: *Cornus paniculata* L.'Her.

TYPE: St. Croix Falls, Wisc.; *Cornus paniculata;* J. J. Davis; Aug. 31, 1914.

NOTE: The wide, fully mature spores being dark colored, thick walled, and closely septate, the species is considered an Helminthosporium, or other closely related genus.

**Cercospora cornicola** Tracy & Earle

Bul. Torrey Bot. Club **23**: 205. 1896

Leaf spots irregular brown areas without definite borders, 5-10 mm. in extent; fruiting epiphyllous; stromata small, dark, globular, 20-40$\mu$ in diameter; fascicles dense to very dense; conidiophores very pale olivaceous brown, delicate, wavy, uniform in width and color, septa not visible, not or rarely mildly geniculate, not branched, rounded tip, spore scars not visible, 2-3.5 x 10-25$\mu$; conidia narrowly obclavate, subhyaline to very pale olivaceous, mildly curved, obconic base, subacute tip, septa indistinct, 2-3 x 20-70$\mu$.

HOSTS: *Cornus florida* L., *C. officinalis* Sieb. & Zucc., *C. controversa* Hems., Cornus spp.

TYPE: Ocean Springs, Miss.; *Cornus florida;* F. S. Earle; Sept. 29, 1895.

DISTRIBUTION: Gulf States, Japan.

**Cercospora curtisiae** Chupp and Doidge
Bothalia **4**: 884. 1948

Leaf spots subcircular, 2-4 mm. in diameter, dark reddish brown to dark purple, oldest spots with a minute gray center, sometimes with a burnt sienna margin; fruiting hypophyllous; stromata when present subglobular, dark brown to almost black, 20-60$\mu$ in diameter; conidiophores when arising from the stromata densely fasciculate, but mostly arising singly as branches from procumbent threads, subhyaline to pale olivaceous, uniform in color and diameter, sparingly septate or geniculate, minute spore scars at the bluntly rounded tip, 2.5-4 x 15-70$\mu$; conidia concolorous, obclavato-cylindric, straight to mildly curved, indistinctly multiseptate, base obconically truncate, tip conic to obtuse, 2.5-4 x 20-75$\mu$.

HOST: *Curtisia faginea* Ait.

TYPE: Knysna, Cape Prov., Union of S. Africa; *Curtisia faginea;* V. Reinecke, No. 32077; Jan. 1940.

DISTRIBUTION: Known only from the type locality.

**Cercospora garryae** Harkness
Cal. Acad. Sci. Bul. **1**: 38. 1884

Indefinite brown areas on upper leaf surface, on corresponding lower surface, leaf hairs blackened; stromata none; nonfasciculate; conidiophores arising singly or rarely in pairs as branches from threads in and among the leaf hairs, pale brown, sparingly septate and branched, not geniculate, spore scars indistinct, 4-5 x 10-35$\mu$; conidia obclavate to obclavato-cylindric, pale fuligenous, obconic base, obtuse tip, mildly curved, multiseptate, 4-5 x 50-110$\mu$.

HOST: *Garrya elliptica* Dougl.

TYPE: Saucelito, Cal.; *Garrya elliptica;* H. W. Harkness, No. 3273; July.

DISTRIBUTION: Known only from the type locality.

NOTE: *C. glomerata,* the other species reported on this host, has prominent stromata and dense fascicles.

**Cercospora glomerata** Harkness
Cal. Acad. Sci. Bul. **1**: 164. 1885

HOST: *Garrya elliptica* Dougl.

TYPE: Tamalpais, Cal.; *Garrya elliptica;* H. W. Harkness, No. 3651; Mar., 1884.

NOTE: The wide, fully mature spores being dark colored, thick walled, and closely septate, the species is considered an Helminthosporium.

**Cercospora nyssae** Tharp
Mycologia **9**: 112. 1917

Leaf spots circular to subcircular, 3-8 mm. in diameter, brown with a gray punctiform center and darker brown, slightly raised margin; fruiting amphigenous; stromata small or lacking; fascicles mostly 2-15 stalks; conidiophores medium to dark brown, multiseptate, not or rarely geniculate, not branched, upper half distinctly wider than near base, small spore scar at bluntly rounded tip, 3.5-7 x 15-60$\mu$; conidia pale to medium olivaceous, obclavate, mildly curved or undulate, plainly 3-12 septate, long obconically truncate base, subobtuse tip, 4-7 x 30-110$\mu$.

HOST: *Nyssa sylvatica* Marsh.

TYPE: Palestine, Texas; *Nyssa sylvatica;* I. M. Lewis & B. C. Tharp; Oct. 30, 1914.
DISTRIBUTION: Known only from the type locality.

**Cercospora sedi** Ellis & Everhart
Jour. Myc. **8**: 72. 1902

Leaf spots indefinite or none; fruiting in scantily effuse black patches on both leaf surfaces; stromata lacking or distinct, globular, 15-30$\mu$ in diameter, brown; nonfasciculate to dense fascicles; conidiophores arising as single branches from procumbent threads or from stroma, pale olivaceous brown, uniform in color, rather irregular in width, septate, not geniculate, branched, small spore scar at rounded tip, 3-4.5 x 10-65$\mu$; conidia pale olivaceous, narrowly obclavate, straight or nearly so, septa indistinct, base obconic, tip subobtuse to subacute, 2.5-4 x 30-110$\mu$.

HOST: Sedum sp.
TYPE: Tuskegee, Ala.; Sedum sp.; G. W. Carver; Sept. 1, 1901.
DISTRIBUTION: Known only from the type locality.

**Cercospora sedoides** Ellis & Everhart
Jour. Myc. **4**: 4. 1888

Leaf spots circular, 3-6 mm. in diameter, dull reddish brown, without distinctive border, not strongly differentiated from remainder of leaf in dried herbarium material; fruiting hypophyllous; stromata filling stomatal openings; most fascicles not dense; conidiophores very pale olivaceous brown, uniform in color and width, sinuous, indistinctly septate, incipient branching, not geniculate, spore scars not visible at narrowly rounded tip, 2.5-4 x 10-40$\mu$; conidia subhyaline to pale olivaceous, linear to narrowly obclavate, straight or slightly curved, septa indistinct, base subtruncate to obconically truncate, tip subobtuse to subacute, 2-3.5 x 40-80$\mu$.

HOST: *Penthorum sedoides* L.
TYPE: Manhattan, Kans.; *Penthorum sedoides;* W. T. Swingle, No. 978; July, 1887.
DISTRIBUTION: Studied material from Wisconsin, Iowa, and Kansas.

**Cercospora albo-maculans** Ellis and Everhart
Proc. Acad. Nat. Sci. Phila. **46**: 378. 1894

HOSTS: *Brassica campestris* L., *Br. chinensis* L., *Br. napobrassica* Mill., *Br. rapa* L., and very sparingly on forms of *Br. oleracea* L.
TYPE: Berkeley, Cal.; *Brassica campestris;* W. C. Blasdale, No. 201; Febr. 3, 1894.
NOTE: It is difficult to know what to do with this species. Pirone (Plant Disease Reporter **19**: 275. 1935) collected material on Long Island, and which plainly has some colored conidiophores. In most instances, however, it has only hyaline fruiting. The type itself is not a true Cercospora. Saccardo (Syll. Fung. **15**: 84. 1901) named it *Cercosporella albo-maculans,* as did W. H. Davis (Phytopath. **17**: 669. 1927), who pointed out also that *Cercosporella Brassicae* Jaap was another synonym. Von Höhnel (Ann. Mycol. **22**: 193. 1924) says it is a synonym of *Cylindrosporium Brassicae* Faut. and Roum. (1891). I am inclined to agree with Mason's statement in a letter that *Cercosporella Brassicae* (Faut. and Roum.) v. Höhnel is the correct classification.

**Cercospora armoraciae** Saccardo
Nuovo Giorn. Bot. Ital. 8: 188. 1876

Leaf spots circular to irregular, sometimes slightly zonate, pale tan to dingy gray, often with yellowish brown margin, occasionally bounded by a narrow raised line border, 4-8 mm. in diameter; fruiting amphigenous, appearing as a sparingly sooty growth on the pale background; stromata slight, pale brown; fascicles mostly dense; conidiophores uniformly pale olivaceous brown, sparingly

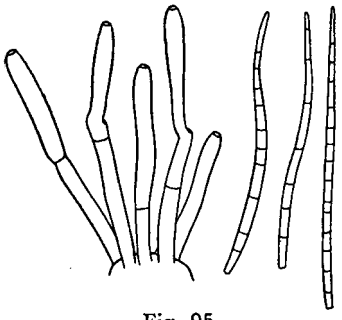


Fig. 95
*C. armoraciae*

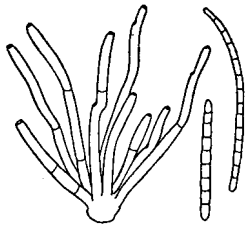


Fig. 96
*C. atro-grisea*

septate, not branched, slightly to copiously geniculate, often attenuated from each successive geniculation, 4-6.5 x 15-50$\mu$, rarely as long as 140$\mu$ (tip 2-4$\mu$ wide); conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse to subacute, 3-5 x 25-150$\mu$, rarely as wide as 6.5$\mu$.

HOSTS: *Armoracia rusticana* Gaertn., Mey. and Scherb. (*Cochlearia armoracia* Linn.) (Radicula, Nasturtium, Roripa).

TYPE: Venice, Italy; *Armoracia rusticana;* Treviso; Sept. 1874. Cotype distributed as Mycotheca Veneta No. 282.

DISTRIBUTION: Probably wherever the host is grown extensively. I have not seen it reported farther south than Missouri and West Virginia, although it is present in Italy.

**Cercospora atro-grisea** Ellis and Everhart
Proc. Acad. Nat. Sci. Phila. 45: 464. 1893

Minute to fairly large effuse black patches of the fruiting fungus on stems and pods; stromata dark brown to almost black, circular to irregular, 15-50$\mu$ in diameter; fascicles 7-20 stalks; conidiophores pale to medium dark brown, uniform in color, sometimes slightly wider near the tip, septate, not branched, sparingly geniculate, medium spore scar at the subtruncate tip, 4-6 x 20-60$\mu$, rarely as long as 125$\mu$; conidia hyaline, cylindric to acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute to subobtuse, 3-5.5 x 35-110$\mu$.

TYPE: Newfield, N. Jersey; *Raphanus sativus* L.; J. B. Ellis; Oct. 3, 1893.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. cruciferarum* for differences between the two species on this host genus.

**Cercospora barbareae** (Sacc.) Chupp

Farlowia 1: 579. 1944

*Cercospora Nasturtii* var. *Barbareae* Sacc., Michelia 2: 557. 1882

Leaf spots circular to angular, 1-3 mm. in diameter, pale tan to gray, sometimes with narrow pale brown raised line border; fruiting amphigenous; stro-

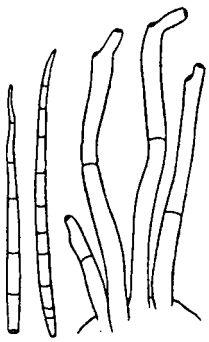


Fig. 97
*C. barbareae*

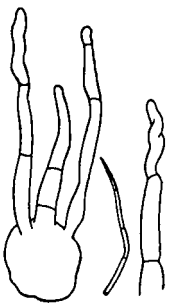


Fig. 98
*C. berteroae*

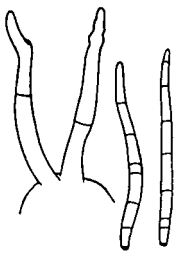


Fig. 99
*C. bizzozzeriana*

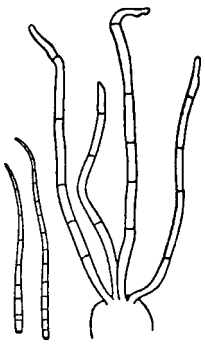


Fig. 100
*C. brassicicola*

mata none to as large as 50$\mu$ in diameter; fascicles partly dense; conidiophores pale olivaceous brown, occasionally with paler tip, sparingly septate, 0-4 geniculate, rarely branched, inclined to be attenuated, medium to small spore scar at the tip, often irregular in outline, 4-6 x 20-80$\mu$ (mostly 20-50$\mu$); conidia hyaline, acicular to cylindric, straight or nearly so, base truncate to subtruncate, tip subobtuse, septa 5-10$\mu$ apart, 3.5-5 x 50-110$\mu$.

HOST: *Barbarea vulgaris* R. Br. (*B. stricta* Willk.). Greene sent a specimen on *Arabis canadensis* and that seems identical.

TYPE: Venice, Italy; *Barbarea vulgaris;* P. A. Saccardo; in the autumn.

DISTRIBUTION: Italy. Common in the northern states as far south as Pennsylvania and Ohio, and as far west as Wisconsin.

NOTE: Davis (Trans. Wisc. Acad. Sci. **24**: 269. 1929) pointed out that the form on Barbarea seems distinct from species on other Cruciferae.

**Cercospora berteroae** Hollós

Ann. Mus. Nat. Hungarici **5**: 468. 1907

Leaf spots circular, 0.5-2 mm. in diameter, gray center and brown margin; fruiting amphigenous; stromata brown, 15-40$\mu$ in diameter; fascicles 3-15 stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, sparingly septate, not branched, straight or upper third undulate to geniculate, large spore scar at the subtruncate tip, 4-5.5 x 50-125$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 3-5 x 30-75$\mu$ or longer.

HOST: *Alyssum incanum* L. (*Berteroa incana* (L.) DC.)

TYPE: Near Kecskemét, Hungary; *Berteroa incana* DC.; L. Hollós; July.

DISTRIBUTION: Hungary, Bavaria, and Wisconsin.

NOTE: I did not see the type of this species, but studied a 1912 collection from Bavaria. Greene, (Trans. Wisc. Acad. Sci., Arts, Letters **36**: 239. 1946) reports

*C. nasturtii* on this host in Wisconsin. Since the two species look much alike, it is possible that the Hollós species is a synonym of *C. nasturtii*.

**Cercospora bizzozeriana** Saccardo and Berlese
Malpighia **2**: 248. 1889

*Cercospora bizzozeriana* var. *drabae* S. Camara, Rev. Agronomica 1: 25. 1903
*Cercospora drabae* Bubak and Kabát, Hedwigia **52**: 362. 1912
*Cercospora camarae* Curzi, Atti Ist. Bot. Univ., Pavia, III. **2**: 101. 1925
*Cercospora lepidii* Niessl, in Herb.

Leaf spots white or gray, circular, sometimes with raised line margin, 1-3 or rarely 5 mm. in diameter; fruiting amphigenous; stromata slight or up to 40$\mu$ in diameter; fascicles partly dense; conidiophores pale olivaceous brown, fairly uniform in color and width or occasionally narrowly clavate, inconspicuously septate, plainly 1-5 geniculate, rarely branched, 4-7 x 10-100$\mu$; conidia hyaline, cylindric to cylindro-obclavate, straight or nearly so, rather closely septate, truncate base, bluntly rounded tip, 3-7 x 30-160$\mu$, mostly 30-60$\mu$ long.

HOSTS: *Lepidium* (*Cardaria*) *latifolium* L., *L. draba* L. (*Cardaria draba* Desv.).

TYPES: Pavia, Italy; *Lepidium latifolium;* Bizzozero; (var. *drabae*) Agron. Hort. Garden, Lisbon, Portugal; *L. draba;* Camara d'Almeida; Oct., 1901; (*C. drabae*) Welwarn, Bohemia; *Cardaria draba;* J. E. Kabát; June 18, 1900; (*C. camarae*) Ascoli-Piceno (Marche); *Lepidium draba;* M. Curzi.

DISTRIBUTION: Appears common in Europe. Found by Bisby in Manitoba, Canada, and by Chardon on Mona Island.

NOTE: A number of Herbarium specimens labeled *C. bizzozeriana* show only Alternaria, as is true of Sydow's Mycotheca March 3087, which was examined both at Harvard and at the New York Botanic Garden. Other specimens, such as Bisby 4439, show the Cercospora but almost hidden by Alternaria.

**Cercospora brassicicola** P. Hennings
Bot. Jahrbücher v. Engler **37**: 166. 1906

*Cercospora bloxami* (Berk. and Br.) Young (amended), Mycologia **8**: 43. 1916
*Cercospora brassicae-campestris* Rangel, Arch. Mus. Nacion., Rio de Janeiro **18**: 163. 1917

Leaf spots circular to angular, 0.5-4 mm. in diameter, pale green or pale brown to yellowish gray or white, usually with a brown raised line border; fruiting amphigenous; stromata mostly a few brown cells, but occasionally as large as 50$\mu$ in diameter; fascicles 2-12 or even 18 spreading stalks; conidiophores pale olivaceous to medium brown, oldest ones uniform in color and width, others with pale attenuated tips, rarely branched, multiseptate when long, 0-7 abruptly geniculate, large spore scar at the subtruncate tip, 3.5-7 x 25-500$\mu$, some collections showing only short conidiophores; conidia hyaline, acicular, curved or undulate, indistinctly multiseptate, base truncate, tip acute, 2-5 x 25-200$\mu$.

HOSTS: *Brassica chinensis* L., *Br. oleracea* L., *Br. pekinensis* Rupr., *Br. rapa* L., *Br. juncea* Coss., *Br. nigra* Koch, *Br. napobrassicae* DC. (*Br. campestris* Linn.), *Br. integrifolia* Schulz., *Br. napus* L., Brassica sp. Halsted made a collection on *Thelypodium pinnatifidum* S. Wats. (*Arabis hesperidoides* A. Gray) and which resembles the one on Brassica closely.

TYPES: Komaba, near Tokyo, Japan; *Br. chinensis;* I. Miyake, No. 14; Sept., 1904; (*C. bloxami*) Puerto Rico collections; (*Cercospora Brassicae-campestris*) Icarahy near Nitery, Brazil; *Br. campestris;* Rangel, No. 16; May, 1910.

DISTRIBUTION: In all tropical and subtropical countries. Common in the United States at least as far north as Virginia.

NOTE: Berkeley and Broome (Ann. and Mag. Nat. Hist. V. 9: 183. 1882) described incompletely a fungus which they named *Cercospora bloxami.* Mason (Brit. Mycol. Soc. Trans. **20**: 110. 1936) has shown that this type is not a Cercospora (a fact I verified while at the Kew Herbarium), and that the name could not be applied to the species on Brassica. The types of *C. brassicicola* and *C. brassicae-campestris* both have shorter paler conidiophores than do the collections generally labeled *C. bloxami,* but I consider them somewhat immature or grown in a less favorable environment. The conidia and leaf spots appear identical.

**Cercospora cardaminae** Losa Español

Anal. Jard. Bot. Madrid 6 (Part 1): 453. 1946

Leaf spots orbicular, center parchment-like, margin dark brown; fruiting epiphyllous; fasciculate; conidiophores pale fuligenous, septate, not branched, flexuous to denticulate, 3-5 x 50-70$\mu$; conidia hyaline, obclavate (acicular ?), straight to mildly curved, base subtruncate, tip subacute, 4 x 50-105$\mu$.

HOST: *Cardamina pratensis* L.

TYPE: Lálin (Pontevedra), Spain; *Cardamina pratensis;* March to Sept., 1944.

DISTRIBUTION: Spain.

NOTE: I have not seen this species, so do not know how it differs from other closely related species on the Cruciferae.

**Cercospora cheiranthi** Saccardo

Nuovo Giorn. Bot. Ital. 8: 187. 1876

Leaf spots circular, 2-10 mm. in diameter, gray to tan or pale brown, on lower surface sometimes greenish and mildly zonate; fruiting chiefly epiphyllous; stromata brown, a few cells to 40$\mu$ in diameter; fascicles mostly dense; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip,

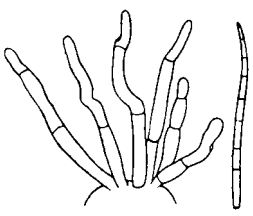


Fig. 101
*C. cheiranthi*

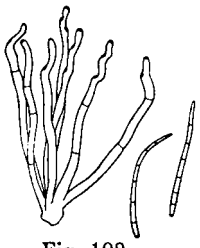


Fig. 102
*C. cruciferarum*

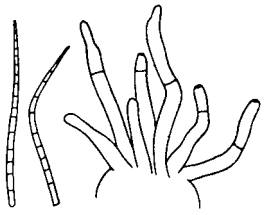


Fig. 103
*C. erysimi*

straight to once abruptly geniculate, not branched, sparingly septate, large spore scar at the subtruncate tip, 4-6.5 x 10-100$\mu$, mostly 10-35$\mu$; conidia hyaline, cylindro-obclavate, the very longest ones may be obclavate, almost straight, indistinctly septate, base subtruncate to obconically truncate, tip subobtuse, 3-5 x 20-100$\mu$.

TYPE: Selva (Treviso); *Cheiranthus cheirus* L.; Sept., 1874. Cotype distributed as Mycotheca Veneta No. 281.

DISTRIBUTION: Northern Italy. A species resembling the cotype was sent me from Minas Geraes, Brazil. J. J. Davis lists it among the Wisconsin Fungi.

**Cercospora cruciferarum** Ellis and Everhart
Jour. Mycol. 3: 17. 1887

Leaf spots circular, 0.5-2 mm. in diameter, white center, pale to dark brown border; fruiting amphigenous; stromata slight, usually a few large brown cells; fascicles mostly 3-12 stalks; conidiophores uniformly pale olivaceous brown, somewhat attenuated toward the tip, which is subtruncate and with medium sized spore scar, rarely once septate near the base, 0-2 geniculate, not or rarely branched, 4-5.5 x 15-60$\mu$, rarely as long as 120$\mu$; conidia hyaline, acicular, straight to mildly curved, base truncate, tip subacute, septa indistinct, 2-4.5 x 40-150$\mu$.

TYPE: Columbia, Missouri; *Raphanus sativus* L.; B. T. Galloway, No. 129; Aug. 18, 1886.

DISTRIBUTION: In southern states, at least as far north as Delaware and Missouri, and in northern South America to Brazil.

NOTE: This has been reported on *Sisymbrium officinale* Scop. (North American Fungi No. 1995) but Davis (Trans. Wisc. Acad. **24**: 271. 1929) has shown that this fungus is a Septoria. The same specimen in the Cornell Herbarium also showed a Septoria. *C. cruciferarum* has been reported also on Brassica (e.g. Atkinson specimen 2422), and *Radicula palustris* (Univ. of Missouri Studies **22**(3): 10. 1948) but none of the species examined on Brassica and Radicula were like the species on radish. The type of *C. raphanistri* reported on radish showed only Cercosporella. See also *C. atro-grisea.*

**Cercospora erysimi** Davis
Wisc. Acad. Trans. **18**: 267. 1915

*Cercospora erysimi cuspidati* Lobik, Bolezni Rast. **17**: 194. 1928

Leaf spots circular to angular, 1-4 mm. in diameter, pale tan to grayish, no distinct border; fruiting amphigenous, visible as a faint sooty growth; stromata none to 30$\mu$ in diameter, dark brown; fascicles 2-18 stalks; conidiophores medium brown base, pale olivaceous brown near the tip, rarely septate, slightly branched, sometimes once mildly geniculate, attenuated toward the tip which is subtruncate with a medium sized spore scar, 4-6 x 10-75$\mu$, mostly 15-50$\mu$ long; conidia acicular to obclavate, rarely cylindric, hyaline, base truncate to subtruncate, tip subobtuse, straight to curved, indistinctly multiseptate, 3-6 x 20-145$\mu$.

HOSTS: *Erysimum cheiranthoides* Linn., *E. cuspidatum* DC.

TYPE: Alma, Wisc.; *E. cheiranthoides;* J. J. Davis; Aug. 13, 1914; (*C. Erysimi-cuspidati*) Near Peatigorsk at a waterfall in the Jutza Mts.; *E. cuspidatum;* A. I. Lobik; Aug. 16, 1925.

DISTRIBUTION: Sparingly present in northern United States; also reported once in Russia.

NOTE: I have not seen the Lobik species, but his description is identical with that for the Davis collection.

**Cercospora lepidii** Peck
N. Y. State Mus. Ann. Rept. **35**: 140. 1884

HOSTS: *Lepidium campestre* R. Br., *L. virginicum* L.

TYPE: New Baltimore, N. Y.; *L. campestre;* C. H. Peck; May.

NOTE: This is an Alternaria. In the Berlin Herbarium was a specimen labeled *Cercospora lepidii* Niessl, on *Lepidium draba;* Flütteldorf-Wien; Sept. 30, 1893. It apparently is the same as *Cercospora bizzozeriana.*

**Cercospora nasturtii** Passerini

Hedwigia **16**: 124. 1877

Leaf spots circular to subcircular, 2-7 mm. in diameter, pale tan to dingy gray, without distinct border, occasionally zonate; fruiting chiefly epiphyllous; stromata lacking or a few pale brown cells; fascicles 1-7 stalks; conidiophores subhyaline to very pale olivaceous brown, plainly attenuated toward the tip which often may be hyaline, sparingly septate, not branched, 0-1 abruptly geniculate, rarely a specimen may show a few with 2-4 geniculations, large spore scar at truncate tip, 4-6.5 x 20-100$\mu$, or even as large as 6.5 x 150$\mu$; conidia hyaline, acicular to obclavato-cylindric, straight to mildly curved, indistinctly multiseptate, base truncate, tip subobtuse, 3-5 x 20-85$\mu$, a few found as large as 6 x 125$\mu$.

HOSTS: *Nasturtium aquaticum* Linn. (Roripa), *N. amphibium* R. Br. (*Radicula amphibium*), *N. sylvestre* R. Br. (*Radicula sylvestris*), *N. palustre* DC. (*Radicula palustris* Moench) (*Roripa hispida*), *N. sublyratum* Fr. & Sav., *N. officinale* R. Br., *N. sinapis* (*Roripa sinapis*).

TYPE: Parma, Cingulum, Italy; *Nasturtium aquaticum;* G. Passerini; Aug. 1876. Cotype distributed as Rabenhorst, F. Europaei 2278.

DISTRIBUTION: Kansas to Wisconsin and eastward, California, Mexico, Minas Geraes, France, Serbia, Roumania, Italy, Formosa, China and Middle Asia (Russia).

NOTE: The following varieties have been described, but all the material which I have been able to study show them as distinct species rather than varieties.

*C. nasturtii* var. *barbareae* Sacc., Michelia **2**: 557. 1882.

*C. nasturtii* var. *lepidii* Roum., Rev. Mycol. **10**: 192. 1888.

*C. nasturtii* var. *sisymbri* Baümler, Zool.-Bot. Ges. Wien. Verh. **38**: 717. 1888. On *Sisymbrium austriacum* Jacq. Also reported on *S. alliaria* Scop. (*Alliaria officinalis* Andrz.), *S. officinale* Scop.

*C. nasturtii* var. *stanleyae* Ellis and Barth. in litt.

I have not had an opportunity of studying Baümler's variety, so at present am not transferring it to a distinct species. *C. nasturtii,* because of confusion in names, has been reported on garden nasturtiums (Tropaeolum), but this is incorrect.

**Cercospora raphanistri** Baudys and Picbauer

Mor. Prirod. Spolecnosti **1**(5F): 305. 1924

TYPE: Between Sychrov and Hvezda, Bohemia; *Raphanus raphanistrus* Linn.; Ed. Baudys; Sept. 8, 1915.

NOTE: The type shows this fungus to be a Cercosporella. It may be *Cercosporella brassicae.*

**Cercospora stanleyae** comb. nov.

*Cercospora nasturtii* var. *stanleyae* Ellis and Barth., in litt.

Leaf spots circular, 1-4 mm. in diameter, pale brown, tan, or almost gray, raised brown line margin; fruiting amphigenous; stromata slight to 75$\mu$ in length, dark brown; fascicles dense; conidiophores with base medium dark brown, pale

tip, uniform in width or slightly attenuated, sparingly septate, not branched, large spore scar at subtruncate tip, 4.5-6 x 10-45$\mu$; conidia hyaline, acicular, straight to much curved, indistinctly multiseptate, base truncate, tip subacute, 3-5.5 x 40-125$\mu$.

TYPE: Rockport, Rooks Co., Kansas; *Stanleya pinnatifida* Nutt.; E. B. Bartholomew; Aug. 24, 1895.
DISTRIBUTION: Known only from the type locality.
NOTE: The acicular forms on the Cruciferae have only minor differences, but at present this seems distinct enough to consider it a separate species.

**Cercospora thlaspiae** Chupp and Greene
Trans. Wisc. Acad. Sci., Arts, Letters. **36**: 262. 1946

Minute black fruiting pustules easily observed with a hand lens, and extending over small areas to almost the entire surface of partly ripe, yellowed fruit pods; stromata small, dark olivaceous brown; fascicles 2-12 spreading stalks; conidiophores pale to medium olivaceous brown, fairly uniform in color and width, excepting near the subtruncate tip which is pale and narrow, indistinctly multiseptate, straight to mildly curved, not branched, rarely geniculate, 4-6 x 50-400$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip subacute, 2-4 x 40-300$\mu$.

HOST: *Thlaspi arvense* L. (*Lepidium thlaspi* Roxb.).
TYPE: Sauk City, Dane Co., Wisc.; silicles of *Thlaspi arvense;* H. C. Greene; July 10, 1943.
DISTRIBUTION: Known only from the type locality.

**Cercospora actinostemmae** Sawada
Formosa Agr. Res. Inst. Rept. **86**: 165. 1943

Leaf spots brown to olivaceous, 2-4 mm. in diameter, angular, bounded by small leaf veins; fruiting plainly amphigenous, when abundant grayish olivaceous in color; stromata small, brown; fascicles 2-15 spreading stalks; conidiophores pale olivaceous, uniform in color and width, 1-5 septate, not branched, rarely geniculate, straight or slightly curved, conic tip, 3-4.5 x 15-60$\mu$; conidia pale olivaceous, cylindric to distinctly obclavate, straight or rarely curved mildly, 1-7 septate, base rounded to obconic, tip obtuse, 3-4.5 x 20-65$\mu$.

HOST: *Actinostemma lobatum* Maxim. var. *typica* Makino; var. *racemosum* Makino.
TYPE: Unknown.
DISTRIBUTION: Formosa (Taiwan), Japan.
NOTE: Professor Shigetaka Katsuki sent me a specimen from Japan.

**Cercospora bulgarica** Christoff (Khristov)
Sved. Zemled. Renseign. Agr. Sofia **11**: 11. 1930

HOST: *Ecballium elaterium* A. Rich. (*Momordica elaterium* L.).
TYPE: Botanischer Garten, Sofia, Bulgaria; *Ecballium elaterium;* A. Khristov; Oct. 1930.
NOTE: I have not seen the type but the description and the drawings show plainly that it is not a Cercospora. It is either an Alternaria or possibly an Helminthosporium.

**Cercospora cayaponiae** Stevens and Solheim
Mycologia **23**: 386. 1931

Leaf spots indefinite or none; fruiting effuse in sparingly olivaceous to dark layers, hypophyllous, 2-6 mm. in extent; stromata rare; nonfasciculate or when massed resembling pseudo-fascicles; conidiophores in mass reddish brown but singly very pale olivaceous brown, irregular in width, sometimes constricted at the septa, multiseptate, 0-2 mildly geniculate, a medium sized spore scar at the rounded tip, branched, procumbent, 4-6 x 45-100$\mu$; conidia obclavato-cylindric, rounded to long obconically truncate base, obtusely rounded tip, subhyaline to pale yellowish brown, 4-6 x 25-110$\mu$.

HOSTS: *Cayaponia* sp., *Gurania wageneriana* (Schl.) Cogn.
TYPE: Rosario, Puerto Rico; Cayaponia sp.; F. L. Stevens; Oct. 27, 1913.
DISTRIBUTION: West Indies and northern South America.
NOTE: The fungus on *Gurania wageneriana* appears identical with the type, the host of which is given as "cucurbit". Later when the description was published the host was given as Cayaponia. Could it be that the cucurbit was a Gurania instead?

**Cercospora citrullina** Cooke
Grevillea **12**: 31. 1883

*Cercospora cucurbitae* Ellis and Everh., Jour. Mycol. **4**: 3. 1888
*Cercospora sechii* Stevenson, P. Rico, Ins. Exp. Sta. Dept. Agr. Ann. Rept. **1917-18**: 137. 1919
*Cercospora trichosanthis* McRae, Ann. Crypt. Exotique **2**: 270. 1929
*Cercospora momordicae* McRae, Ann. Crypt. Exotique **2**: 267. 1929
*Cercospora luffae* Hara, Diseases of cultivated plants, p. 228, 1928?
*Cercospora chardoniana* Chupp, Monographs, Univ. P. Rico, B. **2**: 245. 1934

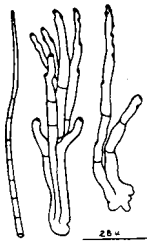



Fig. 104
*C. chardoniana*

*Cercospora momordicae* Mendoza, Philipp. Jour. Sci. **75**: 173. 1941
*Cercospora momordicae* Sawada, Formosa Agr. Res. Inst. Rept. **86**: 173. 1943

Leaf spots circular to irregular, 0.5-7 mm. in diameter, pale brown or tan to white, usually with a purplish to dark brown margin; fruiting chiefly epiphyllous; stromata none to small, brown; conidiophores single or in spreading fascicles of 2-30, mostly 2-5, pale to very pale brown, oldest ones medium brown, uniform in color or youngest ones may have pale tip, uniform in width or mildly attenuated toward the distal end, occasionally swollen at some point, straight to slightly bent or curved, geniculations varying from none to numerous, multiseptate, not

branched, fairly large spore scar at the subtruncate tip, 4-5.5 x 50-300$\mu$, rarely 6.5 x 500$\mu$; conidia hyaline, acicular, almost never obclavate, straight to strongly curved, indistinctly multiseptate, base truncate, tip acute, 2-4 x 50-220$\mu$, or even as large as 5.5 x 450$\mu$.

HOSTS: *Citrullus vulgaris* Schrad., *Cucumis melo* L., *C. sativus* L., *Cucurbita (perennis) foetidissima* Kunth., *C. maxima* Duchesne, *C. pepo* L., *Lagenaria leucantha* Rusby, (*L. vulgaris* Ser.), *Luffa cylindrica* Roem., *Momordica charantia* L., *M. cochinchinensis* Spreng., *M. cordifolia* Sond., *M. foetida* Schum. & Thom., *Sechium edule* Sw., *Sicana odorifera* Haud., *Trichosanthes anguina* L., *T. japonica* Regel.

TYPES: Aiken, S. Car.; *Citrullus vulgaris;* H. W. Ravenel, No. 3101; (*C. cucurbitae*) Manhattan, Kansas; *Cucurbita perennis;* W. T. Swingle, No. 1032; July 20, 1887; (*C. momordicae* McRae) Pusa, India; *Momordica charantia;* L. S. Money, No. 2346; July 17, 1923; (*C. chardoniana*) Maracay, Aragua, Venezuela; *Momordica charantia;* Chardon, Toro, and Alamo, No. 178; (*C. momordicae* Mendoza) Luzon, Manila, Philipp.; *Momordica charantia;* Mendoza, Nos. 55334, 55372; (*C. trichosanthis*) Pusa, India; *Trichosanthes anguina;* L. S. Money, No. 2318; July 30, 1910; (*C. sechii*) Barceloneta and Rio Piedras, P. Rico; *Sechium edule;* J. A. Stevenson, No. 6462, 6888; (*C. momordicae* Sawada) *Momordica cochinchinensis;* K. Sawada.

DISTRIBUTION: Reported from nearly every tropical and subtropical country, as far north as Japan and as far south as Peru, Minas Geraes, and South Africa. In the United States it is present from Kansas to Texas and eastward, rarely being reported as far north as Wisconsin.

NOTE: The acicular species on the Cucurbitaceae intergrade to such an extent that it is impossible without careful cross inoculations to give host limits and synonymy. I am not satisfied with the above classification, but can find no distinct morphologic differences to separate the forms on the various hosts. I have not seen the Hara collection of *C. luffae* but the Minas Geraes specimen resembles *C. citrullina* closely. See also *C. cucurbiticola* for differences between the species on Cucurbita.

**Cercospora cucurbiticola** P. Hennings

Hedwigia **43**: 95. 1904

Leaf spots indefinite or none; fruiting in minute olivaceous effuse specks on the lower leaf surface, 0.5-3 mm. in diameter; stromata none to large, globular, reddish brown; nonfasciculate to very dense fascicles; conidiophores often short branches on procumbent threads on leaf surface or on leaf hair, or in fascicles arising from stromata, pale fuligenous, irregular in width, spore scars indistinct, not geniculate, sparingly septate, bluntly rounded tip, 4-5.5 x 10-40$\mu$; conidia cylindric, straight to mildly curved, subhyaline to pale fuligenous, sometimes catenulate, mostly 1-3 septate, base rounded to subtruncate, tip obtuse, 3.5-5.5 x 20-75$\mu$.

TYPE: Gavea, Rio de Janeiro, Brazil; Cucurbita sp.; E. Ule, No. 2607; Sept., 1899.

DISTRIBUTION: Northern South America, Central America, and the West Indies.

NOTE: A number of species have been listed on the host genus, but a study of the types show only two described species, *C. citrullina* and *C. cucurbiticola.* The one has hyaline, acicular conidia and the other colored, cylindric ones.

**Cercospora cucurbitina** Spegazzini

Anal. Soc. Scient. Argentine **16**: 166. 1883

Leaf spots circular to angular, 0.5-2 mm. in diameter, gray center, dark margin; fruiting amphigenous; stromata none to 50$\mu$ in diameter, globular, brown; nonfasciculate to densely compact fascicles; conidiophores pale to very pale olivaceous brown, paler tip, fairly uniform in diameter, sparingly septate and geniculate, not branched, excepting when borne singly as branches from procumbent threads, bluntly rounded tip, 3-4.5 x 40-115$\mu$; conidia subhyaline to faintly colored, cylindric or mildly attenuated, nearly straight, 1-5, mostly 3-septate, base rounded to short obconically truncate, tip obtuse, 3.5-6 x 30-85$\mu$.

TYPE: Caá-guazú, Paraguay; Cucurbitaceae-Cyclanthera?; B. Balansa, No. 3514 (Speg. 928); Jan. 1882.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. cyclantherae* for differences between the two species on this host genus.

**Cercospora cyclantherae** Chupp and Muller

Bol. Soc. Venez. Cien. Nat. 8(52): 43. 1942

Leaf spots circular to irregular, 1-5 mm. in extent, white to gray center, indistinct yellowish margin; fruiting amphigenous; stromata none or only a few brown cells; fascicles 3-12 divergent stalks, rarely as many as 20; conidiophores pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, 0-3 geniculate, not branched, medium sized spore scar at the subtruncate tip, 3-5 x 10-80$\mu$; conidia hyaline, acicular, shortest ones may be only slightly attenuated, straight to mildly curved, base truncate, tip subacute, indistinctly multiseptate, 2-3.5 x 20-100$\mu$.

HOSTS: *Cyclanthera pedata* Schrod., Cyclanthera sp.

TYPE: Experiment Station garden, El. Valle, Caracas, Venezuela; *Cyclanthera pedata;* A. S. Muller and H. H. Whetzel, No. 2907; March 5, 1939.

DISTRIBUTION: Venezuela, Brazil.

NOTE: See also *C. cucurbitina* for differences between the two species on this host genus.

**Cercospora echinocystis** Ellis and Martin

Jour. Mycol. 1: 40. 1885

Leaf spots white, angular, 0.5-4 mm. in diameter, sometimes bounded by the leaf veins; fruiting chiefly epiphyllous; stromata none or a few large brown cells; conidiophores mostly borne singly but sometimes in fascicles of 2-5, pale olivaceous brown, longest ones paler toward the tip and somewhat attenuated, not branched, 0-3 mildly or abruptly geniculate, medium sized spore scar at the subtruncate tip, 4.5-6 x 20-60$\mu$; conidia hyaline, acicular to obclavate, straight to curved, indistinctly multiseptate, truncate base, subobtuse tip, 4-5.5 x 50-150$\mu$.

HOSTS: *Echinocystis lobata* Torr. and Gr., *Sicyos angulatus* L.

TYPE: Lexington, Ky.; *Echinocystis lobata;* Martin; 1882.

DISTRIBUTION: Studied specimens from Kentucky, New Jersey, Illinois, Ohio, Wisconsin, Hawaii and Minas Geraes. Also reported from Delaware (Mycologia **41**: 16. 1949) and Missouri (Univ. of Missouri Studies **22**(3): 11. 1948).

NOTE: As is true of nearly every other host family, the species of Cercospora on the Cucurbitaceae resemble each other in many respects, and can readily be dis-

tinguished from each other only by a study of all the characters involved in classification.

**Cercospora elaterii** Passerini
Hedwigia **16**: 123. 1877

Leaf spots numerous, circular, 0.5-3 mm. in diameter, very pale tan to dingy gray center, bounded by a narrow, raised, light brown line; fruiting chiefly epiphyllous; stromata a few brown cells to prominent, globular, dark brown; fascicles often dense; conidiophores pale to medium brown, fairly uniform in color, uniform in width or irregular, when 1-3 geniculate, attenuation occurs above each successive spore scar, sparingly septate, not branched, straight to curved or tortuous, medium spore scar at the rather narrowly subtruncate tip, 4-6.5 x 20-125$\mu$; mostly 20-60$\mu$; conidia hyaline, acicular, obclavate, or cylindric, straight to slightly curved, indistinctly multiseptate, rarely catenulate, base truncate, tip subacute to obtuse, 2-5 x 50-110$\mu$.

HOST: *Ecballium elaterium* R. Rich. (*Elaterium elaterium, Momordica elaterium* L.)

TYPE: Castellum Dertonae, Piedmont; *Elaterium elaterium;* Passerini; Oct. 1875. Cotype distributed as Rabenhorst, Fungi europaei No. 2275.

DISTRIBUTION: Not known. Possibly only the type locality.

NOTE: This differs from *C. citrullina* in having wider, paler, more tortuous, shorter conidiophores, and more nearly cylindric conidia. Heald and Wolf (Mycologia **3**: 22. 1911) describe, among the Texas fungi, a *Ramularia momordicae* on *M. balsamina* L. and with colored conidiophores. I have not seen the type, but the description leads me to believe it may be a synonym of the above Cercospora species.

**Cercospora gymnopetali** Sawada
Formosa Agr. Res. Inst. Rept. **86**: 170. 1943

Leaf spots 2-6 mm. in diameter; fruiting hypophyllous; stromata 18-65$\mu$; fascicles 8-10 stalks; conidiophores olivaceous, 2-4 septate, 2.5-3.5 x 26-60$\mu$; conidia pale colored, filiform, 5-9 septate, 2.5-3.5 x 47-92$\mu$.

HOST: *Gymnopetalum chinense* Merr.

TYPE: Unknown.

DISTRIBUTION: Formosa (Taiwan)

NOTE: Description too brief.

**Cercospora melonis** Cooke
Gard. Chronicle III **20**: 271. 1896

HOSTS: *Cucumis melo* L., *C. sativus* L.

TYPE: Cooke did not designate a type, and in Kew there is no collection which he studied. But there is a good specimen which was collected in 1925 on muskmelon.

NOTE: According to Seymour's Host Index, this has been reported from North America. I have not been able to find an American collection. It could well occur here on muskmelon and cucumber leaves if the foliage in the greenhouse had been injured or invaded by some pathogen and the temperature kept excessively high. Güssow (Zeitschr. Pflanzenkr. **16**: 12. 1906) named the fungus *Corynespora mazei.* Laubert (Deut. Landw. Presse **38**: 819. 1911) seeing it

was the same as Cooke described, changed the name to *Corynespora melonis* (Cooke) Güssow. It is different from all other Cercosporae in its nonfasciculate conidiophores 300-1000$\mu$ long, and in the very large catenulate, cylindric conidia with the thick walls like those of Helminthosporium. Because it is so distinct, I suggest that it be not considered as a Cercospora, but as Corynespora. Wei (Mycol. Papers. C.-Wealth Mycol. Inst. **34**: 1-10. 1950) changes it to *Corynespora cassiicola* (Berk. & Curtis) Wei. Since nearly all the synonyms he names are distinct from *Corynespora melonis*, I doubt his conclusions.

**Cercospora melothriae** Sawada

Formosa Agr. Res. Inst. Rept. **86**: 173. 1943

Leaf spots subcircular to angular, 3-8 mm., dingy gray to dull tan, sometimes with a wide yellowish to brown halo; fruiting chiefly hypophyllous; stromata small, mostly a few brown cells; fascicles 2-12 divergent stalks; conidiophores pale olivaceous brown, uniform in color, irregular in width or attenuated toward the conic tip, straight to tortuous, 1-5 septate, not branched, slightly geniculate, 4-5.5 x 20-65$\mu$; conidia very pale olivaceous brown, obclavate, straight to mildly curved, indistinctly multiseptate, rounded base, subacute tip, 3-5 x 25-100$\mu$.

HOST: *Melothria heterophylla* Cogn.

TYPE: The exact type not known.

DISTRIBUTION: Formosa.

NOTE: Sawada first published this species as *Cercospora melothrinae* on *Melothrina heterophylla* Cogn. The correction was made on later collections. A 1944 collection by K. Sawada is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora praelonga** Sydow

Ann. Mycol. **23**: 426. 1925

Leaf spots indefinite or none, sometimes slight yellowing on upper surface; fruiting dark olivaceous, effuse, over large areas of lower leaf surface; stromata lacking; nonfasciculate; conidiophores pale to medium dark brown, long, branched, septate threads, usually straight, sometimes undulate to multigeniculate, medium spore scar at subconic tip, uniform in color and width, 4-5.5 x 50-350$\mu$; conidia pale to medium olivaceous brown, narrowly cylindric, rounded or subobconic base, bluntly rounded tip, straight or slightly curved, indistinctly multiseptate, 3-4.5 x 50-250$\mu$, resembling the straight conidiophores closely.

HOSTS: *Gurania levyana* Cogn., *Cayaponia smilacifolia* Cogn.

TYPE: San Pedro de San Ramon, Costa Rica; *Gurania levyana;* H. Sydow, No. 329; Febr. 5, 1925.

DISTRIBUTION: Costa Rica, Peru, Minas Geraes.

NOTE: See also *C. cayaponiae* for differences between the two species. The latter has shorter, more tortuous conidiophores with a rather reddish tinge, and the conidia often are subhyaline and wider.

**Cercospora thladianthae** Sawada

Trans. Nat. Hist. Soc. Formosa **21**: 330. 1931; also

Desc. Catal. Formosan Fungi VI. Rept. **61**: 95. 1933

Leaf spots angular, vein-limited, 2-3 mm. in diameter or coalescing into larger areas, at first yellowish green but gradually changing to grayish brown; fruiting chiefly epiphyllous; fascicles 10 to many stalks; conidiophores upright, pale

brown, uniform in diameter, paler toward the tip, not branched, 1-3 septate, 0-2 geniculate, medium spore scar at the subtruncate tip, 3.5 x 35-50$\mu$; conidia acicular, hyaline, 3-11 septate, slightly bent, base truncate, tip subobtuse, 2-3 x 52-105$\mu$ (Sawada's drawings show almost cylindric conidia).

HOST: *Thladiantha formosana* Hay.

TYPE: Formosa; *Thladiantha formosana;* K. Sawada; Aug. 30, 6th year of Emperor Shoho.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen the type, but the description and the illustration indicate that the species probably is distinct from others on the Cucurbitaceae.

**Cercospora capensis** (Thümen) Saccardo

Syll. Fung. 4: 469. 1886

HOST: *Cunonia capensis* Bnth.

TYPE: Grahamstown, Union of S. Africa; *Cunonia capensis;* P. MacOwan, No. 1262; 1876.

NOTE: de Thümen (Flora 59: 570. 1876) described on *Cunonia capensis* Benth., *Helminthosporium capense,* and on *Osyris compressa* Al. (Grahamstown, No. 1256, July 1876), *H. capense* var. *Osyridis.* Saccardo transferred them to Cercospora. I have not been able to procure specimens for examination, but as the original description seems to favor Helminthosporium more than it does Cercospora, it is being left in the original genus for the present. Dr. Doidge (Aug. 14, 1942) writes that Dr. Hansford recently studied the species and the variety and also decided that both were Helminthosporium.

## CERCOSPORAE ON CYPERACEAE

(All conidia hyaline)

A. Conidia narrowly linear (Septoria-like).
  B. Conidiophores long, 4-4.5 x 70-120$\mu$; conidia 2-3.5 x 20-45$\mu$, 1-4 septate.
    BULBOSTYLIS — *C. glauciana*
  BB. Conidiophores short, rarely more than 50$\mu$ in length.
    C. Conidiophores 2-3.5 x 15-50$\mu$, in fascicles of 2-6, pale to medium olivaceous brown; conidia 1-2 x 20-60$\mu$.
      RHYNCHOSPORA — *C. crinospora*
    CC. Conidiophores 1.5-3 x 5-15$\mu$, mostly in dense fascicles, subhyaline to pale olivaceous brown; conidia 1.5-3 x 20-70$\mu$.
      ELEOCHARIS — *C. eleocharidis*

AA. Conidia not narrowly linear (not Septoria-like).
  B. Conidiophores 4-6 x 10-30$\mu$; fruiting hypophyllous; conidia 2-3.5 x 20-130$\mu$.
    CAREX — *C. caricis*
  BB. Conidiophores mostly longer than 30$\mu$; fruiting amphigenous.
    C. Conidia mostly cylindric, 5-6 x 40-90$\mu$; conidiophores 4-5 x 10-55$\mu$.
      CYPERUS (MARISCUS) — *C. cyperi*
    CC. Conidia obclavate or acicular.
      D. Conidia 2-3.5 x 20-130$\mu$; conidiophores 4-5 x 20-60$\mu$.
        SCIRPUS — *C. scirpi*
      DD. Conidia 3-5.5 x 30-150$\mu$; conidiophores 5-7 x 50-70$\mu$.
        CYPERUS (MARISCUS) — *C. ugandensis*

**Cercospora caricis** Oudemans

Nederl. Kruidk. Archief II. **6**: 59. 1892

*Cercospora caricina* Ellis & Dearness, Proc. Can. Inst. n.s. Part 3. **1**: 91. 1897
*Cercospora microstigma* Sacc., Ann. Mycol. **10**: 315. 1912
*Cercospora caricis* Dearness & House, N. Y. State Mus. Bul. 188: 29. 1916

Leaf spots elongate, pale brown to tan center, dark margin or leaf blades darkened over entire width, and in length from a few millimeters to more than an inch. On the under surface of this darkened area are minute black tufts in rows between the parallel veins of the leaf; stromata small, usually filling stomatal opening, pale to dark brown; fascicles mostly 3-15; conidiophores pale olivaceous brown, often attenuated toward the tip, rarely septate or once geniculate, medium sized spore scar at the tip, straight or nearly so, not branched, 4-6 x 10-30$\mu$ (rarely 45$\mu$); conidia acicular to cylindro-obclavate, hyaline, base truncate to subtruncate, tip subobtuse, straight or slightly curved, septa indistinct, 2-3.5 x 20-120$\mu$.

HOSTS: *Carex albursina* Sheldon, *C. arctata* Boott, *C. castanea* Wahl., *C. convoluta* Mack., *C. Crawfordii* Fernald., *C. folliculata* Linn., *C. granularis* Muhl., *C. interior* L.H.B., *C. intumescens* Rudge, *C. laxiflora* Lam., *C. lupulina* Muhl., *C. cristatella* Br. & Br., *C. stipata* Muhl., *C. plantaginea* Lam., *C. projecta* Mack., *C. retrorsa* Schw., *C. rosea* Schk., *Carex* sp. Davis (Wisc. Acad. Trans. **16**: 751. 1910; **21**: 258. 1924) and Weiss (Pl. Dis. Reporter **29**: 39. 1945) list also Cyperus spp., but this probably is incorrect.

TYPES: Bois de la Haye, Netherland; Carex sp.; Mlle. C. E. Destrée; Sept. 1891; (*C. caricina*) London, Canada; *Carex rosea;* J. Dearness; Aug. 8, 1896; (*C. microstigma*) London, Ontario; *Carex laxiflora* var.; John Dearness; Aug. 1910; (*C. caricis* D. + H.) Old Forge, N. Y.; *Carex folliculata;* C. H. Peck; Aug.

DISTRIBUTION: New York, Iowa, Wisconsin, Manitoba, and Ontario. Apparently present also in the countries of western Europe. See key above.

**Cercospora crinospora** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 58. 1892

No leaf spots visible on dried specimens; scant black fruiting causes slight darkening of minute patches (in type accompanied by some other fungus which is more evident on the leaf blade); stromata slight or none; fascicles consisting of 1-6 stalks; conidiophores pale to medium olivaceous brown, slightly undulate or 0-3 mildly geniculate, sparingly septate, not branched, spore scars inconspicuous, tip rounded to conic, 2-3.5 x 15-50$\mu$; conidia narrowly linear, hyaline, straight to slightly curved, septa invisible, base short obconic, tip subacute, 1-2 x 20-60$\mu$.

HOST: *Rynchospora* (*Rhynchospora*) *glomerata* (L.) Vahl.

TYPE: Auburn, Ala.; *Rhynchospora glomerata;* B. M. Duggar, No. 2034; Aug. 27, 1891.

DISTRIBUTION: Known only from the type locality.

NOTE: See key immediately above *C. caricis.*

**Cercospora cyperi** Sawada

Agr. Exp. Sta. Formosa (Special Bul. 19) **1**: 37, 668. 1919

Affecting foliage and flowers; spots first show as indistinct yellowish areas, which enlarge gradually and turn pale brown, the spots being more generally present near or at the tips of the leaf blades; fruiting amphigenous; stromata

mostly a few large fuligenous cells in the stomatal openings; fascicles 3-15 stalks; conidiophores pale brown, 4-5 x 40-55$\mu$; conidia hyaline, cylindric to distinctly obclavate, straight to curved, 5-9 septate, base truncate, 5-6 x 40-90$\mu$.

HOSTS: *Cyperus pilosus* Vahl., *C. schweinitzii* Torr. (*C. houghtonii* Torr.), *Mariscus glomeratus* (*C. filiculmis* Vahl.).

TYPE: Formosa; *Cyperus pilosus.*

DISTRIBUTION: Japan, Uganda.

NOTE: I was unable to procure any of Sawada's material. See key immediately above *C. caricis.*

**Cercospora eleocharidis** Davis

Wisc. Acad. Trans. **24**: 300. 1929

Minute elongate pale brown to cinnamon brown areas are formed on green leaf blade, finally turning whole blade brown; fruiting amphigenous; pale fuligenous stromata filling stomatal openings; fascicles usually dense; conidiophores subhyaline to pale fuligenous or olivaceous, very delicate, septa and branching not visible, sometimes once mildly geniculate, minute black spore scar on conic tip, 1.5-3 x 5-15$\mu$; conidia narrowly linear, hyaline, straight to slightly curved, septa not visible, base subtruncate, tip subacute, 1.5-3 x 20-70$\mu$.

HOST: *Eleocharis palustris* R.Br.

TYPE: Brill, Wisc.; *Eleocharis palustris;* J. J. Davis; July 23, 1928.

DISTRIBUTION: Known only from the type locality.

NOTE: See key immediately above *C. caricis.*

**Cercospora glauciana** Viégas

Bol. Soc. Bras. de Agron. **8**: 27. 1945

Leaf spots brown, indistinctly delimited from the healthy area, 10-20 mm. in extent; stromata filling stomatal openings, brown; fascicles sometimes dense, not compact; conidiophores brown, multiseptate, subtorulose, rarely geniculate, not branched, 4-4.5 x 70-120$\mu$; conidia hyaline, cylindric, 1-4 septate, base subtruncate, tip obtuse, 2-3.5 x 20-45$\mu$.

HOST: *Bulbostylis major* Palla.

TYPE: Faz. Sta. Elisa, Campinas, Sao Paulo; *Bulbostylis major;* A. P. Viégas, No. 4141; Febr. 18, 1943.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen this species. See key immediately above *C. caricis.*

**Cercospora scirpi** Zaprometov

Bolezni Rastenii **12**: 92. 1923

Also Contr. Mycfl. Central Asia. I. p. 35. 1926

Leaf spots circular to irregular, 2-4 mm. in diameter, pale brown, darker brown margin; fruiting scanty, white; conidiophores pale olivaceous, 4.5 x 60$\mu$; conidia hyaline, acicular, slightly curved, septa indistinct, base truncate, tip acute, 3 x 120-130$\mu$.

HOST: *Scirpus lacustris* Linn.

TYPE: Tashkent, Turkestan; *Scirpus lacustris;* N. G. Zaprometov; 1920.

DISTRIBUTION: Known only from the type locality.

NOTE: I have been unable to procure specimens of this species. See key immediately above *C. caricis.*

**Cercospora scirpicola** (Fuckel) Zinderen-Bakker
Rev. Mycol. n.s. **5**: 64. 1940

*Sporidesmium scirpicola* Fuckel, Symb. 5. 140. taf. I, f. 8. 1870
*Clasterosporium scirpicola* (Fuckel) Sacc., Syll. Fung. **4**: 393. 1886

HOST: *Scirpus lacustris* L., *S. fluviatilis* Gray.
TYPE: Hattenheim, Rhenogovia; *Scirpus lacustris;* Fuckel.
NOTE: Both the description and the illustrations show plainly that this fungus is not a Cercospora. The extremely large, thick-walled conidia fit into the present-day conception of Pseudocercospora. A specimen was sent me by Dr. G. W. Martin on *Scirpus fluviatilis* Gray. from Iowa and which resembles closely the description. Zinderen-Bakker wrote the name *C. scirpicola* (Sacc.).

**Cercospora ugandensis** Hansford
Proc. Linnean Soc. London **1942-3**: 59. 1943

The fungus causes the death of irregular areas of the leaf tips and bracts and gradually extends downward; small, dark olivaceous stromata are arranged in close lines; fascicles 6-15 diverging stalks; conidiophores pale olivaceous brown, 0-3 septate, rarely branched, straight to tortuous, slightly geniculate, 5-7 x 50-70$\mu$; conidia hyaline to subhyaline, obclavate or shortest ones cylindric, straight to mildly curved, 5-9 septate, base obconic to subtruncate, tip subacute (-1.5$\mu$), 3-5.5 x 30-150$\mu$.

HOST: Mariscus sp. (Cyperus).
TYPE: Kampala Swamp, Uganda; Mariscus sp.; Hansford, 1311; July 1930.
DISTRIBUTION: Uganda.
NOTE: See also *C. cyperi.* Sawada's description is too meager to determine whether his species is the same as Hansford's collection. I am inclined to believe that the two are identical. See key, page 190.

**Cercospora datiscicola** Esfandiari
Sydowia **5**: 368. 1951

Leaf spots irregularly angular, grayish brown, dingy olivaceous margin, 5-10 mm. in diameter; fruiting hypophyllous, sparsely to almost densely dispersed, punctiform in appearance under the hand lens; stromata subglobose, 25-30$\mu$; fascicles compact near the base in passage through the stomata, divergent toward the tip; conidiophores cylindric, unicellular, pale olivaceous brown, 4-5 x 10-80$\mu$; conidia hyaline, cylindro-obclavate, only slightly attenuated to the subobtuse tip, base obconically truncate, straight to curved, 2-9 septate, 4-5 x 30-90$\mu$.

HOST: *Datisca cannabina* L.
TYPE: Karadj, Iran; *Datisca cannabina;* E. Esfandiari; July 11, 1946.
DISTRIBUTION: Iran.
NOTE: I have not seen this species.

**Dilleniaceae**

A. Conidia medium dark in color, 4-6 x 20-80$\mu$; stromata 50-150$\mu$ in length; fascicles very dense.
CURATELLA *C. chirguensis*
AA. Conidia subhyaline to pale in color; stromata mostly small; fascicles mostly dense.

B. Fruiting epiphyllous; conidiophores 4-6 x 10-40$\mu$; conidia, at least longest ones, obclavate, 3-5.5 x 30-85$\mu$.
DILLENIA *C. Dilleniae*

BB. Fruiting amphigenous; conidiophores 3.5-5 x 20-50$\mu$; conidia more nearly cylindric, 3-4.5 x 30-100$\mu$.
DAVILLA *C. Davillae*

**Cercospora chirguensis** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8(52): 41. 1942

Leaf spots numerous, subcircular to irregular, 0.5-4 mm. in diameter, dark purplish to almost black, no distinct border; fruiting amphigenous; stromata prominent, dark brown to almost black, globular to elongate, 50-150$\mu$ in diameter; fascicles mostly very dense; conidiophores in mass dark to almost black, singly pale fuligenous or olivaceous, paler near tip, irregular in width, rarely branched or septate, not geniculate, mostly straight, small spore scar at rounded to conic tip, 3.5-6 x 10-60$\mu$; conidia cylindric to cylindro-obclavate, medium dark olivaceous brown, straight to slightly curved or undulate, often closely and plainly septate, sometimes constricted at the septa, base long obconically truncate, tip obtuse, 4-6 x 20-80$\mu$.

TYPE: Road to Chirgua, Venezuela; *Curatella americana* L. (sand-paper tree); H. H. Whetzel and A. S. Muller, No. 2952; March 8, 1939.

DISTRIBUTION: Known only from the type locality.

NOTE: *C. curatellae,* the other species described on this host genus, has Helminthosporium-like conidia. See key above.

**Cercospora curatellae** Sydow
Ann. Mycol. 28: 208. 1930

Leaf spots circular, 6-15 mm. in diameter, on upper surface dingy gray to mouse-colored, with wide red to purple border, on lower surface uniformly reddish brown; fruiting hypophyllous, often in densely effuse dark to black layers; stromata large, subglobular, black; fascicles dense, compact; conidiophores medium to dark olivaceous brown, sparingly septate, straight to curved or undulate, not geniculate, not branched, tip rounded to conic, 4-5 x 10-50$\mu$ (Sydow says 4-8 x 25-100$\mu$); conidia medium to fairly dark olivaceous brown, cylindric or sometimes distinctly obclavate, plainly multiseptate, pronounced constrictions occasionally at septa, straight to mildly curved, base obconically truncate, tip obtuse, 5-7.5 x 30-80$\mu$.

HOST: *Curatella americana* L.

TYPE: Inter La Victoria et Guacamaya, Aragua, Venezuela; *Curatella americana;* H. Sydow; Jan. 28, 1928.

DISTRIBUTION: Venezuela, Trinidad.

NOTE: Although some collections, presumably immature, have pale colored, thin-walled conidia, the type and other collections have the thick walls and dark color which justify the name *Helminthosporium curatellae* (Sydow).

**Cercospora davillae** Muller & Chupp
Arquiv. Inst. Biol. Veg. Rio de Janeiro 1: 216. 1935

Leaf spots conspicuous, 2-5 mm. in diameter, gray with wide purple margin or uniformly pale reddish brown; fruiting amphigenous, when abundant giving

the appearance of zonations on the spots; stromata globular, dark brown to almost black, 20-50$\mu$ in diameter; fascicles mostly dense; conidiophores pale olivaceous brown, paler and sometimes more narrow toward the tip, 0-2 septate, rarely geniculate or branched, mostly straight, minute spore scar at the conic or rounded tip, 3.5-5 x 20-50$\mu$; conidia subhyaline to very pale olivaceous, obclavato-cylindric, 2-6 septate, straight, base obconically truncate, tip obtuse, 3-4.5 x 30-100$\mu$.

TYPE: Vicosa-Escola, Minas Geraes, Brazil; *Davilla rugosa* Poir.; A. S. Muller, No. 596; June 5, 1933.
DISTRIBUTION: Known only from the type locality.
NOTE: See key, page 194.

**Cercospora dilleniae** Petch

Annals Roy. Bot. Gard. Peradeniya 3(Pt. 1): 9. 1906

Leaf spots large, irregular, gray to tan blotches, 7-30 mm. in diameter, occasionally with two distinct zones, with or without a dark to black margin, on lower surface uniformly reddish brown; fruiting epiphyllous; stromata irregular, dark to black, small; fascicles mostly dense, sometimes very dense; conidiophores in mass dark, singly pale olivaceous brown, paler toward the tip, uniform in diameter, almost straight, 0-1 septate, not geniculate, not branched, small spore scar at the bluntly rounded tip, 4-6 x 10-40$\mu$; conidia obclavato-cylindric to obclavate, subhyaline to pale olivaceous, straight or slightly curved, 5-9 septate, base obconically truncate, tip obtuse, 3-5.5 x 30-85$\mu$ (Petch says 4-7 x 60-90$\mu$).

TYPE: Peradeniya; *Dillenia retusa* Thunb.; T. Petch.
DISTRIBUTION: Several collections from Peradeniya.
NOTE: I did not see the type, but studied a collection Petch made Aug. 8, 1917. See key, page 194.

## CERCOSPORAE ON DIOSCOREA

A. Leaf spots indefinite or none; fruiting effuse (Cladosporium-like).
  B. Conidia cylindro-obclavate, subhyaline or very pale colored, nearly straight.
    DIOSCOREA spp. *C. pachyderma*
  BB. Conidia distinctly cylindric, plainly colored, often strongly curved.
    DIOSCOREA sp. *C. cylindrata*
    D. SEPTEMLOBA
AA. Leaf spots definite; fruiting not Cladosporium-like.
  B. Conidia hyaline to subhyaline, 4-7.5 x 20-120$\mu$; conidiophores 3.5-5 x 20-150$\mu$.
    DIOSCOREA ALATA *C. ubi*
    D. BULBIFERA (*C. brasiliensis*)
  BB. Conidia colored.
    C. Conidiophores long, 4-5 x 30-150$\mu$; conidia often strongly curved, 4-6 x 40-100$\mu$.
      DIOSCOREA ALATA *C. carbonacea*
    CC. Conidiophores 4-5.5 x 10-60$\mu$; conidia not strongly curved.
      D. Conidia 5-8 x 20-120$\mu$; leaf spots often with white or gray centers; stromata dark; fascicles dense.
        DIOSCOREA spp. *C. contraria*

DD. Conidia 4-5.5 x 40-100$\mu$; leaf spots brown or dark colored; stromata pale; fascicles usually not dense.
DIOSCOREA spp. *C. dioscoreae* (*C. nubilosa*) (*C. tokoroi*)

**Cercospora carbonacea** Miles
Trans. Ill. Acad. Sci. **10**: 255. 1917

Leaf spots large, angular, brown to almost black as if charred or burned, 5-20 mm. in diameter; fruiting mostly hypophyllous; stromata globular, brown, 20-90$\mu$ in diameter; fascicles 2-30 divergent stalks; conidiophores pale to medium brown, plainly multiseptate, longest ones wavy or mildly geniculate, not attenuated, tip short conic with small spore scar, not branched, 4-5 x 30-150$\mu$; conidia cylindric, often strongly curved or sinuous, subhyaline to pale olivaceous, many showing a large vacuole in each cell, base long obconic to subtruncate, tip obtuse, 4-8 septate, 4-6 x 40-100$\mu$. Rarely a specimen may have only small stromata, and only an occasional conidium strongly curved.

TYPE: Puerto Rico; *Dioscorea alata* L.; F. L. Stevens, No. 4178; 1913.
DISTRIBUTION: Studied material from Puerto Rico, San Domingo, India, Barbados, and Trinidad.
NOTE: This species differs from the others on the host genus, by having strongly curved conidia and causing definite leaf spots. See key above.

**Cercospora contraria** H. & P. Sydow
Ann. Mus. Congo Belge. Bot. Ser. V. Fasc. 1. **3**: 21. 1909

Leaf spots circular, 3-12 mm. in diameter, dingy gray, pale brown margin, at times with a narrow black line dividing the two areas; fruiting amphigenous; stromata subspherical, almost black, 20-60$\mu$ in diameter; fascicles dense; conidiophores medium dark brown, uniform in color, irregular in width, longest ones septate, rarely geniculate, straight, curved, or tortuous, not branched, small spore scar at the conic tip, 4-5.5 x 10-50$\mu$; conidia cylindric or slightly attenuated, pale olivaceous brown, plainly multiseptate, almost straight, occasionally catenulate, ends rounded to conic, 5-8 x 20-120$\mu$ (Wildeman says 3-4 x 50-100$\mu$).

HOSTS: Dioscorea sp.; *D. hirtiflora* Benth., *D. trifida* L., *D. quinqueloba* Thunb.
TYPE: a Kisantu, Congo Belge; Dioscorea sp.; H. Vanderyst; Feb. 9, 1908.
DISTRIBUTION: Belgian Congo, Uganda, Sao Paulo (Brazil), Sierra Leone. Dr. Togashi sent a specimen from Japan.
NOTE: The Sierra Leone material has slightly wider conidia and conidiophores than does the type. The conidiophores measure 5-7.5 x 10-60$\mu$. The dense fascicles and distinct leaf spots combined with the wide cylindric, straight conidia separate this species from the others on this host genus. See key, page 195.

**Cercospora cylindrata** Chupp & Linder
Mycologia **29**: 29. 1937

Leaf spots indistinct or none; fruiting in a felty layer, hypophyllous, very dark olivaceous to almost black; stromata lacking; nonfasciculate; conidiophores borne singly as long branches from procumbent threads, medium dark brown, uniform in color, irregular in width, plainly multiseptate, constricted at septa, not geniculate, undulate to tortuous, small spore scar at the conic tip, 4-5 x 50-300$\mu$; co-

nidia pale to medium brown, cylindric, plainly 3-5 septate, variously curved, extreme cases being U-shaped or sigmoid, base sharply obconic, tip bluntly rounded, 4-6.5 x 25-75$\mu$.

HOSTS: *Dioscorea septemloba* Thunb., Dioscorea sp.

TYPE: Yung Hsien, Ta Tseh Tsuen, Kwangsi Province, China; Dioscorea sp.; S. Y. Cheo, No. 2515; Aug. 18, 1933.

DISTRIBUTION: China, Japan.

NOTE: The nonfasciculate conidiophores combined with the much curved, dark colored, cylindric conidia separate this species from all the others on the host genus. Olive (Mycologia **40**: 16. 1948) describes the genus, Helicomina, which fits the fungus better than does Cercospora: *H. cylindrata* (Ch. & Lind.).

**Cercospora dioscoreae** Ellis & Martin

Amer. Nat. **16**: 1003. 1882

*Cercospora nubilosa* E. & E., Jour. Mycol. **4**: 115. 1888

*Cercospora tokoroi* Togashi, Imp. College Agr. + Forst. Morioka Bul. 22: 46. 1936

Large dark brown blotches surrounded by irregular yellowish brown areas on upper leaf surface, and on the corresponding lower surface olivaceous areas which resemble patches of effuse fruiting; fruiting, however, not effuse, amphigenous; very slight, pale brown stromata; fascicles 7-20 stalks; conidiophores pale olivaceous brown, uniform in color, sometimes branched, slightly attenuated toward tip, which is rounded and with small spore scar, 0-1 mildly geniculate, 0-1 septate, 4-5.5 x 20-60$\mu$; conidia obclavato-cylindric or rarely obclavate, straight or mildly curved, pale olivaceous, indistinctly 2-8 septate, short obconic base, bluntly rounded tip, 4-5.5 x 40-100$\mu$.

HOSTS: *Dioscorea villosa* Linn; Dioscorea sp.; *D. japonica* Thunb.; *D. tokora* Mak.; *D. alata* L.; *D. sativa* L.

TYPES: Delaware Co., Pa.; *Dioscorea villosa;* Wm. Trimble, No. 3295a; Aug. 1882; (*Cercospora nubilosa*) Cleveland, Ohio; Dioscorea sp.; S. M. Tracy; Aug. 20, 1888; (*Cercospora tokoroi*) Iwate Prefecture, Japan; *Dioscorea tokora;* K. Togashi; Sept. 15, 1934. (2 other collections also given).

DISTRIBUTION: Wisconsin, Iowa, Pennsylvania, Delaware, Ohio, Trinidad, Sao Paulo, Italy, India, Ceylon, Japan, Formosa, Uganda.

NOTE: *C. nubilosa* was first described as occurring on Smilax, but the host later was determined as Dioscorea (Ann. Missouri Bot. Gard. **14**: 425. 1927; **16**: 43. 1929). I did not study the type of *C. tokoroi,* but the description and drawings fit *C. dioscoreae,* which differs from all the other species on this host genus by having almost straight, colored conidia, and pale conidiophores. See key, page 196.

**Cercospora pachyderma** H. & P. Sydow

Ann. Mycol. **12**: 203. 1914

Leaf spots indistinct or none; fruiting effuse, hypophyllous, olivaceous to almost black; stromata rare; nonfasciculate to densely fasciculate; conidiophores mostly rising as single branches from procumbent threads, when in fascicles branched, pale olivaceous brown, uniform in color, irregular in width, multiseptate, commonly constricted at the septa, rarely geniculate, small spore scar at the

conic to rounded tip, 3.5-6 x 75-600$\mu$; conidia when long obclavate, shorter ones obclavato-cylindric, subhyaline to very pale olivaceous brown, straight to mildly curved, multiseptate, base rounded to long obconic, tip obtuse, 4.5-7 x 30-100$\mu$.

HOST: *Dioscorea alata* L., *D. subclava, D. tokora* Makino, *D. yunnanensis.*

TYPE: Los Banos, Laguna, Luzon, Philipp.; *Dioscorea alata;* C. F. Baker, No. 522; Nov. 1913.

DISTRIBUTION: Philippines, China, and Japan.

NOTE: The nonfasciculate conidiophores, and nearly straight conidia that are more nearly obclavate than cylindric, separate this species from the others on this host genus. See key, page 195.

**Cercospora scandens** Saccardo & Winter

Hedwigia **22**: 14. 1883

*Cercospora scandens* var. *macrospora* C. Mass., Osserv. fitolog. in Madonna Verona **2**: 35. 1908

*Cercospora tami* Hollos, Math. Termesz, Közlem Magyar Tud. Akad. **35**: 17. 1926

Leaf spots circular to angular, 0.5-6 mm. in diameter, or coalescing into larger areas, brown to dark brown, usually with paler colored center; fruiting amphigenous; stromata lacking or only a few brown cells, rarely as large as 25$\mu$ in diameter, globular, dark brown; fascicles 2-18 stalks; conidiophores near base medium dark brown, paler and more narrow toward the tip, multiseptate, not branched, 0-5 mildly to abruptly geniculate, a medium sized spore scar at the subtruncate tip, 3.5-6 x 20-100$\mu$; conidia hyaline to subhyaline, rarely appearing almost colored, acicular, straight to slightly curved, indistinctly septate, base truncate, tip acute to subacute, 2.5-5 x 30-150$\mu$.

HOST: *Tamus communis* L.

TYPES: Zurich, Helvetia; *Tamus communis;* G. Winter; June 1882; co-type distributed as Rabenhorst-Winter, Fungi europaei No. 2881; (*Cercospora scandens* var. *macrospora*) Pr. Tregnago, Verona, Ital. bor.; C. Massalongo; Agusto 1906; (*Cercospora Tami*) prope Szekszárd, Hungariae; L. Hollos.

DISTRIBUTION; Switzerland, France, northern Italy, Hungary, Germany, and Palestine.

NOTE: I have not seen the types of the variety and *C. tami,* but their descriptions fit closely the co-type of *C. scandens.* Penzes (Folia Crypt. **1**: 320. 1927) also suggests that *C. tami* Hollos is a synonym of *C. scandens.* In the Berlin herbarium is a collection made by Schroeder, Aug. 1877, at Rastatt in Baden, Germany. The packet is labeled *Cercospora tami* Saccardo. Apparently it is the same fungus that later was described as *C. scandens.* Oudemans (**1**: 1197.) lists *Cercospora tamicola* Lamb & Fautrey. It seems to be a typographical error, and should be *Cercosporella tamicola.* Kuhnholtz-Lordat (Annales des Epiphytes **13**: 51-53. 1947) discusses the possibility of this fungus being *Cercospora asparagi.* He bases his supposition on the size of the conidia (as large as 4 x 150$\mu$) and the length of the conidiophores (as long as 60$\mu$).

**Cercospora ubi** Raciborski

Bot. Inst. Buitenzorg, Batavia. Par. Algen u. Pilze Javas **3**: 39. 1900

*Cercospora brasiliensis* Averna, Bol. Agr. Sao Paulo. XVIII A. 7: 580. 1917

Leaf spots orbicular to irregular, 10-15 mm. in diameter, various shades of

brown, mostly immarginate, the entire leaf finally dies; fruiting amphigenous; stromata lacking or a few brown cells; fascicles 2-12 stalks; conidiophores medium dark brown, uniform in color and width, plainly multiseptate, straight to slightly undulate or geniculate, branched occasionally, small spore scar at the rounded to conic tip, 3.5-5 x 20-150$\mu$; conidia hyaline to older ones faintly colored, obclavate to cylindro-obclavate, straight to moderately curved, 3-9 septate, base bluntly obconic, tip obtuse, 4-7.5 x 20-120$\mu$.

HOST: *Dioscorea alata* L., *D. bulbifera* L.
TYPE: Buitenzorg, Java; *Dioscorea alata;* M. Raciborski; Averna-Sacca does not mention a type, but states it is common in Sao Paulo.
DISTRIBUTION: Philippines, Formosa, China, Java, India, southern Russia, San Domingo, Venezuela, Sao Paulo (Brazil), and Minas Geraes (Brazil). Dr. Togashi sent a specimen from Japan.
NOTE: The small fascicles, the long conidiophores, and the almost hyaline obclavate conidia separate this species from the others on this host genus. See key, page 195.

**Cercospora cephalariae** Rayss

Palestine Jour. Bot. Jerusalem Series 5: 24. 1950

Spots circular to irregular, 3-10 mm. in diameter, grayish brown, bordered by an indistinct brown zone; fascicles hypophyllous, usually filling stomatal openings; conidiophores brown, septate, bent or curved, somewhat geniculate, 3-4 x 50-70$\mu$; conidia pale olivaceous, obclavate, 3-6 septate, curved, base subtruncate, tip subacute, 2-2.5 x 35-60$\mu$.

HOST: *Cephalaria joppica* Coult. ex DC.
TYPE: CA. Daliyah, Palestine; *Cephalaria joppica;* May 27, 1949; Kafr.-Kauna, Palestine, May 26, 1949.
DISTRIBUTION: Palestine.
NOTE: I have not seen this species.

**Cercospora elongata** Peck

N. Y. State Mus. Ann. Rept. 33: 29. 1880

*Cercosporina elongata* (Peck) Speg., Anal. Mus. Nac. Buenos Aires. 20: 425. 1910
*Cercosporina scabiosaecola* Rangel, Bol. Agr. Sao Paulo XVI A. 4: 324. 1915
*Cercospora knautiae* Siemaszko, Arch. Nauk Biol. Towarz. Nauk Warszawskiego. 1(14): 1-57. 1923

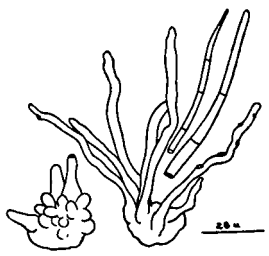


Fig. 105
*C. elongata*

*Cercospora dipsaci* Hollos, Math. Termesz. Közl. Magyas. Tud. Akad. (Budapest) **35**: 17. 1926

Leaf spots angular, bounded by veins, at first greenish to brownish, then turning dingy gray, usually numerous, at first small, but later coalescing and including a large part of the leaf surface; in severe infection all the lower leaves may be killed; fruiting amphigenous, but mostly on the upper leaf surface; stromata none or a few dark brown cells; fascicles 3-30 stalks; conidiophores medium dark brown, paler and more narrow toward the tip, plainly multiseptate, sometimes constricted at the septa, variously crooked or bent or 1-5 geniculate, sometimes slightly branched, often irregular in width, large spore scar at the conical truncate tip, 4-7 x 20-150$\mu$, mostly 4-5 x 20-90$\mu$; conidia hyaline, acicular or sometimes obclavate, straight or slightly curved, truncate base, subobtuse tip, septa indistinct, 3-5 x 50-200$\mu$.

HOSTS: *Dipsacus silvestris* Mill., *Scabiosa montana* Bieb. (*Knautia montana*), *Sc. maritima* L. (*Sc. atropurpurea* L.).

TYPES: Jamesville, N. Y.; *Dipsacus silvestris;* C. H. Peck; Aug.; (*C. scabiosaecola*) Paqueta near Rio de Janeiro, Brazil; *Scabiosa atropurpurea;* Eugenio Rangel, No. 793; Sept. 1913; (*C. knautiae*) Pschu Abchazia, Caucasus; *Knautia montana* DC. var. *heterotricha* C. Koch; W. Siemaszko; Aug. 21, 1917.

DISTRIBUTION: Ontario and New York south to West Virginia and Missouri, and in Brazil, Hungary, Roumania, Poland, middle Asia, Caucasus, China, and Japan.

NOTE: This species makes an excellent specimen for studying spore formation at the tip of a conidiophore. Sorokine (Rev. Mycol. **12**: 54. 1890) described a *C. elongata* Sor., on Convolvulus, but this is ten years later than Peck's use of the name. A detailed study of fresh material on all the hosts, and cross inoculations may show that the named species are distinct. But an examination of slides of the dried types shows no noticeable differences among all of these.

**Cercospora shoreae** Thirumalachar & Chupp
Mycologia **40**: 360. 1948

Leaf spots irregular, 3-10 mm. in diameter, dull gray, pale brown line margin; fruiting amphigenous but chiefly epiphyllous; stromata dark brown, globular, 15-35$\mu$; conidiophores arising singly from the stromata or in spreading fascicles of 2-15, pale olivaceous brown, uniform in color but slightly more narrow toward the bluntly rounded tip, 0-2 septate, curved to undulate, not branched, rarely geniculate, 2-4 x 15-40$\mu$; conidia pale olivaceous, narrowly obclavate to almost linear, straight to mildly curved, indistinctly 1-5 septate, base rounded to subtruncate, tip blunt to conic, 2-4 x 15-60$\mu$.

HOST: *Shorea talura* Roxb.

TYPE: Bannerguatea, Bangalore, India; *Shorea talura;* M. J. Thirumalachar; Dec. 28, 1944.

DISTRIBUTION: Known only from the type locality.

NOTE: This is a new host family.

**Cercospora diospyri** Thümen
Mycoth. Univ. No. 1273. 1874

*Helminthosporium diospyri* Thüm., Rev. Mycol. **1**: 60. 1879
*Cercospora diospyri* (Thüm.) Cooke, Grevillea **12**: 31. 1883

*Cercospora diospyri* Cooke, Kew Herbarium, Ravenel's Col. 2659

Leaf spots indefinite or none; fruiting in small to large effuse olivaceous to black patches on lower leaf surface; nonfasciculate to fasciculate, fascicles dense to very dense; stromata globular, black, 20-50$\mu$ in diameter; conidiophores dark fuligenous or reddish brown, branched, variously curved or crooked, attenuated toward tip or irregular in diameter, 0-1 geniculate, septa indistinct, tip rather conic with 1-3 small spore scars, 3-5 x 10-60$\mu$, branches sometimes longer; conidia obclavato-cylindric to obclavate, dark fuligenous or olivaceous brown, straight to slightly curved, medium to fairly long obconic base, bluntly rounded tip, mostly 1-5 septate, rarely closely septate and with constrictions at septa or irregular in width, 3-5 x 20-100$\mu$.

HOST: *Diospyros virginiana* L.

TYPE: Aiken, South Carolina; *Diospyros virginiana;* H. W. Ravenel (588) 2659. Type distributed as de Thümen, Mycoth. Univ. No. 1273. When de Thümen described *Helminthosporium diospyri,* he gave Ravenel, No. 2196.

DISTRIBUTION: Southern United States, and at least as far north as West Virginia.

NOTE: Saccardo (Syll. Fung. 4: 467. 1886) stated that the name on the packet was *Helminthosporium diospyri,* but this is incorrect. In 1874 de Thümen under Mycotheca Universalis No. 1273 put out *C. diospyri* with a printed description on the packet. Then in 1879 he published the description under the name *Helminthosporium diospyri.* This was followed by Cooke's changing the name again to Cercospora. But as de Thümen already had done this, the latter's name is valid. Tracy and Earle (Miss. Agr. Exp. Sta. Bul. 38: 151. 1896) say *C. flexuosa* is a synonym of *C. diospyri.* This seems incorrect. It is a distinct species with *C. diospyri* var. *ferruginosa* Atk. (Jour. Elisha Mitchell Sci. Soc. 8: 63. 1892), as its synonym. Anderson et al (U.S.D.A. Bul. 1366: 44. 1926) record *C. virginiana* Thümen on Diospyros. I believe this is a typographical error and should have been *C. diospyri* Thümen on *D. virginiana* L. Roumeguere (Rev. Mycol. 11: 8. 1889) in listing his Fungi Sel. Exsiccati No. 4786, gives the host as *Amorpha herbacea* Walt. This is a typographical error, since he gives the Ravenel collection at Aiken, South Carolina. See key below.

## CERCOSPORAE ON DIOSPYROS

A. Leaf spots indefinite; fruiting effuse, hypophyllous.
  B. Conidiophores very pale in color, 2-4 x 10-45$\mu$, non-fasciculate; no stromata; conidia very pale in color, 2-4 x 35-100$\mu$. *C. diospyri-morrisianae*
  BB. Conidiophores and conidia dark in color, nonfasciculate to dense fascicles; stromata sometimes present.
    C. Conidiophores 4-5 x 30-140$\mu$; conidia 4.5-6 x 20-75$\mu$. *C. flexuosa*
    CC. Conidiophores 3-5 x 10-60$\mu$; conidia 3-5 x 20-100$\mu$. *C. diospyri*
AA. Leaf spots distinct; fruiting not effuse; conidia pale to very pale in color, 2-4.5 x 20-120$\mu$.
  B. Fruiting chiefly epiphyllous; conidiophores very short, 3-4 x 5-15$\mu$, pale brown. *C. kaki*
  BB. Fruiting hypophyllous; conidiophores mostly longer than 15$\mu$, very pale in color.
    C. Conidiophores in loose to dense fascicles, 2-4 x 10-75$\mu$; stromata none or up to 50$\mu$. *C. fuligniosa*

CC. Conidiophores in dense fascicles, 2-4 x 10-35$\mu$; stromata 40-75$\mu$.
*C. diospyri-erianthae*

**Cercospora diospyri-erianthae** Sawada

Taiwan (Formosa) Agr. Res. Inst. Rept. 85: 103. 1943

Leaf spots subcircular, 1.5-6 mm. in diameter, reddish brown, with black line margin; fruiting chiefly hypophyllous; stromata globular, dark brown, 40-75$\mu$ in diameter; fascicles dense, mostly divergent; conidiophores subhyaline to pale yellowish olivaceous, uniform in color and width, sparingly septate, straight to curved or undulate, sometimes branched, rarely geniculate, conic tip, 2-4 x 10-35$\mu$; conidia subhyaline to pale yellowish olivaceous, obclavate or shortest ones almost cylindric, 3-7 septate, straight to mildly curved, base subtruncate to long obconically truncate, tip subacute, 2-4.5 x 30-120$\mu$.

HOST: *Diospyros eriantha* Champ.

TYPE: Taipeh, Taiwan (Formosa); *Diospyros eriantha;* K. Sawada; May 24, 1926.

DISTRIBUTION: Formosa.

NOTE: See key for differences among the species on Diospyros. A part of the Sawada cotype is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora diospyri-morrisianae** Sawada

Taiwan (Formosa) Agr. Res. Inst. Rept. 85: 103. 1943

Leaf spots none or indistinct, slightly discolored areas on upper leaf surface; fruiting sparingly effuse on the corresponding lower surface, grayish olivaceous or almost the same color as the dried herbarium leaves; stromata lacking; nonfasciculate; conidiophores branches from procumbent threads, subhyaline to pale olivaceous, uniform in color and width, rarely septate or geniculate, small spore scar at conic tip, 2-4 x 10-45$\mu$; conidia subhyaline to pale olivaceous, obclavate, straight to curved, 3-7 septate, base obconic to obconically truncate, tip subacute, 2-4 x 35-100$\mu$.

HOST: *Diospyros morrisiana* Hance

TYPE: Taipeh, Taiwan (Formosa); *Diospyros morrisiana;* K. Sawada; July 25, 1926.

DISTRIBUTION: Formosa.

NOTE: See the key for differences among the species on Diospyros. A part of the Sawada type is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora flexuosa** Tracy & Earle

Bul. Torrey Bot. Club 22: 178. 1895

*Cercospora diospyri* var. *ferruginosa* Atk., Jour. Elisha Mitchell Sci. Soc. 8: 63. 1892

Leaf spots indefinite or lacking; fruiting in effuse, olivaceous to sooty masses on lower leaf surface, on some specimens rather indistinct; stromata sometimes present, black, globular, small; nonfasciculate to dense fascicles; conidiophores dark brown, plainly multiseptate, branched, uniform in color and width, variously curved or bent, sinuous to multigeniculate, small spore scar at rounded tip, 4-5 x 30-140$\mu$; conidia dark brown or olivaceous brown, obclavate to cylindro-obclavate, plainly and closely septate, straight to slightly curved, base bluntly rounded, tip obtuse, 4.5-6 x 20-75$\mu$.

HOST: *Diospyros virginiana* L.

TYPES; Ocean Springs, Miss.; *Diospyros virginiana;* F. S. Earle; Oct. 10, 1889; (var. *ferruginosa*) Auburn, Ala.; *D. virginiana;* B. M. Duggar, No. 2254; Sept. 26, 1891.

DISTRIBUTION: The Gulf States.

NOTE: Tracy and Earle (Miss. Agr. Exp. Sta. Bul. **38**: 151. 1896) state that this species and variety seemed to be the same as *C. diospyri* Thümen. The olivaceous to sooty effuse fruiting, the long, much branched conidiophores and the closely septate conidia separate this species from the others on Diospyros. Tanaka of Japan described a *Cercospora flexuosa* on Morus, but later Sawada changed it to *C. kusanoi.* See key, page 201.

**Cercospora fuligniosa** Ellis & Kellerman

Jour. Mycol. **3**: 103. 1887

*Cercospora atra* E. + E., Jour. Mycol. **4**: 4. 1888

*Cercospora diospyri* Viégas, Bol. da Soc. Brasil de Agron. **8**: 23. 1945

Leaf spots black, minute reddish brown center on lower surface, 0.5-4 mm. in diameter, angular or sometimes circular; fruiting chiefly hypophyllous; stromata none or black, globular, up to 50$\mu$ in diameter; fascicles mostly not dense and spreading, sometimes dense and compact; conidiophores very pale fuligenous, straight to somewhat curved, rather irregular in width, septa invisible, not branched, not or rarely geniculate, rounded tip without visible spore scar, 2.5-4 x 10-75$\mu$ (Ellis says 100-150$\mu$ and much toothed); conidia cylindric to cylindro-obclavate, pale olivaceous, straight to curved, indistinctly 1-3 or rarely more septate, sharply obconic base, subobtuse tip, 2.5-4 x 20-100$\mu$.

HOSTS: *Diospyros virginiana* L., *D. hispida* DC.

TYPES: Mound City, Kansas; *Diospyros virginiana;* W. A. Kellerman, No. 1010; July, 1887; (*C. atra*) Faulkland, Del.; *D. virginiana;* A. Commons, No. 491; Aug. 1887; (*C. diospyri*) Jardim Botanico, Belo Horizonte, Minas Geraes, Brazil; *Diospyros hispida;* A. P. Viégas, No. 4134; Jan. 30, 1943.

DISTRIBUTION: Probably as widespread in the United States as is the host. Also sent from Minas Geraes, Brazil.

NOTE: Ellis (Jour. Mycol. **4**: 83. 1888) noted the similarity of *C. atra* to *C. fuligniosa.* Saccardo and Sydow (Syll. Fung. **14**: 1106. 1899) suggest for this species the spelling, *C. fuliginosa,* since they consider the original species name a typographical error. But it is confusing to accept the correction inasmuch as Ellis and Everhart described a *C. fuliginosa* on Ceanothus. It would be better if the name *C. atra* could be applied. Definite leaf spots, long conidiophores and distinctly obclavate conidia separate this species from the others on Diospyros. See key, page 201.

**Cercospora kaki** Ellis & Everhart

Jour. Mycol. **3**: 17. 1887

Leaf spots circular to angular, 3-10 mm. in diameter, brown, bordered by a dark narrow line, rarely gray with a black center or almost pure white, less definite on lower surface; fruiting chiefly epiphyllous; stromata small, dark brown, 15-60$\mu$ in diameter; fascicles dense to nonfasciculate; conidiophores almost lacking, pale brown, no geniculation, septation, branching or spore scars visible, 3-4 x 5-15$\mu$, appearing much longer when conidia are persistent; conidia filiform to narrowly obclavate, subhyaline to pale olivaceous, straight to curved, septa in-

distinct, base subtruncate to long obconically truncate, tip subobtuse. 2-4 x 20-60$\mu$, sometimes as long as 100$\mu$.

HOSTS: *Diospyros hispida* var. *camporum* Warm., *D. kaki* Linn., *D. lotus, D. tupru* Buch.–Ham.

TYPE: Lafayette, La.; *Diospyros kaki;* A. B. Langlois, No. 722; Sept. 21, 1886.

DISTRIBUTION: Studied collections from Louisiana, Sao Paulo, Minas Geraes, Japan, India, and Bermuda. It also is reported from Texas, China, and Formosa.

NOTE: See key, page 201 for separation of species on Diospyros.

**Cercospora elaeagni** Heald & Wolf

Mycologia **3**: 16. 1911

*Cercospora carrii* Barth., in Herb. (F. Columb. No. 3305)

Leaf spots circular, 0.5-2.5 mm. in diameter, white with a dark brown margin, rather indistinct on the lower surface; fruiting mostly epiphyllous; small brown stromata; fascicles sometimes dense; conidiophores pale olivaceous brown, septate, 0-4 mildly or abruptly geniculate, rarely branched, medium-sized spore scar at the rounded or subtruncate tip, 3-4 x 40-100$\mu$; conidia acicular, hyaline, straight to mildly curved, truncate base, acute tip, indistinctly multiseptate, 2.5-4 x 30-150$\mu$.

HOSTS: Elaeagnus sp., *Elaeagnus angustifolia* Linn.

TYPES: Floresville, Texas; Elaeagnus sp.; Heald and Wolf, No. 2861; Sept. 18, 1909; (*C. carrii*) San Antonio, Texas; *E. angustifolia;* W. P. Parr; Oct. 31, 1910.

DISTRIBUTION: Gulf States from Texas to Florida.

NOTE: Both Fungi Columbiani and Heald and Wolf's description were put out January 1911, but *C. elaeagni* is accepted because it appeared in published form. See also *C. manitobana* for differences between the two species on Elaeagnus.

**Cercospora manitobana** Davis

Trans. Brit. Mycol. Soc. **8**: 96. 1922

Leaf spots pale brown to tan, 1.5-3 mm. in diameter, sometimes with a faintly raised line border, often difficult to see on the silvery whiteness of the dried leaf; fruiting amphigenous; stromata dark brown, globular, 30-100$\mu$ in diameter; fascicles dense to very dense, often coremoid; conidiophores pale olivaceous brown, in mass dark, uniform in color and width, septa indistinct, not branched, many fascicles without geniculation while in others conidiophores may be 1-4 abruptly geniculate, medium spore scar at rounded to subtruncate tip, 3-5 x 40-135$\mu$; conidia subhyaline to pale olivaceous, obclavate, straight, 1-5 septate, base rounded to long obconic, tip obtuse, 4-7 x 20-80$\mu$.

HOST: *Elaeagnus* (*Shepherdia*) *argentea* Pursh.

TYPE: Gilbert Plains, Manitoba, Canada; *Shepherdia argentea* Nutt.; G. R. Bisby, No. 1125; July 27, 1921.

DISTRIBUTION: Manitoba.

NOTE: See also *C. elaeagni* for differences between the two species on this host genus.

**Cercospora aristoteliae** Cooke

Grevillea **19**: 4. 1890

Leaf spots circular to irregular, 2-8 mm. in diameter, pale to dark brown,

sometimes with a narrow reddish to purplish border; fruiting amphigenous; stromata globular, dark brown, 20-50$\mu$ in diameter; fascicles 2-3 stalks to dense; conidiophores pale olivaceous brown, uniform in color and width, sparingly septate, not branched, not geniculate, straight or nearly so, small conidial scar at the bluntly rounded tip, 4-5 x 10-40$\mu$; conidia obclavato- cylindric, pale yellowish olivaceous, straight or slightly curved, mostly 4-8 septate, base short obconic to obconically truncate, tip obtuse, 4-5.5 x 25-85$\mu$.

TYPE: New Zealand; *Aristotelia racemosa* Hook; Colenso, No. 857.
DISTRIBUTION: Known only from the type locality.

**Cercospora muntingiae** Petrak & Ciferri
Ann. Mycol. **30**: 324. 1932

Leaf spots angular or irregular, 0.5-5 mm. in diameter, reddish brown with a yellowish margin or on a yellow leaf with a green margin; fruiting epiphyllous; stromata dark brown, 10-25$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, uniform in color and width, rarely with paler tip, sparingly septate, not branched, not geniculate, undulate or bent variously, minute conidial scar at the rounded to conic tip, 2-4 x 10-35$\mu$; conidia pale olivaceous, obclavato-cylindric, straight to curved, 3-8 septate, base subtruncate to long obconically truncate, tip obtuse, 2-4 x 20-65$\mu$.

TYPE: Roadsides, Vale del Cibao, Santiago, San Domingo; *Muntingia calabura* L.; E. L. Ekman, No. 3858; Dec. 10, 1930.
DISTRIBUTION: San Domingo, Florida.

**Cercospora equiseti** Dobrozrakova
Bolezni Rastenii (Morbi Plantarum) **16**: 202. 1927

Fruiting amphigenous, fumous, solitary to densely gregarious; fasciculate; conidiophores geniculate, septate, 4.5 x 60-120$\mu$; conidia at first hyaline, then fumous, 0-1 septate, 4.5-6 x 10-21$\mu$.

TYPE: Luga District; *Equisetum arvense* L.; T. L. Dobrozrakova; July 23, 1926.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen a specimen of this species. It would be well to know the depth and uniformity of color, and width in the conidiophore, the density of the fascicles and the shape of the conidia. From the meager description it should be *Didymaria equiseti* (Dobr.)

**Cercospora epigaeae** Ellis & Dearness
Can. Inst. Trans. **6**: 637. 1899

*Cercospora epigaeina* Davis, Wisc. Acad. Trans. **16**: 758. 1910

Leaf spots angular, reddish brown to dark brown, no distinct border, at first 1-3 mm. in extent, but finally coalescing to include the entire leaflet; fruiting amphigenous but chiefly on upper leaf surface; stromata dark brown to black, mostly globular, 20-50$\mu$, rarely 100-225$\mu$, in diameter; fascicles dense, although rarely conidiophores are borne singly; conidiophores pale olivaceous brown or fuligenous, septa indistinct, not branched, slightly irregular in width, longest ones inclined to be wavy or sinuous, mostly not geniculate, but sometimes 1-2 mildly geniculate, small spore scar at conic to rounded tip, 2-3.5 x 8-40$\mu$; conidia subhyaline to pale olivaceous, very narrowly obclavate, straight or nearly so, base trun-

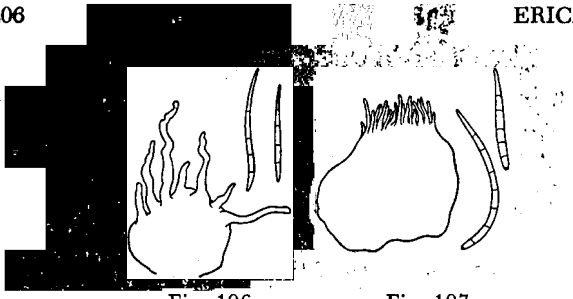


Fig. 106
*C. epigaeae*

Fig. 107
*C. gaultheriae*

cate to long obconically truncate, tip acute to subacute, septa indistinct, 2-3.5 x 40-125$\mu$.

HOST: *Epigaea repens* L.

TYPE: Shore of Lake Huron near Southampton, Ontario; *Epigaea repens;* John Dearness, 2882; Aug. 1898; (*C. epigaeina*) Adams Co., Wisc.; *E. repens;* J. J. Davis; July 18, 1908.

DISTRIBUTION: Reported from Ontario, New York, North Carolina, and Wisconsin.

NOTE: Davis later recognized that this species was a synonym of *C. epigaeae* (Wisc. Acad. Trans. **21**: 275. 1924). The two types verify his statement.

**Cercospora gaultheriae** Ellis & Everhart

Jour. Mycol. **2**: 2. 1886

*Cercospora arctostaphyli* Davis, Wisc. Acad. Trans. **18**: 268. 1915

Leaf spots 2-7 mm. in diameter, circular to irregular, dingy gray with reddish brown border on upper surface and dull brown on the lower; fruiting epiphyllous, visible as black pustules; stromata globular to elongate, dark to black, 40-120$\mu$ in diameter or rarely 200$\mu$ long; fascicles extremely dense; conidiophores subhyaline to pale fuligenous, not septate, not branched, sometimes once mildly geniculate, rounded tip with minute spore scar, slightly attenuated, 2-3 x 10-40$\mu$; conidia narrowly obclavate to linear, hyaline to subhyaline, straight to slightly curved, obconic base, subacute tip, septa indistinct, 1.5-2.5 x 20-75$\mu$, mostly 20-50$\mu$ long.

HOST: *Gaultheria procumbens* L. Davis mentions *Arctostaphylos uva-ursi* (L.) Spreng., but later states this was a wrong identification.

TYPE: Newfield, New Jersey; *Gaultheria procumbens* L.; J. B. Ellis; July 1885; Co-type distributed as N. Amer. Fungi 1514. (*C. arctostaphyli*) Millston, Wisc.; June 1914.

DISTRIBUTION: Sparingly present wherever host is found. Studied material from New Jersey, New York, and Wisconsin.

NOTE: All the Cercospora species on the Ericales resemble each other in many characters, and in some cases are rather difficult to classify. There are enough differences, however, to consider each distinct. Davis (Wisc. Acad. Trans. **21**: 253. 1924) writes, "*C. arctostaphli* seems to have been founded upon a misapprehension. There is no specimen in the University of Wisconsin herbarium and the characters ascribed are those of *Cercospora gaultheriae* E.+E. It should be stricken out."

**Cercospora gay-lussaci** Spegazzini

Rev. Museo de La Plata **15**: 46. 1908

Leaf spots subcircular to angular, 1-5 mm. in diameter or coalescing into larger areas, at first uniformly reddish brown, but on the upper surface the center later changes to dingy gray; fruiting amphigenous but more abundant on the upper leaf surface; stromata dark brown, globular and 20-40$\mu$ in diameter on lower surface, elongate and 40-80$\mu$ in diameter on upper leaf surface; fascicles on lower surface not dense, on upper surface very dense; conidiophores medium dark brown, uniform in color, on upper surface short, not septate, not geniculate, not branched, straight, bluntly rounded tip without evident spore scar, 3-5 x 5-30$\mu$, on lower surface long, septate, occasionally geniculate or branched, sometimes tortuous, 3-5 x 20-80$\mu$; conidia subhyaline, in mass faintly colored, obclavato-cylindric, straight or slightly curved, base subtruncate to short obconically truncate, tip obtuse, 1-3 septate, 2.5-5 x 10-60$\mu$.

TYPE: Ipiranga, Cambucy, Sao Paulo, Brazil; Gay-lussacia sp.; A. Usteri, No. 74 (Speg. No. 952); Sept. 1905.

DISTRIBUTION: Known only from the type locality.

**Cercospora handelii** Bubak

Königl. Naturhist. Hofmus. **23**: 106. 1909

*Cercospora rhododendri* Marchal & Verpl., Bul. Soc. Roy. Bot. Belg. **59**: 24. 1926

Leaf spots circular to irregular, 2-10 mm. in diameter, pale brown or almost gray to dark reddish brown, orange to black line margin, occasionally slightly zonate, dull brown on the lower leaf surface; fruiting amphigenous, but chiefly epiphyllous, often accompanied by an immature perithecial stage showing clearly on the lower leaf surface; stromata dark brown to almost black, variable in shape

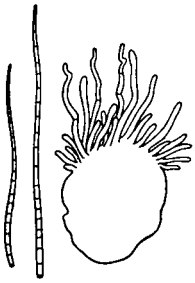


Fig. 108
*C. handelii*

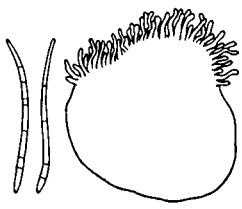


Fig. 109
*C. kalmiae*

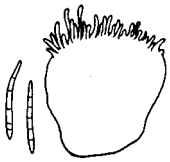


Fig. 110
*C. leucothoes*

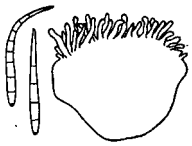


Fig. 111
*C. oxydendri*

and size, 15-70$\mu$ in diameter; fascicles dense, compact; conidiophores delicate, curved or undulate, subhyaline to pale olivaceous, in mass medium dark brown, septation indistinct or lacking, not branched, sparingly geniculate, rounded tip somewhat attenuated, 2-4 x 15-70$\mu$; conidia subhyaline to very pale olivaceous, narrowly linear to almost distinctly obclavate, straight to mildly curved or undulate, indistinctly multiseptate, base obconic to truncate, tip subacute, 1.5-3 x 20-140$\mu$.

HOSTS: *Rhododendron* (*Azalea*) *ponticum* L., *R. catawbiense* Michx., *R.* (*Azalea*) *indicum* Sweet (*R. obtusum* Planch.) (*R. lateritum* Planch.).

TYPES: Pontische Randgebirge im Sandschak Trapezunt; *Rhododendron ponticum;* Handel, No. 451; 1907; (*C. rhododendri*) Wetteren, Meirelbeke, Belgium; *Rhododendron ponticum;* Marchal and Verplancke.

DISTRIBUTION: Probably present over most of the United States. Received specimens from New York, New Jersey, Pennsylvania, Connecticut, Maryland, West Virginia, Mississippi, Oklahoma, and California. It also is present in Belgium, Czechoslovakia, Southern Russia, and Japan. W. S. Fields (Plant Dis. Reporter **29**: 693. 1945) reports it from Alabama.

NOTE: See also *C. sparsa.* Hemmi and Shizuko (Forsch. Gebiet Pflanzenkr. **1**: 4. 1931) state that *C. handelii* is distinguished easily from *C. rhododendri* by its larger spores (they give 2.3-4.3 x 48-134.4$\mu$). My study of cotype and type respectively did not seem to bear out this statement.

**Cercospora kalmiae** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. I. **43**: 88. 1891

Leaf spots circular to irregular, 4-10 mm. in diameter or longer when along the leaf edge, medium to dark brown, sometimes with a puckered margin; fruiting chiefly epiphyllous, showing plainly as black rounded bodies; stromata globular, black, 50-150$\mu$ in diameter; fascicles very dense; conidiophores subhyaline to pale olivaceous, paler toward the tip, sometimes irregular in width, straight to curved or sinuous, septa rare, not branched, not geniculate, bluntly rounded tips, 2-4 x 5-40$\mu$, mostly 5-25$\mu$, when spores are persistent appearing much longer; conidia subhyaline to faintly yellowish olivaceous, very narrowly obclavate to almost linear, straight to mildly curved or undulate, indistinctly multiseptate, base short obconically truncate, tip subacute, 2-4 x 20-65$\mu$ or slightly longer.

HOST: *Kalmia latifolia* L.

TYPE: Newfield, New Jersey; *Kalmia latifolia;* J. B. Ellis; 1890; cotype distributed as N. Amer. Fungi, Second Ser. No. 2591.

DISTRIBUTION: From New York southward; probably co-extensive with the host. Many collections from New Jersey and Pennsylvania.

NOTE: At one time I thought it might be identical with *C. handelii* or *C. epigaeae,* but the large almost globular stromata together with the uniformly short conidiophores and the shape of the conidia differentiate this species from others on the Ericaceae. Greene (The Amer. Midland Naturalist **48**: 757. 1952) reports *C. kalmiae* on *Andromeda glaucophylla* Link (*A. polifolia* L.). It would be interesting to know if it were not *C. leucothoes* instead, for Andromeda and Leucothoe are closely related.

**Cercospora leucothoës** B. H. Davis

Mycologia **33**: 523. 1941

Leaf spots circular or sometimes irregular, 4-12 mm. in diameter, brown to grayish brown or even dingy gray, some of the more definite spots with a narrow black raised line border, less definite and more nearly ferruginous on lower surface; fruiting amphigenous but chiefly epiphyllous; stromata black, globular to elongate, 40-130$\mu$ in length; fascicles on upper leaf surface dense to very dense, on lower leaf surface 2-12 stalks; conidiophores very pale olivaceous, almost hyaline tip, fairly uniform in color and width, septation, branching and spore scars not evident, longer ones wavy or sparingly once abruptly geniculate, rounded tip, 1.5-3 x 10-35$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate

(sometimes distinctly cylindric or plainly obclavate), base long obconically truncate, tip subacute, straight or curved, septa indistinct, 2-3.5 x 20-125$\mu$.

TYPE: Springfield, New Jersey; *Leucothoë catesbaei* Gray; B. H. Davis; July 17, 1931.

DISTRIBUTION: Studied material from Long Island and New Jersey.

NOTE: All the species on the Ericales differ only in minor characters. A close examination, however, shows distinct differences on each host genus.

**Cercospora molleriana** Winter

Hedwigia **23**: 190. 1884

Leaf spots circular to irregular, 2-10 mm. in diameter, pale brown to dull gray center, dark brown margin; fruiting mostly epiphyllous; stromata dark brown, elongate to globular, 40-80$\mu$ in length; fascicles dense to very dense; conidiophores pale to very pale olivaceous brown, almost hyaline tip, uniform diameter, indistinctly septate, not branched, not geniculate, undulate, minute spore scar at the narrowly rounded tip, 2-3.5 x 10-75$\mu$; conidia pale yellowish olivaceous, obclavato-cylindric, straight to mildly curved, indistinctly septate, base obconically truncate, tip obtuse, 2.5-5 x 25-90$\mu$.

HOSTS: *Arbutus longifolia* Andr., *A. Unedo* L.

TYPE: Coimbra, Lusitania; *Arbutus longifolia;* Moller; February 1884; Co-type distributed as Rabenhorst-Winter Fungi europaei No. 3293.

DISTRIBUTION: Known only from Portugal.

**Cercospora oxydendri** Tracy & Earle

Bul. Torrey Bot. Club **26**: 495. 1899

*Cercospora oxydendri* Ellis & Ev., Jour. Mycol. **8**: 71. 1902

Leaf spots irregularly shaped blotches, sometimes 15 mm. in extent, dull red or brown, rather indistinct on brown dried leaves; fruiting epiphyllous; stromata globular, black, 20-40$\mu$ in diameter; fascicles dense; conidiophores medium dark brown, dark in mass, tip pale, shorter ones attenuated, longer ones sinuous, septa none or indistinct, not branched, rarely geniculate, minute spore scar at rounded tip, 2.5-4 x 5-45$\mu$; conidia cylindro-obclavate, pale olivaceous, straight to slightly curved, 2-7 septate, base obconic to obconically truncate, tip obtuse, 2.5-4 x 40-115$\mu$.

TYPES: Biloxi, Miss.; *Oxydendrum arboreum* (L.) DC.; S. M. Tracy, No. 4086; Oct. 1898; (*C. oxydendri* E. & E.) Tuskegee, Ala.; *O. arboreum;* Geo. W. Carver, No. 683.

DISTRIBUTION: Mississippi and Alabama.

**Cercospora sparsa** Cooke

Grevillea **12**: 31. 1883

Leaf spots indefinite or none on upper surface, very sparse dark to black fruiting patches on lower surface, 2-6 mm. in extent; stromata lacking or globular, dark brown to black, 25-75$\mu$; fascicles dense; conidiophores sometimes only slightly elongated peripheral cells of stroma, or 1.5-3 x 5-20$\mu$ and almost hyaline, septation, geniculation, spore scars and branching absent; conidia subhyaline, acicular to narrowly linear, straight to much curved, septa indistinct, base truncate to subtruncate, tip subacute, 1.5-3 x 20-100$\mu$.

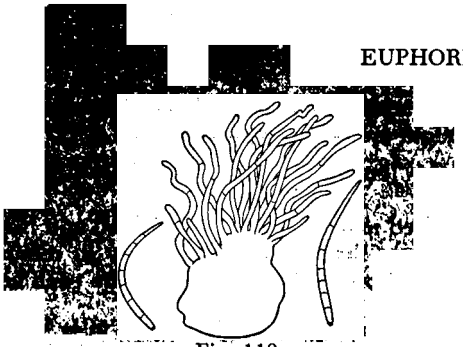


Fig. 112
*C. sparsa*

TYPE: Aiken, South Carolina; *Kalmia latifolia* L.; W. H. Ravenel, No. (590) 2743.

DISTRIBUTION: Apparently from Tennessee southward.

NOTE: See also *C. kalmiae* for differences between the two species on this host genus.

## CERCOSPORAE ON ACALYPHA

A. Conidia hyaline, acicular, truncate base, acute tip, 2-4 x 50-250$\mu$; fruiting amphigenous; conidiophores 4-5.5 x 20-200$\mu$.
A. VIRGINICA, A. OSTRYAEFOLIA — *C. acalyphae*

AA. Conidia colored, mostly cylindric, base not truncate, tip obtuse; fruiting hypophyllous.

B. Leaf spots distinct; fruiting not effuse; stromata 15-40$\mu$; conidia 2.5-4 x 40-75$\mu$; conidiophores 2.5-4 x 5-30$\mu$.
A. PETIOLARIS — *C. transvaalensis*

BB. Leaf spots indistinct; fruiting effuse; stromata usually lacking; conidia 3-6 x 40-100$\mu$; conidiophores 4-6 x 20-150$\mu$.
A. AUSTRALIS — *C. profusa*

### Cercospora acalyphae Peck

Ann. Rep. N. Y. State Mus. 34: 48. 1881

*Cercospora acalypharum* Tharp, Mycologia 9: 106. 1917

Leaf spots usually numerous, small, on lower surface greenish with a purplish

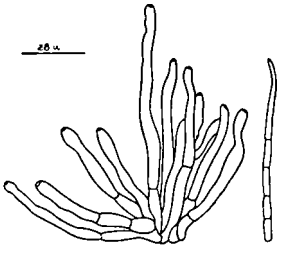


Fig. 113
*C. acalyphae*

or brown border, above either with a central white or gray speck about 1-2 mm. in diameter and surrounded by a brown or purplish border, or the whole spot

uniformly brown, sometimes zonate; fruiting amphigenous, rarely on the stems; stromata slight or none; fascicles mostly not dense, 2-20; conidiophores pale to medium brown or olivaceous brown, sparingly septate, slightly to much geniculate, rarely branched, 4-5.5 x 20-200$\mu$, tip rounded or subtruncate; conidia acicular, truncate or subtruncate base, tip acute to subacute, straight or curved, hyaline, 2-4 x 50-250$\mu$.

HOSTS: *Acalypha virginica* L. (*A. caroliniana* Walt.) (*A. gracilens* A. Gray), *A. ostryaefolia* Ridd.

TYPES: Albany, New York; *Acalypha virginica;* C. H. Peck; Sept.; (*C. acalypharum*) Austin, Texas; *Acalypha ostryaefolia;* A. M. Ferguson; Oct. 30, 1901.

DISTRIBUTION: Minnesota to New Mexico and eastward; also Brazil and Japan.

NOTE: See key above.

## CERCOSPORAE ON JATROPHA

A. Conidia subhyaline to pale olivaceous, 4-8$\mu$ in width; conidiophores not branched, 3.5-6 x 10-40$\mu$.
  B. Conidia cylindric, 15-50$\mu$ in length; stromata 50-85$\mu$; fascicles very dense; fruiting not easily visible.
    J. NANA — *C. ajrekari*
  BB. Conidia cylindro-obclavate, 30-80$\mu$ in length; stromata slight; fascicles dense; fruiting numerous black stipples.
    J. MACROCARPA — *C. jatropharum*

AA. Conidia hyaline or rarely subhyaline, narrow, linear to almost acicular; fascicles mostly dense; stromata small.
  B. Conidia 3-4.5 x 30-80$\mu$; conidiophores not branched, amphigenous, 4-6 x 30-80$\mu$.
    J. MACROCARPA — *C. jatrophicola*
  BB. Conidia 1.5-2.5 x 40-130$\mu$; conidiophores branched, hypophyllous, 2-3.5 x 10-35$\mu$.
    J. URENS — *C. jatrophae*

### Cercospora ajrekari H. & P. Sydow

Ann. Mycol. 12: 202. 1914

Leaf spots circular, 3-10 mm. in diameter, slightly paler brown than the dried leaf, immarginate; fruiting appearing as black stipples, hypophyllous; stromata dark brown, subglobular, 50-85$\mu$ in diameter; fascicles very dense; conidiophores in mass dark brown, singly pale to medium reddish brown, paler and more narrow toward the tip, sparingly septate, not branched, not geniculate, straight to slightly sinuous, small spore scar at the bluntly rounded tip, 3.5-6 x 10-40$\mu$; conidia subhyaline to pale olivaceous, distinctly cylindric, 1-3 septate, base rounded to obconic, tip obtuse, 4-7.5 x 15-50$\mu$.

HOST: *Jatropha nana* Dalz. & Gibs.

TYPE: Poona, Bombay Pres., India; *Jatropha nana;* S. L. Ajrekar; (See Sydow, Fungi exot. exs. No. 292).

DISTRIBUTION: Known only from the type locality.

NOTE: The large stromata, very dense fascicles, and colored, distinctly cylindric conidia separate this species from the others on Jatropha. See key above.

**Cercospora aleuritidis** Miyake
Bot. Mag. Tokyo **26**: 66. 1912
*Cercosporina aleuritidis* Sacc., Syll. Fung. **25**: 902. 1931

Leaf spots irregular in shape, 6-10 mm. in diameter, reddish to reddish brown or almost black, mostly immarginate; fruiting amphigenous; nonfasciculate to dense fascicles; stromata irregular in shape, dark brown to almost black, as long as 75$\mu$; conidiophores medium to dark brown, (Ou says pale olivaceous), uniform in color, irregular in width, multiseptate, branched, curved, sinuous or mildly geniculate, minute spore scar at the conic tip, 3-4.5 x 10-65$\mu$; conidia obclavate, shortest ones distinctly cylindric, subhyaline to very pale olivaceous, straight to slightly curved, indistinctly multiseptate, base subtruncate to obconically truncate, tip subobtuse, 2.5-5 x 25-135$\mu$.

HOSTS: *Aleurites cordata* Steud. (Tung oil tree), *A. fordii* Hemsl.
TYPE: I have not determined this with certainty.
DISTRIBUTION: China, Japan, Minas Gerais, Sao Paulo, and probably other countries where the hosts are grown.
NOTE: I have been unable to procure the type of this species. Shih Kuang Ou (Sinensia **11**: 175. 1940) describes the perfect stage as *Mycosphaerella aleuritidis.*

**Cercospora argythamniae** Dearness & House
N. Y. State Mus. Nat. Hist. Bul. **179**: 33. 1915

Leaf spots indistinct on lower surface but their tan to yellowish color on upper surface stands out sharply from the purplish colored leaf, 2-4 mm. in diameter, the yellowish halo being 5-10 mm. in diameter; fruiting amphigenous; stromata brown, globular, 40-50$\mu$ in diameter; fascicles dense; conidiophores often being nothing more than slightly elongated stromatal cells, pale brown, longer ones with almost hyaline tips, 4 x 5-15$\mu$, slightly wider near the base; conidia hyaline or subhyaline, longer ones obclavate, sometimes with sudden attenuation near center, shorter ones often cylindric, obconic base, obtuse or subobtuse tip, straight or nearly so, indistinctly 1-3 septate, 2-3.5 x 25-50$\mu$.

HOST: *Argythamnia mercurialina* Muell., *Ditaxis fendleri.*
TYPE: Caddo, Indian Territory (Oklahoma); *Argythamnia mercurialina;* Charles S. Sheldon; June 22, 1891.
DISTRIBUTION: Oklahoma, Venezuela.
NOTE: The Venezuela collection on Ditaxis resembles closely the one on Argythamnia, and the two host genera also are similar, so that the two collections are at present considered identical.

**Cercospora atrides** Sydow
Ann. Mycol. **20**: 65. 1922

Leaf spots indefinite or none; fruiting effuse, hypophyllous, dark olivaceous, in minute punctiform patches; stromata present; conidiophores fasciculate, dark olivaceous brown, 1-3 septate, straight to slightly curved, not branched, 4-5 x 20-60$\mu$; conidia dark olivaceous brown, obclavate, 3-6 septate, ends obtuse, 5-7 x 30-55$\mu$.

HOST: *Bridelia monoica* (Lour.) Merr.
TYPE: Canton, China; *Bridelia monoica;* C. W. Howard, No. 11610; Oct. 1920.

DISTRIBUTION: China, Formosa.
NOTE: None of this material was available for study.

**Cercospora bernardiae** Stevens
Trans. Ill. Acad. Sci. **10**: 213. 1917

HOST: *Bernardia bernardia* Millsp.
TYPE: Guanica, Puerto Rico; *Bernardia bernardia;* F. L. Stevens, No. 355a; Febr. 3, 1913.
NOTE: Solheim states in a letter that this species has a sporodochium and should be classed as an Exosporium. It certainly is not a true Cercospora.

**Cercospora bischofiae** Yamamoto
Phytopath. Labor. Taihoku Imp. Univ. Contrib. **26**: 139. 1934
(Trans. Sapporo Nat. Hist. Soc. **13**: 139. 1934)

Leaf spots subcircular to angular, 2-10 mm. in diameter, reddish brown to purplish brown; fruiting mostly hypophyllous; stromata slight; fascicles usually not dense; conidiophores pale to very pale olivaceous, paler tip, irregular in width, often sharply bent, sparingly septate, rarely geniculate or branched, spore scars indistinct, 2.5-4 x 10-70$\mu$; conidia obclavato-cylindric, very pale olivaceous, straight to mildly curved, indistinctly multiseptate, base obconic to obconically truncate, tip subobtuse, 2-3.5 x 20-80$\mu$.

HOST: *Bischofia javanica* Blume.
TYPE: Taihoku, Formosa; *Bischofia javanica;* W. Yamamoto; Nov. 11, 1933.
DISTRIBUTION: Known only from the type locality.

## CERCOSPORAE ON CROTON

A. Conidia hyaline or rarely subhyaline.
  B. Conidia narrowly acicular, 1.5-3 x 30-100$\mu$; conidiophores 3.5-5 x 15-85 (150)$\mu$. *C. capitati* Tharp
  BB. Conidia cylindric to spindle shaped, 2.5-5 x 20-50$\mu$; conidiophores 2.5-4 x 5-30$\mu$, occasionally borne on leaf hairs. *C. crotonifolia* Cooke
AA. Conidia colored.
  B. Leaf spots distinct; fruiting not effuse (not Cladosporium-like).
    C. Conidiophores very pale, narrow, 3-4 x 15-40$\mu$; conidia subhyaline to very pale, 2.5-5 x 20-100$\mu$. *C. crotonophila* Speg.
    CC. Conidiophores pale, wide, 3-7 x 10-75$\mu$; conidia pale, 3.5-6 x 35-85$\mu$. *C. tiglii* Henn.
    (*C. trinidadensis* Stev. + Sol.)
  BB. Leaf spots indistinct or none, at least at first; fruiting effuse (Cladosporium-like).
    C. Fruiting brick red; conidiophores nonfasciculate; conidia 4-5 x 25-85$\mu$. *C. rubida* Muller & Chupp
    CC. Fruiting not red, usually olivaceous; conidiophores chiefly fasciculate.
      D. Conidiophores in dense coremoid-like fascicles, dark colored, 4-6 x 25-130$\mu$; conidia medium in color, 4-7 x 20-80$\mu$; fruiting hypophyllous. *C. maritima* T. & E.
      DD. Conidiophores not in coremoid-like fascicles, pale in color, 4-5 x 20-100$\mu$; conidia pale, 20-100$\mu$ in length; fruiting amphigenous.

E. Conidia cylindric, fairly dark in color, 4-7$\mu$ wide, sometimes catenulate; conidiophores occasionally nonfasciculate and borne on leaf hairs. *C. manaosensis* Henn.

EE. Conidia cylindro-obclavate to obclavate, pale in color, 4-5.5$\mu$ wide, not catenulate; conidiophores in dense fascicles, not borne on leaf hairs. *C. crotonis* E. & E.

NOTE: *Cercospora crotonicola* E. & B. seems to be a Stilbaceae.

**Cercospora capitati** Tharp

Mycologia **9**: 108. 1917

Leaf spots irregular, dingy brown to almost black, 0.5-4 mm. in diameter; fruiting amphigenous; stromata slight or none; fascicles mostly 2-8 spreading stalks; conidiophores pale olivaceous brown, slightly paler and sometimes attenuated toward the tip, medium sized spore scar at tip, indistinctly septate, not to slightly geniculate, not branched or two conidiophores joined at the base, 3.5-5 x 15-85$\mu$ (rarely 150$\mu$); conidia acicular, hyaline, straight to mildly curved, truncate base, tip subacute, 1.5-3 x 30-100$\mu$, rarely as long as 220$\mu$.

HOST: *Croton capitatus* Michx.

TYPE: Conroe, Texas; *Croton capitatus;* Lewis & Tharp, No. 179n; Oct. 30, 1914.

DISTRIBUTION: Reported in S. Carolina, Alabama, and Texas.

NOTE: This species differs from all the other Cercospora species on Croton by having acicular hyaline conidia. See key above.

## CERCOSPORAE ON MANIHOT

A. Conidia colored.

B. Leaf spots distinct; fruiting not effuse; stromata 20-40$\mu$; fascicles dense; conidiophores pale in color, 3.5-5 x 10-50 (100)$\mu$; conidia cylindric, 4-7 x 30-85$\mu$.

MANIHOT spp. *C. henningsii*

BB. Leaf spots indistinct; fruiting effuse; stromata lacking; fascicles sometimes coremoid; conidiophores dark reddish brown, 4-6 x 50-150$\mu$; conidia cylindro-obclavate, 4-6 x 25-100$\mu$.

MANIHOT sp. *C. vicosae*

AA. Conidia hyaline or rarely subhyaline; fascicles sometimes dense.

B. Conidia hyaline, acicular, 3.5-5 x 80-270$\mu$; leaf spots indistinct to sometimes distinct, dark to black; conidiophores pale to medium in color, 4-6 x 70-1000$\mu$.

M. UTILISSIMA *C. manihobae*

BB. Conidia hyaline to subhyaline, obclavato-cylindric, 4-8 x 20-90$\mu$; leaf spots distinct, snow white; conidiophores medium dark, 3.5-5 x 50-200$\mu$.

M. UTILISSIMA *C. caribaea*

**Cercospora caribaea** Chupp & Ciferri

Boll. Staz. Pat. Veg. Roma **20**: 111. 1940

*Ragnhildiana manihotis* Stevens & Solheim, Mycologia **23**: 404. 1931

Leaf spots circular to angular, white or rarely yellowish brown center and sometimes with a wide indistinctly colored border, on lower surface brownish gray, often with lavender margin, 1-3 mm. in diameter; fruiting chiefly hypophyl-

lous; stromata slight; fascicles mostly 2-15; conidiophores medium fuligenous or olivaceous brown, multiseptate, 1-15 geniculate, uniform in color and width, rarely branched, subtruncate tip with fairly large spore scar, 3.5-5 x 50-200$\mu$; conidia hyaline to subhyaline, obclavato-cylindric, bluntly rounded ends, 1-6 septate, straight or nearly so, 4-8 x 20-90$\mu$.

HOST: *Manihot utilissima* Pohl.

TYPES: Vicosa-Escola, Minas Geraes, Brazil; *Manihot utilissima;* A. S. Muller, No. 643; Nov. 8, 1929; (*R. manihotis*) Penal Settlement, British Guiana; *Manihot utilissima;* F. L. Stevens, No. 683; July 25, 1925.

DISTRIBUTION: Studied material from Puerto Rico, San Domingo, Jamaica, Panama, British Guiana, Colombia, and Brazil.

NOTE: This species is distinguished easily from the other species on Manihot by the small snow-white spots and by the hyaline conidia. This is the same as Fungi of Panama, No. 1181, collected by F. L. Stevens, Aug. 20, 1923. P. Hennings (Hedwigia **41**: 18. 1902) described a *C. manihotis,* therefore the name *C. caribaea* is retained for the species causing these white spots. See key above.

**Cercospora cluytiae** Kalchbrenner & Cooke

Grevillea **9**: 24. 1881

Leaf spots indistinct, yellowish to pale brown, irregular in outline, 0.5-5 mm. in diameter; fruiting hypophyllous; stromata subglobular, pale brown, 15-40$\mu$ in diameter; fascicles mostly dense; conidiophores pale brown, paler tip, attenuated or rarely upper half wider than base, occasionally once septate, not geniculate, not branched, straight, a small spore scar at the rounded to conic tip, 3-5 x 10-30$\mu$; conidia hyaline, obclavato-cylindric, straight to slightly curved, ends rounded or base may be subtruncate, indistinctly septate, 2.5-4 x 15-60$\mu$.

HOST: *Cluytia pulchella* L.

TYPE: Somerset East, Cape Colony, S. Africa; *Cluytia pulchella;* MacOwan, No. 1325.

DISTRIBUTION: Known only from the type locality.

**Cercospora codiaei** Fragosa & Ciferri

Rep. Dom. Est. Agron. de Haina D-Bot. **5**: 9. 1926

Leaf spots numerous, irregular, grayish; fruiting abundant, amphigenous; stromota present; fascicles dense, divergent; conidiophores brown, sparingly septate, straight to curved, not branched, geniculate, 5-6 x 90$\mu$; conidia similar in color, cylindric, 1-3 septate, attenuated at both ends, 3-4.5 x 30-50$\mu$.

HOST: Codiaeum sp.

TYPE: prope Haina, Republica Dominicana; Codiaeum sp.; R. Ciferri; Aug. 6, 1925.

DISTRIBUTION: Known only from the type locality.

NOTE: I was unable to procure specimens of this species, so am not sure how it differs from the others on the Euphorbiaceae.

**Cercospora crotonicola** Ellis & Bartholomew

Jour. Mycol. **8**: 177. 1902

HOST: *Croton fruticulosus* Torr.

TYPE: Austin, Texas; *Croton fruticulosus;* W. H. Long, No. 62; Oct., 1900.

NOTE: The type of this species is distinctly a stilbaceous form, having very closely appressed narrow conidiophores which widen near the tip and bend outward, sheaf-like.

**Cercospora crotonifolia** Cooke

Grevillea **12**: 31. 1883

Leaf spots circular to subcircular, 2-4 mm. in diameter, dingy gray to pale tan, sometimes on upper surface with dark brown line border; fruiting abundant, amphigenous, at times darkening the pale colored areas; stromata small, pale brown, often filling the stomatal openings; fascicles may be dense; conidiophores very pale olivaceous brown, paler and more narrow toward the tip, septa not visible, not branched, not geniculate, straight to tortuous, minute spore scar at the conic to rounded tip, 3-4.5 x 7-30$\mu$; conidia hyaline, cylindric or very longest ones may be almost acicular, straight to slightly curved, 3-8 septate, base subtruncate to obconically truncate, rarely obconic, tip obtuse, 2.5-5 x 15-55$\mu$.

HOSTS: *Croton glandulosus* L., Croton sp.

TYPE: Aiken, S. Carolina; *Croton glandulosus;* H. W. Ravenel, No. 593 (Cooke No. 2697).

DISTRIBUTION: S. Carolina, Alabama.

NOTE: The hyaline cylindric conidia borne on delicate conidiophores separate this species from the others on this host genus. See key, page 213.

**Cercospora crotonis** Ellis & Everhart

Proc. Acad. Sci. Phila. **45**: 170. 1893

No definite leaf spots; dull olivaceous to almost black effuse fruiting on both leaf surfaces, but chiefly hypophyllous; small dark fuligenous stromata, 20-40$\mu$ in diameter; fascicles dense; conidiophores pale to medium dark fuligenous brown (in mass dark), uniform in width and color, sparingly septate, usually near the base, 0-3 mildly or sometimes once abruptly geniculate, not branched, medium spore scar at rounded tip, 4-7 x 25-100$\mu$; conidia cylindro-obclavate, pale fuligenous, straight to mildly curved, 1-5 septate, base obconic, tip obtuse to subobtuse, 4-5.5 x 30-100$\mu$.

HOSTS: *Croton lobatus* L., *C. retijerus* (?), *C. texensis* (Klotz) Muell.

TYPE: Brockport, Kansas; *Croton texensis;* Elam Bartholomew, No. 359; Aug. 15, 1889.

DISTRIBUTION: Kansas, California.

NOTE: This differs from the other species on Croton in having effuse fruiting, conidiophores in dense spreading fascicles, and conidia colored. See key, page 214.

**Cercospora crotonophila** Spegazzini

Bol. Acad. Nac. Ciencias, Cordoba (Arg.) **23**: 528. 1919

Leaf spots circular, 1-4 mm. in diameter, uniformly brown to purplish or with a small dingy gray center; fruiting amphigenous; stromata globular, dark brown, 20-50$\mu$ in diameter; fascicles dense; conidiophores pale brown, paler and more narrow toward the tip, sparingly septate, not branched, not geniculate, small spore scar at the rounded to conic tip, 3-5 x 15-40$\mu$; conidia subhyaline to very pale olivaceous, cylindric or slightly attenuated, 1-9 septate, ends rounded to conic, occasionally catenulate, 2.5-5 x 20-100$\mu$.

HOST: Croton sp.

TYPE: Trinidad, Paraguay; Croton sp.; J. L. Anisitz, Nos. 258 and 259; 1892.
DISTRIBUTION: Paraguay; Minas Gerais and Sao Paulo, Brazil.
NOTE: The short conidiophores in dense fascicles and the very pale cylindric conidia, 2.5-5$\mu$ in width, separate this species from the others on this host genus. Greene sent me a specimen on *Croton glandulosus* var. *septentrionalis* from Wisconsin. It resembled closely the Spegazzini species excepting that it had more narrow, longer conidiophores. It may prove to be a new species. See key, page 213.

**Cercospora ehikomontana** Togashi & Katsuki
Trans. Sapporo Nat. Hist. Soc. 17: 99. 1942

Leaf spots indistinct, slight yellowing in irregular areas on the upper leaf surface; fruiting hypophyllous, sparingly effuse, olivaceous; stromata lacking; nonfasciculate; conidiophores single branches from procumbent mycelium, pale to very pale olivaceous brown, uniform in color, irregular in width, septate, curved, tortuous or mildly geniculate, conidial scars indistinct, 2-3.5 x 10-60$\mu$, or rarely much longer; conidia hyaline or oldest ones faintly olivaceous, obclavato-cylindric, slightly curved, indistinctly multiseptate, base subtruncate, tip subacute, 2-3 x 25-80$\mu$.

HOST: *Mercurialis leiocarpa* Sieb. & Zucc.
TYPE: Mt. Ehiko, Pref. Fukuoka, Japan; *Mercurialis leiocarpa;* Y. Maki; Sept. 22, 1940.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. mercurialis* for differences between the species on this host genus. This specimen was sent me by Dr. Togashi.

**Cercospora euphorbiae** Kellerman & Swingle
Jour. Mycol. 5: 76. 1889

*Cercospora helioscopiae* Sydow, Ann. Mycol. 27: 432. 1929

Leaf spots indefinitely darkened areas on both leaf surfaces, at first subcircular but later including much of the leaflet surface; the darkening is due in part to the discoloration of the leaf tissue and in part to the fruiting of various fungi accompanying the Cercospora; fruiting amphigenous; stromata lacking or a few brown cells; fascicles mostly not dense, 2-15 stalks; conidiophores pale to medium olivaceous brown, straight and rigid, multiseptate, rarely once geniculate, not branched, large spore scar at the subtruncate tip, 4-6 x 30-150$\mu$, rarely as wide as 8$\mu$; conidia cylindric or slightly attenuated, longest ones almost acicular, hyaline, straight or nearly so, base subtruncate, tip obtuse, rarely subacute, septa mostly indistinct, 3-5 x 20-120$\mu$, rarely 160$\mu$.

HOSTS: *Euphorbia caracasana* Boiss., *E. corollata* L., *E. helioscopia* L., *E. heterophylla* L., Euphorbia sp.
TYPES: St. George, Pottawatomie Co., Kansas; *Euphorbia corollata;* Aug. 13, 1888; (*C. helioscopiae*) Nanking, Prov. Kiangsu, China; *Euphorbia helioscopia;* No. 2189; May 21, 1925.
DISTRIBUTION: Reported from Kansas, Texas, Wisconsin, Trinidad, Venezuela, India, Japan, and China.
NOTE: There were almost no conidia present on the type and cotype material, and as there were at least two other Hyphomycetous forms present, a large number of mounts had to be made in an attempt to identify the correct fungus.

The final spore measurements were taken from Kellerman and Swingle, inasmuch as they stated that conidia were very abundant. The largest I saw were approximately 3-5 x 20-60$\mu$. Patouillard (Bul. Soc. Mycol. France 9: 160. 1893) also describes a *C. euphorbiae* Pat., which has cylindric colored conidia and does not have rigid, straight conidiophores, and which later was named *C. euphorbiae-pubescentis* Unamuno. See following key.

CERCOSPORAE ON EUPHORBIA

A. Conidia colored, not acicular.
  B. Conidiophores mostly 5-15$\mu$ in length, 2-3.5$\mu$ wide; conidia cylindric, 2-3.5 x 30-75$\mu$; fruiting chiefly epiphyllous.
    E. PULCHERRIMA — *C. petila*
  BB. Conidiophores 10-60$\mu$ in length; conidia obclavate or cylindro-obclavate.
    C. Conidiophores 3-6$\mu$ wide; conidia 3-5 x 20-100$\mu$, base rounded to subtruncate.
      EUPHORBIA spp. — *C. euphorbiae-pubescentis*
    CC. Conidiophores 2.5-4$\mu$ wide; conidia 2-4 x 40-120$\mu$, with short obconic base.
      EUPHORBIA sp. — *C. euphorbiaecola*
AA. Conidia hyaline; conidiophores 4-6 x 20-150$\mu$.
  B. Conidia acicular, tip acute, 2.5-5 x 60-270$\mu$.
    E. PULCHERRIMA — *C. pulcherrimae*
  BB. Conidia mostly cylindric, tip usually obtuse, 3-5 x 20-160$\mu$.
    EUPHORBIA spp. — *C. euphorbiae*

**Cercospora euphorbiaecola** Atkinson
Cornell Univ. Bul. 3 (1): 41. 1897

Leaf spots suborbicular, 0.5-4 mm. in diameter, grayish brown with a narrow raised black border; fruiting chiefly hypophyllous; stromata mostly small, dark brown, globular; fascicles 3-15 stalks; conidiophores pale to medium dark brown, plainly 1-3 septate, occasionally with incipient branches, sinuous or 1-2 rather abruptly geniculate, tip may be subacute, spore scars indistinct, 2.5-4 x 10-50$\mu$; conidia narrowly obclavate, pale olivaceous, straight to mildly curved, indistinctly multiseptate, base short obconic, tip subacute, 2-4 x 40-120$\mu$.

HOST: Euphorbia sp.
TYPE: Auburn, Alabama; Euphorbia sp.; Richards; Aug. 16, 1892.
DISTRIBUTION: Reported from Alabama, Minas Geraes, and China; Uganda.
NOTE: See key above.

**Cercospora euphorbiaecola tragiae** Tharp
Mycologia 9: 109. 1917

Leaf spots circular to irregular, dark brown without distinct margin or pale center and dark brown margin, 2-8 mm. in diameter; fruiting amphigenous but chiefly on the lower leaf surface; small brown globular stromata, 20-35$\mu$ in diameter; fascicles dense; conidiophores very pale brown, tip almost hyaline, slightly attenuated, septation, geniculation and branching not evident, spore scars minute or none, 3-5 x 5-25$\mu$; conidia obclavate to obclavato-cylindric, pale olivaceous, straight to slightly curved, base subtruncate to short obconic, tip subobtuse, septa indistinct, 2-3.5 x 20-110$\mu$, rarely as wide as 5$\mu$.

HOSTS: *Tragia nepetaefolia* Cav., *T. urticaefolia* Michx.
TYPE: Austin, Texas; *Tragia nepetaefolia;* Lewis and Tharp; Oct. 6, 1914.
DISTRIBUTION: The Gulf States.
NOTE: This species is not at all like *C. euphorbiaecola.* Therefore, the name could well be changed to *C. tragiae.* Ellis and Everhart gave that name to a collection of A. H. Curtiss No. 2517, S. East Florida, June 1880, on *T. urticaefolia.* Apparently they never published a description of their species.

**Cercospora Euphorbiae-pubescentis** Unamuno

Bol. Soc. Espan. Hist. Nat. **35**: 435. 1935

*Cercospora Euphorbiae* Pat., Bul. Soc. Mycol. de France **9**: 160. 1893

Spots on leaves subcircular, 3-5 mm. in diameter, and on stems elongate, up to 12$\mu$ in length, reddish brown to almost black, with lead colored or almost gray center; fruiting on the leaves epiphyllous; stromata dark brown, globular, 20-75$\mu$ in diameter; fascicles mostly dense; conidiophores pale brown, paler and more narrow toward the tip or irregular in width, sparingly septate, not branched, not geniculate, almost straight, small to medium sized spore scar at rounded to subtruncate tip, 3-6 x 10-60$\mu$; conidia cylindro-obclavate, subhyaline to pale yellowish olivaceous, straight to slightly curved, base rounded to subtruncate, tip subobtuse, indistinctly multiseptate, 3-5 x 20-100$\mu$.

HOSTS: *Euphorbia pubescens* Vahl, Euphorbia sp. (tree).
TYPES: Prope Abadiano (Vizcaya); *Euphorbia pubescens;* P. Unamuno; Sept. 17, 1934; (*C. Euphorbiae*) Ecuador; Euphorbia sp.; G. v. Lagerheim.
DISTRIBUTION: Ecuador, Brazil, Biscay (Spain).
NOTE: *C. euphorbiae* was used by Kellerman and Swingle, therefore Patouillard's name for the fungus had to be changed. The conidia of both types were rare, so that a satisfactory comparison could not be made. This species differs from the others on Euphorbia in having colored, cylindro-obclavate conidia, and large stromata. See key, page 218.

**Cercospora glochidionis** Sawada

Formosa Agr. Exp. Sta. 1 (Spec. Bul. 19): 37, 670. 1919

Leaf spots circular to irregular, 5-17 mm. in diameter, reddish brown to dark purplish brown, later the center becomes gray; stromata present; fascicles 50-100 stalks; conidiophores pale colored, paler and more narrow toward the tip, 1-2 septate, not branched, rarely geniculate, 4-6 x 10-20$\mu$; conidia subhyaline to very pale olivaceous, cylindric to cylindro-obclavate, 2-5 septate, 3-4 x 25-65$\mu$.

HOST: *Glochidion hongkongense* Muell. Arg.
TYPE: Formosa; *Glochidion hongkongense;* Kaneyoshi Sawada.
DISTRIBUTION: Several collections from Formosa (Taiwan).
NOTE: Sawada, Formosa Agr. Res. Inst. Rept. **85**: 123. 1943, describes *Cercospora taihokuensis* Sawada on the same host. According to him this latter species has much broader conidiophores and conidia than does *C. glochidionis.* His description, however, is too meager to be sure of the differences. The same holds true also for *Cercospora giranensis* Sawada (Rept. **86**: 170. 1943) on *Glochidion fortuni* Hance. A specimen of *C. glochidionis* is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora gymnanthis** sp. nov.

Maculae suborbiculares vel irregulares, 0.5-3 mm. diam., griseae; caespituli amphigeni; stromata fusca, 10-25$\mu$ diam.; conidiophora laxe fasciculata, pallidissime olivaceo-brunnea, curvata vel sinuosa, vix septata et geniculata, simplicia, 3-5 x 10-25$\mu$; conidia hyalina vel pallidissime olivacea, cylindro-obclavata, recta vel leniter curvata, utrimque subobtusa, 1-5 septata, 2-4 x 15-50$\mu$.

Leaf spots subcircular or slightly irregular, 0.5-3 mm. in diameter, gray to nearly white, with an almost microscopic raised reddish brown line border; fruiting amphigenous; stromata pale to medium brown, a few cells to 25$\mu$ in diameter; fascicles mostly not dense, divergent; conidiophores pale to very pale olivaceous brown, uniform in color, irregular in width, curved or variously bent, rarely septate or geniculate, not branched, bluntly rounded tip, 3-5 x 10-25$\mu$; conidia cylindro-obclavate, hyaline to faintly olivaceous, straight to mildly curved, obtuse or obconic base, rounded tip, 1-5, but mostly 3-septate, 2-4 x 15-50$\mu$.

HOST: *Gymnanthes lucida* Sw.
TYPE: Jamaica; *Gymnanthes lucida;* E. B. Martyn, No. 167; Mar., 1947.
DISTRIBUTION: Known only from the type locality.

**Cercospora henningsii** Allescher

*In* Engler's Pflanzenwelt Ost-Afrikas, Teil C, p. 35. 1895

*Cercospora cassavae* Ellis + Ev., Bul. Torrey Bot. Club **22**: 438. 1895
*Cercospora manihotis* P. Henn., Hedwigia **41**: (Beiblatt) 18. 1902
*Cercospora cearae* Petch, Ann. Roy. Bot. Gard. Peradeniya. **3**: 10. 1906
*Septogloeum manihotis* Zimm., Centralbl. f. Bakt. Abt. 2. **8**: 218. 1902
*Helminthosporium manihotis* Rangel, Arch. Jard. Bot. Rio de Janeiro **2**: 71. 1917

Leaf spots subcircular, 3-12 mm. in diameter, pale brown or tan to dingy grayish with yellowish brown margin, rather indefinite on the lower leaf surface; fruiting amphigenous; small globular dark brown stromata 20-40$\mu$ in diameter; fascicles dense; conidiophores very pale olivaceous brown, in mass medium dark, uniform in color and width, longest ones sparingly septate, not branched, 0-2 mildly geniculate, rounded tip with small to medium spore scar, straight or nearly so, 3.5-5 x 10-50$\mu$, rarely as long as 100$\mu$; conidia cylindric, pale olivaceous, both ends bluntly rounded, or base short obconic, straight to slightly curved, plainly 2-8 septate, 4-6 x 30-60$\mu$, rarely as large as 7 x 85$\mu$.

HOSTS: *Manihot glaziovii* Muell., *M. manihot* (L.) Coeherell, *M. utilissima* Pohl., Manihot sp.
TYPES: Usambara (Amboni), East Africa; *Manihot utilissima;* Holst, No. 2899; (*C. cassavae*) Florida; Cassava leaves; Nash, No. 1950; 1895; (*C. manihotis*) Kwango, Kongo; *Manihot utilissima;* H. van Der Byl; May 1901. In the publication is given Kisantu; H. Vanderyst, No. 179; May 1906; but in the Berlin Herbarium the above specimen was listed as type. (*C. cearae*) Peradeniya, Ceylon; *Manihot glaziovii;* J. Petch, No. 2211; May 12, 1905.
DISTRIBUTION: Apparently common wherever *Manihot utilissima* is grown intensively. Studied material from Florida, Brazil, Colombia, Costa Rica, Panama, San Domingo, Trinidad, Barbados, Puerto Rico, East Africa, Uganda, Sierra Leone, Gold Coast, Belgian Congo, Tanganyika, Ceylon, Philippines, Formosa, China.
NOTE: It is not uncommon to find *C. henningsii* and *C. caribaea* on the same leaf, the former being distinguished easily by its large tan spot and the latter

by the small angular almost snow-white lesions. Ghesquiere and Henrard (Rev. Zool. Afr. Suppl. Bot. **12**: 1. 1924) described the perfect stage as *Mycosphaerella manihotis*. *C. henningsii* was described in June and *C. cassavae* in October, 1895. Solheim and Stevens (Mycologia **23**: 381. 1931) say, "the descriptions (of *C. cassavae, C. henningsii, C. manihotis, C. cearae*) are too meager to judge whether or not they are distinct. From what description there is, it appears quite doubtful that they are so." See key, page 214.

**Cercospora heterospora** Ellis & Everhart
Torrey Bot. Club Bul. **25**: 512. 1898

HOST: *Euphorbia corollata* L.
TYPE: Racine, Wisconsin; *Euphorbia corallata;* J. J. Davis, No. 976; July 23, 1897.
NOTE: The type material shows all the fruiting parts hyaline and the conidia obclavate. These characters are representative of Cercosporella.

**Cercospora heveae** Vincens
Bul. Soc. Path. Veget. France **2**: 25. 1915

This species occurs on leaf spots caused by *Phyllachora huberi*. These spots are circular to irregular, dark, with yellowish margin, 3-11 mm. in diameter, or confluent and much larger; fruiting hypophyllous; fascicles dense; conidiophores medium dark, paler tip, irregular in width, multiseptate, not branched, slightly geniculate or wavy to sinuous, small spore scar at the conic tip, 4-6 x 10-60$\mu$ (published measurements 3-5 x 20-25$\mu$); conidia pale to medium olivaceous, cylindric, straight to slightly curved, 2-5 septate, base rounded to obconic, tip subobtuse, 3-5 x 25-50$\mu$.

HOST: *Hevea brasiliensis* Muell.
TYPE: Amazon Valley, Brazil; *Hevea brasiliensis;* F. Vincens.
DISTRIBUTION: Brazil, Panama, and possibly the Malay Peninsula.
NOTE: In the Paris Herbarium there was no specimen in the packet, but only some pen drawings by Vincens. Most of the above description is derived from these drawings, and resembles the specimen sent by Karl Butler from Panama.

**Cercospora hieronymae** sp. nov.

Maculae 7-15 mm. diam., purpureae vel rubido-fuscae, centro tandem expallentes; caespituli fere hypophylli; stromata minuta, atro-fusca; conidiophora non vel dense fasciculata, pallide olivaceo-brunnea, interdum septata, vix ramosa, 3-4.5 x 10-65$\mu$; conidia cylindro-obclavata, pallide olivacea, spurie multiseptata, recta vel curvata, ad basim subtruncata, ad apicem obtuse rotundata vel acuta, 2.5-4 x 35-95$\mu$.

Leaf spots large brown blotches with purple or reddish brown border, 7-15 mm. in length, sometimes with several small pale brown areas toward the center; fruiting chiefly hypophyllous; stromata small, dark brown; nonfasciculate to dense fascicles; conidiophores arising from the stromata or from the superficial mycelium, pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, rarely branched, longest ones undulate to geniculate, spore scars not evident, 3-4.5 x 10-65$\mu$, mostly 10-40$\mu$; conidia cylindro-obclavate, pale olivaceous, indistinctly multiseptate, straight to curved, base truncate to long obconically truncate, tip subobtuse to conic, 2.5-4 x 35-95$\mu$.

HOST: *Hieronyma laxifolia* Muell. (Hyeronima).
TYPE: Sao Paulo, Brazil; *Hieronyma laxifolia;* J. G. Carneiro, No. 972; June 9, 1933.
DISTRIBUTION: Known only from the type locality.

**Cercospora hurae** Stevens

Trans. Ill. Acad. Sci. **10**: 210. 1917

Leaf spots strongly zonate with alternating gray and brown, or large gray blotches with dark border, 5-20 mm. in diameter; fruiting amphigenous, chiefly epiphyllous; small dark globular stromata, 30-60$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, only longest ones septate, geniculate or undulate, not branched, tip rounded, with minute spore scar, shorter ones slightly attenuated, 3-4.5 x 5-40$\mu$, rarely as long as 95$\mu$; conidia subhyaline to pale olivaceous, straight or nearly so, obclavate to almost cylindric, base obconic, tip subobtuse, septa indistinct, 2-4.5 x 25-90$\mu$.

HOST: *Hura crepitans* L.
TYPE: Mayaguez, Puerto Rico; *Hura crepitans;* F. L. Stevens, No. 478; March 9, 1913.
DISTRIBUTION: Studied material from Puerto Rico, San Domingo, Barbados, Minas Geraes, and Venezuela.
NOTE: *C. huricola,* the other species on this genus, has hyaline conidia which may be acicular. For a further description see Mycologia **23**: 372. 1931.

**Cercospora huricola** sp. nov.

Maculae orbiculares vel irregulares, atro-fuscae, centro tandem leniter expallentes; caespituli amphigeni; stromata minuta, atro-fusca, subglobosa; conidiophora laxe vel dense fasciculata, brunnea, evidenter multiseptata, leviter vel subito curvata, 0-3 geniculata, simplicia, ad apicem subtruncata, 4-5.5 x 20-175$\mu$; conidia hyalina, anguste obclavata, recta vel curvata, spurie multiseptata, ad basim truncata, ad apicem subacuta, 2.5-5 x 30-150$\mu$.

Leaf spots circular to irregular in outline, 2-10 mm. in diameter, dark reddish brown, when mature usually with a gray center or 2-3 gray areas; fruiting amphigenous but more abundant on the upper surface; stromata small, dark brown, subglobular to appressed; fascicles 2-20 divergent stalks; conidiophores pale to medium brown, paler tip, uniform in width or attenuated, plainly multiseptate, slightly curved or crooked, 0-3 geniculate, not branched, large spore scar at subtruncate tip, 4-5.5 x 20-175$\mu$, inclined to be irregular in length; conidia hyaline, acicular, shortest ones may be cylindric, straight to curved, base truncate, tip subacute, indistinctly multiseptate, 2.5-5 x 30-150$\mu$.

HOST: *Hura crepitans* L.
TYPE: Vicosa-Escola, Minas Geraes; *Hura crepitans;* A. S. Muller, No. 559; June 3, 1933.
DISTRIBUTION: Brazil, Venezuela.
NOTE: See also *C. hurae.*

**Cercospora jatrophae** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 64. 1892

Leaf spots pale yellowish brown, 2-6 mm. in diameter, circular to subcircular, no distinct border; fruiting chiefly hypophyllous; small pale brown stromata filling stomatal openings; fascicles mostly dense, but conidiophores sometimes nonfas-

ciculate as short branches from procumbent threads, subhyaline to pale brown, tip pale to hyaline, septa if present indistinct, not geniculate, branched, shortest ones attenuated, longest ones curved or bent, spore scars indistinct, tip rounded bluntly, 2-3.5 x 10-35$\mu$; conidia thread-like to very narrowly acicular, hyaline to subhyaline, variously curved, septa indistinct, base truncate to long obconically truncate, tip acute, 1.5-2.5 x 40-130$\mu$.

HOST: *Jatropha urens* L. (*Jatropha stimulosa* Michx.) (*Cnidoscolus stimulosus* A. Gray)

TYPE: Auburn, Ala.; *Jatropha stimulosa;* Geo. F. Atkinson, No. 1171; July 2, 1890.

DISTRIBUTION: Alabama; also reported from Martinique.

NOTE: The long, hyaline, very slender conidia separate this from other species On Jatropha. See key, page 211.

**Cercospora jatropharum** Spegazzini

Anal. Mus. Nac. B. Aires. **20**: 440. 1910

Leaf spots suborbicular, 3-5 mm. in diameter, dingy gray center surrounded by a dark brown zone which in turn is enclosed in a paler brown area bounded by a narrow raised line; fruiting hypophyllous; stromata dark brown, filling stomatal openings; most fascicles dense; conidiophores in mass dark brown, singly pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not branched, not geniculate, small spore scar at the blunt tips, 4-6 x 10-35$\mu$; conidia subhyaline to faintly colored, cylindro-obclavate, straight to slightly curved, indistinctly multiseptate, base rounded to obconic, tip subobtuse, 5-8 x 30-80$\mu$.

HOST: *Jatropha macrocarpa* Griseb.

TYPE: Catamarca, Argentine; *Jatropha macrocarpa;* No. 943; Febr. 1904.

DISTRIBUTION: Known only from the type locality.

NOTE: See key for differences among the species on this host.

**Cercospora jatrophicola** (Speg.) n. comb.

*Cercosporina jatrophicola* Speg., Anal. Mus. Nac. B. Aires. **20**: 426. 1910

Leaf spots orbicular to irregular, 1-7 mm. in diameter, gray center, brown border; fruiting amphigenous; stromata small, brown; fascicles mostly dense, divergent; conidiophores olivaceous to olivaceous brown, paler and more narrow toward the tip, 0-2 septate, not branched, slightly curved, mildly geniculate, 4-6 x 30-80$\mu$; conidia hyaline, obclavate to almost acicular, straight to mildly curved, base subtruncate to obconically truncate, tip subacute, 3-7 septate, 3-4.5 x 30-80$\mu$.

HOSTS: *Jatropha macrocarpa* Griseb., *Cnidoscolus elasticus* Lundell.

TYPE: Tucumán, Argentine; *Jatropha macrocarpa;* April, 1906.

DISTRIBUTION: Argentine, Texas.

NOTE: Although the mycologists of Argentine were very kind in sending me specimens of Spegazzini's species, they did not find the type of this one. J. A. Stevenson sent me a good collection from Texas. See key, page 211.

**Cercosporae macarangae** H. & P. Sydow

Ann. Mycol. **12**: 575. 1914

Leaf spots circular to somewhat irregular, 3-6 mm. in diameter, on upper surface grayish brown to dull grayish; sometimes with a darker margin, on lower surface indistinct on the dried brown leaf; fruiting hypophyllous; stromata small,

dark brown; fascicles dense, often coremoid; conidiophores singly pale to medium olivaceous brown, in mass dark, paler toward the tip, uniform in width, multiseptate, not branched, not geniculate, straight or almost so, tip mostly long conically truncate, 3-4.5 x 50-180$\mu$; conidia subhyaline to pale olivaceous, obclavato-cylindric, nearly straight, 3-9 septate, base subtruncate to obconically truncate, tip obtuse to conic, 3-5.5 x 15-85$\mu$.

HOST: *Macaranga tanarius* (L.) Muell.
TYPE: Luzon, Philippines; *Macaranga tanarius;* M. Ramos; Aug. 1913.
DISTRIBUTION: Philippines, Formosa.

**Cercospora malloti** Ellis & Everhart
Jour. Mycol. **4**: 114. 1888

Leaf spots circular to angular, 1-4 mm. in diameter, white to gray, with a dark line border, sometimes a uniform rusty brown; fruiting amphigenous; fascicles mostly dense; stromata a few brown cells; conidiophores sparingly septate, pale brown, paler and more narrow toward the tip, not branched, longer ones usually geniculate, medium spore scar at subtruncate tip, 3-5 x 10-50$\mu$; conidia hyaline, acicular, straight to slightly curved, septa indistinct, base truncate, tip acute, 1.5-3 x 40-75$\mu$.

HOST: *Mallotus japonicus* Muell.
TYPE: Starkville, Miss.; *Mallotus japonicus;* S. M. Tracy, No. 83; Sept. 20, 1888.
DISTRIBUTION: Mississippi, Japan, and Formosa.
NOTE: See also *C. melanolepidis.* Another named species on Mallotus has been collected in the Philippines. It is nonfasciculate with large cylindric colored conidia (Fungi Malayana No. 312, C. F. Baker, Febr. 1914). It was named *Cercospora bakeriana* Sacc. (Ann. Mycol. **12**: 313. 1914). Another fungus on the host, *Poinciana pulcherrima,* (Fungi Malayana No. 118a, C. F. Baker), was given the same name. The two specimens are quite distinct. The one on *Mallotus moluccanus* Muell. should be listed as an Helminthosporium because of the wide, closely septate, thick-walled conidia. K. Sawada (Formosa Agr. Res. Inst. Rept. **86**: 173. 1943) and Yamamoto (Trans. of Nat. Hist. Soc. Formosa Ann. **26**: 283. 1936) both report *C. malloti* as appearing in Formosa.

**Cercospora manaosensis** P. Hennings
Hedwigia **43**: 395. 1904

Leaf spots indistinct; fruiting effuse, hypophyllous, olivaceous, 0.5-1.5 mm. in extent; stromata elongate, dark brown; fascicles mostly very dense; conidiophores intertwining, pale to medium olivaceous brown, in mass fairly dark, uniform in color and width or slightly clavate, multiseptate, branched, curved to tortuous, 0-3 geniculate, small spore scar at the conic tip, 2-4.5 x 25-200$\mu$, mostly 50-100$\mu$; conidia cylindric, pale olivaceous, straight to mildly curved, 1-7, usually 3-septate, ends rounded to conic, occasionally catenulate, 4-7 x 20-90$\mu$.

HOST: Croton sp.
TYPE: Rio Negro, Manáos, Brazil; Croton sp.; E. Ule (Herb. Brasiliense), No. 3046; Febr. 1901.
DISTRIBUTION: Brazil, Venezuela.
NOTE: The masses of long interwoven conidiophores in very dense fascicles separate this species from the others on Croton. See key, page 214.

**Cercospora manihobae** Viégas

Bol. da Soc. Brasil. de Agron. 8: 38. 1945

Leaf spots indistinct, sometimes with slightly darkened border, subcircular; also occurring on the petioles as elongated lesions; stromata small, black; fascicles numerous, sometimes dense, divergent; conidiophores pale to medium olivaceous brown, paler and slightly attenuated toward the tip, multiseptate, rarely branched or geniculate, 4-6 x 70-1000$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 3.5-5 x 80-270$\mu$.

HOST: *Manihot utilissima* Pohl.

TYPE: Campinas, Sao Paulo, Brazil; *Manihot utilissima;* A. P. Viégas; Feb. 21, 1941.

DISTRIBUTION: Known only from the type locality.

NOTE: This is the only species with hyaline acicular conidia on Manihot. See key, page 214.

**Cercospora maritima** Tracy & Earle

Bul. Torrey Bot. Club 22: 179. 1895

Leaf spots indefinite or none; fruiting in amphigenous black effuse patches; stromata none or a few dark colored cells; fascicles not dense to dense and decidely coremoid in appearance; conidiophores dark fuligenous or dark brown, uniform in width, but somewhat paler in color near the tip, plainly and closely septate, when single sometimes branched, rarely mildly geniculate, straight, tip bluntly rounded to conically truncate, spore scars indistinct, 4-7 x 25-135$\mu$; conidia cylindric to obclavato-cylindric, almost straight, medium olivaceous brown, plainly 1-5 septate, base long obconically truncate, tip blunt, 4-6 x 30-90$\mu$.

HOSTS: *Croton glandulosus* L., *C. maritimus* Walt., Croton sp.

TYPE: Horn Island, Miss.; *Croton maritimus;* F. S. Earle; March, 1892.

DISTRIBUTION: Mississippi, San Domingo, and Venezuela.

NOTE: The coremoid fascicles, dark colored conidiophores, and effuse fruiting separate this species from the others on Croton. See key, page 213.

**Cercospora melanolepidis** Sawada

Formosa Agr. Rev. 38: 698. 1942;

also Formosa Agr. Res. Inst. Rept. 85: 114. 1943

Leaf spots subcircular to irregular, 0.5-3 mm. in diameter, on upper surface black center with a wide orange to yellowish margin, in the largest spots a white stipple may be in the black center, on lower surface slight indistinct darkening; fruiting apparently hypophyllous; stromata composed of a few dark cells; fascicles 2-8 spreading stalks; conidiophores pale brown, much paler and more narrow toward the tip, sparingly septate, not branched, usually straight, rarely geniculate, conic tip, 4-6.5 x 15-65$\mu$; conidia subhyaline to pale yellowish olivaceous, cylindro-obclavate, straight to mildly curved, multiseptate, base subtruncate to long obconically truncate, tip subobtuse, 3.5-5 x 30-130$\mu$.

HOST: *Mallotus moluccanus* Muell. (*Melanolepis multiglandulosa* Reichb. & Zoll.)

TYPE: Urai, Taipeh, Taiwan (Formosa); *Melanolepis multiglandulosa;* K. Sawada; Nov. 4, 1928.

DISTRIBUTION: Formosa.

NOTE: See also *C. malloti.* A part of the Sawada type is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora mercurialis** Passerini
de Thümen, Mycoth. Univ. No. 783

*Phyllosticta mercurialis* Desm., Rabh. Fungi Europ. No. 1945
*Cercospora fructicola* Sacc. (See var. below).
*Cercospora mercurialis* var. *annuae* Roum., Revue Mycol. **15**: 16. 1893
*Cercospora mercurialis* var. *fructicola* Sacc., Fungi Ital. Tab. 674. 1881
*Cercospora mercurialis* var. *latvici* Lepik, Sitzungsber. d. Naturf. Ges. Univ. Tartu. **39**: 152. 1932
*Cercospora mercurialis* var. *multiseptata* Savul. & Sandu, Hedwigia **75**: 225. 1935

Leaf spots subcircular to irregular, 1-5 mm. in diameter, gray, at times with a brown line border; fruiting chiefly hypophyllous; stromata small, dark brown; fascicles 3-20 stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, sparingly septate, not branched, in some collections straight while in others sinuous to closely geniculate, medium sized spore scar at the subtruncate tip, 4-5.5 x 15-60$\mu$; conidia hyaline, in mass subhyaline, cylindric or rarely almost acicular, straight to mildly curved, multiseptate, base subtruncate to long obconically truncate, tip mostly obtuse, 3-6 x 20-140$\mu$.

HOSTS: *Mercurialis annua* L., *M. perennis* L.

TYPES: Parma, Italy; *Mercurialis annua;* Prof. Passerini; Aut. 1874 (de Thümen Mycoth. Univ. No. 783); (var. *annuae*) France; *M. annua;* Fautrey; Aug. 1892; (var. *fructicola*) Selva, North Italy; *M. annua;* P. A. Saccardo; Summer; (var. *latvici*) Tusnad, Bez, Lettland; *M. annua;* Lepik; July 3, 1932; (var. *multiseptata*) see type for var. *latvici.*

DISTRIBUTION: Apparently abundant from northern Spain and Italy to Germany, and present as far north as Latvia. Also present in Bermuda and Palestine.

NOTE: See also *C. ehikomontana* for differences between the two species on this host genus. Saccardo has already placed the variety *fructicola* and the species of the same name into synonymy. The specimen of the variety, *multiseptata,* which Savulescu kindly sent me appeared identical with *C. mercurialis* as represented by the cotype. I did not see variety, *latvici,* but the description is the same; furthermore, Savulescu says it is a synonym of variety, *multiseptata.*

**Cercospora micromera** Sydow
Ann. Mycol. **20**: 65. 1922

HOST: *Sapium sebiferum* Roxb. (*Stillingia sebifera* Michx.)

TYPE: Canton, China; *Sapium sebiferum;* C. W. H., No. 11414; Febr. 1921.

NOTE: The coarse conidiophores, and the closely septate, thick walled, wide, darkly colored conidia are characteristic of Helminthosporium rather than of Cercospora.

**Cercospora mucunaecola** Ciferri & Fragosa
Est. Agron. de Haina Serie B-Bot. **7**: 12. 1926

Leaf spots subcircular, 0.5-5 mm. in diameter, gray, yellowish brown margin; fruiting amphigenous; stromata brown, globular, 20-40$\mu$ in diameter; fascicles

mostly dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not branched, sinuous to slightly geniculate, rounded to conic tip, 2.5-4 x 10-50$\mu$; conidia cylindric or mildly attenuated, subhyaline to very pale olivaceous, straight to curved, indistinctly multiseptate, base long obconically truncate to subtruncate, tip blunt to conic, 2.5-4 x 25-95$\mu$.

HOST: *Dalechampia scandens* L.

TYPE: prope Haina, Republica Dominicana; *Dalechampia scandens;* R. Ciferri; Jan. 26, 1926.

DISTRIBUTION: Several specimens from San Domingo.

NOTE: The type was not available but several other collections by Ciferri and Chardon were studied.

**Cercospora petila** Thirumalachar & Chupp

Mycologia **40:** 359. 1948

Leaf spots dark reddish brown to almost black, subcircular to irregular, 2-6 mm. in diameter, occasionally surrounded by an old-rose colored zone; fruiting chiefly epiphyllous; stromata subglobular, dark, 20-40$\mu$ in diameter; fascicles dense, not compact; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the narrowly rounded or conic apex, straight to curved or undulate, rarely septate, not geniculate, not branched, 2-3.5 x 5-25$\mu$; conidia subhyaline to faintly olivaceous, narrowly cylindric, sometimes mildly attenuated toward the tip, straight to curved, indistinctly 1-7 septate, base rounded to subtruncate, tip blunt to conic, 2-3.5 x 30-75$\mu$.

HOST: *Euphorbia pulcherrima* Willd. (*Poinsettia pulcherrima* Graham).

TYPE: Bangalore, India; *P. pulcherrima;* M. J. Thirumalachar; Nov. 11, 1945.

DISTRIBUTION: Known only from the type locality.

NOTE: The species name indicates the slender conidia. See also *C. bakeriana* and *C. poincianae* for differences among the species on Poinsettia, and key, page 218 for those on Euphorbia.

**Cercospora phyllanthi** Chupp

Jour. Dept. Agr., Puerto Rico **15:** 12. 1931

*Cercospora phyllanthina* Petrak & Ciferri, Ann. Mycol. **30:** 329. 1932

*Cercospora phyllanthi* Sawada, Formosa Agr. Res. Inst. Rept. **85:** 118, 1943

*Cercospora phyllanthi* Hansford, Proc. Linnean Soc. London **1943-4:** 122. 1944

Leaf spots none or indefinite; fruiting in pale olivaceous or grayish effuse patches on lower leaf surface; stromata lacking or a few pale olivaceous brown cells; fascicles 5-20 stalks; conidiophores subhyaline to pale olivaceous brown, uniform in color, somewhat attenuated, meagerly septate, rarely 1-2 geniculate, plainly branched, minute spore scar at subconic tip, 3-4 x 8-55$\mu$; conidia subhyaline to very pale olivaceous, cylindric to cylindro-obclavate, straight to undulate, 1-6 septate, base obconic, tip rounded to conic, 2.5-4.5 x 10-55$\mu$.

HOSTS: *Phyllanthus discoides* Muell., *P. lathyroides* H. B. & K., *P. niruri* L., Phyllanthus sp.

TYPES: Vieques, Puerto Rico; *Phyllanthus niruri;* Whetzel, Kern, and Toro, No. 2663; July 18, 1924; (*C. phyllanthina*) Santiago, San Domingo; *Phyllanthus lathyroides;* E. L. Ekman, No. 3901; Dec. 15, 1930; (*C. phyllanthi* Sawada) Formosa; *Phyllanthus niruri;* K. Sawada; (*C. phyllanthi* Hansford) Entebbe Road, Uganda; *Phyllanthus discoides;* Hansford, 3016.

DISTRIBUTION: Puerto Rico, Brazil, and San Domingo. Apparently it occurs also in Formosa and Uganda.

NOTE: I have not seen the Sawada collection and his description is so incomplete that it is impossible to be sure that his species is a synonym. Hansford's description fits closely the Puerto Rico type, excepting that he gives the measurements of conidiophores as 4-6 x 250$\mu$ and of conidia as 4-7 x 30-60$\mu$. This width may be significantly distinct.

**Cercospora profusa** H. & P. Sydow
Ann Mycol. 7: 175. 1909

Leaf spots indistinct or none; fruiting hypophyllous, effuse, dark olivaceous, covering greater part of the leaf surface; stromata lacking or only a few brown cells; nonfasciculate to dense fascicles; conidiophores pale to medium dark brown, uniform in color, irregular in width, plainly multiseptate, rarely branched, not or rarely geniculate, curved to tortuous, bluntly rounded tip, 4-6 x 20-150$\mu$; conidia medium dark olivaceous brown, cylindric or slightly attenuated, plainly multiseptate to slightly curved, base long obconically truncate, tip mostly obtuse, 3-6 x 40-100$\mu$.

HOSTS: *Acalypha australis* Linn., Acalypha sp.

TYPE: Hoki-ga-mine, Tosa, Japan; *Acalypha australis;* Miss T. Yoshinaga, No. 15; Oct. 17, 1908.

DISTRIBUTION: Japan, China, Colombia.

NOTE: The wide cylindric conidia and effuse fruiting separate this species from the others on Acalypha. See key, page 210.

**Cercospora pulcherrimae** Tharp
Mycologia 9: 114. 1917

*Cercospora pulcherrimae minima* Tharp, Mycologia 9: 114. 1917

Leaf spots circular to subcircular, 1-4 mm. in diameter, center tan to gray, border dark reddish brown; stromata lacking or small, dark, 15-40$\mu$ in diameter, somewhat larger on upper than on lower leaf surface; fascicles sometimes dense, mostly 3-12 diverging stalks, rarely 30-40; conidiophores pale to medium olivaceous brown, uniform in color and width, sometimes paler and more narrow toward the tip, multiseptate, rarely branched, straight, crooked or undulate, 0-3 geniculate, medium spore scar at rounded to subtruncate tip, 4-6 x 20-150$\mu$ or even longer; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2.5-4 x 60-125$\mu$, or even as large as 5 x 270$\mu$.

HOSTS: *Euphorbia heterophylla* L., *E. hirta* L., *E. marginata* Pursh., *E. pulcherrima* Willd. (*Poinsettia pulcherrima* Graham).

TYPES: Austin, Texas; *Euphorbia pulcherrima;* B. C. Tharp; Jan. 29, 1916; (*C. pulcherrimae minima*) Victoria, Texas; *E. pulcherrima;* H. C. Millender; Oct. 18, 1915.

DISTRIBUTION: Material studied was from Texas, Oklahoma, Wisconsin, Uganda, Jamaica, and Brazil. Also reported from Missouri.

NOTE: The differences between these two does not seem so marked as Tharp suggested in his description. The hyaline acicular conidia separate this species from the others on Euphorbia. See key, page 218.

**Cercospora ricinella** Saccardo & Berlese

Atti R. Ist. Ven. Sci. Lett. Arti. VI. 3: 721. 1885

*Cercospora albido-maculans* Wint., Hedwigia **24**: 202. 1885, and Jour. Mycol. **1**: 124. 1885

*Cercospora ricini* Speg., Anal. Mus. Nac. B. Aires Ser. 2. **3**: 343. 1899

*Cercosporina ricinella* (Sacc. + Berl.) Speg., Anal. Mus. Nac. B. Aires **20**: 429. 1910

Leaf spots circular, 0.5-12 mm. in diameter, usually a minute white dot with a dark brown to reddish brown border, but sometimes uniformly brown or grayish blotches; fruiting amphigenous, but more abundant on lower surface; stromata a few brown cells to 50$\mu$ in diameter; fascicles mostly dense; conidiophores pale brown, fairly uniform in color and width, sparingly septate, not branched, straight or 1-2 abruptly geniculate, medium spore scar at subtruncate tip, 4-5.5 x 10-90$\mu$; conidia hyaline, acicular to obclavate or rarely almost cylindric, straight to mildly curved, indistinctly multiseptate, base truncate, tip subobtuse to subacute, 2.5-4.5 x 15-120$\mu$.

HOST: *Ricinus communis* L.

TYPES: Australia; *Ricinus communis;* Logan, No. 13; (*C. ricini*) Tucumán, Argentine; *R. communis;* Spegazzini, No. 937; Feb. 1895; (*C. albido-maculans*) Perryville, Missouri; *R. communis;* C. H. Demetrio; Autumn 1883.

DISTRIBUTION: Material has been received from nearly every part of the world where the host is grown. It seems especially abundant in most of South America, the lower part of North America and the West Indies. It is present in the southern United States from Florida to California and at least as far north as Missouri.

NOTE: Saccardo (Syll. Fung. **15**: 84. 1901) also was of the opinion that *C. albido-maculans* is a synonym. *C. canescens* has been reported on *Ricinus communis,* but this apparently is incorrect.

**Cercospora rubida** Muller & Chupp

Arq. Inst. Biol. Vegetal Rio de Janeiro **1**: 219. 1935

Leaf spots none or indistinct; fruiting hypophyllous, effuse, abundant, brick-red to olivaceous brown, 1-5 mm. in extent; stromata absent; nonfasciculate; conidiophores single branches from procumbent threads, pale or very pale olivaceous to medium olivaceous brown, often with a reddish brown tinge, uniform in color, irregular in width, septate, not geniculate, straight to tortuous, small spore scar at the bluntly rounded tip, 4-5.5 x 10-80$\mu$; conidia similar in color, cylindric, straight to slightly curved, 3-8 septate, sometimes catenulate, base subtruncate to obconically truncate, tip obtuse, 4-5 x 25-85$\mu$.

HOSTS: *Euphorbiaceae, Croton floribundus* Spreng., *C. peruvianus* Briq.

TYPE: Vicosa-Escola, Minas Gerais, Brazil; Euphoribaceae; A. S. Muller, No. 503; April 29, 1933.

DISTRIBUTION: Minas Gerais and Sao Paulo, Brazil; and Peru.

NOTE: This brick-red effuse fruiting together with the nonfasciculate conidiophores and the cylindric conidia separate this species from the others on Croton. See key, page 213.

**Cercospora sapiicola** Spegazzini

Anal. Mus. Nac. B. Aires **20**: 442. 1910

Leaf spots circular to irregular, brown, no distinct border, on some host species

small, 2-5 mm. in diameter, on others large blotches, 10-20 mm. in extent; fruiting hypophyllous; stromata dark brown to almost black, globular to elongate, mostly filling stomatal openings, but sometimes up to 125$\mu$ in length, easily confused with pycnidia or perithecia, which may accompany the Cercospora; fascicles dense; conidiophores frequently only peripheral cells of the stroma, but sometimes elongated stalks, subhyaline to very pale fuligenous, inclined to be clavate, not septate, not geniculate, not branched, spore scars not evident, tip bluntly rounded, 4-6 x 5-25$\mu$ (Spegazzini says 35-60$\mu$); conidia cylindric to obclavato-cylindric, pale olivaceous, straight, mostly 2-3 septate, ends bluntly rounded, or base may be subtruncate to obconic, 4-7 x 30-70$\mu$.

HOSTS: *Sapium aucuparium* Jacq., Sapium sp.

TYPE: Puerto León, Misiones, Argentine; *Sapium aucuparium* var. *salicifolium;* Venturi, No. 130; July, 1909.

DISTRIBUTION: Studied material from Argentine and Costa Rica (Sydow, F. Exot. Exs. 713). Uganda (East Afr. Jour. Agr. 2: 419. 1937).

NOTE: *C. micromera,* another named species on Sapium, has dark colored conidiophores and conidia, and probably is an Helminthosporium. See also *C. stillingiae.*

**Cercospora sapii-sebiferi** Sawada

Formosa Agr. Res. Inst. Rept. 85: 121. 1943

HOST: *Sapium sebiferum* Roxb.

TYPE: Taichung, Taiwan, Formosa; *S. sebiferum;* K. Sawada; Dec. 7, 1925.

NOTE: A part of the type is deposited in the U.S. Dept. Agr. Mycological Herbarium. It is plainly an Helminthosporium.

**Cercospora sebastianiae** Baker and Dale

Mycol. Papers, Commonwealth Mycol. Inst. 33: 105. 1951

Leaf spots indistinct yellowish areas on the upper leaf surface; fruiting effuse on the corresponding lower surface, 2-6 mm. in extent, dark olivaceous to sooty; stromata none to a few dark cells; mostly fasciculate, fascicles composed of 5-20 divergent conidiophores which are pale to medium olivaceous brown, uniform in color, upper third undulate, sometimes attenuated toward the conic tip, multiseptate, branched, not geniculate, 4-5.5 x 20-125$\mu$; conidia pale olivaceous, cylindric or upper half attenuated, straight to mildly curved, 3-11 septate, base rounded to short obconic, tip blunt to conic, 4-5.5 x 30-85$\mu$.

HOST: *Sebastiania corniculata* (Vahl.) Muell.

TYPE: St. Augustine, Trinidad; *Sebastiania corniculata;* R. E. D. Baker, No. 1552; Aug. 20, 1947.

DISTRIBUTION: Various collections from Trinidad. Baker sent me a second packet collected on Grenada, Jan. 30, 1946, and a third collected Sept. 1, 1945.

**Cercospora sebiferae** Patouillard

Bul. Trimestriel Soc. Mycol. de France 31: 78. 1915

HOST: *Stillingia sebifera* Michx.

TYPE: Tonkin, French Indo-China; *Stillingia sebifera;* Cho Gank, No. 39; April ? 1914.

NOTE: This is the same fungus that Sydow described as *Cercospora micromera.* It plainly is an Helminthosporium.

**Cercospora securinegae** Togashi & Katsuki
Annals Phytopath. Soc. Japan **17**: 7. 1952

Leaf spots subcircular, 2-5 mm. in diameter, at first dingy reddish brown, then yellowish to gray, often confluent, margin indefinite; fruiting epiphyllous; stromata subglobose, 35-50$\mu$ in diameter; fascicles dense; conidiophores pale fuligenous, paler toward the tip, not septate, not branched, straight to geniculate, 3-4 x 25-40$\mu$; conidia hyaline, obclavate to cylindric, straight to curved, 2-7 septate, base subtruncate, apex subacute, 3-4 x 25-125$\mu$.

HOST: *Securinega flueggeoides* Muell.
TYPE: Matsudo-shi, Chiba Pref., Japan; *Securinega flueggeoides;* E. Kurosawa; Sept. 14, 1951.
DISTRIBUTION: Japan.

**Cercospora stevensonii** sp. nov.

Maculae suborbiculares, atro-brunneae, centro griseae; caespituli amphigeni; stromata atro-fusca, subglobosa, 20-60$\mu$; conidiophora laxe vel dense fasciculata, pallide olivaceo-brunnea, apicem versus leniter attenuata et pallidiora, 1-2 geniculata, vix septata, simplicia, ad apicem subtruncata, 3-5.5 x 15-60$\mu$; conidia hyalina, anguste obclavata, recta vel leniter curvata, spurie multiseptata, ad basim truncata, ad apicem subacuta, 2-4 x 20-75$\mu$.

Leaf spots subcircular, 3-8 mm. in diameter, gray, pale to dark brown margin; fruiting plainly amphigenous; stromata medium dark brown, subglobular, 20-60$\mu$ in diameter; fascicles 8-27 stalks; conidiophores pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not branched, mostly 1-2 abrupt geniculations, medium spore scar at the narrowly subtruncate base, 3-5.5 x 15-60$\mu$; conidia hyaline, bluntly acicular, straight to slightly curved, indistinctly septate, base truncate, tip subobtuse to almost acute, 2-4 x 20-75$\mu$.

HOST: *Codiaeum variegatuum* Blume.
TYPE: Brownsville, Texas; *Codiaeum variegatuum;* C. G. Anderson, No. 49910; Jan. 20, 1942.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. codiaei* for differences between the species on this host genus.
Named in honor of John A. Stevenson, who sent me the specimen.

**Cercospora stillingiae** Ellis & Everhart
Jour. Mycol. **3**: 20. 1887

Leaf spots circular to irregular, 2-6 mm. in diameter, dark brown, immarginate or with yellowish halo; fruiting amphigenous; stromata dark brown, usually filling stomatal opening, sometimes up to 40$\mu$ in diameter; fascicles dense; conidiophores very pale brown, tip almost hyaline, slightly attenuated, mostly straight, not septate, not geniculate, not branched, minute spore scar at narrowly rounded tip, 2-3.5 x 10-30$\mu$; conidia cylindric to cylindro-obclavate, subhyaline, oldest ones almost colored, straight to mildly curved, 1-7, mostly 3 indistinct septa, base obconic, tip obtuse, 2-3 x 10-50$\mu$.

HOSTS: *Sapium* (*Stillingia*) *sebiferum* Roxb., Sapium sp.
TYPES: Pointe a la Hache, La.; *Stillingia sebifera* Michx.; A. B. Langlois, No. 846; Nov. 29, 1886.
DISTRIBUTION: Material studied from Louisiana and China.

NOTE: The very narrow subhyaline conidia separate this species from the others on Sapium. See also *C. sapiicola.*

**Cercospora tiglii** P. Hennings

Hedwigia 47: 265. 1908

*Cercospora trinidadensis* Stevens & Solheim, Mycologia 23: 376. 1931

Leaf spots circular to angular, 2-6 mm. in diameter, yellowish brown to dark brown, sometimes with a yellow halo; fruiting chiefly hypophyllous; stromata slight, brown, usually filling stomatal opening; fascicles mostly 3-12 stalks; conidiophores pale olivaceous brown, longer ones plainly multiseptate, and constricted at septa or otherwise irregular in width, fairly uniform in color, straight or curved, rarely 1-3 mildly geniculate, not branched, small spore scar at conic tip, 3-7 x 10-75$\mu$ (some collections have only short conidiophores); conidia obclavato-cylindric, shortest ones may be cylindric, subhyaline to pale olivaceous brown, straight to mildly curved, mostly 3-10 septate, base medium to long obconic, tip obtuse, 3.5-5.5 x 20-85$\mu$.

HOSTS: *Croton glandulosus* L., *C. gossypiifolius* Vahl., *C. lobatus* L., *C. tiglium* L.

TYPES: Balut Island, Philippines; *Croton tiglium;* E. D. Merrill, No. 5423; Oct. 8, 1906; (*C. trinidadensis*) St. Augustine, Trinidad; *C. gossypiifolius;* No. 839.

DISTRIBUTION: Studied material from the Philippines, Puerto Rico, Trinidad, and Venezuela.

NOTE: Hennings type shows also a Rhytisma-like growth and a pycnidial form present. The Stevens and Solheim type shows shorter, less septate conidiophores than does the Hennings type. Other collections show various gradations between these two. Definite leaf spots without effuse fruiting, and color, length and width of conidiophores and conidia separate this species from the others on Croton. See key, page 213.

**Cercospora transvaalensis** Sydow

Ann. Mycol. 33: 237. 1935

Leaf spots circular to irregular, 2-5 mm. in diameter, at first uniformly reddish or purplish, then the center becomes dark or grayish brown; fruiting hypophyllous; stromata brown, globular, 15-40$\mu$ in diameter; fascicles sometimes dense; conidiophores very pale olivaceous, uniform in color, much attenuated toward the tip, 1-4 septate, not branched, not geniculate, straight or almost so, tip subacute, 2.5-4 x 5-30$\mu$ or rarely 50$\mu$; conidia very pale olivaceous, obclavato-cylindric, indistinctly multiseptate, base subtruncate, tip conic, 2.5-4 x 40-75$\mu$.

HOST: *Acalypha petiolaris* Krauss.

TYPE: Research Station, Nelspruit, Transvaal; *Acalypha petiolaris;* L. C. C. Liebenberg, No. 26002; May 1931.

DISTRIBUTION: Known only from the type locality.

NOTE: The narrow colored conidia, and distinct leaf spots separate this species from the others on Acalypha. Zundel sent me a collection from Pennsylvania and I received another one from Colombia, S. America. Both collections resemble in many respects the Sydow species, but they no doubt are distinct and probably represent two new species. Additional material is required to prove this. See key, page 210.

**Cercospora vicosae** Muller & Chupp

Arquiv. Inst. Biol. Veg. Rio de Janeiro **1**: 220. 1935

Leaf spots none or indistinct; fruiting hypophyllous, effuse, olivaceous to almost black, sometimes covering most of the lower leaf surface; stromata lacking or only a few dark brown cells; fascicles often dense or even coremoid; conidiophores dark reddish brown, uniform in color, irregular in width or constricted at septa, plainly multiseptate, rarely branched, sinuous to geniculate, small spore scar at the conic tip, 4-6 x 50-150$\mu$; conidia pale to medium olivaceous brown, cylindro-obclavate, straight to slightly curved, plainly 3-11 septate, base rounded to obconically truncate, tip obtuse, 4-6 x 25-100$\mu$.

HOST: Manihot sp.

TYPE: Vicosa-Escola, Minas Gerais, Brazil; Manihot sp.; A. S. Muller, No. 468; April 16, 1933.

DISTRIBUTION: Known only from the type locality.

NOTE: The effuse fruiting, the dark coremoid conidiophores, and the obclavate conidia separate this from the other species on Manihot. See key, page 214.

**Cercospora castaneae** Muller & Chupp

Arch. Inst. Biol. Vegetal, Rio de Janeiro **3**: 92. 1936

Leaf spots subcircular to irregular, 2-10 mm. in extent, reddish brown; fruiting hypophyllous, although some other fungus may be present on the upper surface; stromata slight to 50$\mu$ or more in diameter, dark brown; fascicles dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not branched, not geniculate, slightly wavy, bluntly rounded tips, 2-5 x 10-40$\mu$, when conidia are persistent often appearing much longer; conidia subhyaline to pale olivaceous, linear to narrowly obclavate, straight to slightly curved, indistinctly multiseptate, ends conic, 2-3.5 x 30-85$\mu$.

HOSTS: *Castanea sativa* Muell., Castanea sp.

TYPE: Minas Gerais, Brazil; *Castanea sativa;* A. S. Muller, No. 769; May 5, 1934.

DISTRIBUTION: Minas Gerais and Sao Paulo, Brazil.

**Cercospora macrochaeta** Ellis & Everhart

Bul. Torrey Bot. Club **24**: 473. 1897

HOST: *Quercus chrysolepis* Liebm.

TYPE: Jackson, Cal.; *Quercus chrysolepis;* Geo. Hansen, No. 1334.

NOTE: This is same as *C. polytricha.* Both of them have dark colored, thick walled conidia and should be classed as *Pseudocercospora polytricha* (Cooke).

**Cercospora polytricha** Cooke

Grevillea **7**: 35. 1878

HOST: *Quercus virginiana* Mill. (*Q. virens* Ait.)

TYPE: Darien, Georgia; *Quercus virens;* H. W. Ravenel, No. 2417 (291).

NOTE: See also *C. macrochaeta.* Both have dark colored, thick walled conidia.

**Cercospora querci** sp. nov.

Maculae orbiculares vel irregulares, plus minus confluentes, pallide brunneae; caespituli amphigeni; stromata deficiens vel 30-70$\mu$ diam., globosa, atra; conidiophora haud vel dense fasciculata, pallide olivaceo-brunnea, multiseptata, ramosa, flexuosa, vix geniculata, 3-5 x 20-100$\mu$; conidia subhyalina vel pallide olivacea,

anguste obclavata, fere recta, spurie multiseptata, ad basim subtruncata, ad apicem acuta, 2-4.5 x 40-250$\mu$.

Leaf spots circular to irregular, 1-3 mm. in diameter or coalescing into large areas, pale brown; fruiting amphigenous; stromata lacking or black, globular, 30-75$\mu$ in diameter; nonfasciculate to dense fascicles; conidiophores pale olivaceous brown, arising as branches from procumbent threads or from stromata, multiseptate, irregular in width, branched, tortuous, rarely geniculate, tip sometimes attenuated and almost hyaline, 3-5 x 20-100$\mu$; conidia subhyaline to pale olivaceous, narrowly obclavate, straight or nearly so, indistinctly multiseptate, base subtruncate, tip acute, 2-4.5 x 40-250$\mu$.

HOST: *Quercus bicolor* Willd.
TYPE: Kentwood, Louisiana; *Quercus bicolor;* July 10, 1936.
DISTRIBUTION: Known only from the type locality.
NOTE: The shape, size, and color of the conidia separate this species from the others on Quercus.

## CERCOSPORAE ON FLACOURTIACEAE

A. Conidia colored; fruiting amphigenous.
  B. Conidia medium dark in color, 4.5-6.5 x 30-65$\mu$; conidiophores medium dark, 4-6 x 5-20$\mu$.
    CASEARIA — *C. casearíae*
  BB. Conidia very pale in color, 2.5-4 x 35-95$\mu$; conidiophores merely slightly elongated cells on the periphery of the stromata.
    DORYALIS — *C. doryalidis*
AA. Conidia hyaline to subhyaline.
  B. Conidia acicular, 2-3.5 x 70-170$\mu$; fruiting amphigenous; conidiophores 4 x 50-150$\mu$.
    CALONCOBA — *C. caloncobae*
  BB. Conidia rarely acicular; fruiting not amphigenous.
    C. Conidia cylindro-obclavate to acicular, 2.5-4 x 25-60$\mu$; conidiophores medium dark in color, 3.5-4 x 20-80$\mu$; fruiting hypophyllous, effuse.
      CASEARIA — *C. ciferrii*
    CC. Conidia cylindric; conidiophores pale in color; fruiting epiphyllous, not effuse.
      D. Conidia Cylindrosporium-like, 1.5-3 x 10-50$\mu$; conidiophores 2-3.5 x 5-20$\mu$; fruiting epiphyllous.
        CASEARIA — *C. cylindrosporioides*
      DD. Conidia not Cylindrosporium-like, wider than 1.5-3$\mu$; fruiting hypophyllous.
        E. Conidiophores 3-4 x 5-45$\mu$; conidia 2-4 x 20-75$\mu$.
          KIGGELARIA — *C. kiggelariae*
        EE. Conidiophores 4-6 x 5-20$\mu$; conidia 5-6.5 x 30-70$\mu$.
          FLAGELLARIA — *C. flagellariae*

**Cercospora caloncobae** Viégas
Bragantia 7: 32. 1947

Leaf spots amphigenous, discrete or coalescing, circular, at first brown, later with gray center and dark brown border; fruiting amphigenous; stromata slight or none; fascicles erect, divergent; conidiophores brown, septate, not branched,

slightly geniculate, 4 x 50-150$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 70-170$\mu$.

HOST: *Caloncoba echinata* (Oliv.) Gilg. (*Oncoba echinata* Oliv.).

TYPE: Experiment Station of Agua Limpa, Minarum Province, Brazil; *Caloncoba echinata;* E. P. Heringer, No. 262; June 15, 1945.

DISTRIBUTION: See type above.

NOTE: Dr. Viégas misspelled the names of both the host genus and the Cercospora species.

**Cercospora casearіae** Stevens

Trans. Ill. Acad. Sci. **10**: 212. 1917

Leaf spots ashen white, surrounded by a wide purplish border, circular to subcircular, 2-4 mm. in diameter; fruiting amphigenous, but chiefly on upper leaf surface; stromata globular, almost black, 30-50$\mu$ in diameter; nonfasciculate to dense fascicles; conidiophores medium dark olivaceous brown, sparingly septate, not geniculate nor branched, uniform in color and width, 4-6 x 5-20$\mu$, merely elongated cells on the stromatal periphery, tip rounded, spore scars small or lacking; conidia cylindric to obclavato-cylindric, pale to fairly dark olivaceous or olivaceous brown, sometimes closely and plainly septate, ends rounded bluntly, 4-6.5 x 30-65$\mu$.

HOSTS: *Casearia guianensis* J. R. Johnston, *C. ramiflora* Vahl, *C. sylvestris* Sw., Casearia sp.

TYPE: Villa Alba, Puerto Rico; *Casearia ramiflora;* F. L. Stevens, No. 99; Jan. 3, 1915.

DISTRIBUTION: Apparently common in San Domingo, Trinidad, and Puerto Rico. Also reported from India.

NOTE: See *C. ciferrii* and *C. cylindrosporioides* for differences among the species on Casearia. See also key above.

**Cercospora ciferrii** sp. nov.

Maculae fere nullae, sed discolorationes epiphyllas indeterminatas ochraceas efficiens; caespituli hypophylli, fuliginei; stromata 20-50$\mu$, globosa, atra; conidiophora laxe vel dense fasciculata, atro-brunnea, multiseptata, haud geniculata, simplicia, 3.5-4.5 x 20-80$\mu$; conidia cylindrato-obclavata, fere recta, hyalina, spurie septata, ad basim truncata, ad apicem obtuse rotundata, 2.5-4 x 25-60$\mu$.

Leaf spots indefinite or none at first, later brown spots may appear on upper surface with dark effuse fruiting on the corresponding lower surface, variable in size and shape; stromata small, black, mostly not globose, 20-50$\mu$ in diameter; fascicles 2 to dense; conidiophores medium dark brown, with markedly pale tip, multiseptate, not geniculate, not branched, uniform in width, rounded tip, often with 2-4 minute spore scars at or near the tip, 3.5-4.5 x 20-80$\mu$ (mostly about 40$\mu$ long); conidia cylindro-obclavate to acicular, straight or nearly so, hyaline, truncate base, obtuse tip, septa not distinct, 2.5-4 x 25-60$\mu$.

HOST: *Casearia guianensis* J. R. Johnston.

TYPE: Barceloneta, Puerto Rico; *Casearia guianensis;* Whetzel and Olive, No. 528; Febr. 25, 1916.

DISTRIBUTION: Puerto Rico and San Domingo.

NOTE: Compare *C. casearіae* and *C. cylindrosporioides.* See key, page 234.

**Cercospora cylindrosporioides** Solheim and Chupp sp. nov.

Maculae minutissimae, a primo atro-rubidae vel atrae, centro tandem canescentes; caespituli epiphylli; stromata conspicua, atro-fusca; conidiophora densissime fasciculata, pallide brunnea, sursum saepe attenuata et fere hyalina, recta, haud geniculata, simplicia, spurie septata, 2-3.5 x 5-20$\mu$; conidia cylindrata vel anguste obclavata, hyalina, 1-5 septata, ad basim subtruncata, ad apicem acuta, 1.5-3 x 10-50$\mu$.

Leaf spots minute, 0.25-1 mm. in diameter, white, circular, wide dark red to black margin, often 2 or more white specks in one of the darkened areas; fruiting epiphyllous; stromata prominent, dark brown; fascicles very dense; conidiophores pale brown, almost hyaline, narrow tip, straight, not geniculate, not branched, septation and spore scars indistinct, 2-3.5 x 5-20$\mu$; conidia cylindric to almost acicular, hyaline, base subtruncate, 1-5 septate, tip acute, 1.5-3 x 10-50$\mu$.

HOSTS: *Casearia guianensis* J. R. Johnston, *C. sylvestris* Sw.

TYPE: Puerto Rico; *Casearia guianensis;* F. L. Stevens; 1915.

DISTRIBUTION: Apparently common in Puerto Rico. (See J. A. Stevenson Collection, numbers 199 and 2883, and Barrus, Fungi of Puerto Rico 2973).

NOTE: Compare *C. caseariae* and *C. ciferrii.* Dr. W. G. Solheim, while visiting my office, showed that *C. cylindrosporioides* differed from the other species on Casearia and should be named as a new species. See key, page 234.

**Cercospora doryalidis** Chupp & Doidge

Bothalia 4: 885. 1948

Leaf spots circular, 5-12 mm. in diameter, plainly zonate, each zone with distinct shade of brown from grayish to very dark brown; fruiting amphigenous, more abundant on the lower surface; stromata subglobular, dark brown, 15-60$\mu$ in diameter; fascicles dense to very dense; conidiophores mostly slightly elongated cells on the periphery of the stromata, the largest ones measuring 4 x 30$\mu$, pale to very pale brown near the base, paler and more narrow toward the tip or upper portion hyaline, not septate, not geniculate, not branched, spore scars indistinct; conidia subhyaline to pale olivaceous, narrowly linear or very slightly attenuated, straight to curved or undulate, indistinctly multiseptate, base subtruncate to long obconically truncate, tip conically acute, 2.5-4 x 35-95$\mu$.

HOST: *Doryalis zeyheri* (Sond.) Warb. (*Aberia zeyheri* Sond.).

TYPE: Groenkloof, Pretoria, Transvaal, Union of S. Africa; *Doryalis zeyheri;* E. M. Doidge, No. 7398; Febr. 18, 1914.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 234.

**Cercospora kiggelariae** Sydow

Ann. Mycol. 22: 434. 1924

Leaf spots subcircular to angular, 1-5 mm. in diameter, gray to almost snow white, dark red margin; fruiting epiphyllous; stromata globular, dark brown, 20-50$\mu$ in diameter, rarely elongate (100$\mu$); fascicles dense; conidiophores pale brown, paler and more narrow toward the tip, rarely septate, straight, not branched, not geniculate, often merely slightly elongated peripheral cells of the stomata, the largest ones may measure 3-4 x 5-45$\mu$; conidia hyaline to subhyaline, narrowly linear or cylindric, often bent at right angles near the center, indistinctly multiseptate, base subtruncate, tip rounded to conically acute, 2-4 x 20-75$\mu$.

HOST: *Kiggelaria africana* L.
TYPE: Stellenbosch Kaap., S. Africa; *Kiggelaria africana;* C. K. Brain, No. 1449; May, 1924.
DISTRIBUTION: Several collections from S. Africa.
NOTE: See key, page 234.

**Cercospora flagellariae** Sawada
Formosa Agr. Rev. **38**: 696. 1942

HOST: *Flagellaria indica* L.
NOTE: Sawada, neither in the Agr. Rev. nor in Formosa Agr. Res. Inst. Rept. **85**: 1943, where the species was catalogued, gave enough description to be sure of its identity. He lists the following characters: Conidiophores brown, 0-2 septate, 4-6 x 5-20$\mu$; conidia hyaline, 3-5 septate, 5-6.5 x 65-70$\mu$. It is hoped that a specimen of his collection can finally be procured and the description completed.

## CERCOSPORAE ON GENTIANACEAE

A. Conidia hyaline, obclavate, 3-5.5 x 30-80$\mu$; conidiophores not in dense fascicles, mostly 1-5 stalks, 3-5 x 5-25$\mu$.
HALENIA — *C. haleniae*

AA. Conidia subhyaline to pale colored.
B. Leaf spots distinct; fruiting not effuse, amphigenous; conidiophores not branched, 3-4.5 x 5-30$\mu$.
C. Conidia mostly cylindric, 3.5-6 x 20-60$\mu$, 1-3 septate.
EUSTOMA — *C. eustomae*
CC. Conidia obclavate, 1.5-3 x 20-100$\mu$, multiseptate,
GENTIANA — *C. gentianae*
BB. Leaf spots indistinct, at least at first; fruiting effuse; conidiophores sometimes branched.
C. Conidia obclavate, 3-5 x 40-80$\mu$, mildly curved; fruiting amphigenous; stromata slight; conidiophores 4-5 x 10-35$\mu$.
SABBATIA — *C. sabbatiae*
CC. Conidia more nearly cylindric, 3-5.5 x 30-120$\mu$, rarely strongly curved; fruiting hypophyllous; stromata 20-60$\mu$; conidiophores 4-6 x 10-60$\mu$.
GENTIANA — *C. gentianicola*

**Cercospora eustomae** Peck
N. Y. State Mus. Bul. 157: 45, 107. 1912

*Cercospora nepheloides* Ellis & Holway, U.S.D.A. Bur. Pl. Ind. Bul. 226: 87. 1912

Leaf spots none to tan or brown, indistinct on dried specimens, 3-10 mm. in diameter; fruiting amphigenous, visible either as olivaceous effuse or closely aggregated minute black pustules; stromata dark brown to almost black, 40-80$\mu$ in diameter, or sometimes elongated vertically to 120$\mu$ in length; fascicles dense to extremely dense; conidiophores in mass very dark brown, singly pale olivaceous brown, septation and branching not visible, sometimes once mildly geniculate, bluntly rounded tips, spore scars indistinct, 3-4.5 x 5-30$\mu$; conidia very pale olivaceous, cylindric to obclavato-cylindric, straight to slightly curved, bluntly obconic base, obtuse tip, indistinctly 1-3 septate, 3.5-6 x 20-60$\mu$.

HOSTS: *Eustoma andrewsii* Nels., *E. russellianum* G. Don., *E. silenifolium* Salisb.
TYPES: Denver, Colo.; *Eustoma andrewsii;* E. Bethel; Sept. 29, 1909; Cotype distributed as Fungi Columbiani, No. 3804; (*C. nepheloides*) Austin, Texas; *E. russellianum;* Heald and Wolf, No. 1556; 1910.
DISTRIBUTION: California, Colorado, Texas, and Nebraska. Also reported from San Domingo.
NOTE: Ellis and Holway gave the name, *C. nepheloides,* but no description to a specimen collected by S. B. Parish, Santa Barbara, Cal., Sept. 4, 1894, on *E. silenifolium.* Later a description was published by Heald and Wolf (U.S.D.A. Bur. Pl. Ind. Bul. 226: 87. 1912). This is the same as Peck's species. See key above.

**Cercospora fraserae** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **46**: 379. 1894

HOST: *Frasera speciosa* Dougl.
TYPE: Mountains west of Bear Valley, Colo.; *Frasera speciosa;* C. S. Crandall, No. 65; July 12, 1894.
NOTE: The type has faint coloring in some of the stromata, but other collections are so nearly hyaline that it is better to follow Saccardo who names it *Cercosporella fraserae* (E. + E.) Sacc. (Syll. Fung. **11**: 606. 1895).

**Cercospora gentianicola** Ellis & Everhart

Jour. Mycol. **4**: 2. 1888

Leaf spots indistinct; fruiting in irregular black effuse patches on the lower leaf surface; stromata none to large globular brown ones, 20-60$\mu$ in diameter; nonfasciculate and borne as branches from procumbent threads or dense fascicles from stroma; conidiophores pale olivaceous brown, irregular in width, septate, branched, not geniculate, tip rounded bluntly to conic with small spore scar, 4-6 x 10-60$\mu$; conidia obclavato-cylindric to obclavate, pale olivaceous, rather strongly curved, multiseptate, base mostly long obconically truncate, tip subacute to subobtuse, 3-5.5 x 30-120$\mu$.

HOSTS: *Gentiana crinita* Froel.; *G. procera* Holm.
TYPE: Faulkland, Del.; *Gentiana crinita;* A. Commons, No. 728; Oct. 17, 1887.
DISTRIBUTION: Delaware and Wisconsin. It has been reported a number of times, but proved mostly to be *C. Gentianae.*
NOTE: See *C. gentianae* for differences between the two species on Gentiana. Davis (Wisc. Acad. Trans. **19**: 688. 1919) reports this species also on *Halenia deflexa* Griseb., but his collection shows *C. haleniae* which resembles these two in having stromata and much superficial mycelium from which conidiophores arise. See key, page 237.

**Cercospora gentianae** Peck

N. Y. State Mus. Nat. Hist. Ann. Rept. **41**: 80. 1888

Leaf spots reddish brown, at first circular and 2-4 mm. in diameter, later including whole leaflet; fruiting amphigenous; stromata globular, black or dark brown, 30-70$\mu$; fascicles on stroma dense, but often nonfasciculate as branches on procumbent threads between stromata; conidiophores medium dark brown or fuligenous, septa lacking or indistinct, not branched, not geniculate, slightly attenuated, variously curved, small spore scar at rounded to conic tip, 3-4 x 5-30$\mu$;

conidia narrowly obclavate, subhyaline to very pale fuligenous, straight to mildly curved, base subtruncate to obconic, tip subacute, septa indistinct, 1.5-3 x 20-100$\mu$.

HOST: *Gentiana linearis* Froel.

TYPE: Adirondack Tract No. 4, New York; *Gentiana linearis;* C. H. Peck; July.

DISTRIBUTION: New England and northern tier of eastern and central states, at least as far west as Wisconsin, and North Dakota.

NOTE: *C. gentianae* and *C. gentianicola* are often confused. The former has darker, shorter conidiophores, and paler, narrower, more nearly obclavate conidia. My limited study leads me to believe that this species is found only on *Gentiana linearis,* while *C. gentianicola* is commonly present on *G. crinita* Froel. and *G. procera* Holm. See key, page 237.

**Cercospora haleniae** Chupp & Bisby

*In* Fungi of Manitoba and Saskatchewan, p. 114. 1938

Leaf spots circular, rather water-soaked at first, then turning medium brown and finally extending especially along the margin of the leaf, no distinct border; fruiting amphigenous, visible as numerous minute black pustules; stromata mostly a few large dark brown cells; fascicles 1-5 or more stalks; conidiophores pale to medium olivaceous brown, the longer ones being darker in color, slightly attenuated, not septate, not geniculate, not branched, spore scars indistinct, 3-5 x 5-25$\mu$; in an occasional fascicle will be one elongated conidiophore, septate, slightly geniculate, darker in color and as long as 75$\mu$; conidia obclavate (shortest ones may be cylindric), hyaline, straight to mildly curved, septa indistinct, base sharply obconic to obconically truncate, tip mostly blunt, 3-5.5 x 30-80$\mu$.

HOST: *Halenia deflexa* (J. E. Sm.) Grisebach.

TYPE: Berens River, Manitoba; *Halenia deflexa;* G. R. Bisby, No. 4921; Aug. 1, 1935.

DISTRIBUTION: Studied material from Manitoba and Wisconsin. It also is reported from Michigan.

NOTE: Although this resembles *C. gentianicola, C. gentianae,* and *C. sabbatiae,* there are enough differences in character to consider it a new species. Davis in his Wisconsin collections named it *C. gentianicola.* Povah (Mich. Acad. Sci. Arts, Lett. 20: 153. 1934.) did likewise. See key, page 237.

**Cercospora sabbatiae** Ellis & Everhart

Jour. Mycol. 4: 3. 1888

*Cercospora erythraeae* Hollós, Annal. Mus. Nat. Hung. 4: 369. 1906

Leaf spots indistinct or none; fruiting sparsely effuse on both leaf surfaces, or on stems, olivaceous to dark; stromata slight, mostly a few brown cells; fascicles dense, divergent; conidiophores pale yellowish brown, plainly septate, often constricted at the septa, rarely branched or once geniculate, bluntly rounded tip, 4-5 x 10-40$\mu$; conidia subhyaline to very pale yellowish olivaceous, obclavate, straight to mildly curved, mostly 3-5 septate, base obconically truncate to obconic, tip obtuse, 3-5 x 30-80$\mu$.

HOSTS: *Sabbatia angularis* Pursh., *Erythraea linarifolia* Pers. (*E. uliginosa* Waldst. & Kit.) (Centaurium).

TYPES: Faulkland, Del.; *Sabbatia angularis;* A. Commons, No. 589; Aug. 2, 1887; (*C. erythraeae*) Near Izsák, Hungary; *Erythraea linarifolia;* Lad. Hollós.

DISTRIBUTION: Mississippi, North Carolina, Oklahoma, Texas, Delaware, Hungary.

NOTE: No specimen of *C. erythraeae* was available, but the description fits *C. sabbatiae* and the host genera are closely related; consequently the former is considered a synonym. See key, page 237.

## CERCOSPORAE ON GERANIACEAE

A. Conidia more nearly obclavate (or acicular) than cylindric, not catenulate.
  B. Conidia mostly acicular, base truncate, 2.5-5 x 50-150$\mu$, hyaline; conidiophores 4-5.5 x 50-200$\mu$; stromata slight; fascicles 2-13 stalks.
  PELARGONIUM *C. brunkii*
  BB. Conidia narrowly obclavate, base obconic, 1.5-3 x 30-100$\mu$, hyaline to almost colored; conidiophores 3-4 x 15-50$\mu$; stromata 20-60$\mu$; fascicles dense.
  GERANIUM *C. geranii*

AA. Conidia cylindric, hyaline to subhyaline, sometimes catenulate.
  B. Conidia 4-6 x 20-60$\mu$, 1-3 septate; conidiophores in compact fascicles, 3-6 x 15-125$\mu$; fruiting semi-effuse, sooty.
  GERANIUM *C. geranii-sanguinei*
  BB. Conidia 3.5-5 x 25-180$\mu$, 3-12 septate; conidiophores in spreading fascicles, 4-6 x 10-30$\mu$; fruiting not effuse.
  GERANIUM *C. ithacensis*

### Cercospora brunkii Ellis & Galloway

Jour. Mycol. 6: 33. 1890

*Cercospora pelargonii* Mendoza, Philipp. Jour. Sci. 75: 176. 1941

Leaf spots circular to oval, 0.5-3 mm. in diameter, light brown to tan, raised border slightly darker, center of spots may bulge upward and fruiting in crater on lower surface, rarely on upper surface; stromata small; fascicles mostly not dense (2-13); conidiophores straight, multiseptate, not or rarely geniculate, not branched, uniform in diameter or sometimes slightly narrowed at tip, pale olivaceous brown with tip slightly paler, 4-5.5 x 50-200$\mu$ conidia acicular to obclavate, straight to curved, hyaline, base truncate, tip acute to subacute, septa mostly indefinite, 2.5-5 x 50-150$\mu$ (some mounts show conidia only 2.5-3 wide).

HOSTS: *Pelargonium peltatum* Ait. (Ivy leaved geranium), *P. graveolens* L'Hérit., *P. radula* (Cav.) L'Hérit., *P. zonale* L'Hérit., Pelargonium sp.

TYPES: College Station, Texas; *Pelargonium peltatum;* T. L. Brunk (Jennings); Nov. 1889; (*C. Pelargonii*) Manila, Luzon, Philippines; *Pelargonium radula;* Mendoza, Nos. 55132, 55500.

DISTRIBUTION: Apparently in most of the southern states and as far north as Missouri and Maryland. A specimen was sent from Belleville, Ontario. It occurs also in the Philippines. In addition it has been reported from Ohio and New Hampshire.

NOTE: *Cercospora geranii* Kell. & Sw., has been reported on this host genus, but herbarium specimens do not verify the report. The two species of Cercospora reported on Geranium have shorter conidiophores, more nearly cylindric conidia, and without truncate base. I have not seen the Mendoza species, but aside from his undulate to tortuous conidiophores, the description and drawing resemble closely *C. brunkii.* See key above.

**Cercospora geranii-sanguinei** P. Hennings
Nyt. Mag. Naturvidenskaberne **42**: 33. 1904

Leaf spots circular to irregular, dark brown, at first small, but finally killing the entire leaflet; fruiting in semi-effuse sooty layers on the affected lower surface; stromata slight, brown; fascicles dense, often compact, of markedly unequal length; conidiophores pale to very pale olivaceous brown, uniform in color and width, indistinctly septate, not branched, sinuous, slightly geniculate, small to medium spore scar at the rounded to subtruncate tip, 3-6 x 15-125$\mu$; conidia cylindric, hyaline to subhyaline, 1-3 septate, straight to slightly curved, base short obconic to subtruncate, tip similar when catenulate or rounded bluntly, 4-6 x 20-60$\mu$.

HOST: *Geranium sanguineum* L.

TYPE: Kongeskoven am Strande nach dem Seebad, Norway; *Geranium sanguineum;* P. Hennings; Aug. 15, 1903.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 240 for differences among the species on Geranium.

**Cercospora geranii** Kellerman & Swingle
Jour. Mycol. **5**: 74. 1889

Leaf spots circular to irregular, reddish brown, mostly without border, at first 2-4 mm. in diameter, later including most of the leaflet; fruiting amphigenous, but chiefly on lower leaf surface; small to medium dark brown stromata, 20-60$\mu$ in diameter; most fascicles dense; conidiophores pale olivaceous, slightly paler and more narrow toward the tip, which may be conic and with a small spore scar, rarely septate, not geniculate, not branched, 3-4 x 15-50$\mu$; conidia narrowly obclavate, hyaline to subhyaline, sometimes almost colored, straight to curved, obconic base, subacute tip, septa indistinct, 1.5-3 x 30-100$\mu$.

HOSTS: *Geranium carolinianum* L., *G. mexicanum* H. B. & K., and possibly other Geranium species.

TYPE: St. George, Kansas; *Geranium carolinianum;* Kellerman & Swingle, No. 898; May 30, 1887.

DISTRIBUTION: Wisconsin, Iowa, Kansas, Texas and southward into Mexico. This species has been reported in many other states from New York to Utah and southward.

NOTE: The species on Geranium and Pelargonium are much confused in herbaria specimens. Apparently Pelargonium has only the acicular species, *C. brunkii,* and *Geranium maculatum* L. has a species that heretofore has not been described. The narrowly obclavate conidia separate this species from the others on Geranium. See also *C. ithacensis* and *C. geranii-sanguinei.* Compare in key, page 240.

**Cercospora ithacensis** spec. nov.

Maculae amphigenae, distinctae, ambitu fere orbiculares vel plus minus angulatae, 2-4 mm. diam. metientibus, sordide ochraceo-brunneolae, vix lata flavida cinctae; caespituli amphigeni, praecipue hypophyll; stromatica minuta, denique stomata complentes; conidiophora subhyalina vel pallide olivaceo-brunnea, 0-1 septata, simplicia, vix attenuata, recta vel 1-geniculata, ad apicem subtruncata, 4-6 x 10-30$\mu$; conidia hyalina vel subhyalina, cylindracea, 3-12 septate, recta vel sinuosa, catenulata, ad basim subtruncata, ad apicem obtuse rotundata, 3.5-5 x 25-180$\mu$.

Leaf spots circular to irregular, 2-4 mm. in diameter, dull brown to reddish brown, at first with reddish to yellowish border, finally turning the whole lobe or leaflet dark brown; fruiting amphigenous but more abundant on lower leaf sur-

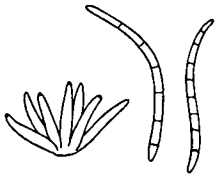


Fig. 114
*C. ithacensis*

face; small brown stromata filling stomatal opening; most fascicles 3-15 stalks, rarely as many as 30; conidiophores subhyaline to pale olivaceous brown, uniform in color, slightly attenuated, rarely septate or abruptly geniculate, not branched, medium sized spore scar at subtruncate tip, 4-6 x 10-30$\mu$; conidia hyaline to subhyaline, cylindric, often catenulate, mostly 3-12 septate, straight to undulate or curved, base short obconic to subtruncate, tip similar when catenulate or bluntly rounded, 3.5-5 x 25-180$\mu$.

HOST: *Geranium maculatum* L.

TYPE: McLean Swamp near Dryden, N. Y.; *Geranium maculatum;* H. H. Whetzel; Aug. 1935.

DISTRIBUTION: New York to Virginia and westward.

NOTE: This formerly was considered *C. geranii* but it is quite distinct. See key, page 240.

**Cercospora gloxiniae** sp. nov.

Maculae orbiculares vel irregulares, subinde confluendo et totam folii omnino obtegentes, a primo flavidae denique griseo-brunneam vel sordide griseam mutans; caespituli amphigeni; stromata minuta; conidiophora laxe fasciculata, olivaceo-brunnea, sursum attenuata et fere hyalina, multiseptata, continua, recta vel flexuosa, ad apicem subtruncata, 4-6.5 x 50-200$\mu$; conidia hyalina, anguste obclavata, recta vel curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2-3.5 x 50-200$\mu$.

Leaf spots circular to irregular, 2-10 mm. in diameter or coalescing and destroying the entire leaf, at first yellowish in color, then changing to grayish brown or even dingy gray; fruiting amphigenous; stromata slight; fascicles 2-10 stalks; conidiophores pale to medium olivaceous brown, paler and more narrow toward the tip, multiseptate, not branched, straight to sinuous or mildly geniculate, small to medium spore scar at the narrowly subtruncate tip, 4-6.5 x 50-200$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 50-200$\mu$.

HOST: *Gloxinia maculata* L'Hérit.

TYPE: Minas Gerais, Brazil; *Gloxinia maculata;* A. S. Muller, No. 782; April 29, 1934.

DISTRIBUTION: Known only from the type locality.

**Cercospora acerosum** Dickhoff & Hein

Arch. voor de Java Suikerind. 9: 1009. 1901

NOTE: The authors describe the symptoms on sugar cane (*Saccharum officinarum* L.) in detail, but say very little about the fungus excepting that the conidiophores are borne in fascicles and that the conidia are hyaline, seven celled, and measure 2-3.5 x 10-50$\mu$. Their drawing of the conidia resembles closely those of a Fusarium. It is not possible to visualize the fungus from their description. They do not cite a definite type.

**Cercospora agrostidis** Atkinson

Jour. Elisha Mitchell Sci. Soc. 8: 44. 1892

Leaf spots broadly elliptic, 3-5 mm. in length, pale brown center and a broad dull reddish brown margin; fruiting amphigenous; stromata slight; fascicles 2-12 stalks; conidiophores pale brown, paler and more narrow toward the tip, sparingly septate, straight to undulate, rarely geniculate or branched, small spore scar at rounded to conic tip, 3-4.5 x 20-65$\mu$ or even 125$\mu$ in length; conidia hyaline, cylindro-obclavate, straight to mildly curved, 1-7 septate, base obconic to obconically truncate, tip subobtuse, 1.5-3 x 10-60$\mu$.

HOST: Agrostis sp., *Sphenopholis obtusata* (Michx.) Scribner (*Agrostis obtusata* Steud.), *S. pallens* (Spreng.) Scribner.

TYPE: Auburn, Lee Co., Ala.; Agrostis sp.; Duggar & Newman, No. 2036; July 23, 1891.

DISTRIBUTION: Alabama, North Dakota, Idaho (The Plant Dis. Reporter **33**: 262. 1949).

NOTE: This has wrongly been reported on Eupatorium (Iowa Acad. Sci. **1899**: 162. 1900., Tuskegee Normal & Ind. Inst. Bul. 4: 8. 1901). It resembles most closely *C. striaeformis* among the species on the Graminaceae.

**Cercospora aristidae** sp. nov.

Maculae ovatae vel extensa, olivaceae vel fuscae, in epiphyllo rubido-brunneas margines circumscribens; caespituli amphigeni; stromata subglobosa, atro-fuscae; conidiophora laxe vel dense fasciculata, fuscae, sursum leniter attenuata, multiseptata, curvata vel flexuosa, simplicia, 0-3 geniculata, ad apicem anguste sub-

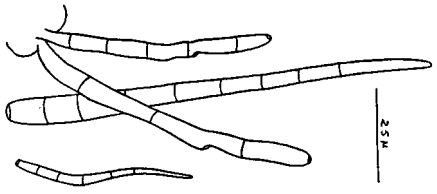



Fig. 115
*C. aristidae*

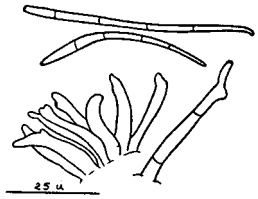



Fig. 116
*C. fusimaculans*

truncata, 4-5.5 x 25-125$\mu$; conidia hyalina, anguste obclavata, recta vel curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2.5-4 x 40-120$\mu$.

Leaf spots oval to elongate, 0.5-2 mm. in length, olivaceous to brown, reddish brown border; fruiting amphigenous but more abundant on the lower leaf surface; stromata subglobular, dark brown, 15-40$\mu$ in diameter; fascicles 6-20 stalks, divergent; conidiophores medium dark brown, uniform in color, slightly attenu-

ated, multiseptate, curved to sharply bent, not branched, 0-3 geniculate, small spore scar at the narrowly subtruncate tip, 4-5.5 x 25-125$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2.5-4 x 40-120$\mu$.

HOST: Aristida sp.

TYPE: Uniontown, Ala.; Aristida sp.; B. M. Duggar; Sept. 4, 1894.

DISTRIBUTION: Known only from the type locality.

NOTE: This species was found in the Atkinson herbarium with the above name appended, but without a description. I should rather have used the form *Cercospora aristidae* Atkinson in litt., but finally complied with recommendation 15E, Article 27 of the International Code.

**Cercospora boutelouae** Chupp & Greene

Farlowia 1: 579. 1944

Leaf spots narrowly elliptic to elongate, 0.5-4 mm. in length, pale brown to almost black, immarginate or with a yellowish halo; fruiting chiefly hypophyllous, seriate; stromata lacking or composed of a few brown cells; fascicles 2-14 spreading stalks; conidiophores pale to medium brown, slightly paler and more narrow near the tip, sparingly septate, not branched, straight to curved, 0-1 abruptly geniculate, apex subtruncate, 3-5.5 x 20-100$\mu$; conidia hyaline to faintly colored, obclavate, straight to mildly curved, indistinctly multiseptate, base long obconically truncate, tip subobtuse, 3.5-5 x 20-80$\mu$.

HOST: *Bouteloua racemosa* Lag. (*B. curtipendula* Torr.) *B. hirsuta* Lag., *B. gracilis* (HBK.) Lag.

TYPE: Madison, Wisconsin; *Bouteloua curtipendula;* H. C. Greene; July 26, 1943.

DISTRIBUTION: Wisconsin, Oklahoma (Plant Dis. Reporter **32**: 398. 1948), Colorado.

**Cercospora bromi** Sprague

Mycologia **29**: 204. 1937

HOST: *Bromus rigidus* Roth.

TYPE: Near Tumwater, Wasco Co., Oregon; *Bromus rigidus;* R. Sprague, Nos. 10405, 10751; March 13, 1935.

NOTE: Although Dr. Sprague was kind enough to send me a second specimen of this species, I could find only hyaline fruit bodies. Furthermore the conidia have the peculiarity of bearing appendages or small secondary conidia. For this reason Sprague later (Mycologia **38**: 61. 1946) classed it with the genus, Ansatospora, which Newhall described (Phytopath. **34**: 92. 1944) and which Neergaard had previously named Centrospora (Centralbl. für Bakt. Parasitenkunde und Infektionskr. II. **104**: 407. 1942). Miura (1920) (See Phytopath. **36**: 190. 1946) made a new genus, Ramulispora, to include forms with conidia having conidial-like appendages along their sides. See also *C. festucae.*

**Cercospora caespitosa** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. I. **43**: 88. 1891

Leaf spots none; fruiting in minute black tufts up to 500$\mu$ in length, usually borne in rows and sometimes coalescing, on both leaf surfaces but chiefly hypophyllous; stromata black, elongated, 100-500$\mu$; fascicles dense to very dense; conidiophores medium dark brown, paler tip, uniform width, sinuous or genicu-

late, multiseptate, not branched, small spore scar at conic tip, 3-4.5 x 50-150$\mu$; conidia pale yellowish brown, narrowly obclavate to cylindro-obclavate, straight to slightly curved, indistinctly septate, base obconic, tip blunt, 1.5-3.5 x 20-65$\mu$.

HOSTS: *Chloris swartziana* Doell., *Ch. petraea* Sw. (*Eustachys petraeus* Desv.).

TYPE: Ocean Springs, Miss.; *Chloris swartziana;* S. M. Tracy, No. 1215; Sept. 16, 1889.

DISTRIBUTION: Known only from the type locality.

NOTE: This species is distinct from all the other species on the Graminaceae because of the large dark stromata.

**Cercospora chusqueae** sp. nov.

Maculae minutissimae, orbiculares vel lineares, saepe zonula flavida cinctae; caespituli hypophylli; stromata fere atra, 25-300$\mu$; conidiophora densissime fasciculata, fuscae, sursum attenuata et pallidiora, evidenter septata, recta vel flexuosa, simplicia, 4-5.5 x 30-150$\mu$; conidia hyalina vel subhyalina, cylindrata, fere recta, 0-5 septata, ad basim subtruncata, ad apicem obtuse rotundata, 3-5 x 20-50$\mu$.

Leaf spots minute circular flecks to long narrow streaks, dark brown, often with yellow halo; when the streaks are numerous the entire leaf turns yellow and dies; fruiting hypophyllous; stromata dark brown to almost black, mostly flattened at the base and much elongated, 25-300$\mu$ in length; fascicles dense; conidiophores medium dark brown, somewhat paler and more narrow toward the tip, plainly multiseptate, straight to curved or bent, upper half sometimes undulate to mildly multigeniculate, not branched, small spore scar at the rounded to conic tip, 4-5.5 x 30-150$\mu$; conidia hyaline to subhyaline, cylindric to obclavato-cylindric, straight or nearly so, 1-5 but mostly 1-3 septate, base subtruncate to obconically truncate, tip subobtuse, 3-5 x 20-50$\mu$.

HOST: Chusquea sp.

TYPE: Lenguazaque (Cundinamarea), Colombia; Chusquea sp.; A. Franco, No. 691; Dec. 1, 1940.

DISTRIBUTION: Known only from the type locality.

**Cercospora echinochloae** Davis

Wisc. Acad. Trans. 18: 106. 1915

Leaf spots elongate, reddish brown, later becoming pale in the center; fruiting hypophyllous; stromata none or filling stomata; fascicles in rows, mostly 5-15 stalks; conidiophores pale to medium olivaceous brown, uniform in color, longest ones slightly attenuated, not branched, rarely septate, sometimes once mildly geniculate, small to medium spore scar at rounded tip, 4-5.5 x 10-35$\mu$; conidia cylindric to obclavato-cylindric, hyaline, rounded ends, straight to mildly curved, 1-7 but mostly 2-3 septate, 3-5 x 20-55$\mu$.

HOST: *Panicum crus-galli* L. (*Echinochloa crus-galli* [L.] Beauv.)

TYPE: Devil's Lake, Wisc.; *Echinochloa crus-galli;* J. J. Davis; Aug. 9, 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: In September, 1944, Dr. Sprague sent me a Cercospora on the above host from North Dakota. It did not resemble the Davis type but fit the characters of *C. sorghi.* Muller sent a specimen on Echinochloa from Venezuela. The conidia were cylindric but appreciably more narrow than those of the Davis species, while the conidiophores were as long as 50-85$\mu$.

**Cercospora elymi** Rostrup

Bot. Tidsskrift **22**: 276. 1899

Leaf spots long narrow streaks, pale to fairly dark brown; fruiting hypophyllous; stromata dark brown, globular to irregular or elongate, a few dark cells to 75$\mu$ in length; fascicles mostly dense; conidiophores in mass dark brown, singly pale olivaceous brown, slightly paler and more narrow toward the tip, not branched, rarely septate, occasionally with 1 geniculation near the tip, small to medium spore scar at the rounded to subtruncate tip, 2-4 x 10-30$\mu$; conidia hyaline, cylindric, straight, 0-5 but mostly 3-septate, base subtruncate to long obconic, tip bluntly rounded, 2-4 x 15-50$\mu$.

HOST: *Elymus arenarius* L.

TYPE: Tisvilde, Iceland (Denmark); *Elymus arenarius;* E. Rostrup; June 29, 1898.

DISTRIBUTION: Known only from the type locality.

NOTE: The type shows also Stagonospora and Heterosporium. Several mounts had to be made before Cercospora was found.

**Cercospora festucae** Hardison

Mycologia **37**: 492. 1945

Leaf spots oval to elongate, 0.5-4 mm. in length, gray center, purplish border; fruiting amphigenous but chiefly hypophyllous; stromata none or only a few brown cells; conidiophores in spreading fascicles of 2-8, or rarely in dense fascicles, near base pale to medium olivaceous brown, paler and sometimes more narrow toward the tip, sparingly septate, rarely geniculate, not branched, almost straight, rounded to subtruncate tip, 3.5-5 x 30-800$\mu$, some collections may have only short conidiophores; conidia hyaline, acicular, curved or undulate, indistinctly multiseptate, base truncate, tip acute, 2-4 x 40-300$\mu$.

HOST: *Festuca elatior* L. var. *arundinacea* (Schreb.) Wimm. and some forms intermediate between *F. elatior* and this variety. *F. elatior,* itself, was not infected. *Bromus inermis* Lyss.

TYPE: Lexington, Ky.; *Festuca elatior* var. *arundinacea;* J. R. Hardison; Aug. 23, 1943.

DISTRIBUTION: Kentucky, Oklahoma, Oregon, Texas.

NOTE: This seems to be the only species with all distinctly acicular conidia on the Graminaceae. D. A. Preston sent me a Cercospora on *Phalaris tuberosa* L. var. *stenoptera* (Hack.) Hitchc. which he collected in the grass nursery at Stillwater, Oklahoma. It resembles the one on Festuca so that at present I am considering it the same. See Phytopath. **40**: 1023. 1950 for an illustration and description. Compare *C. bromi.*

**Cercospora fusimaculans** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 50. 1892

*Cercospora panici* Davis, Wisc. Acad. Trans. **19**: 714. 1919

*Cercospora panici-miliacei* Sawada, Formosa Agr. Res. Inst. Rept. **51**: 131. 1931

*Cercosporina panici* (Davis) Saccardo, Syll. Fung. **25**: 904. 1931

Leaf spots oval to elliptic or irregular in outline, pale tan to dingy gray center and dark brown to reddish brown margin, or whole spot uniformly brown; fruiting chiefly epiphyllous; stromata small, brown, usually filling stomatal opening; fascicles 2-12 stalks, rarely dense or nonfasciculate, single branches arising from

procumbent threads; conidiophores subhyaline to medium dark brown, sparingly septate, not branched, 0-2 mildly geniculate, slightly attenuated, fairly uniform in color or tip pale, conic tip with small spore scar, 2.5-4 x 10-50$\mu$, or very rarely 65$\mu$; conidia cylindric and then catenulate, or rarely acicular to obclavate, hyaline, base truncate to obconically truncate, tip subobtuse to subacute, straight to mildly curved, septa not visible, 1.5-3 x 20-100$\mu$.

HOSTS: *Brachiaria serrata* Stapf., Ichnanthus sp., *Leptoloma cognatum* (Schult.) Chase, *Panicum autumnale* Bosc, *Panicum dichotomum* L., *P. dichotomiflorum* Michx., *P. implicatum* Scribn., *P. javanicum* Poir., *P. latifolium* L., *P. leibergii* Scribn., *P. maximum* Jacq., *P. miliaceum* L., *P. perlongum* Nash, *P. plicatum* Lamb, *P. praecocius* Hitchcock & Chase, *P. scribnerianum* Nash, *P. serratum* R.Br., *P. virgatum* L., *P. wilcoxianum* Vasey, Panicum sp.

TYPES: Auburn, Alabama; *Panicum dichotomum;* B. M. Duggar, No. 2054; Aug. 15, 1891; (*C. Panici*) Shiocton, Wisc.; *Panicum latifolium;* J. J. Davis; Aug. 15, 1917; (*C. panici-miliacei*) Formosa; *Panicum miliaceum;* K. Sawada.

DISTRIBUTION: Alabama to Wisconsin and eastward, Honduras, Puerto Rico, Trinidad, Canal Zone, Colombia, Minas Geraes, Sierra Leone, Uganda, Japan, India, Formosa, South Africa.

NOTE: There is sufficient variation among the collections in the various countries and on the different host species to make one wonder if all of them are identical. But there is no doubt of the combined differences when one examines the specimens on any other host genus of the Graminaceae as compared with those on Panicum, Leptoloma, and Ichnanthus. I did not see Sawada's type, but his description and drawings seem identical with the Atkinson species. Hansford (Proc. Linn. Soc. London **1942-3**: 34. 1943) reports this species on Panicum sp., *Paspalum scrobiculatum, Beckeropsis uniseta* and *Rottboellia exaltata* from Uganda.

**Cercospora graminicola** Tracy & Earle
Bul. Torrey Bot. Club **22**: 179. 1895

HOST: *Phleum pratense* L.

TYPE: Starkville, Miss.; *Phleum pratense;* F. S. Earle; Nov. 1894.

NOTE: Horsfall (N. Y. [Cornell] Agr. Exp. Sta. Mem. 130: 97. 1929) states that this is a synonym of *Scolecotrichum graminis* Fckl. and changes the name to *Cercospora graminis* (Fckl.) Horsfall. But after all the material available was examined, including the Tracy and Earle type, all was found to show minutely echinulate conidia, therefore could not be classed as a Cercospora. Furthermore, *Scolecotrichum graminis* has been reported on many host genera: Phleum, *Dactylis glomerata* L., Elymus, Hordeum, *Avena sativa* L., Poa, Glyceria, and Beckmannia (Jap. Jour. Bot. **2**: 99. 1924). So far as I am aware Cercospora species are strongly limited in their host range, no species ever being known to attack so many host genera. The specimens marked *C. graminicola* and *S. graminis* often follow some pathogen or injury. Also refer to Gregory's *Heterosporium phlei* (Phytopath. **9**: 576. 1919) and Jacques (Contr. l'Inst. Bot. Univ. de Montréal. **39**: 36. 1941).

**Cercospora imperatae** (H. & P. Sydow) Sawada
Formosa Agr. Res. Inst. Rept. **85**: 109. 1943

*Cercosporina imperatae* H. & P. Sydow, Ann. Mycol. **14**: 372. 1916

Leaf spots elongate, irregular, pale brown to straw color; fruiting hypophyllous,

barely visible; stromata none or slight, pale brown; conidiophores arising singly as branches from procumbent threads or in fascicles of 2-10 from stromata in the stomatal openings, pale to medium brown, paler and more narrow toward the tip or slightly irregular in width, sparingly septate, not branched, 0-3 mildly geniculate, medium spore scar at the rounded to subtruncate tip, 4.5-7 x 15-75$\mu$, mostly 5-6 x 25-55$\mu$; conidia hyaline, cylindric to obclavato-cylindric, nearly straight, indistinctly multiseptate, base subtruncate, tip obtuse, 3-4.5 x 20-60$\mu$. (Sawada says 4.5-7 x 30-65$\mu$).

HOST: *Imperata arundinacea* Cyrilli (*I. cylindrica* Beauv.)

TYPE: Los Banos, Philippines; *Imperata cylindrica;* M. B. Raimundo (C. F. Baker, No. 1717); Sept. 17, 1913.

DISTRIBUTION: Philippines, Formosa.

**Cercospora koepkei** Krüger

Ber. Versuch. Zuckerr. W. Java. **1**: 115. 1890

*Cercospora longipes* Butler, Dept. Agr. India. Mem. I (3): 41. 1906

Leaf spots oval to rectangular, uniform dull reddish brown to pale tan or gray center and brown margin, mostly numerous and small; fruiting amphigenous, but chiefly on lower leaf surface; stromata a few dark brown cells; fascicles 2-20 stalks; conidiophores medium brown, uniform in color but attenuated toward the tip, which is rounded and has a small to medium spore scar, multiseptate, rarely branched, often tortuous, 0-4 abruptly geniculate, 3.5-5.5 x 30-200$\mu$; conidia hyaline, obclavate (shorter ones cylindric), straight to slightly curved, 1-6 indistinctly septate, base long obconic or obconically truncate, tip subacute (of longest ones), 3.5-5 x 20-75$\mu$, mostly 20-55$\mu$.

HOSTS: *Saccharum officinarum* L. (*S. edule* Hassk.), *S. glongong? S. spontaneum* L.

TYPES: Kagok-Tegal, West Java; *Saccharum officinarum;* W. Krüger; (*C. longipes*) India; *S. officinarum;* E. J. Butler.

DISTRIBUTION: Probably present wherever sugar cane is grown intensively.

NOTE: I have not been able to study either Krüger's or Butler's type material, but all the collections in the various herbaria bearing the two names are the same. Matsumoto and Yamamoto kindly sent me two packets of *C. taiwanensis,* but I was unable to find Cercospora on either one. Their description and illustration show this species to be distinct. The hyaline conidia together with fasciculate long (longipes) conidiophores separate this species from the others on Saccharum. See following key.

CERCOSPORAE ON SACCHARUM

A. Conidia colored, cylindric, 0-5 septate, 3-6 x 15-50$\mu$; conidiophores nonfasciculate, 2.5-4$\mu$ in width. *C. vaginae*

AA. Conidia hyaline, usually obclavate.

B. Conidiophores nonfasciculate, 2.5-4 x 7-55$\mu$; conidia multiseptate, 2.5-4 x 20-150$\mu$. *C. taiwanensis*

BB. Conidiophores in fascicles of 2-20, 3-5.5 x 30-200$\mu$; conidia 1-7 septate, 3.5-5 x 20-75$\mu$. *C. koepkei* (*C. longipes*)

**Cercospora miscanthi** Sawada

Formosa Agr. Res. Inst. Rept. 87: 83. 1944

NOTE: On *Miscanthus japonicus* Andr. Leaf spots 3-20 mm.; fruiting hypophyllous; conidiophores brown, 0-7 septate, 4.5-5 x 15-112$\mu$; conidia hyaline, 3-7 septate, 3-4.8 x 49-104$\mu$. This brief description by Sawada does not permit a definite classification of the fungus.

**Cercospora muhlenbergiae** Atkinson

Cornell Univ. Bul. 3 (1): 46. 1897

Small areas of the leaf sheath or leaf may turn brown or straw-colored, the color gradually extending until the whole leaf and leaf sheath are included; fruiting amphigenous; stromata brown, 30-50$\mu$ in diameter or several united in a row making a continuous body as long as 300$\mu$; fascicles dense to very dense, sometimes almost coremoid; conidiophores pale to medium olivaceous brown, fairly uniform in color, sometimes attenuated, variously curved or bent, multiseptate, not branched, multigeniculate, at times geniculations extending from base to tip, medium spore scar at narrowly rounded tip, 3-5.5 x 50-200$\mu$; conidia obclavate to spindle-shaped, hyaline, straight to slightly curved, 1-3 septa, long obconic base, blunt tip, 4-5.5 x 20-35$\mu$.

HOSTS: *Muhlenbergia schreberi* Gmel. (*M. diffusa* Willd.), *M. sylvatica* Torr. & Gray, *M. mexicana* Trin. (*M. foliosa* Trin.), *M. glomerata* Trin. (*M. racemosa* [Michx.] B.S. & P.)

TYPE: Auburn, Lee Co., Ala.; *Muhlenbergia diffusa;* G. F. Atkinson; Oct. 3, 1891.

DISTRIBUTION: Alabama, New York, North Dakota, (Plant Dis. Reporter 33: 267. 1949) and Wisconsin.

NOTE: This has mostly one-septate conidia, therefore is not a Cercospora.

**Cercospora oryzae** Miyake

Jour. Coll. Agr. Imp. Univ. Tokyo. 2: 263. 1910

Leaf spots oval to elliptic or linear, mostly small, 1-3 x 2-10 mm., pale to dark brown, sometimes with center paler than margin; fruiting amphigenous; stromata none to 15-20$\mu$ in diameter, brown; fascicles mostly not dense, 1-7 or rarely 15; conidiophores pale to medium brown, uniform in color, multiseptate, shortest ones slightly attenuated, longest ones irregular in width, not branched, a trace of undulation or 1-2 mild or abrupt geniculations, medium spore scar at rounded tip, rather often another spore scar near tip, 4-6 x 10-140$\mu$; many specimens may show only short pale conidiophores; conidia hyaline, cylindric to cylindro-obclavate, straight to mildly curved, mostly 1-4 septate (longest ones may have 10 septa), rarely catenulate, base usually long obconic, tip blunt, 3-5.5 x 15-60.

HOST: *Oryza sativa* L.

TYPE: Agricultural Experiment Station, Ehime, Japan; *Oryza sativa;* I. Miyake; Sept., 1907.

DISTRIBUTION: In all countries where rice is grown intensively. Saw one specimen from Louisiana. It has been reported also from Texas, and Arkansas (The Plant Dis. Reporter 33: 258. 1949).

**Cercospora paspalicola** Petrak & Ciferri

Ann. Mycol. 30: 326. 1932

Leaf spots at first indistinct, later irregular areas turn brown; fruiting tussock-

like, dark to almost black, amphigenous, but more abundant on the lower leaf surface; stromata dark brown to almost black, oval, 30-350$\mu$ in length; fascicles very dense; conidiophores merely slightly elongated cells on the periphery of the stromata, sometimes when conidia are persistent and especially when catenulate they resemble long conidiophores; conidia subhyaline, cylindric to cylindro-obclavate, straight, mostly 1-3 septate, base short obconic or rounded, tip blunt or conic when catenulate, 4-6 x 15-60$\mu$, usually about 5 x 35$\mu$.

HOST: *Paspalum clavuliferum* Wright.
TYPE: Valle de San Juan, Prov. de Azua, San Domingo; *Paspalum clavuliferum;* E. L. Ekman, No. 3777; Aug. 22, 1929 (Type material was labeled 1926).
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. setariae* for differences between the two species on this host genus. The extremely large stromata, the very short conidiophores, and the 1-3 septate conidia are characters of Exosporium rather than of Cercospora.

**Cercospora penniseti** sp. nov.

Maculae suborbiculares, primitus minutae, denique confluentes; caespituli fere hypophylli; stromata minuta, subglobosa, atra; conidiophora laxe vel dense fasciculata, aequabiliter fusca, multiseptata, simplicia, vix geniculata, recta vel flex-

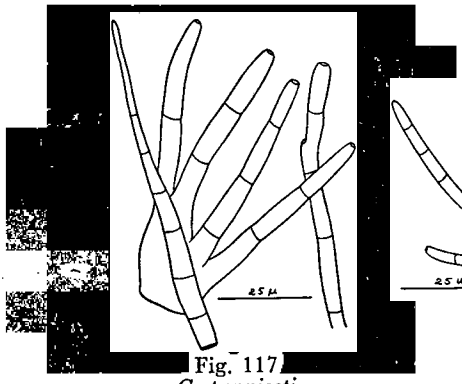


Fig. 117
*C. penniseti*

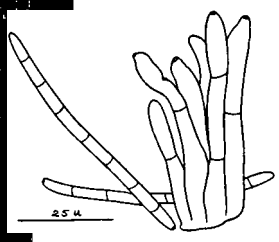


Fig. 118
*C. setariae*

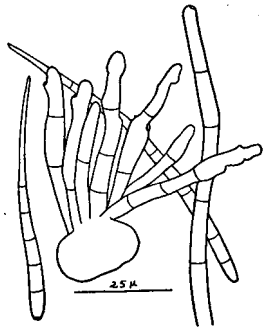


Fig. 119
*C. sorghi*

uosa, ad apicem anguste subtruncata, 4-5.5 x 50-250$\mu$; conidia hyalina, anguste obclavata, recta vel curvata, multiseptata, ad basim truncata, ad apicem acuta, 2-5 x 30-240$\mu$.

Leaf spots at first small, elliptic, ferrugineous to dark brown, gradually enlarging and coalescing until most of the leaf blade becomes discolored; fruiting chiefly hypophyllous; stromata small, subglobular, black; fascicles 2-20 diverging stalks; conidiophores medium dark brown, uniform in color and width, septa 10-25$\mu$ apart, not branched, rarely geniculate, straight to curved or tortuous, narrowly subtruncate tip, 4-5.5 x 50-250$\mu$; conidia hyaline, distinctly acicular, straight to curved, multiseptate, base truncate, tip acute, 2-5 x 30-240$\mu$.

HOST: *Setaria glauca* Beauv. (*Pennisetum glaucum* [L.] R. Br.)
TYPE: Tifton, Georgia; *Pennisetum glaucum;* C. L. Lefebre; Aug. 19, 1943.
DISTRIBUTION: Known only from the type locality.

NOTE: This differs from *C. Setariae* and *C. sorghi* var. *maydis* in having distinctly acicular conidia, and in having long, fairly dark colored conidiophores. See also *C. tungurahuensis.*

**Cercospora poae** Baudys & Picbauer

Moravske Prirod. Spolecnosti **1**: 304. 1924

Leaf spots reddish, often including the entire leaf blade; fruiting chiefly hypophyllous, evident as minute brown pustules, numerous; stromata present; fascicles dense; conidiophores pale brown, paler and wider toward the tip, septate, not branched, curved to multigeniculate, 6-7 x 60-90$\mu$; conidia cylindric, base wide, obconically truncate, apex bluntly rounded, 1-3 septate, often narrow in the center, very pale olivaceous brown. (Drawings indicate conidia are approximately 4-6 x 20-40$\mu$).

HOST: *Poa fertilis* Host.

TYPE: Strasnice pr. urben Praha, Bohemia; *Poa fertilis;* Ed. Baudys; May 13, 1911.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen this species. Dr. Baudys wrote me Dec. 5, 1931: "We are not able to furnish you with *Cercospora poae* as we have very little of this material." The description indicates it is not a Cercospora, but could be classed as a Didymaria.

**Cercospora sacchari** v. Breda de Haan

Meded. Proefst. Suikerr. W.-Java. Kagok-tegal **3**: 15. 1892

TYPE: A definite type is not listed, but apparently J. van Breda de Haan found it in abundance on *Saccharum officinarum* L. about the experiment station of West Java.

NOTE: This has been shown to be *Helminthosporium Sacchari.* See Butler, Mem. Dept. Agr. India. Bot. Ser. **6**: 207. 1913; Cook, Phytopath. **16**: 71. 1926; Lee & Martin, Phytopath. **17**: 315. 1927; Priode, Phytopath. **21**: 41. 1931.

**Cercospora scolecotrichoides** Atkinson

Cornell Univ. Bul. **3** (1): 46. 1897

Aggregates of large black stromata make numerous dark to black points scattered over the leaf surfaces, when pale appearing almost like minute flecks of leaf rust; fruiting amphigenous; stromata dark reddish brown to almost black, elongated, 60-150$\mu$ in length; fascicles very dense; conidiophores medium to dark reddish brown, straight or undulate, often closely and abruptly geniculate and appearing rachis-like, slightly paler toward the tip, multiseptate, rarely branched, small spore scar at rounded tip, 4-6 x 50-200$\mu$; conidia pale fuligenous, obclavate, rather Alternaria-like in outline, straight to slightly curved, 2-4, mostly 3 septate, may be constricted at septa, rounded to obconically truncate base, narrowly rounded, beak-like tip, 6-10 x 30-60$\mu$.

HOST: *Arundinaria tecta* Muhl.

TYPE: Auburn, Lee Co., Ala.; *Arundinaria tecta;* B. M. Duggar; Oct. 28, 1891.

DISTRIBUTION: Known only from the type locality.

NOTE: Many of the conidia appear thick-walled, so that it should be classed as a Pseudocercospora.

**Cercospora secalis** sp. nov.

Maculae extensae, angustae, pallide vel atro-fuscae, saepe zonula flavida cinctae; caespituli amphigeni, series disponentes; stromata minuta atro-fusca; conidiophora laxe vel dense fasciculata, aequabiliter brunnea, interdum septata, simplicia, ad apicem subtruncata, 3.5-5 x 15-100$\mu$; conidia hyalina, obclavata vel cylindrata, recta vel leniter curvata, spurie multiseptata, ad basim subtruncata, ad apicem subobtusa, 3-4.5 x 20-105$\mu$.

Leaf spots elongate, from narrow lines 0.5 mm. in width to 3 mm. and up to 35 mm. in length, pale to dark brown, sometimes with a yellowish margin; fruiting amphigenous, showing under the hand lens as minute black pustules, usually arranged in rows; stromata small to medium in size, arising chiefly from stomata, dark brown; fascicles consisting of 2-25 divergent stalks; conidiophores pale to medium brown, fairly uniform in color, sparingly septate, not branched, 0-2 geniculate, rounded to subtruncate tip, 3.5-5 x 15-100$\mu$, mostly 20-55$\mu$; conidia hyaline, bluntly acicular to almost cylindric, straight to mildly curved, indistinctly multiseptate, base truncate to obconically truncate, tip subobtuse, 3-4.5 x 20-105$\mu$.

HOST: *Secale cereale* L.

TYPE: East of Fredericksburg, Virginia; *Secale cereale;* C. L. Lefebvre and A. G. Johnson; June 9, 1947.

DISTRIBUTION: Known only from the type locality.

NOTE: Although this resembles somewhat *C. setariae* and *C. sorghi,* there seem to be sufficient distinct differences to consider it a new species.

**Cercospora seminalis** Ellis & Everhart

Jour. Mycol. **4**: 4. 1888

Forming a compact, olivaceous to black mass enclosed by the spines of the involucre; the seed is blackened and destroyed; the conidiophores push upward between the tips of the enclosing paleae, in dense interlaced layers, pale to medium olivaceous brown, multiseptate, apparently not branched, not geniculate, 4-6 x 100-500$\mu$; conidia pale to medium dark brown, obclavate to cylindro-obclavate, shortest ones cylindric, multiseptate, base short obconic to obconically truncate, tip subobtuse, 5-7 x 20-160$\mu$.

HOST: *Buchloë dactyloides* (Nutt.) Engelm.

TYPE: Manhattan, Kans.; *Buchloë dactyloides;* W. T. Swingle; July, 1887.

DISTRIBUTION: Studied material from S. Dakota, Nebraska, and Kansas. Also reported from Colorado and Wisconsin.

NOTE: This resembles closely the appearance of a smut. It has been reported also on *Cynodon dactylon* (L.) Pers., Bermuda grass (Pl. Dis. Repr. **29**: 37. 1945). This species should not be classed as a Cercospora, but I am not mycologist enough to advise where it does belong.

**Cercospora seriata** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 59. 1892

Leaf spots yellowish brown to dingy gray, usually with a brown border and sometimes with a yellow halo, at first irregularly oblong, 0.5-1 x 1-3 mm., later may turn entire leaf blade brown; fruiting epiphyllous; stromata in parallel rows, brown, 20-30$\mu$ in diameter; some fascicles dense; conidiophores pale to medium brown, fairly uniform in color and width, rarely septate, not branched, undulate

or 1-4 mildly to abruptly geniculate, medium spore scar at rounded to subtruncate tip, 3-4.5 x 10-50$\mu$; conidia hyaline, cylindric, straight to slightly curved, 2-6 but mostly 3-septate, base truncate to short obconically truncate, tip obtuse or subconic, 2-3.5 x 20-70$\mu$.

HOST: *Sporobolus asper* (Michx.) Kunth.

TYPE: Auburn, Ala.; *Sporobolus asper;* Duggar & Newman, No. 2009; July 24 and Aug. 7, 1891.

DISTRIBUTION: Known only from the type locality.

**Cercospora setariae** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 50. 1892

*Cercospora setariicola* Tehon & Daniels, Mycologia **19**: 128. 1927

*Cercospora paspali* Ray, Mycologia **36**: 173. 1944

Leaf spots oval to elliptic, 0.5 x 2 to 5 x 12 mm., uniformly dark reddish brown, or with a minute speck of tan to gray in the center, often confluent; fruiting amphigenous, chiefly hypophyllous; stromata brown, filling stomatal opening; fascicles 2-15 divergent stalks; conidiophores pale yellowish olivaceous to medium olivaceous brown, paler and more narrow toward the tip, longest ones septate, not branched, occasionally 1-2 mildly geniculate, small spore scar at narrowly rounded tip, 3-5 x 10-45$\mu$, rarely as large as 6 x 85$\mu$; conidia hyaline, cylindric to obclavate, longest ones may be almost acicular, straight, rarely mildly curved or undulate, indistinctly multiseptate, base subtruncate to long obconically truncate, tip subacute to subobtuse, 2-4 x 20-150$\mu$.

HOSTS: *Paspalum conjugatum* Berg, *P. scrobiculatum* L., *P. stramineum* Nash, *Setaria glauca* Beauv., *S. italica* Beauv.

TYPES: Auburn, Alabama; *Setaria glauca;* B. M. Duggar, No. 2120; Sept. 17, 1891; (*C. setariicola*) Macomb, Illinois; *S. glauca;* P. A. Young, No. 11542; Aug. 16, 1924; (*C. Paspali*) Perkins, Okla.; *Paspalum stramineum;* W. W. Ray; Aug. 26, 1942.

DISTRIBUTION: From Alabama and Oklahoma to Wisconsin and eastward. Also reported from Guatemala, Minas Geraes, Argentine, Uganda, Lower Russia, Japan, and China.

NOTE: The type of *C. setariicola* has shorter conidiophores than those of *C. setariae,* but various collections show intermediate forms. This, with the fact that the conidia are identical, leads me to consider them the same species. See also *C. paspalicola.*

**Cercospora sorghi** Ellis & Everhart

Jour. Mycol. **3**: 15. 1887

*Cercospora sorghi* var. *maydis* Ellis & Ev., (Langlois 613)

Leaf spots mostly elongated, at first usually dark purple or red, later center may become tan to brown, occasionally dense fruiting without any definite spots; stromata lacking to distinct, globular, dark brown or almost black, 15-50$\mu$ in diameter; some fascicles dense; conidiophores medium dark brown or olivaceous brown, rarely pale colored, slightly paler and more narrow toward the tip or irregular in width, multiseptate, not branched, upper third undulate or mildly to abruptly 1-3 geniculate, sometimes a number of minute spore scars near the tip, medium sized scar at narrowly subtruncate tip, 3-5.5 x 20-80$\mu$ or even 150$\mu$; conidia hyaline, acicular to obclavate or almost cylindric, indistinctly multiseptate,

straight to mildly curved, base truncate to obconically truncate, tip subacute, 2-4 x 30-70$\mu$, rarely 5-5.5 x 300$\mu$.

HOSTS: *Andropogon pertusus* Willd. (*Holcus pertusus* L., *Amphilophis pertusa* Stapf.), *A. rufus* Kunth. (*Hyparrhenia rufa* [Nees] Stapf.), *Holcus halepensis* L., *H. sorghum* L. (Sorghum, Andropogon), and other species of Holcus, *Panicum crus-galli* L., *Zea mays* L. Specimens were sent from Transvaal on *Cymbopogon excavatus* Stapf. (*Andropogon schoenanthus* var. *versicolor* Steud.) and *Cym. afronardus* Stapf.

TYPES: Louisiana; *Sorghum halepense;* Langlois, No. 543; Aug. 1886; (var. *maydis*) Louisiana; *Zea mays;* Langlois, 613; July 1886.

DISTRIBUTION: Apparently present in all tropical and subtropical countries. Many specimens examined from our southern states as far north as Tennessee; northern South America, Africa and Asia.

NOTE: The material on broom corn collected in South Dakota appears distinct from the type and may prove to be a new species. Ramakrishnan (Mem. Dept. Agr. India, Bot. Ser. **18**: 259. 1931) states that he could not infect maize with the cultures obtained from Holcus. Therefore, the variety *maydis* also may be different even though it appears very much like the type on Sorghum. This species can easily be distinguished from *C. Zeae-maydis.* The latter has wide, very pale conidiophores, and much wider more nearly cylindric conidia. In the Mycological Herbarium of the U.S. Bureau of Plant Industry is a specimen labeled *Cercospora andropogonis* Sawada, on *Andropogon sorghum,* Taipeh, Taiwan, collected by Y. Fujikuro, Nov. 6, 1909. Although this has almost no fruiting it undoubtedly is the same as *C. sorghi.* Katsuki (Bul. Agr. Impr. Sec. Econ. Dept. Fukuoka Perf., Japan **1**: 23. 1949) reports *C. sorghi* on *Panicum miliaceum* L. This probably is *C. fusimaculans.*

**Cercospora striaeformis** Winter
Hedwigia **25**: 103. 1886

Leaf spots linear, brown; fruiting in compact fascicles, hypophyllous; conidiophores pale to medium brown, pluriseptate, not branched, slightly torulose, 4.5 x 120$\mu$; conidia hyaline, obclavato-cylindric, straight to curved, 3-5 septate, base subtruncate, tip obtuse, 1.5 x 45$\mu$.

HOST: Gramineae.

TYPE: Island of St. Thomas, West Africa; Gramineae.

DISTRIBUTION: Collected only in Africa.

NOTE: This was one of the Winter species, the type of which I could not find. The description is hardly complete enough to be sure of its identity. It resembles closely *C. agrostidis.*

**Cercospora subulata** Sprague
Mycologia **29**: 202. 1937

HOSTS: *Melica subulata* (Griseb.) Scribn., *M. bulbosa* Geyer, *Deschampsia caespitosa* (L.) Beauv., *Festuca rubra* L., *Calamagrostis rubescens* Buckl.

TYPE: Main Divide Trail, Ochoco National Forest, Oregon; *Melica subulata;* D. C. Ingram, No. 606; Aug. 21, 1916.

NOTE: Sprague (Mycologia **40**: 177. 1948) changes the name to *Spermospora subulata* apparently because of the distal cells of the conidia being drawn out to a thin whip-like appendage. In Mycologia **40**: 308. 1948, he adds more hosts

and shows some differences in conidial size from the various host genera. Sprague's first name for the pathogen was *Cercosporella subulata.*

**Cercospora taiwanensis** Matsumoto & Yamamoto

Jour. Soc. Trop. Agr. Formosa 6: 584. 1934

Leaf spots elliptical to elongate, 1-1.5 x 2-10 mm., yellowish to reddish brown, finally with a straw colored center; fruiting amphigenous; stromata lacking; nonfasciculate; conidiophores borne as single branches from procumbent threads, pale yellowish brown, uniform in color, attenuated slightly or irregular in width, sparingly septate, 0-2 geniculate, small spore scar at the bluntly rounded tip, 2.5-4 x 7-55$\mu$; conidia hyaline to subhyaline, obclavate, straight to strongly curved or undulate, indistinctly multiseptate, base subtruncate, tip subacute, 2.5-4 x 20-150$\mu$.

HOST: *Saccharum officinarum* L., *Arthraxon hispidus* Mak.

TYPE: Karenko, Formosa (Taiwan); *Saccharum officinarum;* I. Okamoto; spring, 1934.

DISTRIBUTION: Formosa, Japan, China.

NOTE: Even though Dr. Matsumoto was kind enough to send me a second specimen, I found only traces of conidiophores and no conidia. A Helminthosporium was rather abundant. See also Jour. Soc. Chin. Trop. Agric. 1: 12. 1948. Dr Togashi sent me the specimen on Anthraxon from Japan. See key, page 248.

**Cercospora tessellata** Atkinson

Jour. Elisha Mitchell Sci. Soc. 8: 59. 1892

Leaf spots elongate, 0.5-1 x 3-5 mm. in extent, dark brown or almost black, sometimes with a bluish tinge; fruiting hypophyllous, in close rows of pustules; stromata none or filling stomatal opening, dark brown; fascicles dense; conidiophores pale to medium dark olivaceous brown, paler and more narrow toward the tip, septation, geniculation, branching and spore scars absent or indistinct, narrowly rounded tip, 2-3 x 5-15$\mu$; conidia hyaline, narrowly obclavate, straight or mildly curved, septa indistinct, base subtruncate to long obconically truncate, tip subacute, 1.5-2.5 x 30-90$\mu$.

HOST: *Dactyloctenium aegyptiacum* Willd. (*Eleusine aegyptiaca* Desf.)

TYPE: Auburn, Ala.; *Eleusine aegyptiaca;* G. F. Atkinson, No. 2306; Nov. 6, 1891.

DISTRIBUTION: Alabama seems the only certain record.

NOTE: I received a Cercospora on Eleusine from Uganda, which was distinct from the above species.

**Cercospora tungurahuensis** Petrak

Sydowia (Ann. Mycol.) 4: 574. 1950

Spots mostly at the tip of the leaf, finally may include much of the entire surface, dark gray to a leathery brown, gradually fading into the healthy tissue; fruiting epiphyllous; stromata dark, 30-80$\mu$; fascicles dense; conidiophores brown, paler toward the tip, straight to undulate or torulose, not branched, multiseptate, denticulate, conic tip, 4-7.5 x 90-160$\mu$; conidia obclavate to cylindric, hyaline to subhyaline, base obconically truncate, tip subobtuse, 1-4 septate, 3.5-7 x 20-60$\mu$.

HOST: *Pennisetum* ? *bambusiforme* Hemsl.

TYPE: Hacienda San Antonia near Banos, Prov. Tungurahua, Ecuador; *Pennisetum bambusiforme;* H. Sydow, No. 456; Dec. 6, 1937.
NOTE: I have not seen this specimen. It seems distinct from *C. penniseti.*

**Cercospora vaginae** Krüger
Ber. Vers. Stat. Zuckerr. West Java. **1**: 64. 1890

Spots on leaves and leaf sheaths, at first small, elliptic, later increasing in size until they may be 5 or 6 inches in length, dark red on upper surface, indistinct below; fruiting in black effuse area in the center of the spots, epiphyllous; black stromata or sclerotia present, 15-75$\mu$ in length, fascicles not borne on these stromata; nonfasciculate; conidiophores are branches from procumbent threads, pale to medium dark fuligenous or olivaceous brown, uniform in color, slightly irregular in width, intertwined, septate, not or rarely geniculate, spore scars indistinct, 2.5-4$\mu$ in width and of indeterminate length; conidia cylindric to obclavato-cylindric, hyaline to olivaceous, straight, 0-5 septate, base short obconic, tip obtuse, 3-6 x 15-50$\mu$.

HOST: *Saccharum officinarum* L. (*S. edule* Hassk.)
TYPE: Java. (Detailed type not recorded).
DISTRIBUTION: Studied material from Formosa, Puerto Rico and Cuba. Reported from most of the important sugar cane sections in the world.
NOTE: For further descriptions see, Jour. Dept. Agr. P. Rico **1**: 200. 1917; Philipp. Jour. Sci. **66**: 7. 1938; Arch. Java-Suikerind. **4**: 697. 1896. The collection from Formosa had some conidia present with Centrospora-like appendages. It was not possible to determine whether these belonged to the above species or to a concomitant fungus. See key, page 248.

**Cercospora zeae-maydis** Tehon & Daniels
Mycologia **17**: 248. 1925

Leaf spots extended pale brown streaks or irregular gray to tan spots running parallel with the midrib, often with a brown to maroon narrow line border; fruiting amphigenous but more abundant on the lower surface; stromata lacking or a few brown cells in stomatal openings; fascicles 3-12 divergent stalks; conidiophores pale olivaceous brown, uniform in color and width or sometimes slightly wider near the tip, sparingly septate, not branched, straight to mildly sinuous, occasionally 1-3 geniculate, medium spore scar at rounded to subtruncate tip, 4-6 x 40-165$\mu$; conidia hyaline, obclavate, straight to curved, 3-10 septate, base subtruncate to long obconically truncate, tip subobtuse, 5-9 x 30-95$\mu$.

HOST: *Zea mays* L.
TYPE: McClure, Ill.; *Zea mays;* P. A. Young, No. 4276; Aug. 29, 1924.
DISTRIBUTION: Studied material from Peru, Colombia, Trinidad, Brazil, South Carolina, Tennessee, Kentucky, and Illinois.
NOTE: See also *C. sorghi* for differences between the two species on this host genus. (Letter May 16, 1947), C. H. Arndt sent me excellent material from South Carolina.

NOTES: In the U. S. Bureau of Plant Industry herbarium is a specimen marked: *Cercospora asprellae* Ellis & Galw.; on *Asprella hystrix* Moench; Oregon, Ill.; M. B. Waite; Sept. 10, 1889. Apparently a Cercospora is present, but is so scanty and so confused with the presence of Fusarium and Helminthosporium that it cannot be described.

Several times in literature the name *Cercospora herpotrichoides* has appeared (see Compt. Rend. Acad. Sci. 189: 779. 1929). No doubt *Cercosporella herpotrichoides* Fron., the cause of a foot rot of wheat, is meant.

In the Berlin herbarium, and also at Stockholm, is a specimen labeled: *Cercospora Eleusine* P. Henn.; Iwomachi, Tosa, Japan; *Eleusine Indica* Gaertn.; Yoshinaga, No. 66; Aug. 1905. It is definitely an Helminthosporium rather than a Cercospora. Apparently a description was never published.

**Cercospora vismiae** Sydow
Ann. Mycol. 23: 427. 1925

Leaf spots indistinct or none; fruiting in olivaceous to dark effuse irregular patches on lower leaf surface, 2-5 mm. in extent; stromata lacking; nonfasciculate, rarely 2-5 stalks; conidiophores pale olivaceous brown, uniform in color, irregular in width, multiseptate, branched, tortuous, occasionally sinuous to multigeniculate, small spore scar at conic tip, 3-5 x 50-200$\mu$; conidia pale olivaceous, obclavate, mildly curved, 4-7 septate, base sharply obconic, tip subacute to subobtuse, 2-4.5 x 30-90$\mu$.

HOST: *Vismia ferruginea* H.B.K.

TYPE: San Ramon, Costa Rica; *Vismia ferruginea;* H. Sydow, No. 334; Jan. 22, 1925.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. vismicola* for differences between the two species on this host genus.

**Cercospora vismicola** sp. nov.

Maculae 2-30 mm. diam., rubido-fuscae; caespituli epiphylli; stromata subglobosa, atro-fusca, 25-60$\mu$ diam.; conidiophora densissime fasciculata, pallide olivaceo-brunnea, sursum pallidiora et attenuata, spurie septata, vix ramosa, leniter sinuosa, ad apicem obtuse rotundata, 2-3.5 x 10-50$\mu$; conidia subhyalina vel pallidissime olivacea, obclavata, recta vel leniter curvata, spurie septata, ad basim fere subtruncata, 2-3.5 x 30-90$\mu$.

Leaf spots varying from small circular specks to large irregular blotches, 2-30 mm. (mostly 5-10) in diameter, reddish brown, occasionally with a slight yellowish margin; fruiting chiefly epiphyllous; stromata subglobular, dark brown, 25-60$\mu$ in diameter; fascicles dense to very dense; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, inconspicuously septate, rarely slightly branched, not geniculate, lightly wavy, bluntly rounded tips, 2-3.5 x 10-50$\mu$; conidia subhyaline to very pale olivaceous, obclavate, straight to mildly curved, indistinctly septate, base subtruncate to obconic, tip blunt to conic, 2-3.5 x 30-90$\mu$.

HOST: *Vismia ferruginea* H.B.K.

TYPE: Along road from San Cristobal to Rubio, Venezuela; *Vismia ferruginea;* C. Chardon, No. 1273; Sept. 1932.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. vismiae* for differences between the two species on Vismia. The conidia of the two appear much alike.

## CERCOSPORAE ON HAMAMELIDACEAE

A. Conidia hyaline, obclavate to narrowly linear, 1.5-3 x 15-60$\mu$; conidiophores 2-3.5 x 10-75$\mu$.

HAMAMELIS — *C. hamamelidis*

AA. Conidia subhyaline to pale in color.
B. Conidia cylindric, 4-6.5 x 30-75$\mu$; conidiophores 3-4 x 10-75$\mu$; no definite leaf spots; fruiting appearing as minute brown tubercles.
LIQUIDAMBAR *C. tuberculans*
BB. Conidia cylindro-obclavate, 2-4 x 30-120$\mu$; leaf spots definite; tubercles not present; stromata 20-50$\mu$; fascicles dense.
C. Fruiting amphigenous; fascicles not compressed near base; conidiophores 2-3.5 x 10-30$\mu$, very pale olivaceous.
LIQUIDAMBAR *C. liquidambaris*
CC. Fruiting epiphyllous; fascicles compressed near base; conidiophores 3-4 x 5-30$\mu$, pale olivaceous brown.
CORYLOPSIS *C. corylopsidis*

**Cercospora corylopsidis** Togashi and Katsuki
Bot. Magazine, Tokyo **65**: 20. 1952

Leaf spots subcircular to irregular, 0.5-5 mm. in diameter, sometimes continuous along the edge of the leaf, dull brown or on upper surface with gray center, many spots dehiscent; fruiting chiefly epiphyllous; stromata olivaceous brown, subglobular, 20-50$\mu$ in diameter; fascicles dense, rarely compressed near base and flaring at the tip; conidiophores pale olivaceous brown, uniform in color and width, undulate to curved, not geniculate, not branched, septa indistinct, conic tip, 3-4 x 5-30$\mu$; conidia pale olivaceous, cylindro-obclavate, usually curved, indistinctly multiseptate, base subtruncate, tip rounded obtusely, 2-4 x 30-75$\mu$.

HOST: *Corylopsis pauciflora* S. et Z.

TYPE: Kagoshima, Pref. Kagoshima, Japan; *Corylopsis pauciflora;* S. Katsuki; Oct. 26, 1949.

DISTRIBUTION: Japan.

NOTE: Dr. Togashi sent me a very small sample of the type. See key above.

**Cercospora hamamelidis** (Peck) Ellis & Everhart, in litt.

*Ramularia hamamelidis* Peck, N. Y. State Mus. Nat. Hist. **35** (1881): 141. 1884

Leaf spots dark brown to almost black, angular, 2-8 mm. in diameter, no dissinct border; fruiting mostly hypophyllous; stromata pale brown, globular, 20-60$\mu$ in diameter; fascicles dense; conidiophores near the base pale olivaceous brown, upper part wholly colorless, indistinctly septate, not branched, slightly geniculate, small spore scar at subtruncate tip, 2-3.5 x 10-75$\mu$, mostly 10-30$\mu$; conidia obclavate to narrowly linear, hyaline, septa indistinct, straight to slightly curved, obconic to subtruncate base, blunt tip, 1.5-3 x 15-60$\mu$.

HOST: *Hamamelis virginiana* L., H. *japonica* S & Z.

TYPES: No type has been suggested, but Ellis may have studied first the collection by John Dearness, No. 196, London, Canada; July 8, 1889. (*Ramularia hamamelidis*) Sandlake, N. Y.; *Hamamelis virginiana;* C. H. Peck; July, 1881.

DISTRIBUTION: Studied material from Ontario, New York, Florida, and Japan.

NOTE: Immature specimens may show even the stromata hyaline, and it may be for this reason that Ellis hesitated in publishing a description. The Cercospora was distributed as North American Fungi No. 2586 and Fungi Columbiani No. 796. Peck in his original description of the Ramularia states that the fascicles are colored. See key, page 257.

**Cercospora liquidambaris** Cooke & Ellis

Jour. Elisha Mitchell Sci. Soc. 8: 48. 1892

*Cercospora liquidambaris* Sawada, Formosa Agr. Res. Inst. Rept. 85: 112. 1943

Leaf spots angular to subcircular, 2-10 mm. in length, dark brown, sometimes slightly zonate, usually with a narrow raised line border; fruiting amphigenous; small dark brown stromata, 20-40$\mu$ in diameter; fascicles dense; conidiophores very pale olivaceous, uniform in width and color, longer ones somewhat undulate, septation, geniculation, branching, and spore scars indistinct or lacking, rounded tip, 2-3.5 x 10-30$\mu$; conidia narrowly obclavate to linear, straight, curved, or undulate, base subtruncate to obconically truncate, tip subacute, septa indistinct, subhyaline to pale olivaceous, 2-3.5 x 40-100$\mu$.

HOSTS: *Liquidambar styraciflua* L., *L. formosana* Hance.

TYPE: St. Gabriel, La.; *Liquidambar styraciflua;* A. B. Langlois; Jan., 1886; (*C. liquidambaris* Sawada) Taichung, Taiwan (Formosa); *L. formosana;* K. Sawada.

DISTRIBUTION: Gulf states and as far north as Maryland and Delaware; also in Mexico and Formosa.

NOTE: This species was not described by Cooke or Ellis, but in 1892 Atkinson described a species under the above name. His description fits more nearly *C. tuberculans* which also occurs on this host and which Ellis described in 1888. Atkinson seems to have had leaves showing both species in the same mount. In the Ellis herbarium was a collection which he determined and which was collected by Geo. V. Nash, Lake City, Fla., (Plants of Florida No. 2231); July 11-19, 1895. I take the specimen to be authentic and have based the species on it, rather than on the Atkinson description. See also *C. tuberculans* for differences between the two species on Liquidambar. A part of a Sawada collection made in 1945 is deposited in the U.S. Dept. Agr. Mycological Herbarium. See key, page 258.

**Cercospora tuberculans** Ellis & Everhart

Jour. Mycol. 4: 115. 1888

Leaf spots none or slight discoloration on upper surface; fruiting on lower leaf surface on small brown tubercles, 0.5-1 mm. in diameter, or effuse between tubercles; nonfasciculate to very dense fascicles; stromata lacking or black, globular, 20-75$\mu$ in diameter; conidiophores pale fuligenous, uniform in color and width, longest ones septate, not branched, rarely once geniculate, spore scar indistinct at rounded to conic tip, 3-4 x 10-35$\mu$, rarely 75$\mu$; conidia cylindric, pale fuligenous, 1-5 septate, usually curved, base subtruncate to long obconically truncate, tip obtuse, 4-6.5 x 30-75$\mu$.

HOST: *Liquidambar styraciflua* L.

TYPE: Starkville, Mississippi; *Liquidambar styraciflua;* S. M. Tracy; June, 1888.

DISTRIBUTION: Studied three collections from Mississippi and one from Missouri. Also reported from Louisiana and Florida.

NOTE: See also *C. liquidambaris* and key, page 258 for differences between the two species on this host genus.

**Cercospora namae** Dearness & House

N. Y. State Mus. Bul. 179: 34. 1915

Leaf spots subcircular, immarginate, 2-6 mm. in diameter, pale to medium

brown, slightly darker on upper surface than below; fruiting amphigenous; stromata small groups of brown cells below the stomatal openings, 10-25$\mu$ in diameter; fascicles in compact clusters of 3-20; conidiophores very short, pale brown or olivaceous, not septate, not geniculate, not branched, mostly the peripheral cells of the stroma, a few are long enough to protrude above the leaf surface, 4-5 x 5-15$\mu$; conidia subhyaline to olivaceous, obclavate, straight to slightly curved, septa mostly distinct, fairly sharp, obconic base, tip blunt, 2-3.5 x 40-100$\mu$.

HOST: *Nama* (*Hydrolea*) *ovatum* (Nutt.) Britt.•
TYPE: Crebs, Indian Territory; *Nama* (*Hydrolea*) *ovatum;* Chas. S. Sheldon; Aug. 21, 1891.
DISTRIBUTION: Known only from the type locality.

**Cercospora hyperici** Tehon & Daniels
Mycologia **19**: 127. 1927

Leaf spots mostly angular, 3-5 mm. in diameter, dark brown, without distinct border; fruiting hypophyllous; stromata a few large brown cells; fascicles sometimes dense; conidiophores pale olivaceous brown, often with swollen base, rarely septate, not geniculate, not branched, small spore scar at rounded tip, 3-6 x 10-25$\mu$; conidia pale olivaceous, obclavate to obclavato-cylindric, rounded or obconic base, blunt tip, 0-5 septate, straight, 2-4 x 15-40$\mu$.

HOST: *Hypericum adpressum* Barton, *H. ellipticum* Hook.
TYPE: Bement, Piatt Co., Illinois; *Hypericum adpressum;* L. R. Tehon, No. 13035; July 6, 1925.
DISTRIBUTION: Illinois, Wisconsin.
NOTE: Since many of these conidia are 0-1 septate and all are short, the fungus might better be classed as a Didymaria.

**Cercospora cassinopsidis** Winter
Hedwigia **24**: 34. 1885

Leaf spots none or indistinct; fruiting effuse, pale fuligenous, sometimes covering large parts of the leaf area, hypophyllous; stromata lacking; nonfasciculate; conidiophores intertwining branches from procumbent threads, multiseptate, irregular in width, paler toward the tip, not geniculate, variously curved or bent, 4-4.5 x 150$\mu$; conidia obclavato-cylindric, remotely septate, very pale yellowish brown, 3.5 x 50$\mu$.

HOST: *Cassinopsis capensis* Harv. & Sond.
TYPE: Prope Somerset-East, Promont., Bonae Spei, South Africa; *Cassinopsis capensis;* MacOwan.
DISTRIBUTION: Known only from the type locality.
NOTE: This is another of the Winter species which I could not find.

**Cercospora iridis** sp. nov.

Maculae irregulares, 5-20 mm. diam., pallidissime brunneae; caespituli amphigeni, atri; stromata atro-fusca, globosa, 20-40$\mu$ diam.; conidiophora laxe vel dense fasciculata, brunnea, sursum pallidiora et attenuata, vix septata, recta vel leniter curvata, 0-2 geniculata, simplicia, ad apicem subtruncata, 3-5.5 x 15-50$\mu$; conidia hyalina, anguste obclavata, recta vel leniter curvata, spurie septata, ad basim truncata, ad apicem subacuta, 2-4 x 25-70$\mu$.

Leaf spots elongate to elliptic, 5-20 mm. in length, pale tan or straw colored, darkened on both surfaces when fruiting is abundant; stromata dark brown, globular or flattened, 20-40$\mu$ in diameter; fascicles 2-20 spreading stalks; conidiophores pale to medium brown, paler and sometimes more narrow toward the tip, sparingly septate, straight to slightly curved, 0-2 geniculate, not branched, subtruncate tip, 3-5.5 x 15-50$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute to subobtuse, 2-4 x 25-70$\mu$.

HOST: Iris sp.

TYPE: Matamoros, Mexico; Iris sp.; C. J. Hansel, No. 57462; May 12, 1944 (U.S.D.A. Herbarium).

DISTRIBUTION: Mexico, Brazil.

NOTE: S. M. Tracy collected a specimen on *Iris pabularia* at Starkville, Miss., Jan. 1894, and which was distributed to several herbaria under the name *Cercospora iridicola* Tracy & Earle. It was never described. It proved to be an Heterosporium.

## CERCOSPORAE ON JUGLANDACEAE

A. Conidia colored, cylindric to cylindro-obclavate.
  B. Conidiophores medium dark olivaceous, chiefly epiphyllous, 2.5-4 x 10-40$\mu$; conidia 3-6 x 30-135$\mu$, medium dark olivaceous, multiseptate.
  CARYA — *C. fusca*
  BB. Conidiophores pale brown, chiefly hypophyllous, 3-4.5 x 15-65$\mu$; conidia 3-5.5 x 20-85$\mu$, pale colored, 1-5 septate.
  JUGLANS — *C. juglandis*

AA. Conidia hyaline, acicular, 2-4 x 20-120$\mu$.
  B. Conidiophores pale in color, not branched, chiefly hypophyllous, in dense fascicles, 4-6 x 15-80$\mu$.
  CARYA — *C. caryae*
  BB. Conidiophores medium brown, branched, chiefly epiphyllous, 2-12 in a fascicle, 3.5-5 x 20-65$\mu$ (90$\mu$).
  JUGLANS — *C. forsteriana*

### **Cercospora caryae** Chupp & Doidge

Bothalia **4:** 882. 1948

Leaf spots numerous, minute, white to almost black, 0.5-2 mm. in diameter, finally the entire leaflet turns brown; fruiting chiefly hypophyllous; stromata dark brown, subglobular, 25-60$\mu$ in diameter; fascicles dense; conidiophores in mass fairly dark, singly pale brown, almost hyaline tip, irregular in width, 1-4 septate, often constricted at the septa, not branched, not geniculate, nearly straight, tip bluntly rounded, 4-6 x 15-80$\mu$, some of the widest cells enlarged to 8$\mu$ in width; conidia hyaline, acicular to obclavate, straight to slightly curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute, 2.5-4 x 30-120$\mu$.

HOST: *Carya pecan* (Marsh.) Eng. & Graebn. (*C. olivaeformis* Nutt.) (*C. illinoënsis* C. Koch) (*Hicoria pecan* Brit.)

TYPE: Alkamaar Estates, Alkmaar, Transvaal, S. Africa; *Carya pecan;* Manager, No. 25441; April, 1930.

DISTRIBUTION: Two specimens were sent from Transvaal (Alkmaar and Barberton).

NOTE: See also *C. fusca* and key above for differences among the species on Carya.

**Cercospora forsteriana** Chupp & Viégas
Bol. da Soc. Brasil. de Agron. 8: 26. 1945

Leaf spots begin as small circular gray to white specks, which enlarge until they become angular and vein-limited, 0.5-4 mm. in length; fruiting amphigenous but chiefly on the upper leaf surface; stromata small, 15-30$\mu$ in diameter, dark brown; fascicles fairly compact, 2-12 stalks; conidiophores medium dark brown near the base, pale and slightly more narrow toward the tip, 1-5 septate, branched, straight to mildly curved or undulate, occasionally once abruptly geniculate, small to medium spore scar at the narrowly subtruncate tip, 3.5-5 x 20-65$\mu$, rarely 90$\mu$; conidia hyaline, acicular to obclavate, straight to slightly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4 x 25-120$\mu$.

HOST: *Juglans regia* L.
TYPE: Rua D. Pedro. I, 1. Piracicaba, Est. Sao Paulo, Brasil; *Juglans regia;* Reynaldo Forster, No. 1146; Sept. 18, 1935.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. juglandis* and key, page 261 for differences between the species on Juglans.

**Cercospora fusca** (Heald & Wolf) Rand
Jour. Agr. Res. 1: 318. 1914
*Clasterosporium diffusum* H. + W., Mycologia 3: 21. 1911

Leaf spots circular to irregular, 5-15 mm. in diameter, grayish brown to dark reddish brown, when pale in color usually with a dark center or margin; fruiting chiefly epiphyllous; stromata usually lacking; nonfasciculate to fascicles of 10-12 stalks; conidiophores mostly short branches from procumbent threads, medium dark olivaceous, rarely closely and plainly septate, 0-2 mildly geniculate, minute spore scar at rounded tip, uniform in color and width, 2.5-4 x 10-40$\mu$; conidia cylindric to obclavato-cylindric, medium dark olivaceous, closely and plainly septate, sometimes strongly constricted at septa—giving the appearance of a string of beads, straight to variously curved, bluntly rounded ends, 3-6 x 30-135$\mu$.

HOST: *Carya pecan* (Marsh.) Eng. & Graebn. (*Hicoria pecan* Brit.) (*Carya illinoënsis* C. Koch).
TYPE: Gonzales, Texas; *Hicoria pecan;* Heald and Wolf, No. 2695.
DISTRIBUTION: Southern states as far north as S. Carolina and Oklahoma, and as far west as New Mexico.
NOTE: Often mixed with another species, having dense fascicles, and obclavate conidia (Alternaria-like in outline). This latter may be a fasciculate form of the fungus previously known as *C. halstedii. C. diffusa* E. & E. (Jour. Mycol. 4: 3. 1888) does not permit the use of the Heald and Wolf name for the species. See also *C. caryae* and key, page 261 for differences among the two species on Carya.

**Cercospora halstedii** Ellis & Everhart
Proc. Acad. Nat. Sci. Phila. I. 43: 90. 1891

HOSTS: *Carya tomentosa* Nutt., *C. pecan* (Marsh.) Eng. & Graebn., *Carya alba* Nutt.
TYPE: Cold Spring Harbor, Long Island; *Carya tomentosa;* B. D. Halsted; July July 13, 1890.

NOTE: This fungus is characterized by thick-walled conidia, Alternaria-like in outline. Therefore, it is not a Cercospora. If the species is not acceptable under Helminthosporium, it might be considered a Pseudocercospora, a genus Spegazzini (Anal. Mus. Nac. B. Aires **20**: 437. 1910) established to include such forms.

**Cercospora juglandis** Kellerman & Swingle

Jour. Mycol. **5**: 77. 1889

Large irregular brown blotches that may include half the leaflet, no distinct border; fruiting hypophyllous; stromata usually lacking; fascicles mostly 2-10 stalks; conidiophores pale brown, slightly paler and more narrow toward the tip, 0-2 septate, 0-1 abruptly geniculate, occasionally with incipient branches, medium spore scar at subtruncate tip, 3-4.5 x 15-65$\mu$, when conidia are attached appearing much longer; conidia subhyaline to pale fuligenous, cylindric to cylindro-obclavate, frequently catenulate, 1-5 septate, sometimes constricted near the center, base subtruncate to long obconically truncate, tip similar when catenulate or bluntly rounded, 3-5.5 x 20-85$\mu$.

HOST: *Juglans nigra* L.

TYPE: Manhattan, Kansas; *Juglans nigra;* Kellerman and Swingle, No. 1079; Aug. 19, 1887.

DISTRIBUTION: Massachusetts, Kansas, and Minas Geraes.

NOTE: See also *C. forsteriana* and key, page 261 for differences among the species on Juglans.

**Cercospora juncicola** n. comb.

*Cercosporina juncicola* Hori & Kasai, Jap. Jour. Bot. **2**: 105. 1923

Spots on the stems inconspicuous, elongated, slightly darker brown than the dried specimens, later the elliptic centers of the spots may turn pale to gray; fruiting appears in the gray areas; stromata medium dark, filling stomatal openings; fascicles mostly 3-8 stalks; conidiophores pale olivaceous brown, paler and more narrow toward the tip or irregular in shape, inconspicuously 1-4 septate, incipient branching, rarely geniculate, 2.5-3.5 x 15-65$\mu$; conidia subhyaline to faintly olivaceous, obclavato-cylindric, only slightly attenuated, straight to curved, indistinctly septate, base subtruncate, tip subacute to subobtuse, 2.5-5 x 20-85$\mu$, in moist air may be as long as 115$\mu$.

HOST: *Juncus effusus* var. *decipiens* Bu.

TYPE: Prov. Bingo, Kanaemura, Japan; *Juncus effusus* var. *decipiens;* Mikio Kasai; June 28, 1921.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. juncina* for differences between the two species on this host genus.

**Cercospora juncina** Saccardo

Ann. Mycol. **11**: 552. 1913

*Cercospora junci* Davis, Trans. Wisc. Acad. Sci. **24**: 300. 1929

Leaf spots at first small, oval to elliptic, brown with yellow halo, later leaf sheath or stem may turn dark brown for a distance of 20-50 mm.; fruiting showing as minute black pustules; stromata dark brown, filling stomatal openings and sometimes extending 75$\mu$ horizontally below the openings; fascicles dense to very

dense; conidiophores when closely massed dark brown, singly pale fuligenous, fairly uniform in color and width, rarely septate, not branched, 0-3 mildly or rarely once abruptly geniculate, small spore scar at rounded to subtruncate tip, 3-5 x 10-50$\mu$; occasionally a single plainly septate, branched, dark brown conidiophore 50-100$\mu$ in length may arise from the center of the fascicle; conidia cylindro-obclavate, subhyaline to pale olivaceous, straight to slightly curved, base obconic, tip blunt, mostly 1-4 septate, 3.5-6 x 40-75$\mu$.

HOSTS: *Juncus canadensis* J. Gay., *J. brevicaudatus* Fernald.

TYPES: London, Ontario, Canada; *Juncus canadensis;* John Dearness, No. 3502; Aug. 12, 1910; (*C. Junci*) Brill, Wisc.; *Juncus brevicaudatus;* J. J. Davis; July 23, 1928.

DISTRIBUTION: Studied material from Ontario and Wisconsin.

NOTE: See also *C. juncicola.*

**Cercospora anisomelicola** Sawada

Formosa (Taiwan) Agr. Res. Inst. Rept. **86:** 166. 1943

Leaf spots on upper surface indistinct yellowish angular areas, bounded by leaf veins, 1-7 mm. in length; fruiting effuse on corresponding lower surface, dark olivaceous; stromata small, dark, subglobular; fascicles mostly dense; conidiophores pale to medium olivaceous brown, paler and more narrow toward the bluntly rounded tip, not branched, usually straight, not geniculate, ordinarily so short that they seem merely peripheral cells of the stromata, but occasionally (according to Sawada) as large as 4-5 x 30-60$\mu$; conidia cylindro-obclavate, pale olivaceous brown, straight to curved, 1-7 septate, base obconically truncate, tip obtuse, 4-5.5 x 25-100$\mu$.

HOST: *Anisomeles indica* OK.

TYPE: Taipeh, Taiwan (Formosa); *Anisomeles indica;* E. Kurosawa; Oct. 26, 1919.

DISTRIBUTION: Known only from the type locality.

NOTE: Part of the type is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora blephiliae** Chupp & Greene

Trans. Wisc. Acad. Sci., Arts, Letters. **36:** 266. 1946

Leaf spots subcircular to irregular, 2-8 mm. in diameter, brown to dark brown or rarely with almost gray center; fruiting chiefly epiphyllous; stromata none or a few brown cells; fascicles 2-15 spreading stalks; conidiophores pale to medium olivaceous brown, almost hyaline apex, uniform in width, multiseptate, not branched, 0-2 geniculate, subtruncate tip, 4-5 x 30-150$\mu$; conidia hyaline, acicular, shortest ones may be cylindric, indistinctly multiseptate, straight to mildly curved, base truncate, tip subacute, 2-4.5 x 30-200$\mu$.

HOSTS: *Blephilia ciliata* (L.) Raf., *Lycopus virginicus* L. (*L. uniflorus* Michx.)

TYPE: Scuppernong Prairie, 2 miles N.W. of Eagle, Waukesha Co., Wisconsin; *Blephilia ciliata;* H. C. Greene; Aug. 8, 1943.

DISTRIBUTION: Wisconsin.

**Cercospora calaminthae** sp. nov.

Maculae suborbiculares vel irregulares, 0.5-3 mm. diam., atro-fuscae, centro expallentes; caespituli fere hypophylli; stromata minutissima; conidiophora aequabiliter brunnea, laxe fasciculata, multiseptata, vix ramosa, flexuosa, 1-6 genicu-

lata, ad apicem acuta, 3-5 x 40-300$\mu$; conidia hyalina, ad apicem acuta, ad basim truncata, 2-3.5 x 40-100$\mu$.

Leaf spots subcircular to irregular in outline, 0.5-3 mm. in diameter, pale to dark brown or almost black, rarely with a small gray center; fruiting chiefly hypophyllous; stromata none or a few brown cells; fascicles 2-10 spreading stalks; conidiophores pale to medium brown, uniform in color and width or occasionally strongly attenuated, multiseptate, rarely branched, tortuous, 1-6 geniculate, conic tip, 3-5 x 40-300$\mu$; conidia hyaline, acicular, straight to curved, base truncate, tip acute, 2-3.5 x 40-100$\mu$.

HOST: *Calamintha officinalis* Moench. (*Clinopodium calamintha* [L.] Kuntze) (*Melissa calamintha* L.)

TYPE: Paget West, Bermuda; *Clinopodium calamintha;* L. Ogilvie, No. 410; July 1927.

DISTRIBUTION: Known only from the type locality.

**Cercospora coleicola** Chupp and Muller sp. nov.

*Hab.* in caulibus vegetis et ramulis tenellis; maculae minutae vel 50 mm. in longitude; caespituli evidenter conspicui; stromata globosa, atra, 30-80$\mu$ diam.; conidiophora dense fasciculata, brunnea, apicem versus attenuata et dilutius colorata, 1-4 septata, simplicia, fere recta, ad apicem subtruncata, 4-5.5 x 20-80$\mu$; conidia hyalina, anguste obclavata, recta vel leniter curvata, spurie multiseptata, ad basim truncata, ad apicem subacuta, 2-4.5 x 25-90$\mu$.

Dark to black spots on stems, minute to 50 mm. in length, sometimes girdling the stem; fruiting plainly visible as black pustules; stromata dark to black, globular, 30-80$\mu$ in diameter; fascicles dense, divergent; conidiophores pale to medium dark brown, slightly paler and more narrow toward the tip, 1-4 septate, not branched, usually straight, rarely once mildly geniculate, medium spore scar at the rounded to subtruncate tip, 4-5.5 x 20-80$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4.5 x 25-90$\mu$.

HOST: Coleus sp.

TYPE: Vicosa-Escola, Minas Gerais, Brazil; Coleus sp.; A. S. Muller, No. 1109; Oct. 16, 1936.

DISTRIBUTION: Known only from the type locality.

**Cercospora ellisii** Saccardo & Sydow

Syll. Fung. **14**: 1103. 1899

*Cercospora hyptidis* Ellis & Everh., Erythea **5**: 5. 1897

HOST: Hyptis sp.

TYPE: Playa Maria, Lower California; Hyptis sp.; A. W. Anthony, No. 97; July-Oct. 1896.

NOTE: The olivaceous effuse fruiting, the nonfasciculate conidiophores and the cylindric 1-septate conidia are the characters of Cladosporium and not of Cercospora. Rarely can a conidium be found with 2-3 septa. *C. Hyptidis* Speg., also described on Hyptis, has a distinct coremium and is considered an Isariopsis.

**Cercospora guatemalensis** Muller & Chupp

Ceiba **1**: 173. 1950

Leaf spots subcircular, 0.5-4 mm. in diameter, white center, wide dull brown

border; fruiting chiefly epiphyllous; stromata a few brown cells to 30$\mu$ or more in diameter; fascicles 2-12 divergent stalks; conidiophores pale olivaceous brown, slightly paler and more narrow toward the tip, 1-5 septate, not branched, straight to slightly curved, rarely geniculate, tip rounded bluntly or subtruncate, 3.5-6 x 30-100$\mu$; conidia hyaline, cylindric or very longest ones almost acicular, straight to mildly curved, indistinctly multiseptate, base truncate to obconically truncate, tip conic, 2-3.5 x 30-110$\mu$.

HOST: *Ocimum canum* Sims.

TYPE: Barcena, Guatemala; *Ocimum canum;* A. S. Muller, No. 599; July 8, 1944.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. ocimicola.*

**Cercospora hyptidis** Spegazzini

Bol. Acad. Nac. de Cien. de Cordoba 11: 614. 1889

HOST: Hyptis sp.

TYPE: Apiahy, Sao Paulo, Brazil; Hyptis sp.; J. Puggari, No. 2477 (Speg. No. 938); 1880.

NOTE: The long slender conidiophores are in a distinct coremium, with only the tips bending outward. Their color, and the shape and color of the conidia should place this fungus under Isariopsis rather than Cercospora. When more than half of the fascicles are divergent the fungus is considered a Cercospora.

**Cercospora Isanthi** Ellis & Kellerman

Bul. Torrey Bot. Club 11: 115 1884

Leaf spots circular, 0.5-1.5 mm. in diameter, white with a narrow raised border; fruiting amphigenous; stromata a few brown cells to 30$\mu$ in diameter; fascicles 5-30 stalks; conidiophores subhyaline to very pale brown, paler and more narrow toward the tip, indistinctly septate, sometimes branched, occasionally once abruptly geniculate, irregular in width or attenuated, medium sized spore scar at rounded to subtruncate tip, 3.5-6 x 20-50$\mu$; conidia hyaline, acicular, straight to curved, septa indistinct, truncate base, acute tip, 2-3.5 x 40-150$\mu$.

HOSTS: Isanthus sp., *I. coeruleus* Michx. (*I. brachiatus* Britt.)

TYPE: Manhattan, Kansas; Isanthus sp.; W. A. Kellerman, No. 610; Aug., 1884. Cotype distributed as N. Amer. Fungi, Sec. series, No. 1513.

DISTRIBUTION: Studied collections from Mississippi and Kansas. Greene reports it from Wisconsin.

**Cercospora kabatiana** Allescher

Rabenhorst, Krypt. flora 9: 130. 1910

Leaf spots irregular in shape, 3-15 mm. in diameter, dingy gray to tan; fruiting amphigenous; stromata slight, dark brown to almost black; fascicles 2-15 stalks; conidiophores pale to medium olivaceous brown, almost uniform in color, slightly attenuated, sparingly septate, not branched, straight to curved, 0-2 geniculate, medium spore scar at the narrowly subtruncate tip, 4-5.5 x 20-75$\mu$; conidia hyaline, acicular, mildly curved or undulate, indistinctly multiseptate, base truncate, tip acute, 2-4 x 35-150$\mu$.

HOSTS: *Lamium galeobdolon* Crantz (*L. luteum* Krock. *Galeobdolon luteum* Huds.) *Leonotis nepetaefolia* R. Br.

TYPE: Turnau, Bohemia; *Galeobdolon luteum;* Col. Jos. Em. Kabat; Sept. 4,

1900. Cotype distributed as Vestergren, Micromycetes rariores selecti No. 546, and as Kabat & Bubák Fungi Imp. No. 244.

DISTRIBUTION: Bohemia and possibly in the United States.

NOTE: Langlois Collection No. 768 on *Leonotis nepetaefolia* resembles the Allescher species so closely that for the present the two are considered identical. *C. leonotidis* has distinctly cylindric conidia which are relatively short.

**Cercospora labiatarum** Chupp & Muller sp. nov.

Maculae orbiculares, ca. 3-6 mm. diam., saepe confluentes, flavido-brunneae vel fuscae; caespituli effusi, atri, amphigeni; stromata minuta, atro-brunnea; conidiophora 4-12 fasciculata, olivaceo-brunnea, apicem versus pallidiora, leniter clavata, evidenter multiseptata, vix ramosa, ad apicem subtruncata, 4-6.5 x 50-400$\mu$; conidia hyalina, anguste obclavata, recta vel leniter curvata, ad basim truncata, ad apicem subacuta, spurie multiseptata, 3.5-6 x 40-175$\mu$.

Leaf spots circular, mostly 3-6 mm. in diameter, often coalescing, yellowish brown to mouse-colored; fruiting black, effuse, amphigenous; stromata slight, dark brown; fascicles 4-12 stalks; conidiophores pale to medium olivaceous brown, paler toward the tip, uniform in width or occasionally slightly clavate, plainly multiseptate, rarely branched, 0-2 or more geniculate, large spore scar at the subtruncate tip, 4-6.5 x 50-400$\mu$; conidia hyaline, acicular, straight to slightly curved, base truncate, tip subacute, indistinctly multiseptate, 3.5-6 x 40-175$\mu$.

HOST: a Labiate hedge.

TYPE: Ponte Nova, Minas Geraes, Brazil; a Labiate hedge; A. S. Muller, No. 284; July 10, 1931.

DISTRIBUTION: Known only from the type locality.

**Cercospora leonotidis** Cooke

Grevillea **8**: 72. 1879

Leaf spots indistinct on the brown dried specimen, slightly darkened on the under leaf surface, 1-4 mm. in extent; fruiting hypophyllous; stromata lacking or small, pale brown; conidiophores nonfasciculate or sometimes arising from stromata in fascicles of 2-12, very pale colored, tip hyaline, uniform in width, straight to curved, rarely septate, not geniculate, not branched, minute spore scar at the conic tip, 2-3.5 x 10-35$\mu$; conidia hyaline to subhyaline, cylindric, straight, indistinctly 1-5 septate, base truncate to almost obconic, tip blunt, 1.5-3 x 15-55$\mu$.

HOSTS: *Leonotis leonitis* R. Br., *Leonotis leonurus* R. Br., *L. ovata* Boj. var. *natal*, *L. nepetaefolia* R. Br.

TYPE: Natal; *Leonotis leonurus;* J. M. Wood, No. 5; June 1879.

DISTRIBUTION: Natal; Louisiana (Plant. Dis. Rept. **32**: 407. 1948).

NOTE: It has been reported several times from the Americas, but the specimens examined in each instance proved to be distinct.

**Cercospora leonuri** Stevens & Solheim

Mycologia **23**: 395. 1931

Leaf spots circular to irregular, more or less vein-limited, 0.5-2.5 mm. in diameter, uniformly brown to dark brown, or with tan to grey center; fruiting amphigenous; stromata slight or none; fascicles mostly not dense, divergent; conidiophores pale brown, almost hyaline tip, rather strongly attenuated, plainly multiseptate, 0-2 abruptly geniculate, not branched, large spore scar at subtruncate tip, 4-7 x 15-110$\mu$, mostly 25-60$\mu$; conidia hyaline, acicular, shortest ones

almost cylindric, straight to mildly curved, indistinctly multiseptate, base truncate, tip subobtuse, 2-4 x 35-270$\mu$, mostly 35-100$\mu$.

HOST: *Leonurus cardiaca* L.

TYPE: Cartago, Costa Rica; *Leonurus cardiaca;* F. L. Stevens, No. 33; June 22, 1923.

DISTRIBUTION: Known only from the type locality. Possibly the same species was sent from Campinas, Sao Paulo, Brazil (No. 1152).

NOTE: This has distinctly shorter and more plainly attenuated conidiophores than has *C. nepetae,* which it resembles in other respects. It also resembles *C. kabatiana,* but the base of its conidiophores are wider and their color not so nearly medium brown. *C. isanthi* has a larger number of conidiophores in the fascicle, which has a tendency of being compact rather than divergent.

**Cercospora lycopi** Ellis & Everhart

Jour. Mycol. **3**: 15. 1887

*Cercospora hypticola* Chupp & Muller, Bol Soc. Venez. Cien. Nat. **8** (52): 47. 1942

Leaf spots indistinct to large rusty brown blotches which gradually grade into the normal green of the leaf, 1-10 mm. in extent; fruiting hypophyllous, scantily effuse, grayish to olivaceous; stromata a few pale colored cells filling the stomatal openings; fascicles 5-25 divergent stalks; conidiophores pale to very pale olivaceous or olivaceous brown, paler and more narrow toward the tip, the base may be relatively wide, longest ones variously curved or bent, sparingly septate, occasionally branched, rarely geniculate, small spore scar at conic tip, 2-5 x 10-50$\mu$ or in a humid atmosphere as long as 75$\mu$; conidia hyaline to very pale olivaceous, linear to narrowly obclavate, straight to mildly curved, indistinctly multiseptate, base sharply obconic to long obconically truncate, tip subobtuse to conic, 2-4.5 x 25-150$\mu$.

HOSTS: *Lycopus rubellus* Moench., *Hyptis verticillata* Jacq., Hyptis sp.

TYPES: St. Gabriel, Louisiana; *Lycopus rubellus;* A. B. Langlois, No. 522; Sept., 1886; (*C. hypticola*) Les Tincheras, Edo Carabobo, Venezuela; Hyptis sp.; M. F. Barrus & A. S. Muller, No. 3863; Febr. 24, 1940.

DISTRIBUTION: Alabama, Louisiana, Venezuela.

NOTE: *C. ellisii* and *C. hyptidis* Speg. have also been described on Hyptis, but are not true Cercosporae.

**Cercospora marrubii** Tharp

Mycologia **9**: 111. 1917

*Cercospora marrubii* Savulescu & Sandu-Ville, Hedwigia **73**: 129. 1933

Leaf spots circular to angular, 1-4 mm. in diameter, uniformly yellowish brown and indistinct or sometimes with grayish center; fruiting amphigenous; stromata lacking or a few brown cells; fascicles mostly 3-10 stalks, but occasionally very dense; conidiophores pale olivaceous brown, in mass dark, uniform in width but slightly paler toward the tip, multiseptate, not branched, longer ones undulate or 1-4 mildly to abruptly geniculate, medium spore scar at rounded to subtruncate tip, 4-5.5 x 25-125$\mu$; conidia hyaline, acicular, mildly curved, septa indistinct, base truncate, tip subacute, 2.5-5 x 25-125$\mu$.

HOSTS: *Marrubium vulgare* L., *M. peregrinum* L.

TYPES: Austin, Texas; *Marrubium vulgare;* I. M. Lewis & B. C. Tharp; Sept.-

Dec., 1914; (*C. Marrubii* S. & S.) Near Comana distr. Vlasca, Roumania; *Marrubium peregrinum;* C. Sandu-Ville; Aug. 29, 1931.
DISTRIBUTION: Texas and Roumania. Oklahoma (Pl. Dis. Rept. **32**: 408. 1948.

**Cercospora menthicola** Tehon & Daniels
Mycologia **17**: 247. 1925

Leaf spots circular to angular, 0.5-3 mm. in diameter, gray to tan center, dark purple border; fruiting chiefly epiphyllous; stromata lacking or a few brown cells; non-fasciculate to dense fascicles; conidiophores pale to medium olivaceous brown, multiseptate, sometimes constricted at septa, uniform in color but irregular in width, variously bent or curved, plainly branched, not geniculate or 1-4 mild to abrupt geniculations, small spore scar at rounded tip, 4-6 x 40-140$\mu$; conidia hyaline, acicular, straight to variously curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 60-150$\mu$.

HOSTS: *Mentha arvensis* var. *canadensis* (L.) Briq., *M. canadensis* L.
TYPE: Vandalia, Fayette Co., Ill.; *Mentha canadensis;* P. A. Young, No. 13699; July 14, 1924.
DISTRIBUTION: Illinois; Texas (Plant Dis. Rept. **32**: 408. 1948).
NOTE: *C.Menthae* Hori has been listed on cultivated Mentha in Japan, but in June 1941 Dr. Togashi wrote that he could find neither the type material, nor a printed description of the species.

**Cercospora molucellae** Bremer & Petrak
Sydowia **1**: 261. 1947

Leaf spots circular or elliptic to irregular, 5-10 mm. in diameter, dull gray to fuligenous brown, sometimes with a yellow halo 5 mm. wide; fruiting amphigenous, chiefly epiphyllous, punctiform; stromata erumpent, dark brown, spherical to irregular, 15-50$\mu$ in length; fascicles 2-12 widely divergent stalks; conidiophores clear brown, paler near the apex which is subtruncate, straight to curved, not branched, rarely geniculate, multiseptate, 4-5.5 x 50-500$\mu$; conidia hyaline, acicular, base truncate, tip acute, straight to curved, multiseptate, 3-5 x 80-250$\mu$, tip 2.5-3$\mu$ wide.

HOST: *Molucella laevis* L.
TYPE: Adana, Turkey; *Molucella laevis;* G. Karel; June 6, 1943.
DISTRIBUTION: Turkey.
NOTE: The original description gives the size of the conidiophores as 4-7 x 100-250$\mu$, and of the conidia 5-6 x 120-230$\mu$.

**Cercospora nepetae** Tehon
Mycologia **16**: 140. 1924

Leaf spots numerous, circular to angular, 0.5-3 mm. in diameter, uniformly grayish brown or with a dingy gray center; fruiting amphigenous; stromata mostly lacking; fascicles 2-15 stalks; conidiophores pale to medium brown, slightly paler and more narrow toward the tip, multiseptate, not branched, 0-2 mildly or abruptly geniculate, large spore scar at subtruncate tip, 4-6.5 x 50-225$\mu$, usually 50-150$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute to acute, 3-4 x 40-125$\mu$.

HOST: *Nepeta cataria* L.

TYPE: Ullin, Pulaski Co., Ill.; *Nepeta cataria;* P. A. Young, No. 1419; Aug. 11, 1922.
DISTRIBUTION: Illinois; Texas (Pl. Dis. Rept. **32**: 410. 1948).
NOTE: This differs from the other species with acicular condia on the Labiatae by having especially wide, long, simple conidiophores and relatively narrow condia.

**Cercospora ocimicola** Petrak & Ciferri
Ann. Mycol **30**: 324. 1932

*Corcospora ocimi* Sawada, Literature unknown.

Leaf spots none or indistinct yellowish areas on the upper leaf surface; fruiting in olivaceous to grayish brown effuse areas on the corresponding lower surface; stromata none or filling stomatal openings; nonfasciculate to fairly dense fascicles; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the conic tip, multiseptate, more or less curved, 3-5 x 20-75$\mu$; condia subhyaline to very pale olivaceous brown, cylindric to narrowly obclavate, 5-9 septate, straight to curved, base obconic, tip subacute, 3-4 x 25-155$\mu$.

HOST: *Ocimum micranthum* Willd., *O. basilicum* L.
TYPE: Valle del Cibao, Santiago, San Domingo; *Ocimum micranthum;* E. L. Elkman, No. 3863; Nov. 26, 1930.
DISTRIBUTION: San Domingo, Formosa.
NOTE: A Sawada collection is desposited in the U.S. Dept. Agr. Mycological Herbarium.

**Cercospora perillulae** Togashi et Katsuki
Bot. Magazine, Tokyo **65**: 24. 1952

Leaf spots gray brown above, pale brown below, suborbicular to irregular, 2-4 mm. in diameter, occasionally confluent; fruiting hypophyllous; stromata present, fascicles dense; conidiophores pale olivaceous brown, almost hyaline near the tip, sparingly septate, 2.5-4 x 20-68$\mu$, mostly 20-30$\mu$ in length; conidia pale olivaceous brown, cylindric or longest ones obclavate, straight to slightly curved, base obconically truncate, 5-8 septate, 2.5-3 x 65-95$\mu$.

HOST: *Perillula reptans* Maxim.
TYPE: Kosugidani, Yaku Island, Pref. Kagoshima, Japan; *Perillula reptans;* S. Katsuki; Oct. 16, 1949.
DISTRIBUTION: Japan.
NOTE: Dr. Togashi sent me a small part of the type material.

**Cercospora physostegiae** W. A. Jenkins
Phytopath. **35**: 329. 1945

Leaf spots subcircular to irregular, 2-6 mm. in diameter, ferrugineous to reddish brown; fruiting amphigenous but more abundant on the upper surface, visible under a hand lens; stromata small, pale brown; fascicles dense, compact; conidiophores subhyaline to pale olivaceous brown, almost hyaline at the tip, irregular in width or mildly attenuated, not branched, rarely geniculate, indistinctly septate, 2.5-4 x 10-35$\mu$; conidia hyaline or in mass very pale olivaceous. obclavate or shorter ones almost linear, straight to curved, base long obconically truncate, tip conic, indistinctly multiseptate, 2-4 x 15-70$\mu$.

HOST: *Physostegia virginiana* (L.) Benth.

TYPE: Chatham, Virginia; *Physostegia virginiana;* W. A. Jenkins; Aug. 31, 1943.
DISTRIBUTION: Virginia, Georgia, Missouri.
NOTE: Jenkins described the perfect stage as *Mycosphaerella physostegiae* (Phytopath. 35: 329. 1945.).

**Cercospora racemosa** Ellis & Martin
Amer. Nat. 19: 76. 1885
(Also Jour. Mycol. 1: 55. 1885.)

*Cercospora teucrii* (Schw.) Arthur & Bisby, Proc. Amer. Philos. Soc. 57: 201. 1918.
HOST: *Teucrium canadense* L. (*T. virginicum* L.)
TYPE: Charles City, Iowa; *Teucrium canadense;* J. C. Arthur No. 48; Sept. 27, 1883.
NOTE: These coarse, nonfasciculate forms with thick-walled conidia certainly should not be classed with Cercospora. If nonfasciculate forms may be placed under Helminthosporium, it should be a species of that genus. Halsted in 1892

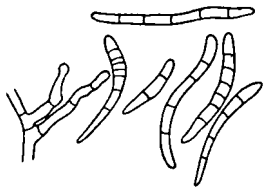


Fig. 120
*C. racemosa*

collected a similarly appearing fungus on *Ambrosia psilostachya* DC. in New Jersey. Apparently Ellis was not sure what to do with the fungus so left it without a label in his herbarium. *C. racemosa* var. *Ambrosiae* (Iowa State Col. Jour. Sci. 3: 321. 1929) on *A. trifida,* being wholly unlike *C. racemosa,* has been placed in the new species *C. trifidae.*

**Cercospora salviicola** Tharp
Mycologia 9: 115. 1917

Leaf spots subcircular to angular, 0.5-5 mm. in diameter, gray center, dark purple border; fruiting amphigenous; stromata a few dark cells; fascicles 3-20 stalks; conidiophores pale to medium dark olivaceous brown, paler and more narrow toward the tip, multiseptate, not branched, 1-5 mildly to abruptly geniculate, rarely straight, medium spore scar at the subtruncate tip, 4-5.5 x 30-80$\mu$ or even 120$\mu$; condia hyaline, acicular, indistinctly multiseptate, straight to slightly curved, base truncate, tip subacute, 2.5-4 x 40-200$\mu$.
HOSTS: *Salvia farinacea* Benth., *S. officinalis* L., *S. azurea* Lam. var. *grandiflora* (*S. pitcheri* Torr.)
TYPE: Austin, Texas; *Salvia farinacea;* B. C. Tharp; Oct. 27, 1915.
DISTRIBUTION: Texas, Oklahoma, and West Virginia; Guatemala.

**Cercospora scorodoniae** Unamuno

XIV, Congr. Assoc. Espanol Progr. Cienc. **1934**: 18. 1935

Leaf spots amphigenous, circular, 2-2.5 mm. in diameter, pale brown; fruiting amphigenous; stromata dark brown, globose, 30-75$\mu$; fascicles usually dense, fairly compact; conidiophores olivaceous brown, paler and more narrow toward the tip, not branched, not septate, straight to slightly curved, 5-6.5 x 25-30$\mu$; conidia pale olivaceous, cylindric to cylindro-obclavate, 4-10 septate, at times somewhat constricted at the septa, straight to mildly curved, ends rounded bluntly, 4-5 x 45-100$\mu$.

HOST: *Teucrium scorodonia* L.
TYPE: Near Atalá, Llanes (Oviedo), Spain; *Teucrium scorodonia;* L. M. Unamuno; July, 1927.
DISTRIBUTION: Spain.
NOTE: I have not seen this species. M. B. Ellis of the Commonwealth Mycological Institute sent me a photostat of the description and illustrations.

**Cercospora scutellariae** Ellis & Everhart

Jour. Mycol. **4**: 54. 1888

Leaf spots angular, limited by leaf veinlets, 2-6 mm. in diameter, dark brown, often with a pale brown or yellow halo; fruiting epiphyllous; stromata pale brown, globular, 25-60$\mu$ in diameter; fascicles dense to very dense; conidiophores pale to medium brown, either attenuated or slightly clavate, rather commonly once septate, not branched, not geniculate, spore scars indistinct, tip conic or obtuse, 4-5.5 x 10-25$\mu$; conidia obclavate, pale olivaceous, straight to mildly curved, indistinctly multiseptate, base obconically truncate to obconic, tip subobtuse, 2-3.5 x 40-125$\mu$.

HOSTS: *Scutellaria versicolor* Nutt., *S. canescens* Nutt. (*S. incana* Spreng.)
TYPE: Concordia, Mo.; *Scutellaria versicolor;* C. H. Demetrio, No. 88; Oct., 1886.
DISTRIBUTION: Studied material from Missouri and Mississippi. In The Plant Dis. Reporter **32**: 413. 1948 it is reported from Texas and Illinois.

**Cercospora stachydis** Ellis & Everhart

Bul. Torrey Bot. Club **24**: 474. 1897

Leaf spots circular, 0.5-3 mm. in diameter, pale rust color to dark brown, sometimes with a fleck of tan in the center, occasionally with a darker brown margin; fruiting chiefly hypophyllous; stromata lacking or a few dark brown cells; fascicles mostly 2-8 stalks; conidiophores pale olivaceous brown, uniform in color and width, not branched, longest ones septate and undulate or 1-3 geniculate, medium spore scar at rounded to subtruncate tip, 4-5 x 20-130$\mu$; conidia hyaline, acicular to almost cylindric, straight to mildly or rarely strongly curved, septa indistinct, base truncate, tip subobtuse, 3-4 x 40-100$\mu$.

HOST: *Stachys palustris* L.
TYPE: Ames, Iowa; *Stachys palustris;* Geo. W. Carver, June, 1895.
DISTRIBUTION: Maine, Iowa, Wisconsin.
NOTE: A packet dated Oct. 4, 1895, in the New York Botanical Garden herbarium bears the appearance of being the type.

**Cercospora teucrii** Ellis & Kellerman

Bull. Torrey Bot. Club **11**: 116. 1884

Leaf spots circular, 1-2.5 mm. in diameter, center gray to white, margin dark brown, fruiting amphigenous; stromata a few dark brown cells; fascicles sometimes dense; conidiophores medium dark yellowish brown, uniform in color, attenuated, sparingly septate, not branched, straight or 1-3 mildly to abruptly geniculate, 2 or more small spore scars at and near the tip, 4-6.5 x 15-80$\mu$ conidia hyaline, acicular, straight to variously curved, indistinctly multiseptate, base truncate, tip acute, 2-3 x 70-200$\mu$.

HOSTS: *Teucrium canadense* L. (*T. virginicum* L.) *T. scorodonia* L.

TYPE: Manhattan, Kansas; *Teucrium canadense;* W. A. Kellerman, No. 457; Aug. 1883.

DISTRIBUTION: Reported in the United States from Wisconsin and Texas eastward. Also reported from Europe and India. Material has been studied from Long Island, Kansas, Wisconsin, and Louisiana.

NOTE: Arthur and Bisby (Proc. Philos. Soc. **57**: 201) found that Schweinitz' *Caeoma* (*Uredo*) *teucrii* is a Cercospora and have proposed the name *Cercospora teucrii* (Schw.) Arth. & Bisby. As Davis (Wisc. Acad. Trans. **20**: 416. 1921) pointed out, their species has long been known as *Cercospora racemosa* and much confusion would result in using the name which has for a number of years represented an entirely different species. I think the Davis point of view is well taken. Besides, the rules of nomenclature do not demand any change in names.

**Cercospora vestita** Ramakrishnan

Proc. Indian Acad. Sci. Sect. B. **34**: 69. 1951

Leaf spots indistinct; fruiting hypophyllous, dark olivaceous, effuse; stromata lacking; fascicles present; conidiophores olivaceous brown, indistinctly septate, strongly flexuous, geniculate near tip; 4-5 x 50-75$\mu$; conidia hyaline or becoming subhyaline with age, cylindric to obclavate, straight to curved, 1-4 septate, 2-4 x 34-60$\mu$.

HOST: *Leucas vestita* Benth.

TYPE: Kodaikanal, Madras, India; *Leucas vestita;* K. V. Srinivasan; Dec. 24, 1949.

DISTRIBUTION: Madras.

NOTE: I have not seen this species, so have not been able to compare it with others on closely related host genera.

**Lauraceae**

A. Conidiophores 3-5 x 30-120$\mu$ or longer; conidia 2.5-5 x 20-100$\mu$.
  B. Leaf spots indistinct; fruiting effuse, olivaceous, hypophyllous; fascicles spreading.
    LAURUS — *C. unicolor*
  BB. Leaf spots large irregular blotches; fruiting amphigenous, not olivaceous; fascicles coremoid.
    PERSEA — *C. purpurea*
AA. Conidiophores 3-5 x 10-35$\mu$ or sometimes longer; leaf spots present.

B. Fruiting amphigenous; stromata 30-80$\mu$ in diameter; conidia 2-3.5 x 30-100$\mu$.
LINDERA *C. lindericola*

BB. Fruiting hypophyllous; stromata lacking; conidia 3-5 x 20-70$\mu$
LITSEA *C. litseae-glutinosae*

**Cercospora iteodaphnes** (Thümen) Saccardo
Syll. Fung. **4**: 464. 1886

*Helminthosporium iteodaphnes* Thümen, Rev. Mycol. **2**: 38. 1880.

HOST: *Tetranthera iteodaphne* Nees. (*Litsea ovalifolia* Trimen).

TYPE: Ceylon; *Tetranthera iteodaphne;* Thwaites.

NOTE: Ravenel sent Cooke a specimen on *Tetranthera geniculata* Nees. from Darien, Ga. (Rav. No. 777, Cooke No. 3360). Cooke placed it in the Kew herbarium as *Helminthosporium pistillare.* Later he thought it was the same as *C. berkeleyi* which Ravenel had sent him on Gleditschia. The fungi on the two hosts resemble each other, but are plainly distinct. *C. iteodaphnes* could be considered an Helminthosporium with more justification than leaving it a Cercospora.

**Cercospora lindericola** Yamamoto
Phytopath. Lab. Taihoku, Imp. Univ. Contrib. **28**: 603. 1934

Leaf spots irregular in outline, from small specks to large part of leaf area, yellowish brown to dark brown, either with black border, or with irregular black areas mixed with the brown; fruiting amphigenous; stromata when present dark brown, subglobular, 30-80$\mu$ in diameter; conidiophores borne singly from procumbent threads or in dense fascicles on the stromata, in mass dark brown, singly pale olivaceous brown, fairly uniform in color and width or sometimes attenuated, multiseptate, branched, not geniculate, almost straight to bent or curved, small spore scar at the narrowly subtruncate tip, 3-4.5 x 20-75$\mu$; conidia very narrowly linear or slightly attenuated, subhyaline to very pale olivaceous, straight to curved or undulate, indistinctly multiseptate, base subtruncate, tip subacute, 2-3.5 x 30-100$\mu$.

HOST: *Lindera oldhami* Hemsl.

TYPE: Taihoku, Formosa; *Lindera oldhami;* W. Yamamoto; Dec. 12, 1933 Publication says 1934 but type packet is marked 1933).

DISTRIBUTION: Known only from the type locality.

NOTE: See note under *C. unicolor* and key, page 273.

**Cercospora lingue** Spegazzini
Bol. Acad. Nac. Ciencias, Cordoba **25**: 114. 1921

HOST: *Persea lingue* Nees.

TYPE Los Perales, Chile; *Persea lingue;* No. 958; 1918.

NOTE: The dark colored, plainly septate, thick walled conidia bar this species from being a Cercospora. It probably should be listed as a Helminthosporium. Spegazzini published the species with a question mark following the genus.

**Cercospora litseae** P. Hennings
Bot. Jahrb. von Engler **31**: 742. 1902

HOST: *Litsea glauca* Sieb.

TYPE: Tokyo: Komaba, Japan; *Litsea glauca;* Ikeno, No. 117.

NOTE: I could find only traces of fruiting when I studied the type in the Berlin Herbarium. These fragments seemed to indicate that the fungus was not a Cercospora. If fruiting could be found, it still might be possible to show that it is identical with *C. litseae-glutinosae.*

**Cercospora litseae-glutinosae** H. & P. Sydow
Philipp. Jour. Sci. (Bot.) 8: 283. 1913

Leaf spots dark brown to black, on upper surface with paler center, 0.5-5 mm. in diameter, on lower surface indistinct; fruiting hypophyllous; stromata lacking; nonfasciculate; conidiophores short branches from procumbent threads, pale brown, sparingly septate, not or rarely geniculate, small spore scar at rounded to conic tip, 3-5 x 10-35$\mu$; conidia pale to very pale olivaceous, obclavato-cylindric, shorter ones distinctly cylindric, straight to slightly curved, 1-8 septate, base obconically truncate, tip obtuse, 3-5 x 20-70$\mu$.

HOST: *Litsea glutinosa* C. B. Rob., *L. japonica* Mirb.
TYPE: Luzon, Prov. of Laguna, Los Banos, Philippines; *Litsea glutinosa;* E. D. Merrill (C. F. Baker, No. 639); Jan. 7, 1913.
DISTRIBUTION: Several collections from the Philippines. Japan.
NOTE: This may finally prove to be the same as *C. litseae,* although Hennings describes the latter as having very wide conidia. See key, page 274.

**Cercospora machili** Sawada
Formosa Agr. Res. Inst. Rept. 85: 113. 1943

Leaf spots brown, 3-10 mm. in diameter; fruiting epiphyllous; stromata 34-60$\mu$; fascicles dense; conidiophores olivaceous brown, not septate, strongly geniculate, not branched, 2.5-3 x 10-15$\mu$; conidia olivaceous, 5-9 septate, 2.5-3 x 40-90$\mu$.

HOST: *Machilus kusanoi* Hay.
DISTRIBUTION: Formosa (Taiwan).
NOTE: I have not seen this species, nor do I know what the type is. It is unfortunate that Sawada did not describe his specimens in more detail.

**Cercospora perseae** Ellis & Martin
Amer. Nat. 18: 189. 1884

HOST: *Persea palustris* Sarg.
TYPE: Florida; *Persea palustris;* Geo. Martin; Febr. 3, 1883.
NOTE: Saccardo (Syll. Fung. 4: 464. 1886) has made this a synonym of *C. Purpurea.* He is wrong. *C. purpurea* has relatively short conidiophores in compact to spreading fascicles. *C. Persea* has a distinct and compact coremium up to 400$\mu$ long, similar to those of Arthrobotryum. Both Arthrobotryum and *C. purpurea* may sometimes be present on the same leaf, and this may account for their being confused in literature.

**Cercospora purpurea** Cooke
Grevillea 7: 34. 1878

At first leaf spots indistinct and the fruiting on lower leaf surface along the veins, especially in the vein angles; later leaf spots large irregular blotches, up to 15 mm. in diameter, pale brown, slightly darker line margin, sometimes no distinct spots and fruiting appears semi-effuse on lower leaf surface, finally leaf dies; when spots are present fruiting is amphigenous; also occurs on the fruit; stromata dark to black, globular to irregular, 15-125$\mu$ in diameter; fascicles

fairly to extremely dense, divergent to compact; conidiophores pale to medium dark olivaceous brown, dark in mass, uniform in width and color, multiseptate, not or rarely branched, slightly geniculate, straight to undulate, small spore scar at rounded tip, 3-4.5 x 20-200$\mu$, some collections showing only short divergent conidiophores and others only long ones, appearing especially long when conidia are persistent; conidia obclavato-cylindric, pale olivaceous, long obconically truncate base, obtuse to subacute tip, indistinctly 1-9 septate, straight to curved, 2-4.5 x 20-100$\mu$.

HOSTS: Persea sp., *P. americana* Mill. (*P. gratissima* Gaertn.), *P. carolinensis* Nees. (*P. pubescens* Sarg.), *P. palustris* Sarg.

TYPE: Darien, Georgia; Persea sp.; W. H. Ravenel, No. 290 (Cooke 2499).

DISTRIBUTION: Studied material from Florida, Georgia, Mississippi, Puerto Rico, and Sao Paulo, Brazil. Also reported from Costa Rica and Peru.

NOTE: Saccardo (Syll. Fung. **15:** 84. 1901) states that *C. perseae* is a synonym of *C. purpurea.* This is incorrect. The type of *C. perseae* has effuse fruiting with long conidiophores in a true coremium. *C. purpurea* has distinct spots and relatively short conidiophores in divergent fascicles. The original descriptions gave *C. purpurea* much wider conidia and conidiophores but the type at Kew shows only narrow ones. See key, page 273.

**Cercospora unicolor** Saccardo & Penzig

Michelia **2:** 642. 1882

Leaf spots none or indistinct; fruiting in effuse olivaceous patches on lower leaf surface; fasciculate; conidiophores olivaceous, sparingly septate, branched, 4-5 x 100-120$\mu$; conidia pale olivaceous, cylindric, slightly curved, 3-5 septate, bluntly rounded at both ends, 4-5 x 70-100$\mu$.

HOST: *Laurus nobilis* L.

TYPE: A garden in Grenoble, France; *Laurus nobilis;* Therry, No. 6187.

DISTRIBUTION: France, and possibly Alabama.

NOTE: I was unable to study the type of this species. Seymour (Host Index p. 173. 1929) and Anderson et al (Check list of diseases p. 59. 1926) report this species as present in Florida on Lilium. So far as I am aware *C. unicolor* does not occur on Lilium. Berkeley (Grevillea **3:** 102. 1874) reported *C. petersii,* on *Laurus Benzoin* L. (=*Lindera Benzoin* Meissn.) collected in Alabama. This may have been *C. unicolor* or *C. lindericola.* Atkinson has a packet of the same host, the fungus of which is labeled *C. cladosporioides.* It is not that species but the material is too meager to be sure of its identity. See key, page 273.

**Cercospora barringtoniae** H. & P. Sydow

Ann. Mycol. **11:** 406. 1913

Leaf spots circular to subcircular, 3-6 mm. in diameter, brown, no distinct margin; fruiting amphigenous but far more abundant on the upper surface; stromata subglobular, dark brown, 30-60$\mu$ in diameter; fascicles dense, compact to divergent; conidiophores in mass dark brown, singly medium brown, fairly uniform in color and width, multiseptate, not branched, sparingly geniculate, mildly to moderately sinuous or tortuous, tip conic, 3-4 x 25-180$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate, straight to curved, indistinctly multiseptate, base long obconically truncate, tip subobtuse, 2.5-4 x 25-85$\mu$.

HOST: *Barringtonia luzoniensis* Vidal.

TYPE: Los Banos, Philippines; *Barringtonia luzoniensis;* S. A. Reyes (C. F. Baker, No. 1555); Aug. 8, 1913.
DISTRIBUTION: Known only from the type locality.

**Cercospora careyae** T. S. & K. Ramakrishnan

Proc. Indian Acad. Sci. Sect. B. **32**: 105. 1950

Leaf spots amphigenous, isolated, irregular, brown; fruiting amphigenous; stromata small, brown, at first subepidermal, later erumpent; fascicles dense, divergent; conidiophores brown, 0-4 septate, straight to tortuous, not branched, geniculate near tip, 3-4.5 x 50-100$\mu$; conidia subhyaline to pale brown, obclavate, mildly curved, 1-6 septate, base obconic, tip subobtuse, 3-6 x 15-85$\mu$.

HOST: *Careya arborea* Roxb.
TYPE: Gudalur, Madras, India; *Careya arborea;* T. S. Ramakrishnan; May 17, 1949.
DISTRIBUTION: India.
NOTE: I have not seen the species.

**Corcospora couratariae** sp. nov.

Maculae suborbiculares vel angulatae, 3-7 mm. diam., pallide brunneae vel atrofuscae, in epiphyllo saepe zonula angusta flavida cinctae; caespituli fere epiphylli; stromata globosa, pallide olivaceo-brunnea, 15-30$\mu$ diam.; conidiophora dense sed diverse fasciculata, subhyalina vel pallidissime olivaceo-brunnea, vix septata, simplicia, haud geniculata, recta vel sinuosa, 2-4 x 10-40$\mu$; conidia obclavata, subhyalina vel pallide olivacea, spurie 1-7 septata, recta vel leniter curvata, ad basim subtruncata, ad apicem obtuse rotundata, 2-4 x 20-70$\mu$.

Leaf spots subcircular to angular, 3-7 mm. in diameter, pale to dark reddish brown, narrow yellowish brown margin; fruiting chiefly epiphyllous; stromata globular, pale olivaceous brown, 15-30$\mu$ in diameter; fascicles mostly dense, divergent; conidiophores subhyaline to very pale olivaceous brown, uniform in color and width, sparingly septate, not branched, not geniculate, straight to undulate, tip rounded to conic, 2-4 x 10-40$\mu$; conidia obclavate to obclavato-cylindric, subhyaline to pale olivaceous, indistinctly 1-7 septate, straight to mildly curved, base obconically truncate, tip subobtuse, 2-4 x 20-70$\mu$.

HOST: *Couratari estrellensis* Raddi (*Cariniania estrellensis* [Raddi] O. Kuntze).
TYPE: Minas Geraes; *Couratari estrellensis;* A. S. Muller, No. 761; March 21, 1934.
DISTRIBUTION: Several collections from Minas Geraes.

**Cercospora acaciae-confusae** Sawada

Dept. Agr. Governm. Res. Inst. Formosa, Report **35**: 105. 1928

Leaf spots circular, 0.5-2 mm. in diameter, brown or when older with gray center and raised margin; fruiting amphigenous; stromata slight; fascicles 10 or more stalks; conidiophores brown, 1-2 septate, erect, branched near the basal region, 3-4 x 20-65$\mu$; Conidia hyaline, cylindric, straight to mildly sinuous, 6-10 septate, occasionally constricted at the septa, ends rounded, 3.5-5 x 50-80$\mu$, averaging 4 x 66.7$\mu$.

TYPE: Formosa; *Acacia confusa* Merr.; Kaneyoshi Sawada.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not been able to procure material of this species.

**Cercospora aeschynomenes** Muller and Chupp

Arch. Inst. Biology Veget. Rio de Janeiro **3**: 91. 1936

TYPE: Minas Geraes, Brazil; *Aeschynomene falcata* DC.; A. S. Muller, No. 893; April 20, 1935.

NOTE: Neither Engler and Prantl nor Saccardo list a genus which has medium dark brown, long conidiophores and 1-septate, clavate conidia, subhyaline to pale olivaceous and measuring 5-8 x 15-35$\mu$. But the fungus on Aeschynomene resembles Didymaria so closely in all respects, excepting color, that this fungus at present is listed as a species of that genus. Its short, wide, 1-septate conidia do not fit Cercospora.

**Cercospora alemquerensis** Spegazzini

Anal. Soc. Cient. Argentina **93**: 116. 1922

TYPE: Rio Parú, Pará, Brazil; *Acacia alemquerensis* Huber; Ducke, No. 10453 (Speg. No. 950); July 9, 1919.

NOTE: The type has only one tiny leaflet, which so far as I could discover, has no fruiting present. Neither his drawing on the packet nor the published description resembles *Cercospora*. The conidiophores are supposed to be 14-16$\mu$ wide and the falcate conidia 12-14$\mu$. These measurements are abnormal, therefore, for the present the species is considered not a Cercospora.

**Cercospora alhagi** Barbarin

Astrachan Plant. Prot. Stat. Notes **1** (3): 10, 1924

Affects leaves, twigs and spines; no definite spots but small aggregations of minute black pustules, 0.5-3 mm. in extent; most of the pustules are immature pycnidial or perithecial stages of some fungus; among these are dark brown, globular to elongate stromata, 30-125$\mu$ in length; nonfasciculate or on the stromata dense fascicles; conidiophores pale to medium brown, slightly paler and more narrow toward the tip, longest ones 1-2 septate, not branched excepting as single branches from procumbent threads, not geniculate, nonfasciculate ones may be variously bent, minute spore scar at bluntly rounded tip, 4-6 x 5-40$\mu$; conidia pale olivaceous brown, cylindric, straight, 1-5 septate, at times constricted at the septa, base short obconic or rounded, tip obtuse, 3-5 x 10-50$\mu$.

TYPE: Astrachan; Turcestania; *Alhagi camelorum* Fisch.; I. E. Barbarin; 1912.

DISTRIBUTION: Several collections from Astrachan.

NOTE: The above description was taken mainly from a collection Szembel made in 1924, and which he kindly sent. me. Szembel states that the conidia are hyaline and some as large as 5.6 x 115-125$\mu$.

**Cercospora amphicarpaeae** Togashi & Katsuki

Annals Phytopath. Soc. Japan **17**: 5. 1952

Leaf spots subcircular to angular or irregular, 1-3 mm. in diameter, brown with the center later becoming gray, distinct margin, often confluent; fruiting hypophyllous; stromata subglobose, dark brown, 25-40$\mu$ in diameter; conidiophores in loose fascicles, olivaceous brown, not branched, denticulate, straight to slightly flexuous, 1-4 septate, tip subtruncate, 4-5 x 95-200$\mu$; conidia hyaline, acicular to obclavate, mildly curved, 6-12 septate, base truncate, tip acute, 4-5 x 70-160$\mu$.

HOST: *Amphicarpaea trisperma* Baker.

TYPE: Hino-machi, Minamitama, Toyko Pref., Japan; *Amphicarpaea trisperma*; E. Kurosawa; Sept. 10, 1951.
DISTRIBUTION: Japan.
NOTE: Professor Katsuki kindly sent me type material of nearly all his collections.

**Cercospora anagyridis** Patouillard

Bul. Soc. Mycol. de France **19**: 261. 1903

Leaf spots circular, 2-5 mm. in diameter, pale brown to reddish brown center, dark to almost black margin; fruiting sparsely amphigenous; stromata dark brown to almost black, globular, 30-75$\mu$ in diameter; fascicles dense to very dense, divergent, conidiophores pale to medium olivaceous brown, uniform in color, somewhat attenuated toward the tip, or rarely the base swollen to 7-8$\mu$ in width, sparingly septate, not branched, straight to tortuous or 1-2 abruptly geniculate, large spore scar at the subtruncate tip, 4-6 x 20-100$\mu$, many fascicles showing only lengths of 20-40$\mu$; conidia hyaline, cylindric to almost acicular, straight to mildly curved, indistinctly multiseptate, base subtruncate, tip mostly subobtuse, 3-5 x 30-75$\mu$.

TYPE: Algeria; *Anagyris foetida* L.; Dr. Trabut; 1901.
DISTRIBUTION: Known only from the type locality.

CERCOSPORAE ON CASSIA

A. Conidia hyaline, often acicular.
  B. Conidia acicular, base truncate, 4-5 x 30-130$\mu$; conidiophores occasionally in coremoid-like fascicles, 4-5.5 x 30-100$\mu$; fruiting forming black stipples on the pods.
    C. OCCIDENTALIS — *C. cassiocarpa*
  BB. Conidia a mixture of cylindric and acicular, base truncate to obconic, 4-7.5 x 30-55$\mu$; conidiophores in loose fascicles, 4.5-7 x 15-70$\mu$; fruiting on leaves, hypophyllous.
    C. CHAMAECRISTA — *C. chamaecrista*
AA. Conidia colored, not acicular.
  B. Stromata very prominent, 50-250$\mu$ in diameter; fascicles exceedingly dense; conidiophores 4-5.5 x 10-35$\mu$; conidia obclavato-cylindric, 4-5.5 x 20-125$\mu$.
    CASSIA spp. — *C. sphaeroidea*
  BB. Stromata lacking or small; fascicles not exceedingly dense.
    C. Leaf spots distinct; fruiting not effuse, amphigenous; fascicles compact; conidia narrowly obclavate, 2-4 x 15-75$\mu$; conidiophores 2-3.5 x 10-50$\mu$.
      C. HIRSUTA — *C. angustata*
    CC. Leaf spots indistinct; fruiting effuse; fascicles not compact.
      D. Fruiting sooty in color, sometimes on both leaf surfaces; conidia 3.5-5 x 30-80$\mu$; conidiophores in fascicles of 2-12, pale to medium in color, 3.5-5 x 15-125$\mu$, branched.
        CASSIA spp. — *C. nigricans*
      DD. Fruiting olivaceous or sometimes almost black; conidia 3-7$\mu$ in width; fascicles fairly dense; conidiophores rarely branched.
        E. Conidia plainly multiseptate, more nearly cylindric than obclavate, 35-150$\mu$ in length; conidiophores rarely branched, 4-6 x 5-40$\mu$.
          CASSIA spp. — *C. occidentalis*

EE. Conidia mostly 3-septate, more nearly obclavate than cylindric, 20-80$\mu$ in length; conidiophores not branched, 3-5 x 50-300$\mu$.
C. MARYLANDICA *C. simulata*
C. ALATA

**Cercospora angustata** Chupp et Solheim, sp. nov.

Maculae suffuscae vel obscure griseae, 0.5-3 mm. diam., angulatae; stromata minuta, atro-fusca, subglobosa; conidiophora dense fasciculata, conferta pallidissme olivaceo-brunnea, apicem versus saepe subhyalina, recta vel fortiter sinuosa, simplicia, haud geniculata, vix septata, 2-3.5 x 10-50$\mu$; conidia obclavato-cylindrata, pallidissime olivacea, recta vel leniter curvata, 3-7 septata, utrimque subacuta, 2-4 x 15-75$\mu$.

Leaf spots brownish to dingy gray, 0.5-3 mm. in diameter, angular, on dried leaf almost invisible, especially on the upper surface; stromata small, dark brown, subglobose; fascicles dense, fairly compact; conidiophores pale to very pale olivaceous brown, almost hyaline near the conic tip, straight to strongly undulate, not branched, not geniculate, rarely septate, 2-3.5 x 10-50$\mu$; conidia obclavato-cylindric or very narrowly obclavate, very pale olivaceous, straight to mildly curved, 3-7 septate, base obconic, tip subacute, 2-4 v 15-75$\mu$.

HOST: *Cassia hirsuta* L.

TYPE: Finca "Rincon" along Ponce River, South of Cali, Columbia; *Cassia hirsuta;* Chardon and Nolla, No. 258; May 14, 1929.

DISTRIBUTION: Several collections from Columbia.

NOTE: See key above for separation of the species on Cassia.

**Cercospora arachidicola** Hori

Nishigahara Agri. Expt. Sta. Tokyo. Ann. Rep. p. 26. 1917

*Cercospora arachidis* var. *macrospora* Maffei, Riv. Pat. Veget. **12**: 7. 1922

Leaf spots circular to irregular, often confluent, dark brown to almost black, usually surrounded by a yellow halo, 1-10 mm. in diameter; fruiting amphigenous, on young spots chiefly epiphyllous; stromata present, slight or 25-100$\mu$

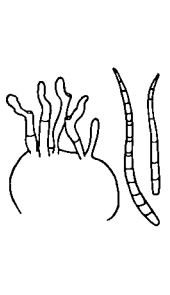


Fig. 121
*C. arachidicola*

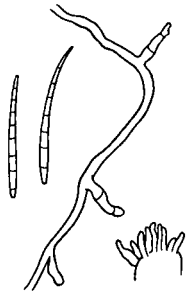


Fig. 122
*C. bradburyae*

Fig. 123
*C. cajani*

in diameter, dark brown; fascicles sometimes dense (5 to many); conidiophores pale olivaceous brown, 0-2 septate, mostly plainly once geniculate, not branched, 3-5 x 15-45$\mu$; conidia subhyaline to pale olivaceous; obclavate, mildly to much curved, 3-12 septate, base rounded to distinctly truncate, tip subacute, 3-5 x 35-110$\mu$.

HOST: *Arachis hypogaea* L.
TYPE: Experiment Station, Tokyo, Japan; *Arachis hypogaea;* S. Hori.
DISTRIBUTION: Probably co-extensive with intensive culture of the host. Saw material from a number of southern states, Sao Paulo, Formosa, Japan, India, and South Africa.
NOTE: At first glance this species might be confused with *C. tuberosa, C. lussoniensis,* and *C. pueraricola,* also occurring on the Papilionatae of the Leguminosae. But the distinct geniculation of the conidiophores, the less dense fascicles, and the truncate base of some conidia separate it from all the other species on this host family. It is easily separated from *C. personata,* which has cylindric conidia, 5-7$\mu$ wide. The two species sometimes are found in the same mount. A perfect stage has been described by Jenkins. He named it *Mycosphaerella arachidicola* (Jour. Agr. Res. **56:** 317. 1938).

**Cercospora argyrolobii** Chupp & Doidge
Bothalia **4:** 881. 1948

Leaf spots angular to irregular dark areas on the foliage, minute to large part of leaf surface, no distinct border; fruiting chiefly epiphyllous; stromata lacking or small, dark brown, nonfasciculate to dense fascicles; conidiophores pale to medium brown, somewhat paler toward the tip, irregular in width, closely and plainly septate, may be constricted at septa, variously curved to tortuous, branched, rarely geniculate, 4-6.5 x 20-100$\mu$, small spore scar at the bluntly rounded to conic tip; conidia pale to medium olivaceous brown, obclavate to obclavato-cylindric, shortest ones may be cylindric, straight to mildly curved, distinctly 3-13 septate, constriction at some of the septa, base subtruncate to long obconically truncate, tip mostly obtuse, 4-6.5 x 15-110$\mu$.
HOST: *Argyrolobium wilmsii* Harms.
TYPE: Nelspruit, Barberton, Transvaal; *Argyrolobium wilmsii;* L. Liebenberg (D 54), No. 26075; April, 1931.
DISTRIBUTION: Known only from the type locality.
NOTE: This is a border line species between Helminthosporium or Pseudocercospora and Cercospora.

**Cercospora ariminensis** Cavara
Rev. Mycol. **21:** 103. 1899

Leaf spots circular to subcircular, 1.5-4 mm. in diameter, pale to medium brown, sometimes with a pale narrow raised line border; fruiting amphigenous; stromata none or a few brown cells; fascicles 1-12 stalks; conidiophores pale olivaceous brown, slightly paler and more narrow toward the tip, sparingly septate, not branched, not geniculate, straight, medium spore scar at the subtruncate tip, 4-6 x 40-150$\mu$; conidia hyaline, acicular, straight to curved, indistinctly septate, base truncate, tip subacute, 2.5-4 x 50-150$\mu$.
TYPE: Rimini, Italy; *Hedysarum coronarium* L.; D. Shrozzi; 1899. Cotype distributed as I. Funghi Parassiti della Piante Coltivate od utili No. 333.
DISTRIBUTION: Italy and Sao Paulo. Cavara determined the collection from Brazil.

**Cercospora astragali** Woronichin
Trav. Mus. Bot. Acad. Science USSR **21:** 232. 1927

Leaf spots subcircular or irregular when at the tip or margin of the leaf,

2-4 x 5-10 mm. in extent, ochre-brown; fruiting amphigenous but chiefly epiphyllous; stromata slight; fascicles partly dense; conidiophores pale to medium fuligenous or brown base, paler and more narrow toward the tip, 1-3 septate, rarely branched, 0-4 geniculate, medium spore scar at the subtruncate tip, 3.5-5 x 20-80$\mu$; conidia hyaline, acicular to almost cylindric, indistinctly multiseptate, straight to mildly curved, base truncate, tip subobtuse, 2-4.5 x 30-130$\mu$.

HOSTS: *Astragalus canadensis* L., *A. cicer* L., *A. galegiformis* L., *A. sinicus* L.

TYPE: Transcaucasia, Grev. Tiflis, dist. Gori, prope p. Likani; *Astragalus galegiformis;* N. Woronichin; July 17, 1920.

DISTRIBUTION: Transcaucasia, Wisconsin, Oklahoma, Japan.

NOTE: The Wisconsin and Oklahoma specimens fit closely Woronichin's description. I have not seen the type. The specimen Professor Shigetaka Katsuki sent me from Japan had longer conidiophores (65-180$\mu$) and conidia (30-280$\mu$) than did the other specimens I examined.

CERCOSPORAE ON PUERARIA

A. Conidia hyaline, acicular, 4-6 x 50-200$\mu$; fascicles 3-12 stalks; conidiophores medium dark brown, 4.5-7 x 30-140$\mu$.
P. HIRSUTA *C. austrinae*

AA. Conidia colored, not acicular.
B. Conidia cylindric, medium dark brown, 5.5-8 x 30-80$\mu$; conidiophores medium dark brown, 5-7 x 50-300$\mu$; fascicles usually not dense.
P. PHASEOLOIDES *C. puerariae*

BB. Conidia cylindro-obclavate, very pale colored, 3-6 x 20-135$\mu$; conidiophores very pale, 3-4.5 x 20-80$\mu$; fascicles dense.
P. THUNBERGIANA *C. pueraricola*

**Cercospora austrinae** Chupp & Viégas
Bol. da Soc. Brasil de Agron. **8**: 10. 1945

Leaf spots circular, 0.5-4 mm. in diameter, at first minute yellowish specks, which enlarge as the center turns dark reddish brown; fruiting epiphyllous; stromata lacking or a few brown cells; fascicles 3-12 stalks, divergent; conidiophores medium to dark brown, slightly paler and more narrow toward the tip, 1-6 septate, branching fairly common, straight to tortuous, upper third sometimes undulate to multigeniculate, small to medium spore scar at the subtruncate tip, 4.5-7 x 30-140$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip subacute, 4-6 x 50-200$\mu$.

TYPE: Instituto Agronomico, Campinas, Sao Paulo, Brazil; *Pueraria hirsuta* Kurz; H. P. Krug and A. S. Costa, No. 696; May 29, 1935.

DISTRIBUTION: Known only from the type locality.

NOTE: See key above for differences among the species on this host genus.

**Cercospora bakeriana** Saccardo
Ann. Mycol. **12**: 313. 1914

Oval to elliptical, dark to almost black, effuse fruiting areas on stems, 2-5 mm in extent; stromata subglobular, dark brown, 20-50$\mu$; fascicles a few stalks to dense; conidiophores medium to dark brown, uniform in color and width, multiseptate, not branched, rarely geniculate, almost straight, medium spore scar at the subtruncate tip, 4-6 x 100-170$\mu$; conidia hyaline acicular, straight to mildly curved, indistinctly septate, base truncate, tip subacute, 3-4 x 40-125$\mu$.

HOST: *Caesalpinia pulcherrima* Sw. (*Poinciana pulcherrima* L.).

TYPE: Mt. Maquiling, near Los Banos, Prov. Laguna, Philippines; *Poinciana pulcherrima;* C. F. Baker, No. 118a; Sept. 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: The same fungus was supposed to occur also on *Mallotus moluccanus* Muell. (C. F. Baker, No. 312) and *M. japonicus* Muell. (Formosa Agr. Res. Inst. Rept. 87: 1944). Since the one on *Poinciana* has hyaline acicular conidia as mentioned in the original description, the fungus on this host is retained as *C. bakeriana.* The species on Mallotus has colored, closely septate, thick-walled conidia, so is considered an Helminthosporium.

**Cercospora barbatimao** Viégas

Bragantia **5**: 567. 1945

Leaf spots numerous, punctiform, irregular in shape, reddish brown, under hand lens appearing as if cuticle had been burst out; fruiting chiefly hypophyllous; stromata brown, filling stomatal openings or occasionally as large as 30$\mu$ in diameter; fascicles 3-15 divergent stalks; conidiophores pale olivaceous brown, uniform in color, irregular in width, rarely septate or geniculate, not branched, bluntly rounded to conic tip, 3-6 x 10-45$\mu$ (Viégas says 4-4.5 x 30-120$\mu$); conidia subhyaline to pale olivaceous, cylindro-obclavate, straight to mildly curved, 3-7 septate, base obconically truncate, tip subobtuse, 3-4.5 x 25-110$\mu$.

TYPE: Escola Superior de Agricultura Lavras, Minas Geraes, Brazil; *Stryphnodendron barbatimam* Mart.; Aray Martins & G. A. Black, No. 4752; Sept. 3, 1944.

DISTRIBUTION: Several collections from Lavras, Brazil.

NOTE: The host is closely related to Prosopis, but the Cercospora on the latter has denser fascicles, more narrow conidiophores and very closely septate conidia.

**Cercospora bauhiniae** H. & P. Sydow

Ann. Mycol. **12**: 202. 1914

*Cercospora latimaculans* Wakefield, Kew Bul. Misc. Inform. **1918**: 210. 1918

Leaf spots orbicular to angular, 2-9 mm. in extent, grayish brown to pale brown, with a dark brown line margin; fruiting chiefly hypophyllous; stromata globular, dark brown, 15-40$\mu$ in diameter; fascicles dense, rarely very dense; conidiophores pale to medium brown, paler and more narrow toward the tip, 0-1 septate, not branched, not geniculate, straight to mildly curved, small spore scar at the bluntly rounded tip, 3-4.5 x 10-20$\mu$ or in some collections as long as 40$\mu$; conidia subhyaline to pale olivaceous, obclavate, shortest ones may be cylindric, almost straight, 3-9 septate, base obconically truncate, tip subobtuse, 2.5-5 x 30-125$\mu$, mostly 30-65$\mu$.

HOSTS: *Bauhinia galpini* N. E. Br., *B. malabarica* Roxb., *B. reticulata* DC., Bauhinia sp.

TYPES: Mt. Maquiling, near Los Banos, Prov. Laguna, Philippines; *Bauhinia malabarica;* C. F. Baker; Dec. 1913. Cotype distributed as Fungi Malayana, No. 15; (*C. latimaculans*) Gold Coast, Africa; Bauhinia sp.; R. H. Bunting; June 1917.

DISTRIBUTION: Philippines, Transvaal, Venezuela, Colombia, Gold Coast, Ethiopia.

NOTE: The different collections vary somewhat more than usually is true of a species, but all of them seem nearly enough alike to consider them as one species.

**Cercospora bonjeaneae** Maire

Bul. Soc. Hist. Nat. l'Afrique du Nord. **8**: 193. 1917

*Cercospora bonjeaneae-rectae* Caballero, Facul. Cien. Univ. Barcelonia. Publ. Secc. Cien. Nat. **12**: 104. 1920

HOST: *Dorycnium rectum* Ser. (*Bonjeanea recta* Reichb.).

TYPES: Maurentania (Mitija, Misserrghin, etc.); *Bonjeanea recta;* R. Maire; (*C. bonjeaneae-rectae*) Prope Barcelonia, Las Planas; *Bonjeanea recta;* A. Caballero; Oct. 1919.

NOTE: Material of neither species was available for comparison. The two descriptions are nearly enough alike to consider them at present identical. Maire states that the conidia are verruculose. If this is true, his species cannot be a Cercospora.

**Cercospora boringuensis** Young

Mycologia **8**: 45. 1916

*Didymaria boringuensis* (Young) Solheim & Stevens, Mycologia **23**: 400. 1931

Leaf spots pale brown to dingy tan, circular to angular, 2-12 mm. in diameter, often bordered by a dark brown line; fruiting amphigenous; stromata slight; fascicles often dense, occasionally coremium-like; conidiophores pale olivaceous brown, not geniculate, sparingly branched, tip sometimes conic, slightly curved or wavy, septa not prominent, 3-4 x 75-200$\mu$; conidia subhyaline to pale olivaceous or olivaceous brown, clavate to cylindric, long obconic base, tip bluntly rounded, straight to curved, rarely almost shepherd-crook, 1-7 septate, 4-7 x 30-55$\mu$.

TYPE: Mayaguez, Puerto Rico; *Calopogonium orthocarpum* Urb.; F. L. Stevens, No. 6752; Dec. 27, 1913.

DISTRIBUTION: Puerto Rico and San Domingo.

NOTE: Solheim and Stevens change the genus to Didymaria, because some of the conidia are clavate. If there were not a large number of species with a mixture of clavate, cylindric, and oblcavate conidia, this might be a character for dividing the large genus. See also *C. calopogonii* for difference between the species on this host genus.

CERCOSPORAE ON BRADBURYA, CENTROSEMA, AND CLITORIA

A. Conidia hyaline, acicular, base truncate, 2-4 x 20-120$\mu$; conidiophores chiefly epiphyllous, in fascicles of 3-12, 3.5-6 x 20-125$\mu$.
CLITORIA TERNATEA — *C. ternateae*

AA. Conidia hyaline to faintly colored, not acicular, base not truncate.

B. Leaf spots indistinct; fruiting effuse, hypophyllous; conidia obclavate, 4-6 x 20-60$\mu$; conidiophores branched, tortuous, 3-5.5 x 40-200$\mu$.
CENTROSEMA (BRADBURYA, CLITORIA) — *C. centrosemae*

BB. Leaf spots distinct; fruiting not effuse; conidia linear to narrowly obclavate, 2-4 x 30-120$\mu$; conidiophores not branched.
C. Conidiophores long, 2-3.5 x 30-105$\mu$; fruiting chiefly hypophyllous; stromata slight; fascicles dense.
CENTROSEMA (BRADBURYA) *C. cylindrospora*
CC. Conidiophores rarely as long as 50$\mu$; fruiting chiefly epiphyllous; stromata present.
D. Conidiophores 3-4.5 x 5-50$\mu$, arising singly from mycelium or in dense fascicles from stromata which measure 20-70$\mu$; conidial septa fairly evident.
CENTROSEMA (BRADBURYA) *C. bradburyae*
DD. Conidiophores 2.5-4 x 10-25$\mu$, arising in fascicles of 5-20 from stromata measuring 20-40$\mu$; conidial septa indistinct.
CLITORIA, CENTROSEMA *C. clitoriae*

**Cercospora bradburyae** Young
Mycologia 8: 46. 1916

Leaf spots angular to irregular, 1-4 mm. in diameter, or coalescing into larger spots, brown, yellowish brown, or tan, usually with an orange-colored halo; fruiting chiefly epiphyllous; stromata dark brown, globular, 20-70$\mu$ in diameter; fascicles dense from stromata, or single stalks from procumbent threads; conidiophores pale olivaceous brown or yellowish olivaceous, tip almost hyaline, wavy to slightly irregular in thickness, not attenuated, sometimes minute spore scar at tip, not visibly septate, not geniculate, not branched, 3-4.5 x 5-50$\mu$; conidia narrowly obclavate or almost linear, subhyaline to pale olivaceous, straight to mildly curved, septa fairly evident, base obconic to obconically truncate, tip bluntly rounded to conically subacute, 2-4 x 40-100$\mu$.

HOSTS: *Centrosema pubescens* Benth. (*Bradburya pubescens* [Benth.] Kuntz), *C. virginianum* Benth. (*Bradburya virginiana* [L.] Kuntz).
TYPE: Rosario, Puerto Rico; *Bradburya pubescens;* F. L. Stevens, No. 446; Febr. 15, 1913.
DISTRIBUTION: Puerto Rico, Mona, Barbados, San Domingo, Venezuela, and Trinidad.
NOTE: Chardon collected a Cercospora on *Galactia striata* in Dominican Republic that may be the same as the one on Bradburya. There are a number of species on the legumes, and having short conidiophores with narrowly obclavate pale colored conidia. Possibly cross inoculations will have to be made before their identity or synonymy can be established. Among these are *C. cassiaecola, C. iponemensis, C. wisteriae, C. bauhiniae, C. latimaculans, C. meibomiae, C. pumila, C. ichthyomethiae, C. rhynchosiarum,* and *C. latens.* The other species reported on Bradburya are *C. cylindrospora* and *C. centrosemae.* See key above.

**Cercospora cajani** P. Hennings
Hedwigia 41: 309. 1902

Spots mostly indefinite on upper surface, or dull brown, ranging from minute specks to fairly large blotches, corresponding lower surface brown to lavender, wine-colored, or purplish, 0.5-10 mm. in extent; fruiting hypophyllous; conidiophores on leaf surface or on leaf hairs, nonfasciculate or in pseudofascicles, some-

times in procumbent, coremoid-like fascicles, with tips or branches extending outward or upward, often with numerous spore scars, and more rarely having geniculations at these scars, multiseptate, pale fuligenous or sometimes ferrugineous, 3-7 x 20-80$\mu$, branches mostly 7-15$\mu$ long; conidia cylindric to obclavato-cylindric, straight to mildly curved, ends bluntly rounded, often catenulate, hyaline when young, and showing a very pale olivaceous color only in the old conidia, 3-7 x 10-50$\mu$, or rarely elongated up to 80$\mu$, 1-4 septate, the longest ones having as many as 9 septa.

HOST: *Cajanus indicus* Spreng.
TYPE: Sao Paulo, Brazil; *Cajanus indicus;* Ars. Puttemans, No. 237; May 1901.
DISTRIBUTION: Saw material which had been collected in Puerto Rico, San Domingo, Trinidad, Barbardos, Venezuela, Sao Paulo, and Tanganyika. It has been reported also from India and Uganda.
NOTE: The fungus being nonfasciculate and having catenulate conidia, investigators have correctly considered it a new genus. Rangel (Bol. Agr. Sao Paulo **16**: 145. 1915) has given it the name *Vellosiella cajani,* and apparently Curzi (Bol. R. Staz. Pat. Veg. N. S. **12**: 149. 1932) had this fungus in mind when he described *Cercodeuterospora trichophila* nov. gen. *C. instabilis* Pet. & Cif., differs from *C. cajani* in having definite fascicles and hyaline acicular conidia with truncate base. In some herbaria are specimens labeled *Cercospora indica* Singh. I do not know if this name ever was published, but the fungus is identical with *C. cajani.*

**Cercospora calopogonii** Stevens & Solheim

Mycologia **23**: 379. 1931

Leaf spots subcircular to irregular, 3-7 mm. in diameter, various shades of brown, usually center paler than the margin; fruiting amphigenous but more abundant on the upper surface; stromata globular, dark brown, 15-40$\mu$ in diameter; fascicles mostly dense, compact to divergent; conidiophores pale olivaceous brown, uniform in color and width or slightly clavate, sparingly septate, rarely branched or geniculate, nearly straight, small spore scar at the conic or rounded tip, 3-5 x 20-75$\mu$, or even as long as 150$\mu$; conidia obclavato-cylindric, very pale olivaceous, indistinctly multiseptate, straight to mildly curved, base obconically truncate, tip obtuse, 2.5-4 x 25-100$\mu$.

HOST: Calopogonium sp.
TYPE: St. Augustine, Trinidad; Calopogonium sp.; F. L. Stevens, No. 836; Aug. 13, 1922.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. boringuensis* for difference between the species on Calopogonium.

**Cercospora calpurniae** Petch

Annals. Roy. Bot. Gard. Peradeniya **6**: 250. 1917

Leaf spots indistinct, or on the upper surface slightly yellowed areas; fruiting scantily effuse, black, hypophyllous, extending from 1 or 2 mm. to most of the leaf surface; stromata none or very slight; conidiophores borne singly, in pseudofascicles, or in dense fascicles, crooked, curved or sinuous, somewhat irregular in width, sometimes branched, medium dark olivaceous brown, plainly

multiseptate, not geniculate, 4-6 x 35-110$\mu$; conidia pale olivaceous, cylindro-obclavate, sometimes almost spindle-shaped, ends obtuse, 1-5, but mostly 3-septate, 5-7 x 20-50$\mu$.

HOST: *Calpurnia aurea* Baker.

TYPE: Peradeniya, Ceylon; *Calpurnia aurea;* T. Petch, No. 4799; May 1916.

DISTRIBUTION: Ceylon.

NOTE: The type is at the Kew Botanical Garden.

**Cercospora canavaliae** H. & P. Sydow

Ann. Mycol. 12: 203. 1914

Leaf spots indistinct or none; fruiting in dark olivaceous to almost black effuse fruiting patches on lower leaf surface, 5-30 mm. in extent; stromata none; conidiophores non-fasciculate, borne singly from procumbent threads, multiseptate, not branched, not or rarely geniculate, spore-scars when present small, not attenuated, dark brown, uniform in color, 3-4.5 x 75-175$\mu$; conidia cylindric, rarely spindle-shaped or obclavate, bluntly rounded ends, 1-4 septate, mildly curved, pale olivaceous brown, 3-4.5 x 20-55$\mu$.

HOSTS: *Canavalia ensiformis* DC., *C. obtusifolia* DC. (*C. maritima* Thou. in Desv.), [*C. lineata* (Thumb.) DC.].

TYPE: Mt. Maquiling, near Los Banos, Philipp.; *Canavalia ensiformis;* C. F. Baker, No. 119; Nov., 1913.

DISTRIBUTION: Reported from Honduras, Trinidad, Minas Geraes, Bermuda, Sierra Leone, India, Philippines, Formosa, Japan, and China.

NOTE: There is present also on Canavalia a fasciculate form of Cercospora with narrowly obclavate conidia, which for the present has been referred to *C. cruenta.*

CERCOSPORAE ON DOLICHOS, GLYCINE, PHASEOLUS, AND VIGNA

A. Conidia colored (conidia of *C. columnaris* rarely are hyaline).
  B. Conidiophores often in coremoid-like fascicles, clavate, 4.5-8 x 20-75$\mu$; conidia cylindric, 4.5-8 x 20-75$\mu$ = *Isariopsis griseola.*
    PHASEOLUS spp. *C. columnaris*
  BB. Conidiophores not in coremoid-like fascicles, not clavate, not as wide as 8$\mu$; conidia 2-5 x 25-150$\mu$, obclavato-cylindric or longest ones plainly obclavate.
    C. Conidiophores subhyaline to pale olivaceous, slightly branched, in loose to dense fascicles, 2.5-5 x 10-75$\mu$; conidia subhyaline to very pale, base obconic, tip subacute.
      GLYCINE, PHASEOLUS, VIGNA *C. cruenta*
    CC. Conidiophores pale olivaceous brown, not branched, in dense fascicles, 4-7 x 10-45$\mu$; conidia pale olivaceous, base short obconically truncate, tip obtuse.
      VIGNA, DOLICHOS *C. dolichi*
AA. Conidia hyaline or rarely subhyaline (old spores of *C. vanderysti* may show color).
  B. Conidia mostly acicular and with truncate base, tip acute to subacute.
    C. Conidia 2-3.5 x 40-120$\mu$, rarely 250$\mu$; conidiophores paler and more narrow toward the tip, 3.5-5 x 40-75$\mu$, hypophyllous.
      GALACTIA, GLYCINE *C. flagellifera*

CC. Conidia 2.5-6$\mu$ in width; conidiophores uniform in color and width, 3-6.5 x 20-220$\mu$, amphigenous.
D. Conidiophores pale to medium in color, rarely branched, in rather loose fascicles; conidia 2.5-6 x 30-300$\mu$, acute tip.
DOLICHOS, VIGNA, PHASEOLUS *C. canescens*
DD. Conidiophores medium dark in color, not branched, in fairly compact fascicles; conidia 2.5-5 x 50-175$\mu$, subacute to subobtuse tip.
GLYCINE MAX *C. kikuchii*
BB. Conidia mostly cylindric, rarely with truncate base; conidiophores not branched, amphigenous, borne singly or in fascicles of varying density.
C. Conidia (1.5-3 x 15-75$\mu$) and conidiophores (1.5-3 x 10-25$\mu$) very narrow; stromata 20-60$\mu$.
GLYCINE *C. glycines*
CC. Conidia and conidiophores appreciably wider than 3$\mu$; stromata none or small.
D. Leaf spots indistinct; fruiting effuse, hypophyllous; stromata none; nonfasciculate to dense fascicles; conidia 4.5-6 x 20-60$\mu$; conidiophores plainly branched, 4-6.5 x 30-140$\mu$ or even 500$\mu$.
VIGNA *C. vanderysti*
DD. Leaf spots distinct; fruiting not effuse, amphigenous; stromata small; fascicles usually dense; conidiophores not branched.
E. Conidia 3-5.5 x 30-125$\mu$, long obconically truncate base; conidiophores medium dark in color, uniform in width, 4-6 x 15-110$\mu$.
PHASEOLUS *C. caracalle*
EE. Conidia 4-8 x 20-80$\mu$, rarely 120$\mu$, subtruncate base; conidiophores pale in color, attenuated toward the tip, 4-6.5 x 40-200$\mu$.
GLYCINE *C. sojina*

**Cercospora canescens** Ellis & Martin
Amer. Nat. **16**: 1003. 1882

*Cercospora vignicaulis* Tehon, Mycologia **29**: 436. 1937.

Leaf spots subcircular to irregular, with pale brown, tan or dingy gray center

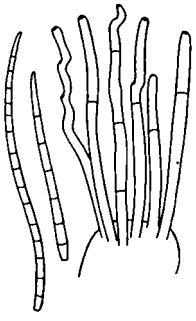


Fig. 124
*C. canescens*

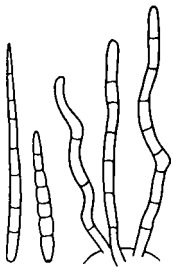


Fig. 125
*C. caracallae*

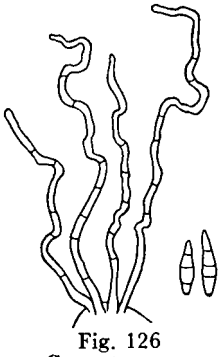


Fig. 126
*C. centrosemae*

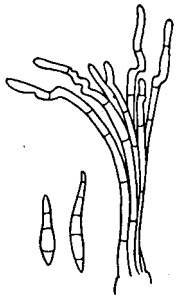


Fig. 127
*C. cercidicola*

and reddish brown to ferrugineous margin, often along margin of leaf, 3-15 mm. in extent; fruiting amphigenous, but more abundant on lower surface,

sometimes present on leaf, stem, cotyledon, and dying pod in effuse black to gray patches; stromata slight; some of the fascicles dense; conidiophores mostly straight, 0-2 geniculate, multiseptate, rarely branched, pale to medium dark brown, fairly uniform in color and width, usually with a medium to large spore scar at the subtruncate tip, 3-6.5 x 20-175$\mu$ or rarely much longer; conidia acicular, hyaline, truncate base, acute tip, straight to variously curved, 2.5-5 (rarely 6) x 30-300$\mu$, some collections with only narrow conidia.

HOSTS: Dolichos sp., Dolichos biflorus L., Dolichos lablab L., Phaseolus sp., Phaseolus aconitifolius Jacq., Phaseolus lunatus L., Phaseolus mungo L. (Phaseolus aureus Roxb.), Phaseolus semierectus L. (Phaseolus lathyroides L.), Phaseolus vulgaris L., Vigna catjang Walp. (Vigna unguiculata [L.] Walp.), Vigna sinensis (L.) Endl. (Dolichos sinensis L.), Vigna glabra Savi (Vigna luteola Benth.), Vigna repens Baker.

There probably are other leguminous hosts. Solheim had a collection on *Teramnus labialis* from Puerto Rico (Dec. 14, 1913) that resembled *C. canescens* closely. Various collections of Crotalaria have shown a similar fungus. *C. canescens* has been reported (Jour. Myc. 8: 73. 1902) on dead stems of *Lycopersicum esculentum, Petunia parviflora,* and on leaves of *Ricinus communis* and Amaranthus, but judging from an examination of several such named specimens, the reports are erroneous.

TYPES: Newfield, N. J.; Phaseolus sp.; J. B. Ellis; 1882. (*C. vignicaulis*) Near Equality, Gallatin Co., Ill.; *Vigna sinensis;* G. H. Boewe, No. 23703; Sept. 8, 1932.

DISTRIBUTION: In all tropic and subtropic countries and states. Rarely present farther north than Missouri and New Jersey.

NOTE: There are a number of Cercospora species with acicular conidia found on Legumes, but usually there are sufficient morphologic differences to distinguish each one. For instance, *C. lathyrina* has slightly more narrow conidia and conidiophores with more geniculation and attenuation, and paler in color. At one time *C. kikuchii* was considered as a synonym, but the darker colored conidiophores in dense fascicles and the shorter conidia make it a separate species. Miura (Fl. Manchuria pt. 3, p. 529. 1928) renamed the fungus, *Cercosporiopsis canescens.* This is not acceptable, because it would be renaming a species almost identical with the type of Cercospora. See key above.

**Cercospora caracallae** n. comb.

*Cercosporina caracallae* Speg., Anal. Mus. Nac. B. Aires **20**: 425. 1910

Leaf spots subcircular to angular, 2-7 mm. in diameter, gray center, wide red to dark brown border, fruiting amphigenous but somewhat more abundant on the upper leaf surface, rarely there are no definite spots but effuse growth, hypophyllous; stromata dark brown, subglobular, slight to medium in size; fascicles usually dense; conidiophores medium dark olivaceous brown, slightly paler in color toward the tip, fairly uniform in width, 0-4 septate, not branched, 0-4 geniculate or otherwise bent to tortuous, medium spore scar at the subtruncate tip, 4-6 x 15-110$\mu$; conidia hyaline, cylindric, straight or nearly so, usually 3-5 septate, base truncate to long obconically truncate, tip obtuse, 3-5.5 x 30-125$\mu$.

HOSTS: *Phaseolus adenanthus* Meyer, *P. caracalla* L., *P. mungo* L. (*P. aureus* Roxb.), *P. vulgaris* L., Phaseolus sp.
TYPE: In silvis prope Tucaman, Argentina; *Phaseolus caracalla;* Spegazzini.
DISTRIBUTION: Argentina, Brazil, Venezuela, Puerto Rico, Wisconsin.
NOTE: Dr. H. C. Greene sent me an excellent specimen of this species on *P. aureus* from Wisconsin. The seed from which the plants were grown presumably came from California. The cylindric hyaline conidia with fairly long conidiophores separate this species from the others on Phaseolus. See key, page 288.

**Cercospora cassiae** P. Hennings
Bul. l'Herb. Boiss. **1**: 121. 1893
also in Engl. Bot. Jahrb. **17**: 41. 1893

HOSTS: *Cassia goratensis* Fres., *C. leptocarpa* Benth., *C. marylandica.*
TYPE: Eritrea, near Akrur, Abyssinia; *Cassia goratensis;* G. Schweinfurth; March 5, 1892.
NOTE: The very wide clavate conidiophores in compact fascicles and the extremely thick walled conidia, 5-15 x 20-60$\mu$, resemble species of Napicladium more nearly than those of Cercospora.

**Cercospora cassiaecola** Roumeguere
Fungi Selecti exsiccati No. 4486

TYPE: Cordillere de Peribebuy; Paraguay; *Cassia* sp.; B. Balansa; Mar. 1883.
NOTE: This was not described but was widely distributed by Roumeguere. This packet in the Kew, England herbarium contains a small square of some thick bark. In New York and at Harvard the specimens are leaves, but have such scanty fruiting that no conclusions can be drawn regarding its identity. It is listed in Rev. Mycol. **10**: 93. 1888.

**Cercospora cassiocarpa** n. comb.

*Cercospora occidentalis* var. *cassiocarpa* Sacc., Ann. Mycol. **11**: 557. 1913
Black stipples on ripe pods, on the type the larger stipples are caused by a pycinidial form; on the smaller stipples are sparingly effuse dark layers of fruiting; stromata globular, dark brown to almost black, 15-40$\mu$ in diameter; fascicles partly dense, occasionally almost coremoid; conidiophores medium dark brown, uniform in color and in width, multiseptate, not branched, sparingly geniculate, medium spore scar at the subtruncate tip, 4-5.5 x 30-100$\mu$; Conidia hyaline, acicular, shortest ones may be cylindric, indistinctly septate, straight to slightly curved, base truncate, tip subtruncate, 4-5 x 30-130$\mu$.
TYPE: Manila, Luzon, Philippines; *Cassia occidentalis* L.; E. D. Merrill, No. 8463; 1912.
DISTRIBUTION: Known only from the type locality.
NOTE: The hyaline acicular conidia, with dark almost coremoid fascicles separate this species from the others on *Cassia.*

**Cercospora cavarae** P. &. D. Saccardo
Sylloge Fung. **16**: 1069. 1902

Leaf spots, when present, angular, usually running parallel with veins branching from midrib, brown; often no definite spots and sooty effuse fruit-

ing on lower leaf surface; stromata small, pale brown; fascicles mostly dense; conidiophores pale to very pale olivaceous brown, uniform in color, irregular in width, rarely septate, not branched, not geniculate, minute spore scar at bluntly rounded tip, 3-5 x 5-40$\mu$; conidia subhyaline to very pale olivaceous, cylindric or slightly attenuated, straight to mildly curved, 1-6 septate, base obconically truncate, tip obtuse, 4-6 x 30-110$\mu$.

HOSTS: *Glycyrrhiza asperrima* L. (*G. aspera* Pall.), *G. glabra* L.

TYPE: In Horto Botanico, Cagliari, Sardegna; *Glycyrrhiza glabra;* Fr. Cavara; Aug. 1900. Cotype distributed as Mycotheca Italica, No. 790.

DISTRIBUTION: Sardinia, Turkestan, Astrakhan, Middle Asia.

NOTE: Zaprometov (Materials for the Microflora of Middle Asia I. p. 25. 1926) lists *Cercospora glycyrrhizae* Sacc. I believe this is a typographical error, and that he meant the species *C. cavarae.* See also *C. glycyrrhizae* S. & S. for difference between the two species on the host genus.

**Cercospora centrosemae** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 40. 1942

Leaf spots indistinct or none; fruiting in sparingly effuse, dark olivaceous to almost black patches on lower leaf surface; stromata lacking or composed of the bases of the conidiophores packed in the stomatal openings; fascicles 3-30 divergent stalks; conidiophores medium dark brown, uniform in color, rarely wider near conic tip, wavy, tortuous or abruptly multigeniculate, branched occasionally, 3-5.5 x 40-200$\mu$; conidia hyaline or oldest ones faintly colored, obclavate to cylindro-obclavate, long obconically truncate base, obtuse tip, mostly 3-5 septate, straight to mildly curved, 4-6 x 20-60$\mu$.

HOST: *Centrosema virginianum* Benth. [*Bradburya virginiana* (L.) Kuntze], (*Clitoria virginiana* L.).

TYPE: Caracas, Venezuela; *Centrosema virginianum;* A. S. Muller, No. 2204; June 28, 1938.

DISTRIBUTION. Known only from type locality.

NOTE: See key, page 284 for differences among the species on Centrosema (Bradburya).

**Cercospora ceratoniae** Patouillard & Trabut

Bul. Soc. Mycol. de France 19: 260. 1903

Leaf spots circular, 2-8 mm. in diameter, dark brown, occasionally bordered by a narrow raised line; fruiting amphigenous; stromata up to 100$\mu$ in length, somewhat flattened, dark brown; fascicles extremely dense, compact; conidiophores pale brown, paler and more narrow toward the tip, 0-1 septate, not branched, not geniculate, mostly straight, bluntly rounded tip, 2-3.5 x 10-40$\mu$, usually 10-25$\mu$; conidia pale yellowish olivaceous, obclavato-cylindric or rarely almost obclavate, straight to slightly curved, 1-6 septate, base obconically truncate, tip obtuse, 4-5.5 x 30-95$\mu$.

TYPE: Algeria; *Ceratonia siliqua* L.; Trabut; 1901.

DISTRIBUTION: Algeria, Italy, Cyprus, Formosa.

NOTE: Maire (Bul. Soc. Hist. Nat. Afr. Nord 10: 149. 1919) states that *Sphaerella cuprea* Sacc. is the perfect stage. The type shows only some Ascomycete; at least 6 mounts did not show a Cercospora. Passerini described a *Sphaerella ceratoniae* from Sicily. It fits fairly closely the Ascomycete that

seemingly is connected with the Cercospora. The present description was taken from the Italian collection. Killian (Bul. Soc. Hist. Nat. Afr. Nord **16**: 108. 1925) figures also a pycnidial stage. It is possible he may have had a spermagonial form of the fungus. The Formosa material has large irregularly-branched conidiophores, so may be a new species. The conidia resemble those of the Italian collection.

**Cercospora cercidicola** Ellis

Amer. Naturalist **16**: 810. 1882

*Cercospora cercidicola* var. *coremioides* Tehon. Mycologia **16**: 140. 1924

Leaf spots circular to subcircular, 1-6 mm. in diameter, dull reddish brown, some of the largest ones with a pale colored center; fruiting chiefly hypophyllous; stromata small, globular, 15-25$\mu$ in diameter, brown; fascicles mostly dense, varying from wide spreading to coremoid; conidiophores dark olivaceous brown, multiseptate, 0-3 abruptly geniculate or sometimes mildly geniculate, not branched, medium-sized spore scar at rounded or subtruncate tip, 3-4.5 x 50-300$\mu$; conidia cylindro-obclavate, pale olivaceous, mostly 3-septate, base obconic to obconically truncate, straight, tip obtuse, 4-7 x 20-60$\mu$.

HOSTS: *Cercis canadensis* L., *Cercis chinensis* Bunge.

TYPES: Lexington, Ky.; *Cercis canadensis;* W. A. Kellerman, No. 44; June, 1882. (var. coremoides) Boaz, Massac Co., Ill.; *C. canadensis;* P. A. Young, No. 1129; Aug. 8, 1922.

DISTRIBUTION: In Eastern United States, as far west as Missouri. Rarely farther north than West Virginia and southern Illinois. Also reported in Japan.

NOTE: Tehon describes *C. cercidicola* var. *coremioides* based on the coremoid type of fascicle, and some of the conidiophores being 310$\mu$ in length. Inasmuch as the Ellis type shows variations in the fascicles from divergent to coremoid and conidiophores 200$\mu$ in length, there seems to be no special reason for recognizing the variety (Univ. Ill. Biol. Monogr. **12**: 1929). *C. chionea* differs from the above species in having short conidiophores (10-50$\mu$) and narrow long conidia, 4-5 x 40-100$\mu$. Wolf (Mycologia **32**: 129. 1940) described the perfect stage as *Mycosphaerella cercidicola* (E. & K.).

**Cercospora chaetocalycina** Petrak & Ciferri

Ann. Mycol. **30**: 308. 1932

Leaf spots none or irregular indistinct yellowish areas on the upper leaf surface; fruiting on the corresponding lower surface, effuse, grayish to olivaceous brown, 2-6 mm. in extent; stromata present; fascicles dense; conidiophores pale olivaceous, uniform in color, irregular in width, sparingly septate, occasionally with 1-2 short branches, not geniculate, straight to mildly curved, 3.5-5 x 20-80$\mu$; conidia narrowly cylindric or filiform, subhyaline to very pale olivaceous, 1-9 septate, straight to strongly curved, ends bluntly rounded to conic, 3-4.5 x 20-105$\mu$.

TYPE: Valle del Cibao, Prov. Santiago, Hato del Yaque, San Domingo; *Chaetocalyx pubescens* DC.; R. Ciferri, No. 4132; Jan. 22, 1931.

DISTRIBUTION: Known only from the type locality.

NOTE: No material of this species has been studied by the author.

**Cercospora chamaecrista** Ellis & Kellerman
Jour. Mycol. **4**: 7. 1888

Leaf spots irregular in shape, brown, difficult to distinguish from the reddish brown of the dried herbarium leaf tissue, often including tip of leaflet; fruiting hypophyllous; stromata slight or none; fascicles 3-10 divergent stalks; conidiophores multiseptate, pale olivaceous brown, bluntly rounded or subtruncate tip with small spore scars, rarely geniculate, not branched, mildly constricted at the septa, sometimes slightly wider near the tip, 4.5-7 x 15-70$\mu$; conidia hyaline, variable in shape from true acicular to cylindric and with truncate to obconic base, straight or nearly so, 1-8 septate, tip obtuse, 4-7.5 x 30-55$\mu$.

TYPE: Manhattan, Kansas; *Cassia chamaecrista* L.; W. A. Kellerman, No. 1126; Oct., 1887.

DISTRIBUTION: Known only from the type locality. Herbarium specimens on other Cassia species are labeled as *C. chamaecrista*, but of all those examined only the type proved to be this species.

NOTE: It is differentiated from all the other Cercosporae on Cassia by its wide, almost cylindric, hyaline conidia.

**Cercospora chionea** Ellis & Everhart
Bul. Torrey Bot. Club **11**: 122. 1884

*Cercospora cercidis* Ray, Mycologia **33**: 175. 1941

Leaf spots yellowish tan to dark reddish brown, circular to irregular, margin none to burnt sienna color, 5-15 mm. in diameter; fruiting chiefly epiphyllous, often showing as a whitish mold; stromata circular to globular, very pale brown,

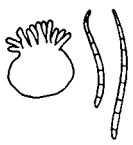


Fig. 128
*C. chionea*

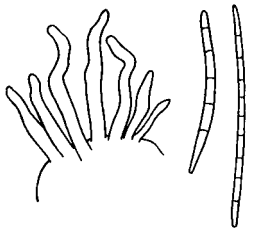


Fig. 129
*C. cruenta*

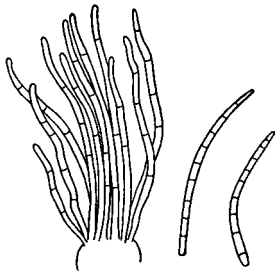


Fig. 130
*C. cylindrospora*

20-50$\mu$ in diameter; fascicles dense; conidiophores very pale olivaceous brown near base, almost hyaline tip, often much attenuated or long conic tip with small spore scar, septa not visible, not geniculate, not branched, 4-6 x 8-50$\mu$ (mostly 10-20$\mu$); conidia linear or cylindric, hyaline, straight to variously curved, base truncate, rounded or short obconic, tip obtuse, septa not distinct, 4-5.5 x 40-100$\mu$. Rarely spores are subhyaline or almost colored.

HOSTS: *Cercis canadensis* L., *C. chinensis* Bunge (*C. japonica* Siebold).

TYPE: Manhattan, Kansas; *Cercis canadensis;* W. A. Kellerman, No. 580; July, 1884. (*C. cercidis*) Stillwater, Okla; W. W. Ray; Aug. 14, 1939.

DISTRIBUTION: Apparently very sparingly present in the area of Kansas,

Missouri, Oklahoma, Illinois, Indiana, and eastward to New York. Also reported from China. Dr. Togashi sent a specimen from Japan.

NOTE: Saccardo (Syll. Fung. **10**: 564. 1892) suggests that this species is a Cercosporella. This statement probably is based on Ellis's description of the conidiophores as being subhyaline. See *C. cercidicola* for the differences between the two species on Cercis. The fact that some specimens have completely hyaline conidia and others have fairly plainly colored ones explains Dr. Ray's naming the latter a different species. Yoshikazu Nishikado and Toshiichi Oshima (Ohara Agr. Inst. Rept. **36**: 411-415. 1944) describe in Japanese a *Cercospora cercidis* Nish. & Oshima on *Cercis chinensis*. If it is like the Japanese specimen sent me by Dr. Togashi on the same host, it is a synonym of *C. chionea*.

**Cercospora chupii** Viegas

Bragantia **5**: 568. 1945

Leaf spots minute, irregular, dark reddish brown, grouped closely together in large areas, the intervening tissue being pale green or yellowish; fruiting amphigenous; stromata small, subglobular or slightly flattened, dark brown; fascicles dense; conidiophores medium dark brown, uniform in color, somewhat irregular in width, straight or undulate to curved, septation, branching and geniculation absent or indistinct, tip rounded to conic, 2-3.5 x 10-35$\mu$; conidia medium olivaceous, cylindric, straight to mildly curved, 1-5 septate, rounded or conic ends, 2-3.5 x 15-35$\mu$.

TYPE: Monte Alegre Agr. Exp. Sta., Amparo, Sao Paulo, Brazil; *Ormosia arborea* Harms; M. Kuhlmann, No. 4765; April, 1943.

DISTRIBUTION: Known only from the type locality.

NOTE: Since these conidia are so short and rarely have more than 3 septa, the fungus should be named Didymaria.

**Cercospora cladrastidis** Jaczewski

(Komarov. No. 350) Hedwigia **39**: (Beiblatt) 123. 1900.

TYPE: Along the Amur River, Russia; *Cladrastis amurensis* (Rupr.) Benth.; W. L. Komarov; Aug. 26, 1895. Cotype distributed as Fungi Rossiae Exsiccati No. 350b.

NOTE: The wide thick-walled, rather closely septate, medium dark conidia place this fungus with Helminthosporium rather than with Cercospora.

**Cercospora clitoriae** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 62. 1892

Spots on leaves and pods, brown to black, 3-6 mm. in diameter; fruiting when on leaves chiefly epiphyllous; small dark brown, nearly globular stromata, 20-40$\mu$ in diameter; some of the fascicles dense; conidiophores very pale colored, not septate, not geniculate, not branched, rounded tip without visible spore scar, 2.5-4 x 10-25$\mu$ or rarely longer; conidia linear to narrowly obclavate, straight or mildly curved, subhyaline to faintly olivaceous, base subtruncate to obconic, tip subacute, septa indistinct, 2-3.5 x 30-120$\mu$.

HOSTS: *Clitoria mariana* L., *Centrosema virginianum* Benth. (*C. virginiana* L.).

TYPE: Auburn, Lee Co., Ala.; *Clitoria mariana;* Geo. F. Atkinson, No. 2069; Aug. 29, 1891.

DISTRIBUTION: Alabama.

NOTE: The other species on this host is *C. ternateae,* which has wide, brown, long conidiophores and acicular hyaline conidia. See key, page 285 for differences among the species on these hosts. *C. clitoriae* may finally prove to be a synonym of *C. kennedyae.*

**Cercospora columnaris** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **46**: 380. 1894

*Isariopsis griseola* Sacc., Michelia **1**: 273. 1878
*Graphium laxum* Ellis, Torrey Bot. Club. Bul. **8**: 64-66. 1881
*Arthrobotryum puttemansii* Henn., Hedwigia **41**: 309. 1902
*Cercospora stuhlmanni* Henn., Bot. Jahrb. v. Engler **33**: 40. 1904
*Phaeoisariopsis griseola* (Sacc.) Ferr. Annales Mycol. **7**: 273. 1909

Leaf spots angular, brown to grayish brown or on lower surface may be olivaceous, 2-5 mm. in diameter or coalescing into fairly large areas; fruiting amphigenous or only hypophyllous, olivaceous to gray in color, often effuse; stromata none to medium in size, dark brown; fascicles mostly dense, sometimes coremoid; conidiophores subhyaline to medium olivaceous brown, multiseptate, not branched, not or rarely geniculate, slightly sinuous, often distinctly clavate, spore scars small, bluntly rounded tip, 3-5.5 x 100-270$\mu$; conidia cylindric or somewhat spindle-shaped, long obconically truncate base, attenuated near the tip, hyaline to plainly olivaceous, 1-5 septate, mildly curved, 4.5-8 x 20-75$\mu$.

HOSTS: *Phaseolus vulgaris* L., *Phaseolus lunatus* L., Phaseolus sp.

TYPES: Newfield, N.J.; leaves of cultivated Phaseolus; J. B. Ellis; Sept. 27, 1894; (*C. Stuhlmanni*) Usambara, East Africa; Phaseolus sp.; Stuhlmann; Sept. 7, 1900.

DISTRIBUTION: Reported in the Americas from New York to northern Argentine, and in all of Europe as far north as Germany; various areas in Africa, Hawaii, Japan, Trinidad, Puerto Rico, China.

NOTE: Keissler (Ann. Mycol. **21**: 70. 1923) showed that *C. columnaris* and *Isariopsis griseola* were identical. Since *Isariopsis griseola* was described 16 years before *C. columnaris,* a new combination of names is justified provided Cercospora is retained as the proper genus. It is a borderline fungus, so that I favor the retention of *Isariopsis griseola.* On the label of Fungi Columbiani 2434 *G. laxum* is given as a synonym of *I. griseola.* Ellis gives the name as *C. columnare* but Saccardo added the genitive ending. A fungus was found on Vigna in Puerto Rico with coremium-like fascicles, but the conidiophores were darker, slightly branched, and the conidia hyaline, so that it may be a new species. See key, page 287, for separation of species on Phaseolus and Vigna.

**Cercospora commonsii** Saccardo

Syll. Fung. **10**: 623. 1892

*Cercospora stylosanthis* Ellis & Ev., Jour. Mycol. **3**: 13. 1887

Leaf spots circular to irregular, ranging from small specks to large part of the leaflet, dark brown; fruiting chiefly hypophyllous, sometimes almost dense enough to appear diffuse; stromata none to intermediate in size, dark to almost black, globular; some of the fascicles dense; conidiophores medium olivaceous brown, plainly and rather closely septate, either constricted at septa or irregu-

lar in width, branched, not distinctly geniculate, small spore scar at rounded tip, 3-5 x 10-40$\mu$; conidia narrowly obclavate, hyaline to subhyaline, straight to much curved, base obconic to subtruncate, tip acute to subacute, 2-4 x 35-90$\mu$.

HOST: *Stylosanthes elatior* Swartz.; (*S. biflora* Britton).

TYPE: Faulkland, Del.; *Stylosanthes elatior;* A. Commons, No. 336; Sept. 12, 1886.

DISTRIBUTION: Several collections from Delaware.

NOTE: Spegazzini previously had used the name *C. stylosanthis* for a species with wide, colored conidia, and a slime-mold like fruiting layer.

**Cercospora condensata** Ellis & Kellerman

Jour. Mycol. 1: 2. 1885

Leaf spots minute white or gray specks with brown margin, 0.5-2 mm. in diameter; fruiting hypophyllous; stromata slight to 50$\mu$ in diameter, almost black, globular; fascicles dense to very dense; conidiophores medium brown, 0-3 septate, not branched, 0-2 mildly or abruptly geniculate, usually with 1-3 minute spore scars near or at rounded tip, 3.5-5.5 x 10-50$\mu$; conidia obclavate, pale brown, mildly curved, fairly plainly multiseptate, base rounded to long obconic, tip subacute, 4-6 x 40-115$\mu$. In young stages of the fungus, the conidia may be almost sessile, and partly cylindric.

TYPE: Manhattan, Kans.; *Gleditschia triacanthos* L.; W. A. Kellerman, July, 1884.

DISTRIBUTION: Kansas, Missouri, Oklahoma, Wisconsin, Delaware.

NOTE: Ellis wrote on the packet that this species is *C. seymouriana* Winter, but the fungus Winter named resembles an Helminthosporium and is considered one. In 1885 Ellis and Kellerman named a fungus, *C. condensata* var. *desmanthi.* In 1887 they changed their mind regarding it and described it as *C. desmanthi.*

**Cercospora conjugans** n. comb.

*Didymaria conjugans* Stev. & Solh., Mycologia 23: 401. 1931

Leaf spots subcircular with irregular margin, 4-12 mm. in diameter, rusty brown, later with tan center, often with yellow halo; fruiting amphigenous, but more abundant on lower leaf surface; stromata mostly slight; fascicles sometimes dense; conidiophores pale fuligenous, paler tip, uniform in width, often collapsed or twisted ribbon-like, sparingly septate, not or rarely geniculate, branched occasionally, minute spore scar at the conic tip, 3-5 x 25-150$\mu$; conidia pale olivaceous, cylindric, straight to much curved, 1-5 septate, base long obconic, tip blunt, 2.5-5 x 25-60$\mu$.

TYPE: Tumatumaria, British Guiana; unknown legume; F. L. Stevens, No. 54; July 8, 1922.

DISTRIBUTION: Known only from the type locality.

NOTE: The long obconic base make many of the conidia appear clavate, hence the proposed name of Didymaria. There are about 50 species of Cercospora with a mixture of clavate and some other form of conidia.

**Cercospora coronillae** C. Massalonga

Mem. d. Accad. Agr. Arti. e Comm. di Verona. III. 65: 262. 1889

TYPE: Tregnago, Prov. Verona, Italy; *Coronilla emerus* L.; C. Massalonga.

NOTE: The colored, thick-walled, wide conidia identify this species as an Helminthosporium rather than a Cercospora.

CERCOSPORAE ON CROTALARIA

A. Conidia colored, obclavate, 2.5-5 x 40-90$\mu$; fruiting effuse, hypophyllous; conidiophores branched, 3.5-6 x 15-75$\mu$.
*C. cotizensis*

AA. Conidia hyaline, acicular to obclavate; fruiting not effuse, amphigenous; conidiophores not branched.

B. Conidia 2.5-4 x 40-160$\mu$; conidiophores pale to medium in color, much paler and strongly attenuated toward the tip, 4-6 x 20-60$\mu$.
*C. crotalariae*

BB. Conidia 4-7 x 75-230$\mu$; conidiophores medium dark in color, uniform in color and width, 4.5-7 x 50-150$\mu$.
*C. demetrioniana*

**Cercospora cotizensis** Muller & Chupp
Ceiba 1: 173. 1950

*Cercospora crotalariae* Sydow, Ann. Mycol 28: 208. 1930
*Cercospora crotalariae* Sawada, Taihoku Soc. Agr. and Forestry Jour. 7: 118. 1942.

Leaf spots indistinct yellowish areas on the upper leaf surface, 1-4 mm. in extent; fruiting in effuse, olivaceous layers on the corresponding lower surface; stromata small, filling stromatal openings, pale to medium brown; nonfasciculate to dense fascicles, divergent stalks arising from single procumbent threads or from the stromata; conidiophores pale olivaceous brown, uniform in color, irregular in width, 1-3 septate, often constricted at the septa, branched, slightly geniculate, small spore scar at the conic tip, 3.5-6 x 15-75$\mu$; conidia obclavate, pale olivaceous, straight to curved, 3-7 septate, base obconic, tip subobtuse, 2.5-5 x 40-90$\mu$.

HOSTS: *Crotalaria anagyroides* H. B. K., *C. verrucosa* L., Crotalaria sp.

TYPES: Cotiza pr. Caracas, Venezuela; *Crotalaria anagyroides;* H. Sydow; Dec. 20, 1927. Cotype distributed as Fungi exotici exsiccati No. 885; (*C. crotalariae*) Taipeh, Taiwan (Formosa); *Crotalaria verrucosa;* Y. Fujikuro; Dec. 21, 1915.

DISTRIBUTION: Several collections from Venezuela and Formosa. Guatemala.

NOTE: The obclavate, colored conidia, 2.5-5 x 40-90$\mu$ and the pale colored, branched conidiophores, partly fasciculate, separate this species from the others on Crotalaria. See also *C. crotalariae* Sacc. and key above.

**Cercospora crotalariae** Saccardo
Ann. Roy. Bot. Gardens, Peradeniya 3: 2. 1906

*Cercospora crotalariae-junceae* Sawada, Taihoku Soc. Agr. and Forestry Jour. 7: 27. 1942.

Leaf spots subcircular, 4-10 mm. in diameter, dingy gray to pale tan, very narrow raised line border; fruiting chiefly epiphyllous; stromata dark brown to black, globular, 30-60$\mu$ in diameter; fascicles usually dense; conidiophores pale to medium brown, much paler and more narrow toward the tip, sparingly septate, not branched, straight to occasionally once geniculate, medium spore scar at the subtruncate tip, 4-6 x 20-60$\mu$ (tip mostly about 2$\mu$ wide); conidia hyaline,

acicular to obclavate, straight to slightly curved, indistinctly multiseptate, base truncate, tip subacute, 2.5-4 x 40-100$\mu$, or even 160$\mu$.

HOSTS: *Crotalaria juncea* L., *C. striata* DC.

TYPES: Ceylon; *Crotalaria striata;* Petch; (*C. crotalariae-junceae*) Taipeh, Taiwan (Formosa); *Crotalaria juncea;* Y. Fujikuro; Aug. 18, 1907.

DISTRIBUTION: Ceylon, Formosa.

NOTE: In 1906 when Petch described *Sphaerella crotalariae,* he mentioned that a Cercospora stage also was present, and described the conidia, and said they were borne on fascicles of conidiophores. Saccardo suggested in Syll. Fung. **22:** 129. 1913, that the Cercospora should be named *C. crotalariae.* This species is distinct from the *C. crotalariae* which Sydow described in 1930 as having colored conidia. See also *C. cotizensis.* Specimens of *C. crotalariae* Sawada and *C. crotalariae-juncea* Sawada are deposited in the Mycological Herbarium of the U. S. Bureau of Plant Industry. See key, page 297.

**Cercospora cruenta** Saccardo

Michelia **2:** 149. 1880

*Cercospora phaseolorum* Cooke, Grevillea **12:** 30. 1883

*Cercospora vignae* E. + E., Jour. Mycol. **3:** 19. 1887

*Cercospora lussoniensis* Sacc., Annales Mycol. **12:** 314. 1914

*Cercospora phaseoli* D. + B., Mycologia **21:** 329. 1929

Leaf spots distinct or indistinct, circular to irregular, 1-10 mm. in diameter, greenish or yellowish to rusty brown or almost blood red, sometimes with almost gray center and somewhat darker margin; fruiting amphigenous, but usually much more abundant below, sometimes distinctly effuse and then slate to olivaceous in color; stromata usually filling stomatal openings; some of the fascicles dense; conidiophores subhyaline to pale olivaceous brown, straight to sinuous or 1-3 geniculate, branched occasionally, 0-2 septate, often attenuated slightly and with a conic tip, which may show a minute spore scar, 2.5-5 x 10-75$\mu$ (mostly 10-25$\mu$); conidia subhyaline to very pale olivaceous or olivaceous brown, obclavato-cylindric, or long ones may be distinctly obclavate, straight to mildly curved, mostly rather sharply obconic base, tip obtuse to subacute, indistinctly multiseptate, 2-5 x 25-150$\mu$.

HOSTS: *Glycine max* Merr. (*Soja max* [L.] Piper), Phaseolus sp., *Phaseolus aconitifolius* Jacq., *Phaseolus adenanthus* Meyer, *Phaseolus lunatus* L., *Phaseolus semierectus* L. (*Phaseolus lathyroides* L.), *Phaseolus vulgaris* L., *Vigna antillana* Fawcett & Rendle, *Vigna catjang* Walp. (Vigna sinensis [L.] Endl.), (Dolichos sinensis Stickm.) (Vigna unguiculata [L.] Walp.) (Dolichos catjang Burm.), *Vigna cylindrica* (L.) Skeels, *Vigna glabra* Savi, (Vigna luteola Benth.), *Vigna sesquipedalis* F. Agcaoili (Dolichos sesquipedalis L.). This does not occur on the true Dolichos genus.

TYPES: South Carolina; Phaseolus and *Dolichos sinensis* Stickm. (=*Vigna sinensis* Endl.); Ravenel. (*C. phaseolorum*) Aiken, South Carolina; Phaseolus sp.; Ravenel, No. 584 (Cooke 2692). (*C. vignae*) Point a la Hache, La.; *Vigna luteola;* A. B. Langlois; Oct., 1886; cotype distributed as N. Amer. Fungi 2nd Ser. No. 1759. (*C. lussoniensis*) Mt. Maquiling, near Los Banos, Prov. Laguna, Philipp.; *Phaseolus lunatus;* C. F. Baker, No. 122; Aug., 1913. (*C. phaseoli*) Brownwood, Mo.; *Phaseolus vulgaris;* E. Bartholomew, No. 8516 (Dearness 5431); Oct. 3, 1923.

DISTRIBUTION: Specimens available from nearly every country and state where the hosts are grown.

NOTE: This species can easily be confused with *C. Dolochi,* but the latter has wider, more plainly septate conidiophores, which usually are not attenuated and do not have conic tips, and conidia with obconically truncate base. The coptype material of *C. vignae* put out as North American Fungi No. 1759 as well as a cotype packet in Atkinson's herbarium is *C. caracallae* with hyaline cylindric conidia having a truncate base. Latham (Mycologia 26: 516. 1934) described the perfect stage as *Mycosphaerella cruenta.* Anderson et al (U.S.D.A. Bul. 1166; 61. 1926) report this species on tomato. Undoubtedly this is incorrect. It is possible that specimens of Canavalia, which Viegas sent from Brazil in 1933 and Baker from Trinidad in 1946, had *C. cruenta* on them. It is not certain but *C. cruenta* and *phaseolorum* probably are based on similar specimens sent by Ravenel to Saccardo and Cooke. Klotch in 1855 placed into the herbarium at Dresden specimen No. 327, listed under the name *Cylindrospora phaseoli* Rabenh. In 1863 when Fresenius created the genus Cercospora, the transferred the fungus to *Cercospora phaseoli* (Rabenh.) Fres. No description seems to have been prepared in either case, but the fungus apparently is the same as *C. cruenta.* See also *C. canescens* and key, page 287.

**Cercospora curvata** (Rabh. et Br.) Wollenweber
Ann. Mycol. 15: 28. 1917

*Fusarium vogelii* P. Henn., Zeitschr. f. Pflanzenkr. 12: 14. 1902
*Septoria robiniae* Rabh.

TYPE: Franconia-Bayreuth; Robinia sp.; Aug. 1875; also, Berganlagen, Tamsel; Robinia sp.; Vogel; Aug. 26, 1901.

NOTE: Wollenweber gives the host as being *Robinia pseudacacia* L. Material was examined both at Berlin and Copenhagen, and of the packets marked Fusarium and Septoria. Both had hyaline acervuli as fruit bodies, therefore should be listed as a Cylindrosporium or Cercosporella.

**Cercospora cylindrospora** Stevens & Solheim
Mycologia 23: 376. 1931

Leaf spots circular to angular, 0.5-3 mm. in diameter, center pale tan to gray with a brown or reddish brown border; fruiting chiefly hypophyllous; small dark stromata; fascicles dense; conidiophores very pale yellowish brown, uniform in color and width, sparingly septate, not geniculate, not branched, mostly straight, minute spore scar at rounded or conic tip, 2.5-3.5 x 30-105$\mu$; conidia cylindric to slightly attenuated, straight or curved, hyaline to very faintly olivaceous, base long obconic, tip subobtuse to subacute, indistinctly multiseptate, 2-3.5 x 40-105$\mu$.

HOSTS: *Centrosema pubescens* Benth. (*Bradburya pubescens* [Benth.] Kuntze.) *C. virginianum* Benth. (*Bradburya virginiana* [Benth.] Kuntze.).

TYPE: Cabo Rojo, Puerto Rico; *Bradburya pubescens;* F. L. Stevens, No. 6482a; Dec. 27, 1913.

DISTRIBUTION: Puerto Rico, Mexico.

NOTE: See key, page 285 for differences among the species on Centrosema. O. A. Plunkett collected a Cercospora on *Centrosema virginianum* in Cor-

doba, Mexico. It resembles *C. cylindrospora* excepting that it has conidiophores as large as 4 x 200$\mu$, which at times are in coremoid fascicles, and the conidia are as wide as 4.5 x 70$\mu$, none of which are perfectly hyaline.

**Cercospora cytisi** sp. nov.

Maculae irregulares, 1-4 mm. in diam., fuscae; caespituli amphigeni; stromata carentia vel minuta, atrofusca; conidiophora 2-7 fasciculata aut interdum unica, aequabiliter brunnea, apicem versus attenuata, multiseptata, 1-7 leniter vel subito geniculata, vix ramosa, 4-5.5 x 35-150$\mu$; conidia hyalina, anguste obclavata, recta vel curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2-4 x 40-80$\mu$.

Leaf spots irregular, 1-4 mm. in extent, brown, no distinct border; fruiting amphigenous; stromata none to 25$\mu$ in diameter, dark brown, fascicles 2-7, or conidiophores may be borne singly; conidiophores pale to medium brown, fairly uniform in color, attenuated from each geniculation toward the tip, multiseptate, 1-7 mildly to abruptly geniculate, sometimes branched, spore scar not at the narrowly rounded tip but at the last geniculation, usually near the tip, 4-5.5 x 35-150$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, truncate base, acute tip, 2-4 x 40-80$\mu$.

TYPE: Manhattan, Kans.; *Cytisus capitatus* Scop.; Kellerman & Swingle; Sept. 4, 1889.

DISTRIBUTION: Known only from the type locality.

NOTE: I did not find a printed description of this species, but studied the collection by Kellerman and Swingle found in the U.S.D.A. Path. and Mycol. Cols. Hollós also has given this name to a Cercospora on the same host genus. I was unable to locate his species or determine whether he ever published a description. The only other species on Cytisus is *C. innumerabile* with cylindric conidia, which are almost sessile.

**Cercospora dalbergicola** T. S. & K. Ramakrishnan

Proc. Indian Acad. Sci. Sect. B. **32**: 106. 1950

Leaf spots grayish brown, minute, prominent on lower surface; fruiting hypophyllous, powdery in appearance; stromata small; fascicles dense, divergent; conidiophores pale brown, sometimes branched, multiseptate, tortuous or multigeniculate, 4-7 x 80-125$\mu$; conidia subhyaline to pale brown, obclavate, mostly 1-septate, 4-8 x 20-37$\mu$.

HOST: *Dalbergia volubilis* Roxb.

TYPE: Valayar, Madras, India; *Dalbergia volubilis;* T. S. & K. Ramakrishnan; July 28, 1948.

DISTRIBUTION: India.

NOTE: This is not a Cercospora. It may be a Didymaria or possibly a Piricularia. I have not studied the fungus.

**Cercospora daleae** Ellis & Kellerman

Jour. Mycol. **4**: 6. 1888

TYPE: Kansas; *Dalea laxiflora* Pursh; W. A. Kellerman, No. 954; 1887.

NOTE: The large globular to saucer-shaped stromata, the closely packed conidiophores not much longer than sterigmata, and the small, pale colored, 2-celled conidia are not characters which represent Cercospora. According to

the Engler-Prantl classification the fungus should be classed somewhere under the **Tuberculariaceae-Mucedineae-Didymosporae** group. None of the listed genera resembles the Ellis and Kellerman fungus.

**Cercospora daviesiae** Cooke & Massee

Grevillea **18**: 7. 1889

Leaf spots circular to angular, 2-6 mm. in diameter, brown, mostly without any distinct border excepting the veins, inclined to coalesce into large areas; fruiting amphigenous; stromata small, black, globular; fascicles not dense, mostly 1-7 stalks; conidiophores dark brown, uniform in color, constricted at the septa or otherwise irregular in width, 1-5 septate, not branched, rarely geniculate, variously curved to abruptly bent, bluntly rounded tip, 5-6 x 20-100$\mu$; conidia subhyaline to pale in color, cylindric, straight to slightly curved, 3-5 septate, base subtruncate to rounded, tip obtuse, 4-5.5 x 20-60$\mu$.

TYPE: Victoria, Australia; *Daviesia latifolia* R. Br.; Wm. Martin, No. 438.
DISTRIBUTION: Known only from the type locality.

**Cercospora davisii** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **43**: 89. 1891

Leaf spots circular to irregular, 2-5 mm. in diameter, no distinct border, brown; fruiting amphigenous; stromata mostly slight; fascicles 2-20 stalks or rarely quite dense; conidiophores subhyaline to pale olivaceous brown, fairly uniform in color, shorter ones not or once mildly geniculate and sometimes attenuated, longer ones 1-4 mildly to abruptly geniculate, not attenuated, 1-4 septate, not branched, fairly large spore scar at subtruncate tip, 3-5 x 10-60$\mu$ or even 140$\mu$ long, but specimens may be found with the conidiophores not longer than 35$\mu$; conidia hyaline, acicular to obclavate, shortest ones may be almost cylindric, straight or mildly curved, truncate to subtruncate base, subobtuse tip, septa indistinct, 3-4.5 x 20-65$\mu$, rarely as long as 110$\mu$.

HOSTS: *Melilotus alba* Desr., *M. officinalis* Lam.
TYPE: Lake Shore Drive, Racine, Wisc.; *Melilotus alba;* J. J. Davis, No. 1089; July 7, 1889.
DISTRIBUTION. From Manitoba, Kansas, and Alabama, eastward. Specimens were sent also from California and Lima, Peru.
NOTE: Horsfall (Mycologia **21**: 304. 1929) makes *C. davisii* a synonym of *C. zebrina.* It is true that some of the species on Trifolium, Medicago, Melilotus and Lespedeza are very much alike, but there are distinct morphologic differences among them. Furthermore, Jones (see below) states that Nagel of Iowa in an unpublished thesis shows that by cross inoculation, the Cercospora on Melilotus does not infect Medicago and Trifolium. Oudemans (Nederl. Kruidk Arch. ser. 2, **4**: 551. 1886) described *C. meliloti* on Melilotus. This is based on *Depazea meliloti* Lasch, the cotype of which is distinctly a Septoria with large globular pycnidia. The perfect stage of *C. davisii* is *Mycosphaerella davisii* Jones (Mycologia **36**: 518. 1944).

**Cercospora demetrioniana** Winter

Hedwigia **23**: 170. 1884; also Jour. Mycol. **1**: 34. 1885

Leaf spots circular to oval or irregular, 3-5 mm. in extent, brown to dark brown; fruiting amphigenous; stromata none to 50$\mu$ in diameter, dark brown or almost black, globular; fascicles 3-30 divergent stalks; conidiophores straight,

medium dark brown, multiseptate, fairly uniform in width and color, not branched, not geniculate to rarely 1-4 mildly geniculate, large spore scar at subtruncate tip, 4.5-7 x 50-150$\mu$, conidia hyaline, acicular to obclavate, truncate base, subobtuse to subacute tip, straight to slightly curved, septa indistinct, 4-7 x 75-230$\mu$.

HOSTS: *Crotalaria intermedia* Kotschy., *Crotalaria juncea* L., *Crotalaria sagittalis* L., *Crotalaria sericea* Retz. (*Crotalaria spectabilis* Roth).

TYPE: Perryville, Missouri; *Crotalaria sagittalis;* C. H. Demetrio; summer, 1883; cotype distributed as Rabenhorst-Winter, Fungi europaei No. 3079.

DISTRIBUTION: Material examined from Florida, Missouri, Delaware, Transvaal, Hawaii, San Domingo, Trinidad, and Minas Geraes.. Reported also from France and Uganda.

NOTE: Fragosa and Ciferri (Rep. Dom. Est. Agr. Moca. Ser. B-Bot. Bul. 11: 68. 1927) describe a variety of this species — var. *minor*. The conidia are 5-5.5 x 35-70$\mu$ and the conidiophores in proportion. I have been unable to procure material for study. The wide long acicular conidia and medium dark conidiophores separate this species from the others on Crotalaria. See key, page 297.

**Cercospora desmanthi** Ellis & Kellerman

Jour. Mycol. 3: 14. 1887

*Cercospora condensata* var. *desmanthi* Ellis & Kellerman, Jour. Mycol. 1: 2. 1885

HOST: *Desmanthus brachylobus* Benth. (*Desmanthus illinoensis* [Michx.] MacMill.).

TYPES: Louisiana; *Desmanthus brachylobus;* A. B. Langlois, No. 548. (var. *Desmanthi*) Great Bend, Kansas; W. A. Kellerman; 1884.

NOTE: The coarse short conidiophores in compact fascicles and the cylindric, 0-3 septate, thick-walled conidia, 4-7 x 20-34$\mu$, places this fungus more naturally into Cercosporidum than in to Cercospora. It has been named *Camptomeris desmanthi* by Petrak and *Cercosporidium desmanthi* by Earle and Dearness.

**Cercospora desmodii** Ellis & Kellerman

Bull. Torrey Bot. Club 11: 121. 1884

Leaf spots circular to subcircular, 2-4 mm. in diameter, brown to dark brown, sometimes pale brown center, no definite border, rarely margin extending irregularly into healthy tissue, occasionally cupped upwards; fruiting chiefly hypophyllous; stromata slight or none; fascicles mostly 2-10, rarely dense; conidiophores pale to medium brown, uniform in color and width, plainly 1-4 septate, sinuous or 1-2 mildly geniculate, sometimes once abruptly geniculate with an incipient branch, 1-3 minute spore scars at or near the tip, which is rounded or subconic, 3-4 x 45-110$\mu$; conidia cylindric to cylindro-obclavate, straight or nearly so, septa indistinct, long obconic base, subobtuse tip, hyaline to subhyaline, or oldest ones very pale olivaceous brown, 3-4.5 x 30-50$\mu$ (some collections show no colored conidia).

HOSTS: Desmodium sp., *Desmodium acuminatum* DC. (*Meibomia acuminata* [Michx.], Blake) (*Desmodium grandiflorum* [Walt.] DC.), *Desmodium molle* DC., *Desmodium nudiflorum* (L.) DC., *Desmodium rotundifolium* (Michx.) DC., *Desmodium viridiflorum* Beck.

TYPE: Manhattan, Kansas; *Desmodium acuminatum;* W. A. Kellerman, No. 585; July, 1884.

DISTRIBUTION: From Wisconsin, Iowa, and Missouri to Mississippi and eastward. Also in San Domingo and France.

NOTE: Atkinson (Jour. Elisha Mitchell Sci. Soc. 8: 53. 1892) described this with acicular hyaline conidia, but apparently later placed his collection in the herbarium under the name of *C. desmodiicola. C. desmodii* is separated from other species on the host genus by having conidia without truncate base and rarely colored.

**Cercospora desmodiicola** Atkinson

Jour. Elisha Mitchell Sci. Soc. 8: 53. 1892

*Cercospora melaleuca* Ellis & Everh., Bul. Torrey Bot. Club 27: 56. 1900

Leaf spots angular, 2-5 mm. in diameter, white center, reddish brown narrow margin or uniformly brown, spots on stems elliptic, 2-4 x 4-8 mm. either uniformly dark or with gray center; fruiting amphigenous; on leaves stromata lacking or only a few large brown cells, on stems slightly flattened, dark, 30-50$\mu$ in length; fascicles 3-10 stalks, or on stems dense; conidiophores fairly dark brown near base, almost hyaline tip, sparingly septate, not branched, upper half often sinuous or with alternate, mild geniculations, attenuated toward the tip, medium sized spore scar at the tip, 3-5 x 10-125$\mu$, on stem mostly 10-20$\mu$ in length; conidia hyaline, acicular, truncate base, subacute tip, straight or slightly curved, septa indistinct, 2.5-4 x 25-150$\mu$.

HOSTS: Desmodium sp., *Desmodium canadense* DC., *Desmodium canescens* (L.) DC., *Desmodium rotundifolium* (Michx.) DC., *Desmodium tortuosum* DC,. *Desmodium intortum* Faw. & Rendle.

TYPES: Auburn, Lee Co., Ala.; Desmodium sp.; Geo. F. Atkinson, No. 1580; Sept. 3, 1890. (*C. melaleuca*) Lake City, Florida; *Desmodium tortuosum;* H. H. Hume; Oct., 1899.

DISTRIBUTION: Alabama, Oklahoma, Florida, Indiana, Wisconsin, Jamaica.

NOTE: Fragosa and Ciferri described a variety, *C. desmodiicola* var. *leiocarpi* on *Desmodium leiocarpum* G. Don. (Rep. Dom. Est. Agr. Haina Ser. B-Bot. Bul. 4: 9. 1926). It has conidia that resemble closely Atkinson's species, but the conidiophores are long, wide, uniformly colored, not attenuated, sometimes abruptly geniculate, and with wide spore scar at the subtruncate tip. These differences probably justify a new species. *C. desmodiicola* is described by Atkinson under *C. desmodii,* but seeing that this name had previously been used he changed the name on the type to *C. desmodiicola.*

**Cercospora dolichi** Ellis & Everhart

Jour. Mycol. 5: 71. 1889

*Cercospora vignae* Rac., Zeitschr. Pflanzenkr. 8: 66. 1898

*Cercospora raciborskii* (Rac.) Mats. et Nag., Jour. of Plant Prot. 18: 721. 1931

*Cercospora vignae-sinensis* Tai & Wei, Sinensia 4: 126. 1933

*Cercospora neovignae* Yam., Phytopath. Lab. Contrib., Taihoku Imp. Univ. 26: 142. 1934

*Cercospora vignae-sinensis* Sawada, Formosan Agr. Res. Inst. Rept. 85: 125. 1943

Leaf spots reddish or reddish brown blotches, sometimes with a distinct yellow

halo, at other times indistinguishable from those caused by *C. cruenta;* fruiting mostly on upper leaf surface; stromata slight; fascicles dense; conidiophores pale olivaceous brown, sparingly septate, sometimes constricted at the septa,

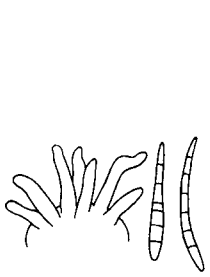


Fig. 131
*C. dolichi*

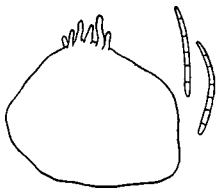


Fig. 132
*C. glycines*

Fig. 133
*C. instabilis*

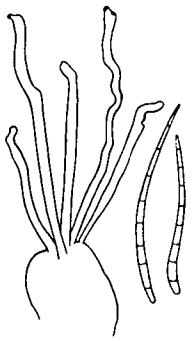


Fig. 134
*C. kikuchi*

not geniculate, not branched, tip rounded bluntly, with small spore scar, straight to variously curved, 4-7 x 10-45$\mu$; conidia pale olivaceous or olivaceous brown, obclavato-cylindric, straight to mildly curved, indistinctly multiseptate, short obconically truncate base, tip obtuse, 3-5 x 30-110$\mu$.

HOSTS: Vigna (Dolichos) sp., *Vigna sinensis* (L.) Endl. (*Dolichos sinensis* Stickm.), *Vigna unguiculata* (L.) Walp. McRae (Sci. Rept. Imp. Inst. Agr. Res. Pusa. **1931-32:** 122. 1933) adds Phaseolus and Glycine. I am not sure that this is correct.

TYPES: Starkville, Miss.; *Dolichos sinensis;* S. M. Tracy; Sept. 1888. (*C. vignae*) Tegal, Java; *Vigna sinensis;* M. Raciborski. (*C. vignae-sinensis*) Wuchang, Hupeh, China; *Vigna sinensis;* T. F. Yu, No. 2331; July 29, 1928. (*C. neovignae*) Taihoku, Formosa; *Vigna sinensis* var. *catjang;* W. Yamamoto; Dec. 20, 1933.

DISTRIBUTION: Gulf States and as far north as Missouri; Puerto Rico, Trinidad, Barbardos, Italian Somaliland, India, Japan, Formosa, and China.

NOTE: See also *C. cruenta* for differences between the two species. McRae states that the two species can be differentiated in culture even though they attack the same hosts. It resembles *C. cruenta* and *C. lussoniensis,* but plainly has wider conidiophores than either, and differs mildly in other characteristics. Raciborski does not cite a definite type. Sawada suggests the name of his species to replace that of Raciborski, but Matsumoto and Nagaoka, as well as Tai and Wei had thought of the same thing previously. See key, page 287.

**Cercospora eriosemae** Hansford

Proc. Linnean Soc. London **1944-45:** 40. 1945

Leaf spots indistinct yellowish areas on the upper leaf surface; fruiting on the corresponding lower surface, effuse, among the leaf hairs appearing grayish brown, 1-4 mm. in extent; stromata lacking; nonfasciculate or 2-6 diverging stalks; conidiophores olivaceous, variously curved or crooked, branched occasionally, prominently geniculate, as large as 4-5 x 250$\mu$; conidia pale oliva-

ceous, cylindric to narrowly obclavate, 2-6 septate, base obconically truncate, tip about 2$\mu$ wide, straight to curved, 4-6 x 50-90$\mu$.

HOSTS: *Eriosema psoraleoides* G. Don, Eriosema sp.
TYPE: Semuto Road, Uganda; *Eriosema psoraleoides;* Hansford, 3313; cotype: Eriosema sp.; Hansford, 2353.
DISTRIBUTION: Uganda.
NOTE: I have not seen this species.

## CERCOSPORAE ON ERYTHRINA

A. Conidia hyaline, acicular, base truncate, 3-5 x 40-200$\mu$; conidiophores 4-6 x 40-220$\mu$.

*C. erythrinicola*

AA. Conidia colored, not acicular, base not truncate.
B. Stromata 20-50$\mu$ in diameter; fascicles mostly dense; fruiting amphigenous; conidia obclavate, 2-4 x 20-70$\mu$; conidiophores 3-4.5 x 10-40$\mu$.

*C. erythrinae*

BB. Stromata none or slight, fascicles not dense; fruiting hypophyllous; conidia 4-7 x 20-90$\mu$; conidiophores 4-5.5 x 50-200$\mu$.
C. Conidiophores not fasciculate, irregular in width, tortuous, uniform in color, branched.

*C. pittierii*

CC. Conidiophores in fascicles of 2-12, uniform in width, almost straight, paler toward the tip, not branched.

*C. tomentosae*

### **Cercospora erythrinae** Ellis & Everhart

Jour. Mycol. **3**: 18. 1887

Leaf spots 0.5-4 mm. in diameter, white center, brown border; fruiting amphigenous, but chiefly on upper surface; small globular stromata, dark fuligenous, 20-50$\mu$ in diameter; fascicles mostly dense; conidiophores subhyaline to pale fuligenous or olivaceous brown, sparingly septate, not or rarely geniculate, not branched, longer ones attenuated, rounded tip, numerous small black spore scars at end and near tip, 3-4.5 x 10-40$\mu$; conidia pale olivaceous, obclavate to cylindro-obclavate, long obconic base, subobtuse tip, straight or nearly so, mostly 3-5 septa, 2-4 x 20-70$\mu$.

HOSTS: *Erythrina crista-galli* L., *E. glauca* Willd., *E. tomentosa* R. Br.
TYPE: Lafayette, La.; *Erythrina crista-galli;* A. B. Langlois, No. 728; Sept. 21, 1886.
DISTRIBUTION: Southern United States, Central America, and northern South America. Uganda (East Afr. Jour. Agric. **2**: 419. 1937).
NOTE: The combination of gray leaf spots, short conidiophores, and obclavate conidia separates this species from the others on Erythrina. For a further description see also Ann. Mycol. **28**: 210. 1930. See also *C. erythrinicola* and *C. pittieri,* and key above.

### **Cercospora erythrinicola** Tharp

Mycologia **9**: 109. 1917

Leaf spots circular to subcircular, 3-8 mm. in diameter, grayish brown or grayish, with a dark border; fruiting amphigenous but more abundant on the upper surface where definite fascicles are formed, stalks mostly single on the

lower surface; stromata lacking or only a few brown cells; conidiophores pale to medium brown, slightly paler and more narrow toward the tip, multiseptate, not branched, straight to curved or undulate, sparingly geniculate, medium spore scar at the subtruncate tip, 4-6 x 40-220$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute to subacute, 3-5 x 40-200$\mu$.

HOSTS: *Erythrina herbacea* L., *E. velutina* Willd.

TYPE: Rockdale, Texas; *Erythrina herbacea;* B. C. Tharp; Oct. 31, 1914.

DISTRIBUTION: Texas; Sao Paulo, Brazil.

NOTE: I found only a Colletotrichum on the type specimen, but Tharp's description fits fairly closely the Brazil collection. See key, page 305 for differences among the species on this host genus.

**Cercospora faseolina** Spegazzini

Anal. de la Soc. Cient. Argentina **13:** 28. 1882

TYPE: Palermo, Buenos Aires, Argentina; *Phaseolus ovatus* Benth.; C. Spegazzini, No. 912; May 15, 1881.

NOTE: The spores being hyaline, cylindric, mostly 1-septate (limits 0-3), this species is classed as a Didymaria rather than a Cercospora. Saccardo uses the spelling, *C. phaseolina.*

**Cercospora flagellifera** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8:** 51. 1892

Leaf spots numerous, minute, 0.5-4 mm. in diameter, indistinctly brown or gray, the affected tissue soon falling out leaving irregular holes, resembling insect injury; a pycnidial form may occur on the same leaf and cause a much more distinct leaf spot; fruiting hypophyllous; stromata none or small, brown, up to 30$\mu$ in diameter; fascicles 2-15 spreading stalks; conidiophores pale olivaceous brown, becoming paler and more attenuated upward, multiseptate, sometimes branched, 0-10 mild to abrupt geniculations, medium spore scar at subtruncate tip, 3.5-5 x 40-75$\mu$, but occasionally as long as 300$\mu$; conidia acicular to obclavate, (flagelliform) hyaline, base truncate to subobconic, tip subacute, septa indistinct, straight to curved, 2-3.5 x 40-120$\mu$, rarely as long as 250$\mu$.

HOSTS: *Galactia pilosa* Ell., *Glycine striata* Jacq. (*Galactia striata* Urban).

TYPE: Auburn, Lee Co., Ala.; *Galactia pilosa;* Geo. F. Atkinson, No. 2180; Sept. 9, 1891.

DISTRIBUTION: Gulf states and West Indies.

NOTE: Lespedeza also has been mentioned as a host, but both the Atkinson and the J. J. Davis collections are *C. lespedezae.* See key, page 287.

**Cercospora galactiae** Ellis & Everhart

Bul. Torrey Bot. Club **22:** 438. 1895

Leaf spots indistinct or lacking; fruiting in minute velvety black specks, less than 1 mm. in extent, on both leaf surfaces; stromata black, globular, 40-70$\mu$ in diameter; fascicles dense; conidiophores sprawling, medium dark olivaceous brown, multiseptate, not branched, wavy to mildly geniculate, spore scars indistinct, rounded tip, 4-6.5 x 50-350$\mu$; conidia medium olivaceous brown, obclavate to obclavato-cylindric, straight or nearly so, base mostly long obconically truncate, tip obtuse, plainly multiseptate, 4-6.5 x 30-110$\mu$.

TYPE: Florida; *Galactia nuttallii* Ell.; Nash, No. 1987; 1895.
DISTRIBUTION: Known only from the type locality.
NOTE: Colored obclavate conidia, and fasciculate conidiophores arising from a stroma separate this species from the others on Galactia. See key, page 287.

**Cercospora galegae** Saccardo
Michelia 1: 267. 1878

*Cercospora radiata* Sacc., Mycoth. Venet. No. 229. 1873

Leaf spots circular to oval, 0.5-1.5 mm. in length, gray center, narrow reddish to brown margin; fruiting amphigenous; stromata brown, slight or rarely 50$\mu$ in diameter; fascicles 2 stalks to dense; conidiophores pale olivaceous brown, paler toward the tip, uniform in diameter, 1-7 septate, not branched, mildly geniculate, medium spore scar at the subtruncate tip, 4-6 x 20-100$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly septate, base truncate, tip subacute, 2.5-4 x 45-130$\mu$.

TYPE: Selva (Treviso) Italy; *Galega officinalis* L., Oct., 1876. Cotype distributed as Mycotheca Veneta No. 1055.
DISTRIBUTION: Northern Italy, Hungary, southern Russia.
NOTE: Fuckel had already described *Cercospora radiata* on Anthyllis.

**Cercospora glauca** Sydow
Ann. Mycol. 27: 432. 1929

Leaf spots angular or irregular, 3-10 mm. in diameter, dark brown, occasionally with a pale center; fruiting hypophyllous; stromata pale olivaceous brown, globular, 20-35$\mu$ in diameter; fascicles dense; conidiophores very pale olivaceous, almost hyaline at the narrowed tip, not septate, not geniculate, not branched, longest ones may be slightly curved, narrowly rounded tip, 2-3.5 x 5-15$\mu$; conidia subhyaline to very pale olivaceous, narrowly linear or slightly attenuated, indistinctly multiseptate, variously curved or undulate, base obconic to subtruncate, tip rounded to subacute, 2-3.5 x 25-80$\mu$.

TYPE: Nanking, prov. Kiangsu, China; *Albizzia kalkora* Prain; F. L. Tai, No. 2238; Oct., 1928.
DISTRIBUTION: Known only from the type locality.

**Cercospora gliricidiae** H. & P. Sydow
Philipp. Jour. Sci. (Bot.) 8: 283. 1913

*Cercospora gliricidiasis* Fragosa & Ciferri, Rep. Dom. Est. Agr. Haina Ser. B-Bot. Bul. 4: 9. 1926
*Cercospora gliricidiae* var. *gliricidiasis* Frag. & Cif., Rep. Dom. Est. Agr. Moca Ser. B-Bot. Bul. 11: 67. 1927

HOST: *Lonchocarpus sepium* DC. (*Gliricidia sepium* HBK.) (*G. maculata* HBK.).
TYPES: Philippines, Luzon, Prov. of Laguna, Los Banos; *Gliricidia sepium;* C. F. Baker, No. 624; Jan. 7, 1913; (*C. gliricidiasis*) Near Salcedo, San Domingo; *Gliricidia sepium;* R. Ciferri; Aug. 1925, and near Moca, Dec. 1926.
NOTE: The dark colored, thick-walled conidia, 1-3 septate, measuring 5-9 x 20-50$\mu$, characterize this fungus as Helminthosporium, unless the short conidiophores in compact dense fascicles would make Coryneum a more desirable genus for the classification. See *C. lonchocarpi.*

**Cercospora glothidiicola** Tracy & Earle
Bul. Torrey Bot. Club **23**: 206. 1896

Numerous small circular, smoky to sooty effuse patches on fruit pods, 0.5-3 mm. in diameter; small dark stromata, 20-30 mm.; fascicles sometimes dense; conidiophores pale fuligenous or olivaceous brown, not septate, not branched, rarely once geniculate, slightly attenuated, medium-sized spore scars at subtruncate tip, 3-5 x 10-40$\mu$ (T. + E. say 70$\mu$); conidia hyaline, acicular, shortest ones cylindric, straight or nearly so, base truncate, tip subobtuse, septa indistinct, 2-4 x 30-100$\mu$.

HOST: *Sesbania platycarpa* Pers. (*Glottidium floridanum* DC.).
TYPE: Ocean Springs, Miss.; *Glothidium floridanum;* E. S. Earle; Sept. 25, 1895.
DISTRIBUTION: Known only from the type locality.
NOTE: *C. sesbaniae* the other species on this host genus has pale colored, obclavate conidia.

**Cercospora glycines** Cooke
Grevillea **21**: 39. 1892

Leaf spots subcircular to angular, 0.5-1.5 mm. in diameter, dark brown to almost black; fruiting amphigenous; stromata brown, subglobular, 20-60$\mu$ in diameter, or several joining and extending 100$\mu$ or more; fascicles dense to very dense; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, straight to curved, septation, branching, geniculation, and spore scars absent or indistinct, narrowly rounded tip, 1.5-3 x 10-25$\mu$ or when conidia are persistent appearing much longer; conidia hyaline to subhyaline, cylindric although there may be a mixture of acicular and obclavate ones with slight attenuation, straight to curved, indistinctly septate, base obconically truncate, tip subobtuse or conic, 1.5-3 x 15-75$\mu$.

HOSTS: Glycine sp., *G. clandestina* Wendl.
TYPE: Victoria, Australia; Glycine sp.; Morrison, No. 30. The published description gives *Glycine clandestina.*
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. sojina* and *C. canescens* and key, page 288 for differences among the species on Glycine (Soja).

**Cercospora glycyrrhizae** n. comb.
*Cercosporina glycyrrhizae-echinatae* Savulescu & Sandu-Ville, Hedwigia **75**: 227. 1935.

Leaf spots circular to irregular, 1-4 mm. in diameter, brown, narrow line margin; fruiting amphigenous but more abundant on the upper leaf surface; stromata globular, brown, up to 40-50$\mu$ in diameter; fascicles dense; conidiophores pale brown, paler and more narrow toward the tip, multiseptate, not branched, 0-6 mildly geniculate, straight to flexuous, medium spore scar at the subtruncate tip, 3-4.5 x 30-140$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 3-4.5 x 50-180$\mu$.

HOSTS: *Glycyrrhiza echinata* L., *G. asperrima* L. (*G. aspera* Pall.)
TYPE: Apud Zimnicea, dist. Teleorman, Roumania; *Glycyrrhiza echinata;* Savul. & Sandu.; Aug. 7, 1932.
DISTRIBUTION: Roumania, Turkestan.

NOTE: No material of this species was available. Compound names for species usually are wrongly used. Besides in this case there is no previously described *G. glycyrrhizae.* See *C. cavarae* for difference between the species on this host genus. This may finally prove identical with *C. astragali.* Zaprometov in his Materials for the Microflora of Middle Asia, p. 35, 1926, lists *Cercospora glycyrrhizae* Saccardo, and refers to Sylloge Fungorum **16:** 1069. But on that page is given *C. cavarae* on *G. glabra.*

**Cercospora greciana** Sydow

Ann. Mycol. **23:** 426. 1925

TYPE: Grecia, Costa Rica; *Cassia oxyphylla* Kunth; H. Sydow, No. 110; Jan. 19, 1925.

NOTE: The coarse, dark colored conidiophores and the thick-walled, medium dark conidia place this species in Helminthosporium.

**Cercospora guanicensis** Young

Mycologia **8:** 45. 1916

Leaf spots indefinite, yellowish on upper leaf surface, sparsely effuse dark fruiting on corresponding lower surface, often inconspicuous; stromata sometimes present, dark brown, globular, 40-75$\mu$ in diameter; fascicles dense to stalks borne singly; conidiophores pale olivaceous brown, multiseptate, 0-2 abruptly geniculate, not branched, sometimes irregular in width, at times variously curved or undulate, tip conic to rounded, with small spore scar, 3-5 x 20-150$\mu$; conidia obclavate to cylindro-obclavate, pale olivaceous, straight to curved, base long obconic, tip blunt, indistinctly 3-8 septate, 2.5-4.5 x 20-110$\mu$.

HOST: *Caesalpinia crista* L. (*Guilandina crista* [L.] Small).

TYPE: Guanica, Puerto Rico; *Guilandina crista;* F. L. Stevens, No. 6840; Dec. 29, 1913.

DISTRIBUTION: Puerto Rico, Bermuda.

NOTE: In some of the mounts of the type are slightly darker, cylindric conidia, up to 8$\mu$ in diameter. I am not sure whether these belong to the above species or represent a second fungus.

**Cercospora gymnocladi** Ellis & Kellerman

Bul. Torrey Bot. Club **11:** 121. 1884

*Cercospora superflua* Ellis & Holway, Jour. Mycol. **2:** 2. 1886

TYPES: Manhattan, Kansas; *Gymnocladus canadensis* Lam.; W. A. Kellerman, No. 571; July, 1884; (*C. superflua*) Decorah, Iowa; Gymnocladus sp.; E. W. D. Holway; Aug. 16, 1885.

NOTE: When *C. superflua* was first named, the host was considered to be a Fraxinus, but in the Jour. of Mycol. **4:** 83. 1888, Ellis shows that it was a synonym of *C. gymncladi.* The coarse dark conidiophores, and the large, dark-colored, thick-walled conidia are characteristic of Helminthosporium rather than of Cercospora. The plainly obclavate conidial forms were placed in Pseudocercospora by Spegazzini. If his genus is accepted, the species could be classed in it.

**Cercospora haematoxylonis** sp. nov.

Maculae suborbiculares, 0.5-2 mm. diam., rubrobrunneae, centro tandem expallentes; caespituli evidenter amphigeni; stromata subglobosa, 30-60$\mu$ diam.,

atro-fusca, superiores leniter elongatae et tandem in conidiophora brevia 1-cellularia paullo dilutius colorata, 2-4 x 10-25$\mu$; conidiophora dense fasciculata; conidia subhyalina vel pallide olivacea, obclavata, leniter curvata, 1-5 septata, ad basim subtruncata, ad apicem subobtusa, 2-4 x 20-55$\mu$.

Leaf spots subcircular to almost elliptic, 0.5-2 mm. in length, minute pale brown to tan center, dark reddish brown margin; fruiting plainly amphigenous; stromata dark reddish brown, subglobular, 30-60$\mu$ in diameter; fascicles dense; conidiophores often so short as to appear merely as elongated peripheral cells of the stroma, largest ones pale olivaceous, undulate, not branched, not septate, not geniculate, rounded to conic tips, 2-4 x 10-25$\mu$; conidia subhyaline to pale olivaceous, obclavate to cylindro-obclavate, mildly curved, 1-5 septate, base obconically truncate, tip subobtuse, 2-4 x 20-55$\mu$.

HOST: *Haematoxylon campechianum* L.

TYPE: Long Mt., Jamaica; *Haematoxylon campechianum;* E. B. Martyn, No. 221; Oct. 1947.

DISTRIBUTION: Known only from the type locality.

**Cercospora hippocrepidis** Jaap

Ann. Mycol. **5**: 271. 1907

Leaf spots indistinct, circular, 0.5-3 mm. in diameter, grayish with brown border, or when fruiting is abundant lead colored; fruiting amphigenous; stromata small to medium, brown; fascicles sometimes dense; conidiophores pale brown, paler and more narrow toward the tip, sparingly septate, not branched, 0-1 geniculate, straight to mildly curved, medium spore scar at the subtruncate tip, 4-6 x 25-70$\mu$; conidia hyaline, a mixture of obclavate, acicular and cylindric forms, indistinctly multiseptate, straight to slightly curved, base truncate to long obconically truncate, tip subobtuse to obtuse, 3.5-6 x 40-100$\mu$.

TYPE: Bei Meiringen, Schweiz; *Hippocrepis comosa* L.; Otto Jaap; Aug. 6-7, 1905.

DISTRIBUTION: Several collections from Switzerland.

NOTE: The above description was taken in large part from a collection made by Jaap in 1910.

**Cercospora hosackiae** sp. nov.

Maculae orbiculares vel irregulares, 0.5-3 mm. diam., brunnea in epiphyllo saepe zonula lata flavida; caespituli amphigeni; stromata minutissima; conidiophora laxe fasciculata, pallide flavido-brunnea, 0-3 septata, recta vel leniter sinuosa, vix geniculata, simplicia, ad apicem fere hyalina et subacuta, 3-4.5 x 20-50$\mu$; conidia hyalina, obclavata, recta vel leniter curvata, 5-13 septata, ad basim, subtruncata, ad apicem obtuse rotundata, 3-4.5 x 35-120$\mu$.

Leaf spots circular to irregular, pale to medium brown, 0.5-3 mm. in diameter, sometimes surrounded by a yellowish zone; fruiting amphigenous; stromata mostly only a few yellowish brown cells; fascicles usually dense, divergent; conidiophores pale yellowish brown, 0-3 septate, straight to slightly undulate, 0-3 indistinctly geniculate, not branched, tips rounded to conic, narrow, almost hyaline, 3-4.5 x 20-50$\mu$; conidia hyaline, obclavate, straight to mildly curved, 5-13 septate, base rounded to obconically truncate, tip subobtuse, 3-4.5 x 35-120$\mu$.

HOST: *Hosackia americana* (Nutt.) Piper.

TYPE: Turner Falls, Murray Co., Okla.; *Hosackia americana;* D. A. Preston, No. 2034; June 16, 1944.
DISTRIBUTION: Oklahoma.

**Cercospora hypsophila** Sydow
Ann. Mycol. **37**: 430. 1939

Leaf spots angular to irregular, 3-10 mm. in diameter, dull brown, sometimes with yellow to orange margin; fruiting hypophyllous; stromata subglobular, 30-80$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, septation, geniculation and branching absent or not visible, wavy, narrowly rounded tip, 2-3.5 x 5-35$\mu$, mostly slightly elongated peripheral cells but when conidia are persistent appearing as long stalks; conidia subhyaline to pale olivaceous, obclavato-cylindric, rarely almost obclavate, straight to slightly curved, 4-13 septate, base subtruncate to long obconically truncate, tip blunt or occasionally conic, 3-5.5 x 30-95$\mu$.

TYPE: Guapulo, Prov. Pichincha, Ecuador; *Mimosa floribunda* Willd.; H. Sydow; Sept. 9, 1937. Cotype distributed as Fungi Ecuador, No. 22.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. sensitivae* for differences between the species on this host genus.

**Cercospora ichthyomethiae** Dearness & Bartholomew
Mycologia **16**: 175. 1924

Leaf spots dingy gray to grayish brown, with dark brown line margin, at first circular and 2-5 mm. in diameter, later coalescing into areas 20-30 mm. in extent and irregular in outline; fruiting epiphyllous; most fascicles dense; conidiophores pale to medium olivaceous brown, uniform in color and width, 0-1 mildly or abruptly geniculate, not branched, 0-1 septate, minute spore scar at rounded tip, 3-4 x 5-30$\mu$; conidia cylindro-obclavate, shortest ones may be cylindric, subhyaline to very pale olivaceous, straight or nearly so, base long obconic, tip subobtuse, indistinctly 0-4 septate, 2-3.5 x 20-55$\mu$.

HOST: *Piscidia erythrina* L. (*Ichthyomethia piscipula* Kuntze).
TYPE: Miami, Florida; *Ichthyomethia piscipula;* L. W. Nuttall; March, 1923.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. piscidiae* for differences between the two species on this host genus.

**Cercospora ingae** Obregon-Botero
Caldasia **3**: 49. 1941

Leaf spots circular to elongate or irregular, 3-12 mm. in diameter, pale brown to grayish brown, often with a black line border; fruiting epiphyllous; stromata 20-30$\mu$ in diameter, dark olivaceous brown; fascicles dense; conidiophores pale to medium olivaceous brown, mostly of uniform color, slightly attenuated, 0-4 septate, rarely branched, slightly geniculate, minute spore scar at the rounded to conic tip, 3-4 x 10-60$\mu$ or the base may be 6$\mu$ in width; conidia subhyaline to pale fuligenous, obclavato-cylindric, very slightly attenuated, straight to curved, base obconically truncate, tip blunt, 2-8 multiseptate, 2-4 x 30-85$\mu$.

HOSTS: *Inga spectabilis* Willd., Inga sp.

TYPE: Armero (Tolima) Colombia; *Inga spectabilis;* G. J. Quintana; May 14, 1939.

DISTRIBUTION: Minas Geraes (Brazil) and Colombia.

**Cercospora innumerabilis** (Fckl.) v. Höhnel

Sitzber. K. Akad. Wiss. Math.-Naturw. I **116**: 622. 1907

*Psilothecium innumerabile* Fuckel, Jahrb. Nassau. Ver. Naturk. **23**: 116. 1869

Leaf spots dark to almost black areas, mostly on the under side of the leaf; fruiting hypophyllous; stromata dark to almost black, globular, resembling pycnidia; fascicles dense; conidiophores slightly elongated cells on the periphery of the stromata; conidia obclavato-cylindric, subhyaline, straight to slightly curved, 1-4 septate, ends rounded or base almost obconic, 4-5.5 x 20-60$\mu$.

COTYPE: In silva, Hostrichiensi, Fungi Rhenani No. 1571; *Cytisus sagittalis* Koch; raro, Vere, 1865.

DISTRIBUTION: France and Germany.

NOTE: Fuckel described a "spermagonial" stage of *Myriocarpa cytisi,* (Leptosphaeria) naming it *Psilothecium innumerabile.* von Höhnel studied Fuckel's collections (Fungi Rhen. 2323, 2324, and 1571) and decided it was a Cercospora. There are so many other types of fruiting present that it is difficult to study the fungus in enough detail to describe it fully. If it really belongs to Leptosphaeria, it is doubtful that it is a true Cercospora. See also *C. cytisi.*

**Cercospora instabilis** Rangel

Bol. Agr. Sao Paulo, Serie 16A, 2: 154. 1915

Leaf spots angular, 1-3 mm. in diameter, gray center, dark margin; fruiting amphigenous but more abundant on the lower surface; stromata lacking, at least on the lower leaf surface; conidiophores borne singly or in groups of 2 or 3 (Rangel pictures them in dense fascicles, and on the upper leaf surface arising from stromata), medium brown, uniform in color, multiseptate, irregular in width or constricted at the septa, branched sparingly, variously curved or crooked, rarely geniculate, medium spore scar at the subtruncate tip, 4-6.5 x 40-200$\mu$; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to almost obconic, tip subacute, 2.5-4 x 30-200$\mu$.

TYPE: Niteroy, Brazil; *Cajanus indicus* Spreng.; Eugenio Rangel, Nos. 427 and 427A; July, 1911.

DISTRIBUTION: Known from the type locality. Reported from China.

NOTE: See also *C. cajani* for differences between the two species on Cajanus.

**Cercosporina josensis** Sydow

Ann. Mycol. **23**: 427. 1925

HOSTS: *Crotalaria guatemalensis* Benth., *C. pumila* Rafin., *C. vitellina* Ker-Gawl.

TYPE: San Jose, Costa Rica; *Crotalaria guatemalensis;* H. Sydow, No. 99; Dec. 22, 1924.

NOTE: The dark colored, coarse, closely septate conidiophores, and the wide, thick-walled conidia represent Helminthosporium rather than Cercospora, even though the conidia are subhyaline to pale in color.

**Cercospora Kennedyae** Cooke & Massee
Grevillea **19**: 90. 1891

Leaf spots subcircular to irregular, 1-4 mm. in diameter or coalescing into large areas, pale to dark brown, usually with a darker line margin; fruiting amphigenous; stromata medium to dark brown, subglobular, 20-40$\mu$ in diameter or even as long as 60$\mu$; fascicles dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, straight to mildly undulate, rarely septate, not branched, not geniculate, small spore scar at the narrowly rounded tip, 2-3.5 x 10-35; conidia subhyaline to pale olivaceous, obclavato-cylindric, straight to mildly curved, indistinctly septate, base truncate to obconically truncate, tip subobtuse to conic, 2-4 x 20-75$\mu$.

TYPE: Victoria, Australia; *Kennedya prostrata* R. Br.; Martin, No. 603.
DISTRIBUTION: Australia.
NOTE: This resembles closely *C. clitoriae.*

**Cercospora kikuchii** Matsumoto et Tomoyasii
Annals Phytopath. Soc. of Japan **1** (6): 1. 1925

*Cercosporina kikuchii* Mat. et Tomoy. (See above citation)

Leaf spots subcircular to irregular, often along margin of leaf, 3-15 mm. in extent or including the entire leaflet, pale brown, tan or dingy gray center with a wide reddish brown to violet margin; fruiting amphigenous, also on stems, pods and seeds; stromata small; fascicles mostly dense, but some specimens show only 2-5 stalks, fairly divergent; conidiophores medium dark brown, uniform in color or tip pale, multiseptate and geniculate, not branched, tip subtruncate, 4-6 x 45-220$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to curved, base truncate, tip subacute to subobtuse, 2.5-5 x 50-375$\mu$, some collections not over 100$\mu$ in length. See Phytopath. **41**: 305. 1951.

HOST: *Glycine max* Merrill.
TYPE: No definite type published. Found abundantly, especially in the northern provinces of Japan.
DISTRIBUTION: Probably present wherever the host is grown intensively.
NOTE: At first this was considered a synonym of *C. canescens,* which it resembles. It, however, has denser fascicles, darker colored conidiophores, and generally shorter, more blunt conidia. See key, page 288.

**Cercospora laburni** Ray
Mycologia **32**: 271. 1940

Leaf spots subcircular to angular, inclined to coalesce, 1-8 mm. in length, gray, narrow dark reddish brown margin; fruiting amphigenous; stromata slight to 50$\mu$ in width; fascicles mostly dense, often coremoid; conidiophores in mass dark, singly pale olivaceous brown, uniform in color and width, sparingly septate, not branched, sometimes once or rarely twice geniculate, large spore scar at subtruncate tip, 4-6 x 20-125$\mu$; conidia hyaline, acicular, straight to slightly curved, septa indistinct, base truncate, tip acute to subacute, 2-3.5 x 20-110$\mu$.

HOST: *Laburnum anagyroides* Medic. (*L. vulgare* J. Presl).
TYPE: College Gardens, O.A.M.C. Stillwater, Okla.; *Laburnum anagyroides;* W. W. Ray; Aug. 18, 1939.
DISTRIBUTION: Known only from the type locality.

**Cercospora latens** Ellis & Everhart
Jour. Mycol. 4: 3. 1888

*Cercospora lespedezae* Ellis & Dearness, Can. Inst. Proc. N. ser. Part 3. 1: 91. 1897

Leaf spots angular or irregular, 1-5 mm. in extent, pale brown to ferruginous, indistinct on lower surface; fruiting mostly epiphyllous; small brown stromata, from a few cells to 30$\mu$ in diameter; fascicles sometimes dense, mostly 3-15 stalks; conidiophores pale olivaceous brown, somewhat attenuated, not or rarely septate, not geniculate, not branched, small to medium spore scar at rounded tip, 3-5 x 5-30$\mu$; conidia obclavate to cylindro-obclavate, hyaline to subhyaline (rarely almost colored), straight or slightly curved, base subtruncate to long obconically truncate, tip subobtuse, septa mostly indistinct, 2.5-5 x 40-100$\mu$.

HOSTS: *Lespedeza capitata* Michx., and probably other species.

TYPES: Manhattan, Kansas; *Psoralea argophylla* Pursh; W. T. Swingle; June, 1887 (Cotype distributed as N. Amer. Fungi No. 2298); (*C. Lespedezae*), London, Canada; *Lespedeza capitata;* John Dearness, No. 2135; July, 1893 (Cotype distributed as N. Amer. Fungi No. 3094).

DISTRIBUTION: Kansas, Illinois, Wisconsin, New York, Ontario, Middle Asia, China, Formosa, Japan.

NOTE: The host name later was corrected to read *Lespedeza capitata* Michx. Although other Cercospora species have been reported on this host genus, an examination of herbarium material refutes the report. Zaprometov (Materials for the Microflora of Middle Asia Part 1. p. 35. 1926) reports *C. latens* on *Psoralea drupacea.* It may have been *C. psoraleae.*

## CERCOSPORAE ON PISUM AND LATHYRUS

A. Conidia distinctly acicular, hyaline, acute tip; stromata slight; fascicles 2-20 spreading stalks.
  B. Conidiophores sometimes with incipient branching, very pale brown, almost straight, 4-5.5 x 50-180$\mu$, rarely 300$\mu$; conidia 2-3.5 x 50-110$\mu$. *C. lathyrina*
  BB. Conidiophores not branched, pale to medium brown, sinuous, 4.5-7 x 50-170$\mu$; conidia 3-4.5 x 35-240$\mu$. *C. pisa-sativae*

AA. Conidia not acicular, subobtuse tips; stromata 20-60$\mu$; fascicles dense.
  B. Conidia cylindro-obclavate, base truncate, hyaline, 2-3.5 x 40-70$\mu$; conidiophores 3-4 x 5-20$\mu$; leaf spots definite; fruiting not effuse. *C. lathyri*
  BB. Conidia obclavate, base subtruncate, subhyaline, 3.5-5 x 50-160$\mu$; conidiophores 4-6 x 50-160$\mu$; leaf spots indistinct; fruiting effuse. *C. szechuanensis*

**Cercospora lathyri** Dearness & House
N. Y. State Mus. Nat. Hist. Bul. 188: 30. 1916
(Also Bul. 197: 25. 1918.)

Leaf spots angular, 2-4 mm. in diameter, very pale tan to grayish tan, almost same color as remainder of leaf in dried herbarium material, with very pale brown line border; fruiting amphigenous; stromata globular, pale olivaceous brown, 30-60$\mu$ in diameter; fascicles dense; conidiophores closely appressed, pale olivaceous brown, straight, not septate, not geniculate, not branched, slightly attenuated, 3-4 x 5-20$\mu$; rarely a longer one present showing geniculation or un-

Fig. 135
*C. lathyri*

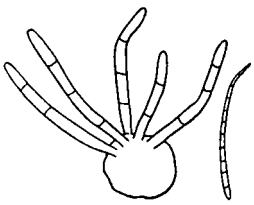


Fig. 136
*C. lathyrina*

Fig. 137
*C. occidentalis*

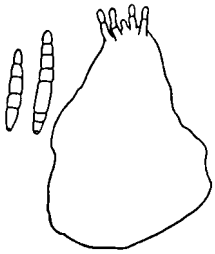


Fig. 138
*C. personata*

dulations; conidia hyaline, cylindro-obclavate, straight or mildly curved, septa indistinct, base truncate, tip subobtuse, 2-3.5 x 40-75$\mu$.

HOST: *Lathyrus maritimus* (L.) Bigelow.

TYPE: Wading River, Long Island; *Lathyrus maritimus;* Charles H. Peck; Sept.

DISTRIBUTION: Roumania, Long Island, Massachusetts and Manitoba.

NOTE: See also *C. lathyrina* and key above for differences between the two species on this host genus.

**Cercospora lathyrina** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. I. **43:** 91. 1891

Leaf spots angular to elongate, dingy gray center, black line border, 3-7 mm. in extent; stromata a few brown cells to 30$\mu$ in diameter; fascicles mostly 2-20 stalks; conidiophores medium brown, shorter ones slightly paler and more narrow toward the tip, plainly multiseptate, rarely with incipient branching, straight to tortuous or 0-5 abruptly geniculate, medium spore scar at subtruncate tip, 4-5.5 x 50-180$\mu$ or even much longer; conidia hyaline, acicular, straight to variously curved, septa indistinct, base truncate, tip acute, 2-3.5 x 50-110$\mu$.

HOSTS: *Lathyrus latifolius* L., *L. odoratus* L., *L. venosus, L. polymorphus* Nutt., *L. palustris, L. ochroleucus,* and probably other Lathyrus species. J. L. Weimer sent me a specimen also on some hybrid peas (*Pisum arvense* x *P. sativum*). He reports it also on field peas (*P. arvense* L.) (Phytopath. **31:** 1031. 1941.).

TYPE: Newfield, New Jersey; *Lathyrus latifolius;* J. B. Ellis; Aug. 1890.

DISTRIBUTION: Southern states at least as far north as New Jersey and Missouri.

NOTE: See also *C. lathyri* for differences between the two species on Lathyrus; and *C. pisa-sativae* and *C. szechuanensis* on Pisum. *C. lathyrina* has been reported on other legumes but apparently is limited to Lathyrus and Pisum. *C. viciae* has been reported on *Lathyrus venosus, L. ochroleucus,* and *L. palustris* (Wisc. Acad. Trans. **24:** 297. 1929). Each specimen examined seems to have been *C. lathyrina.* The conidiophores of this species are somewhat different in outline and darker than are those of *C. pisa-sativae.* See key, page 314.

**Cercospora leguminum** Chupp & Linder

Mycologia **29:** 30. 1937

TYPE: Lo Ch'en, Kwangsi Prov., China; Legume, possibly Crotalaria sp.; S. Y. Cheo, No. 2873; Oct. 1, 1933.

NOTE: The dark colored fruiting, the coarse conidiophores, and the thick-walled

cylindric conidia represent Helicomina rather than Cercospora. For the sake of classification, it is unfortunate that Passalora, when described by Fries, did not include multiseptate conidia so that all such coarse nonfasciculate forms could be placed in this genus.

**Cercospora lonchocarpi** Stevenson

Mycologia **38**: 532. 1946

Leaf spots large, 5-20 mm. in diameter, yellowish gray to tan, outlined by a narrow dark reddish brown line; fruiting amphigenous; stromata subglobular, dark brown, 20-50$\mu$ in diameter; fascicles dense, fairly compact; conidiophores medium dark brown, paler and more narrow toward the tip, 0-3 septate, straight to slightly undulate, longest ones may be once geniculate, not branched, tip rounded to conic, rarely an incipient branch at side of tip, 2-4 x 10-45$\mu$; conidia very pale yellowish olivaceous, narrowly cylindric to cylindro-obclavate, indistinctly septate, straight to curved, base obconically truncate to obconic, tip sharply conic, 2-3.5 x 30-75$\mu$.

HOSTS: *Lonchocarpus nicou* (Aubl.) DC., *L. urucu* Kil. & Sm., *L. chrysophyllus* Kleinh, *Lonchocarpus utilis* A. C. Smith.

TYPE: Belem, Estado do Pará, Brasil; *Lonchocarpus nicou;* W. A. Archer, No. H.-464; Febr. 14, 1945.

DISTRIBUTION: Brazil, Peru, British Guiana.

NOTE: See also *C, gliricidiae.*

CERCOSPORAE ON LUPINUS

A. Conidia hyaline, acicular, base truncate, 3-4 x 30-200$\mu$; conidiophores 4-6 x 20-150$\mu$.
L. SUBCARNOSUS — *C. lupinicola*

AA. Conidia colored, not acicular, base not truncate.
B. Leaf spots indistinct; fruiting effuse, hypophyllous; conidia cylindric, 3.5-6 x 25-100$\mu$; conidiophores branched, 3.5-6 x 20-125$\mu$.
L. DIFFUSUS — *C. lupini*
BB. Leaf spots distinct; fruiting not effuse, chiefly epiphyllous; conidia mostly obclavate, 2-3.5 x 75-170$\mu$; conidiophores 1.5-3 x 5-30$\mu$.
LUPINUS spp. — *C. longispora*

**Cercospora longispora** Peck

N. Y. State Mus. Rept. **35**: 141. 1884

*Cercospora filispora* Peck (in herb.), Jour. Mycol. **1**: 63. 1885
*Cylindrosporium longisporum* Ellis & Dearness, Can. Rec. Sci. **1893**: 270. 1893?
*Cercoseptoria longispora* (Peck) Davis, Wisc. Acad. Trans, **20**: 401. 1921

Leaf spots circular to irregular, 2-4 mm. in diameter, pale to dark brown, narrow darker brown line border; fruiting amphigenous but more abundant on upper surface; small brown stromata filling stomatal openings; fascicles dense, very compact; conidiophores pale olivaceous brown, septation, geniculation, branching, and spore scars indistinct or lacking, rounded tip, 1.5-3 x 5-30$\mu$, when conidia are persistent as they often are, appearing much longer; conidia linear or rarely narrowly obclavate to acicular, subhyaline to pale olivaceous brown, variously curved or undulate, indistinctly multiseptate, base truncate to long obconically truncate, tip subacute, 2-3.5 x 75-170$\mu$.

HOSTS: *Lupinus perennis* L., *L. pilosus* Murr., *L. villosus* Willd., *L. humicolus* A. Nelson, Lupinus sp.

TYPES: Center (Karner), Albany Co., N. Y.; *Lupinus perennis;* C. H. Peck; July, 1881. This is the type also for *C. filispora.*

DISTRIBUTION: Studied material from New York, Wisconsin, and Ontario. Also reported from Florida (P. Dis. Reporter Suppl. **148**: 265. 1944) and Missouri (Hedwigia **24**: 21. 1885).

NOTE: Fruiting effuse, conidiophores in dense fascicles, and conidia colored separate this from other species on Lupinus. Ellis must have overlooked the fact that Peck had already described the fungus. This *C. longispora* should not be confused with the one Traverso described on lettuce (Malpighia **17**: 217. 1902). von Höhnel (Ann. Mycol. **22**: 198. 1924) stated that *Cylindrosporium longisporum* was a Cercospora and that it was the synonym of *C. longispora* Peck. See key above.

**Cercospora loti** Hollós

Ann. Mus. Nat. Hungarici **5**: 468. 1907

Leaf spots orbicular, reddish brown; fruiting epiphyllous, when abundant effuse, olivaceous; stromata present; fascicles mostly dense; conidiophores pale olivaceous brown, 1-2 septate, not branched, lightly geniculate, medium spore scar at the subtruncate tip, 4-5 x 30-100$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to slightly curved, base truncate, tip subacute, 4-5 x 30-90$\mu$.

TYPE: Kecskemét, Hungary; *Lotus siliquosus* L.; L. Hollós; May.

DISTRIBUTION: Known only from the type locality.

NOTE: No material was available for study. It resembles *C. radiata* closely.

**Cercospora lupini** Cooke

Hedwigia **17**: 39. 1878

*Septosporium lupini* Thuemen Mycotheca Universalis No. 1171

Leaf spots indistinct; fruiting in olivaceous effuse patches on the lower leaf surface; stromata lacking; nonfasciculate to dense fascicles; conidiophores pale olivaceous brown, uniform in color and width, sometimes closely and plainly septate, branched, not geniculate, spore scars indistinct, mostly bluntly rounded tips, 3.5-6 x 20-125$\mu$; conidia cylindric to obcalvato-cylindric; rarely distinctly obclavate, straight to mildly curved, pale olivaceous or olivaceous brown, 1-7 septate, base obconic to obconically truncate, tip rounded to conic, 3.5-6 x 25-100$\mu$.

HOSTS: *Lupinus diffusus* Nutt., Lupinus sp.

TYPE: Aiken, South Carolina; *Lupinus diffusus;* H. W. Ravenel, No. 67 (Cooke, No. 2213); 1876.

DISTRIBUTION: South Carolina and Florida. Also reported from Oregon.

NOTE: Thuemen used the same collection of Ravenel's to describe *Septosporium lupini.* The description was printed on the packet and distributed as Mycotheca Universalis No. 1171. It could almost be considered an Helminthosporium, but with its long conidiophores and multiseptate, narrow conidia it certainly is not a Septosporium as Thuemen suggested. The effuse fruiting and some nonfasciculate branched conidiophores separate this species from the others on Lupinus. In the Kew herbarium Thuemen's co-type is labeled *Cercospora lupini* Thüm. See key, page 316.

**Cercospora lupinicola** Lieneman

Ann. Missouri Bot. Gard. **16**: 40. 1929

*Cercospora texensis* Tharp, Mycologia **9**: 115. 1917

Leaf spots circular, 0.5-6 mm. in diameter, pale brown to tan, dark brown margin, occasionally zonate; fruiting amphigenous; stromata none or composed of a few brown cells; fascicles rarely dense; conidiophores pale olivaceous to medium dark brown, paler and more narrow toward the tip, multiseptate, not branched, occasionally once geniculate, spore scars at times causing minute excrescences on the side of the stalk, medium sized spore scar at rounded to subtruncate tip, 4-6 x 20-150$\mu$; conidia acicular, hyaline, straight to mildly curved, septa indistinct, base truncate, tip subacute to subobtuse, 3-4 x 30-100$\mu$, rarely 5 x 200$\mu$.

HOST: *Lupinus subcarnosus* Hook (*L. texensis* Hook).

TYPE: Austin, Texas; *Lupinus texensis;* B. C. Tharp; Febr. 22, 1916.

DISTRIBUTION: Known only from the type locality.

NOTE: The name *C. texensis* had been used previously. The hyaline acicular conidia separate this species from the others on Lupinus. See key, page 316.

**Cercospora maricaoensis** Young

Mycologia **8**: 44. 1916

TYPE: Das Bucas below Utuado, Puerto Rico; *Teramnus uncinatus* (L.) Sw.; F. L. Stevens, No. 6554; Dec. 30, 1913.

NOTE: Even though the fruiting is pale in color, the wide conidiophores, and the wide thick-walled conidia place this fungus in Helminthosporium rather than Cercospora. For a discussion of the double wall, see F. L. Stevens, Bull. Nat. Hist. Survey **14** (5): 111-112. 1922.

**Cercospora medicaginis** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. Part I **43**: 91. 1891

*Cercospora helvola* var. *medicaginis* Gandara, Mem. Soc. Scien. "Antonia Alzate" **29**: 380. 1909

Leaf spots circular to irregular, 1-5 mm. in diameter, yellowish brown to tan, or sometimes with a greenish tinge, the remainder of the leaf may at first turn pinkish and then brown; fruiting amphigenous, showing as a sooty layer in the center of the spots; stromata lacking or only a few dark brown cells, rarely collections found with stromata up to 30$\mu$ in diameter; fascicles 3-12, but occasionally as many as 30 stalks; conidiophores subhyaline to pale olivaceous in some collections, but mostly pale olivaceous brown, slightly paler and more narrow toward the tip, longest ones multiseptate, not branched, none or 1-4 mild to abrupt geniculations, large spore scar at subtruncate tip, mostly 4-5 x 15-135$\mu$, some collections showing stalks no longer than 60$\mu$, while others may have them 200-300$\mu$ in length; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip subacute to subobtuse, 2-4 x 40-165$\mu$.

HOSTS: *Medicago denticulata* Willd., *M. hispida* Gaertn., *M. lupulina* L., *M. maculata* Willd. (*M. arabica* All.), *M. sativa* L.

TYPE: College Station, Texas; *Medicago denticulata;* H. S. Jennings, No. 146; May 1890.

DISTRIBUTION: From Wisconsin to Texas and eastward; San Domingo, and in many countries in South America, Africa, Asia, and Europe.

NOTE: *C. medicaginis* has been reported also on Trifolium and Melilotus, but apparently occurs only on Medicago. Horsfall (Mycologia **21**: 304. 1929) considered it a synonym of *C. Zebrina*. It may finally be proved that he is correct, but as there are differences in the lesions as well as in the fungus, I am at present considering the three species on Medicago, Trifolium and Melilotus respectively as being distinct. *C. medicaginis* has distinctly longer and usually paler condidophores than do the other two. This observation is based on a study of collections from many states and several other countries. See also E. F. Hopkins, Phytopath. **11**: 311. 1921, for a further description. It is impossible from Gandara's description to be sure he was dealing with *C. medicaginis*, and he does not designate a type.

**Cercospora meibomiae** Chupp

Monogr. Univ. P. Rico. B. **2**: 249. 1934

Leaf spots angular, 1-4 mm. in diameter, brown, pale yellowish brown margin; fruiting amphigenous; stromata present on upper surface, globular, dark brown, 30-50$\mu$ in diameter; on upper surface dense fascicles, on lower surface nonfasciculate and appearing as minute effuse olivaceous specks; conidiophores pale to very pale olivaceous, paler and more narrow toward the tip, longer ones septate and undulate, nonfasciculate ones branched, minute spore scar at bluntly rounded to conic tip, 2-4 x 5-20$\mu$ or when nonfasciculate as long as 20-50$\mu$; conidia subhyaline to very pale olivaceous, obclavate or shortest ones cylindric, straight to mildly curved, inditsinctly multiseptate, base obconic to long obconically truncate, tip conic, 2.5-5 x 20-120$\mu$.

HOST: *Desmodium incanum* DC. (*Meibomia supina* [Sw.] Britton).

TYPE: Juan Diaz, E. of Macuto, Venezuela; *Meibomia supina;* Chardon and Toro, No. 352; June 27, 1932.

DISTRIBUTION: Several collections from Venezuela.

NOTE: The short conidiophores, fasciculate and nonfasciculate, and the colored conidia separate this species from the others on Desmodium.

**Cercospora melaena** Sydow

Ann. Mycol. **22**: 434. 1924

HOST: *Flemingia congesta* Roxb. (*F. rhodocarpa* Baker) (*Moghania rhodocarpa* Kuntze), *F. grahamiana* W. & A.

TYPE: Houtbos, Transvaal; *Flemingia rhodocarpa;* P. A. van der Byl, No. 1522; July, 1924.

NOTE: The dark colored fruiting, the coarse conidiophores, fasciculate and nonfasciculate, and the wide, thick-walled conidia are characteristic of Helminthosporium rather than of Cercospora.

**Cercospora monoica** Ellis & Holway

Jour. Mycol. **1**: 6. 1885

Leaf spots subcircular to angular, 1-6 mm. in diameter, dull grayish brown, with a slightly yellowish border; fruiting epiphyllous; stromata globular, dark brown to black, 40-80$\mu$ in diameter, or elongated to 125$\mu$; fascicles extremely dense; conidiophores often only peripheral cells on stromata, when elongated very pale fuligenous or brown, tip almost hyaline, wavy to variously bent, not geniculate, not branched, not septate, bluntly rounded tip, spore scars not visible, 4-6.5

x 5-50$\mu$; conidia pale olivaceous, narrowly linear, usually slightly thicker at center and very gradually attenuated toward the ends, base subtruncate, tip obtuse to subobtuse, straight to mildly curved, septa indistinct, 2-3.5 x 35-125$\mu$.

TYPE: Decorah, Iowa; *Amphicarpaea monoica* (L.) Ell. E. W. D. Holway; July 24, 1884.

DISTRIBUTION: Studied material from Winnipeg, Canada, and from Iowa, Kansas, and Wisconsin. Also reported from Illinois, Indiana, Ohio, and Delaware.

NOTE: See also *C. simulans* for the differences between the two species on this host genus.

**Cercospora morongiae** Tracy & Earle

Bul. Torrey Bot. Club **26**: 495. 1899

Minute olivaceous to sooty effuse fruiting patches on stem, 0.5-2 x 1-5 mm. in extent; nonfasciculate (branches from procumbent threads) to extremely dense fascicles; stromata when present black, globular to elongate, 50-150$\mu$ in diameter; conidiophores pale fuligenous, undulate to variously bent, occasionally 1-2 mildly to abruptly geniculate, branched, uniform in color but slightly irregular in width, multiseptate, small spore scar at conic to subconic tip, 3-5 x 10-135$\mu$; conidia pale fuligenous, narrowly obclavate, at times almost cylindric, straight to curved, septa indistinct, base rounded to obconically truncate, tip subobtuse, 3-5 x 20-60$\mu$.

HOST: *Schrankia uncinata* Willd. (*Morongia uncinata* Britton).

TYPE: Ocean Springs, Miss.; *Morongia uncinata;* S. M. Tracy, No. 5205; April 1898.

DISTRIBUTION: Known only from the type locality.

**Cercospora mucunae** H. & P. Sydow

Hedwigia **42**: (Beiblatt 3). 106. 1903

Leaf spots none or indistinct; fruiting hypophyllous, in dark violet to almost black tussock-like pustules, 0.5-1 mm. in diameter; stromata subglobular to irregular, prominent, dark brown to black; fascicles dense or sometimes very dense, compact to divergent; conidiophores medium dark brown, uniform in color, irregular in width or occasionally clavate, plainly multiseptate, constricted at some of the septa, not branched, almost straight to tortuous, 0-12 geniculate, small spore scar at rounded to subconic tip, 5-7 x 40-400$\mu$; conidia cylindro-obclavate, very pale olivaceous, straight to slightly curved, multiseptate, base long obconically truncate, tip obtuse, 4.5-8 x 35-115$\mu$.

HOST: Mucuna sp. (=Stizolobium).

TYPE: Brazil; Mucuna sp.; E. Ule, No. 973.

DISTRIBUTION: Known only from the type locality.

NOTE: The Riksmuseum, Stockholm, kindly sent me the type for examination in 1930. It is one of those intermediate species between Cercospora and Helminthosporium. See also *C. stizolobii* for differences between the two species on this host genus.

**Cercospora munduleae** Saccardo & Sydow

Ann. Mycol. **2**: 173. 1904

TYPE: Togo; Sokade-Basari, Africa; *Mundulea suberosa* Benth.; Kersting; 1902.

NOTE: The dark colored coarse conidiophores and the thick-walled conidia place this species in Exosporium rather than in Cercospora.

**Cercospora nigricans** Cooke

Grevillea **12:** 30. 1883

*Cercospora atro-maculans* Ellis & Ev., Jour. Mycol. **3:** 17. 1887

*Cercospora torae* Tharp, Mycologia **9:** 115. 1917

Leaf spots indefinite at first, later becoming grayish brown; fruiting in sooty effuse patches on corresponding lower leaf surface or rarely on both leaf surfaces; stromata none or only a few cells; fascicles mostly 2-12 stalks; conidiophores pale to medium olivaceous brown, uniform in color, slightly wider near tip, plainly multiseptate, branched, upper third undulate or mildly to abruptly geniculate, minute spore scar at rounded to conic tip, 3.5-5 x 15-125$\mu$; conidia obclavate to obclavato-cylindric, straight or nearly so, subhyaline to pale olivaceous, medium to long obconic base, tip obtuse, 3.5-5 x 30-80$\mu$.

HOSTS: *Cassia tora* L. (*C. obtusifolia* L.), Cassia sp., *C. Marylandica* L., *C. occidentalis* L., *C. tecta* Vog.

TYPES: Aiken, South Carolina; *Cassia obtusifolia;* W. H. Ravenel, No. 4023; (*C. atro-maculans*) Natchitoches, La.; *Cassia tora;* A. B. Langlois, Sept. 23, 1886; (*C. torae*) Palestine, Texas; *Cassia tora;* Lewis & Tharp; Oct. 30, 1914.

DISTRIBUTION: Massachusetts, Texas, Alabama, Louisiana, South Carolina, West Virginia, Missouri, Wisconsin; also in Puerto Rico, East Africa, and Japan.

NOTE: *C. nigricans* differs from *C. occidentalis* in having almost no stroma; the conidiophores are appreciably longer and show more branching. It too is often confused with *C. simulata.* The latter has darker more plainly septate conidiophores, which are not branched, and the conidia are as wide as 7$\mu$. Colored conidia, stromata slight or none, fascicles not dense, conidiophores branched and mostly 3.5-5 x 15-65$\mu$ in size separate this species from the many others on Cassia. It is possible that *C. cassiaecola* Roum. in litt. (No. 4486) is a synonym of *C. nigricans,* but there is such slight fruiting of the fungus that no definite conclusion can be drawn. *C. atro-maculans* wrongly was reported on *Aralia spinosa* in the original description.

**Cercospora occidentalis** Cooke

Hedwigia **17:** 39. 1878

*Cercospora personata* var. *cassiae occidentalis* Berk. & Curtis, Grevillea **3:** 106. 1875.

*Cercospora occidentalis* Ellis & Kellerman, See U.S.D.A. Bur. Plant Ind. Bul. 226: 101. 1912

*Cladosporium personatum* var. *Cassiae* Thümen Myc. Univ. 1964. 1881

*Cercospora paulensis* P. Henn, Hedwigia **48:** 18. 1909

*Ramularia cassiaecola* Heald & Wolf, U.S.D.A. Bur. Plant Ind. Bul. 226: 101. 1912

*Cercosporina occidentalis* (Cooke) Sacc., Syll. Fung. **25:** 906. 1931

*Cercospora somalensis* Curzi, Bol. R. Staz. Patol. Veget. n.s. **12:** 158. 1932

Leaf spots indistinct; fruiting in dark olivaceous effuse patches on both leaf surfaces, though far more abundant on the lower surface; stromata lacking or dark brown, globular, 15-45$\mu$ or larger in diameter; fascicles dense; conidiophores pale to medium brown, in mass dark, sparingly septate, uniform in color,

irregular in width, rarely branched, sometimes once geniculate or suddenly bent near tip, which is rounded and has a small spore scar, 4-6 x 5-40$\mu$ or longer; conidia olivaceous, cylindric to cylindro-obclavate, straight to mildly curved, plainly multiseptate, rarely constricted at septa, base short to medium obconically truncate, tip blunt, sometimes catenulate, 3.5-7 x 35-150$\mu$, usually 3.5-5 x 35-70$\mu$.

HOSTS: *Cassia occidentalis* L., Cassia sp., *C. delagoensis* Harv., *C. fistula* L., *C. grandis* L., *C. Tori* L. (*C. obtusifolia* L.)

TYPES: Aiken, South Carolina; *Cassia occidentalis;* H. W. Ravenel, No. 65 (Cooke No. 2289); 1876; (var. *Cassiae*) Same Ravenel collection; Cotype distributed as Thümen's Myc. Univ. 1964; 1881; (var. *Cassiae occidentalis*) Aiken, South Carolina; *Cassia occidentalis;* H. W. Ravenel, No. 1748, Curtis Sheet 324. (Probably identical Ravenel No. 65 collection); (*C. paulensis*) Iponema, Sao Paulo, Brazil; Cassia sp.; A. Puttemans, No. 715; April 11, 1903; (*Ramularia cassiaecola*) Beeville, Texas; *Cassia occidentalis;* Heald and Wolf, No. 1868, and other Texas collections; (*C. somalensis*) Near "Genale" in Somalia Italica; *Cassia fistula;* M. Curzi.

DISTRIBUTION: Studied material from South Carolina, Alabama, Texas, Georgia, South Africa, Trinidad, Barbados, Dominican Republic, Colombia, and Brazil. Also reported from Argentine, Somaliland, India, and the Philippines.

NOTE: This species is differentiated from all the other species on Cassia by having a small stroma and short simple conidiophores. *Cercospora occidentalis* var. *cassiocarpa* Sacc. (Ann. Mycol. **11**: 557. 1913) has been described from the Philippines as a variety, but it is quite distinct and no doubt should be considered a separate species, *C. cassiocarpa.* Heald and Wolf change *Cercospora occidentalis* Ellis & Kellerman to *Ramularia cassiaecola,* and state that Ravenel's collection also should be a Ramularia, even though they describe both conidia and conidiophores as colored. See key, page 279.

**Cercospora ononidicola** Unamuno

Trab. Secc. Cienc. Nat. Cong. Assoc. Progr. Cienc. de Oporto de 1921. p. 94. 1922

Leaf spots amphigenous, subcircular, often concentric, dark in color; conidiophores fasciculate, sparingly septate, 0-3 geniculate, not branched, straight to variously curved or sinuous, conic tip, olivaceous brown, 4-6 x 35-65$\mu$; conidia subhyaline to pale olivaceous, obclavate or sometimes almost cylindric, straight to mildly curved, 5-13 septate, obconic base, narrow tip, 3.5-5 x 30-110$\mu$.

HOST: *Ononis reclinata.*

TYPE: Playa de Toró, Llanes (Oviedo), Spain; *Ononis reclinata;* P. Unamuno.

DISTRIBUTION: See type.

NOTE: Fragrosa (Mem. Real Acad. Cienc. Exactas, Fisicas, y. Nat. de Madrid Ser. 2. **6**: 242. 1926) describes and illustrates the fungus.

**Cercospora ononidis** (Auersw.) v. Höhnel

Ann. Mycol. **3**: 190, 339. 1905

HOST: *Ononis arvensis* L.

TYPE: In Pinetis Ca. Budenheim; *Ononis arvensis;* raro, Autumno, 1863. Cotype distributed as Fungi Rhenani No. 230.

NOTE: The dark, thick-walled, closely septate conidia exclude this from Cercos-

pora. It should be considered as a Septosporium. Auerswald first named the fungus *Exosporium ononidis* (Fuckel, Symbolae Mycologicae, page 373. 1869) but it was not described. There are some large dark bodies present, which I regarded as some type of fruit bodies, possibly immature perithecia. If, however, they are stromata as Auerswald presumably believed, the fungus could well be an Exosporium.

**Cercospora pahudiae** H. & P. Sydow
Ann. Mycol. **12**: 203. 1914

Leaf spots circular, 1-6 mm. in diameter, dark brown, occasionally with two or more zones outlined by black lines; fruiting amphigenous; stromata brown, 20-60$\mu$ in diameter; fascicles dense; conidiophores pale brown, slightly paler and more narrow toward the tip or irregular in width, sparingly septate, not branched, slightly geniculate, small spore scar at rounded to conic tip, 3-4 x 10-35$\mu$; conidia subhyaline to pale olivaceous, obclavate, straight to slightly curved, 3-7 septate, base obconically truncate, tip subobtuse, 3-4.5 x 30-55$\mu$.

HOST: *Afzelia rhomboidea* Vidal (*Pahudia rhomboidea* Prain).
TYPE: Mt. Maquiling, near Los Banos, Prov. Laguna, Philippines; *Pahudia rhomboidea;* C. F. Baker; Sept. 1913. Cotype distributed as Fungi Malayana, No. 124.
DISTRIBUTION: Known only from the type locality.

**Cercospora passaloroides** Winter
Hedwigia **22**: 71. 1883

Leaf spots circular to subcircular, 1-5 mm. in diameter, dull red to reddish brown; fruiting hypophyllous; stromata small, brown, 15-30$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, rarely septate, sometimes once mildly geniculate, not branched, small to medium spore scar at subtruncate to rounded tip, 2-4 x 10-35$\mu$ (reported as long as 70$\mu$); conidia pale olivaceous brown, cylindric to cylindro-obclavate, straight to mildly curved, mostly 1-3 septate, base long obconic, tip blunt, 3.5-5 x 20-70$\mu$.

HOSTS: *Amorpha canescens* Nutt., *A. fruticosa* L.
TYPE: Illinois; *Amorpha canescens;* A. B. Seymour.
DISTRIBUTION: Manitoba, Wisconsin, Nebraska, Kansas, Illinois, Missouri, and Alabama.
NOTE: I was unable to find the type of this species.

**Cercospora personata** (Berk. & Curt.) Ellis and Everhart
Jour. Mycol. **1**: 63. 1885

*Cladosporium personata* Berk. & Curt., Grevillea **3**: 106. 1875
*Septogloeum arachidis* Racib., Zeitschr. Pflanzenkr. **8**: 66. 1898
*Cercospora arachidis* P. Henn., Hedwigia **41**: (Beiblatt) 18. 1902

Leaf spots circular to coalescing and then irregular in form, 1-10 mm. in diameter, elliptic when on rachis or petiole, dark brown to black, resembling in appearance a superficial effuse fungous growth, often with a yellow halo; fruiting amphigenous; stromata globular, brown to black, 20-30$\mu$ in diameter, rarely elongated and 70-200$\mu$ in extent; fascicles dense to very dense; conidiophores pale fuligenous or olivaceous brown, uniform in color and fairly so in width,

straight to slightly curved, very sparingly septate, longest ones 1-3 mildly to abruptly geniculate, not branched although some abrupt geniculations appear almost like incipient branches, medium spore scar at bluntly rounded tip, 3-5 x 10-70$\mu$; conidia medium dark olivaceous, cylindric to slightly spindle shaped, straight to mildly curved, 1-8 septate, mostly 2-5, ends bluntly rounded or base sometimes long obconically truncate, 5-7.5 x 20-70$\mu$.

HOST: *Arachis hypogaea* L. This has been reported also on Cassia, but the reports were erroneous.

TYPES: Santee River, South Carolina; H. W. Ravenel (Curtis Sheet 324); (*S. arachidis*) Tegal, Java. No type listed. (*C. arachidis*) Para, Brazil; P. Hennings, No. 43; June, 1901.

DISTRIBUTION: A common and destructive disease wherever peanuts are grown intensively. General in our Southern States. A specimen was sent from China.

NOTE: Jenkins (Jour. Agr. Res. **56**: 317. 1938) described the perfect stage and named it *Mycosphaerella berkeleyii*. See also *C. arachidicola* for the differences between the two species on peanut (Phytopath. **23**: 627. 1933). Both sometimes are present in the same microscopic mount. *C. personata* var. *cassiae occidentalis* is not related to *C. personata*, but is a synonym of *C. occidentalis*.

**Cercospora phaeocarpa** Mitter

Ann. Mycol. **35**: 239. 1937

TYPE: Majhgawan, East India; Bauhinia sp.; R. N. Tandon, No. 195; Jan. 5, 1935.

NOTE: This has dark colored, closely septate, thick-walled conidia, which should place it in the genus, Helminthosporium. The fungus was sent me on *Bauhinia reticulata* DC. from Southern Rhodesia. It was reported on *Bauhinia thonningii* Schum. from South Africa (Bothalia **4**: 890. 1948).

**Cercospora pinnulaecola** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 64. 1892

Leaf spots indistinct; fruiting in hypophyllous effuse olivaceous to dark patches on lower surface of leaflets; stromata lacking or a few brown cells; fascicles 1-7 stalks; conidiophores pale olivaceous brown, uniform in color, occasionally slightly attenuated, plainly multiseptate, not branched, sinuous or 1-4 mildly to abruptly geniculate, medium sized spore scar at bluntly rounded to subtruncate tip, 4-6.5 x 30-180$\mu$; conidia hyaline, obclavate, straight or mildly curved, septa indistinct, base obconically truncate, tip subobtuse, 4-5 x 50-150$\mu$.

TYPE: Auburn, Lee Co., Ala.; *Cassia nictitans* L.; B. M. Duggar, No. 2197; Oct. 1, 1891.

DISTRIBUTION: Known only from the type locality.

NOTE: In the Atkinson herbarium the type specimen is labeled *C. pumulaecola*. The hyaline obclavate conidia, the fascicles which are not dense, the pale conidiophores, and almost no stromata separate this species from the numerous others on Cassia.

**Cercospora pisa-sativae** Stevenson

Puerto Rico Ins. Exp. Sta. Ann. Rept. **1917-18**: 138. 1919

Leaf spots circular, rarely angular, 1-8 mm. in diameter, at first uniformly

brown, later center becomes gray or tan; fruiting amphigenous; stromata slight to 40$\mu$ in diameter, brown; fascicles 5-20 diverging stalks; conidiophores pale or rarely medium dark brown, uniform in color, plainly multiseptate, occasionally slightly attenuated, not branched, somewhat undulate, very sparingly geniculate, medium spore scar on rounded to subtruncate tip, 4.5-6 x 50-170$\mu$; conidia hyaline, acicular, strongly curved, indistinctly multiseptate, base truncate, tip acute, 3-4 x 35-240$\mu$.

TYPE: Rio Piedras, Puerto Rico; *Pisum sativum* L.; J. A. Stevenson, No. 6887; Febr. 25, 1918.

DISTRIBUTION: Puerto Rico, San Domingo, Java, India and China.

NOTE: This differs in a number of minor characters from *C. lathyrina* and *C. szechuanensis* and should remain distinct unless cross-inoculations can prove them identical. See key, page 314.

**Cercospora piscidiae** P. Hennings

Hedwigia **37**: 282. 1898

Leaf spots indistinct or none; fruiting in yellowish or yellowish ferruginous effuse patches on lower leaf surface; stromata lacking; nonfasciculate to distinct fascicles; conidiophores pale yellowish or ferruginous, upper half may be almost hyaline, septate, branched, undulate, not geniculate, 1-5 minute spore scars at and near the bluntly rounded tip, 4-6 x 30-65$\mu$, or when nonfasciculate of indeterminate length; conidia subhyaline to pale ferruginous, obclavato-cylindric, straight to mildly curved, 2-6 septate, occasionally with wide walls (Helminthosporium-like), short obconic to rounded base, blunt tip, 5-8 x 20-55$\mu$.

HOST: *Piscidia erythrina* L. (*Ichthyomethia piscipula* Kuntze).

TYPE: Rowing River, Jamaica; *Piscidia erythrina;* Humphrey; Mar. 27, 1893.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. ichthyomethiae* for differences between the two species on this host genus. *C. piscidiae* could equally well be considered as an Helminthosporium.

**Cercospora pittierii** Sydow

Ann. Mycol. **28**: 216. 1930

Leaf spots none or grayish brown to gray or tan areas on the upper leaf surface; fruiting effuse, hypophyllous, dark olivaceous to almost black, stromata none or slight; nonfasciculate, or divergent fascicles of 2-12 stalks; conidiophores medium dark brown, uniform in color, irregular in width, plainly multiseptate, constricted at some of the septa, rarely branched, straight to tortuous, slightly geniculate, small spore scar at the conic tip, 4-5.5 x 50-250$\mu$; conidia subhyaline to pale olivaceous brown, cylindro-obclavate, 1-7 septate, nearly straight, base long obconically truncate to obconic, tip obtuse, 4-7 x 20-70$\mu$.

HOSTS: *Erythrina glauca* Willd., *E. tomentosa* R. Br., *E. reticulata* Presl.

TYPE: El Valle, pr. Caracas, Venezuela; *Erythrina glauca;* H. Sydow, No. 50; Dec. 18, 1927. Cotype distributed as Fungi Exotici exsiccati No. 889.

DISTRIBUTION: Venezuela, Uganda, Minas Geraes (Brazil).

NOTE: See key, page 305 for differences among the species on this host genus.

**Cercospora poincianae** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. **8** (52): 53. 1942

Leaf spots at first subcircular, but finally may include entire tip or side of

leaflet, medium brown to almost black, sometimes with a yellowish margin on the upper surface; fruiting chiefly hypophyllous; stromata slight, dark, or lacking; fascicles mostly dense; conidiophores medium dark brown, paler toward the tip, 0-2 septate, occasionally constricted at the septa, uniform in width or slightly attenuated, not branched, rarely once geniculate, medium sized spore scar at the rounded to subtruncate tip, 3-4.5 x 10-55$\mu$; conidia hyaline, older ones obclavate, short ones mostly cylindric or spindle-shaped, straight to mildly curved, indistinctly 1-4 septate, base sharply obconic to subtruncate, tip subacute, 2-4.5 x 15-50$\mu$.

TYPE: Los Chorros, Edo, Miranda, Venezuela; Poinciana sp.; H. H. Whetzel and A. S. Muller, No. 2804; Febr. 22, 1939.

DISTRIBUTION: Known only from the type locality.

**Cercospora prosopidis** Heald & Wolf

Mycologia 3: 20. 1911

Leaf spots irregular, from small specks to large areas covering half of the leaflet, on inner side often bounded by the midrib, pale tan to brown, the paler ones with a brown border; fruiting amphigenous, appearing under hand lens as numerous black pustules; stromata globular, dark brown, 40-75$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, slightly paler and more narrow toward the tip, straight or slightly undulate, rarely septate, not geniculate, not branched, minute spore scar at conic tip, 3.5-5 x 10-40$\mu$; conidia cylindric to cylindro-obclavate, pale olivaceous, straight or nearly so, 1-12 septate, base rounded to short obconic, tip blunt, 3.5-5 x 20-110$\mu$.

HOST: *Prosopis juliflora* DC. (*P. glandulosa* Torr.).

TYPE: Uvalde, Texas; *Prosopis glandulosa;* Heald and Wolf; Aug. 19, 1909.

DISTRIBUTION: Known only from the type locality.

**Cercospora pseudarthiae** Petch

Ann. Roy. Bot. Gard. Peradeniya 6: 250. 1917

TYPE: Peradeniya, Ceylon; *Pseudarthia viscida* W. & A.; T. Petch, No. 4096; Dec. 30, 1913.

NOTE: The wide, thick-walled, cylindric conidia place this species in Helminthosporium rather than in Cercospora. Petch spells it *C. pseudarthriae.*

**Cercospora psoraleae** Ray

Mycologia 33: 176. 1941

*Cercospora psoraleae* Petrak, Sydowia, Ann. Mycol. 4: 572. 1950

*Cercospora psoraleae-bituminosae* Savul. et Sandu, Anal. Acad. Romane Memor. Sect. Stüntif Ser. III. 15: 485. 1941

Leaf spots circular, 0.5-2.5 mm. in diameter, dull brown, with a raised line border; fruiting epiphyllous; stromata slight, mostly only a few brown cells; fascicles divergent, 2-10 stalks, occasionally as many as 30; conidiophores medium dark brown, paler and more narrow toward the tip, multiseptate, not branched, straight to curved, mildly geniculate, medium spore scar at the subtruncate tip, 4-5.5 x 20-140$\mu$; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4 x 20-120$\mu$.

HOSTS: *Psoralea corylifolia* L., *P. digitata* Nutt., *P. glandulosa, P. bituminosa* L.

TYPES: College Nursery, Stillwater, Okla.; *Psoralea digitata;* W. W. Ray; July

3, 1940; (*C. psoraleae* Petrak) Quito, Ecuador; *Psoralea glandulosa;* H. Sydow, No. 57; Sept. 13, 1937; (*C. psoraleae-bituminosae*) near Balcic, Caliacra Distr., Roumania; *Psoralea bituminosa;* June 17, 1939.

DISTRIBUTION: Oklahoma, Ethiopia, Ecuador, Roumania.

NOTE: C. L. Lefebvre sent me a collection made by H. W. Johnson at Chapel Hill, North Carolina, Aug. 31, 1943, on pedicels of *Dalea alopecuroides* Willd. Professor Luttrell sent me a similar specimen on *Cyamopsis tetragonoloba* Taub. from Experiment, Ga., Sept. 18, 1950. The fungus appears the same as the Ray species, even though the stromata are more pronounced, and the conidiophores slightly darker in color. Zaprometov (Materials for the Microflora of Middle Asia, Part 1, p. 35. 1926) reports *C. latens* on *Psoralea drupacea* Bunge. Possibly it was *C. psoraleae,* since *C. latens* is not known to affect Psoralea. Petrak gives size of conidia as 3-6.5 x 20-150$\mu$. It may be possible that the Savulesco and Sandu-Ville species name was published first, but because they applied a compound nomenclature, which is most awkward to use, I have retained the Ray name for the species.

**Cercospora puccinioides** Spegazzini

Anal. Mus. Nac. Buenos Aires **20:** 441. 1910

HOST: *Galactia argentina*? (*Collaea argentina* Griseb.).

TYPE: Cordoba, Argentine; *Collea argentina;* C. Spegazzini, No. 948; Jan. 1908.

NOTE: The wide, thick-walled, cylindro-obclavate conidia and stout conidiophores place this in Helminthosporium rather than in Cercospora.

**Cercospora puerariae** H. & P. Sydow

Ann. Mycol. **12:** 204. 1914

Leaf spots none or indistinct; fruiting sparingly effuse, hypophyllous, sooty in color; stromata only a few brown cells; fascicles 2-20 divergent stalks or rarely very dense; conidiophores medium dark brown, somewhat paler toward the tip, uniform in diameter, plainly multiseptate, not branched, very sparingly geniculate, straight to mildly curved, small spore scar at the conic tip, 5-7 x 50-300$\mu$; conidia medium dark olivaceous brown, cylindric, straight to curved, 3-8 plainly septate, base long obconically truncate, tip blunt, 5.5-8 x 30-80$\mu$.

TYPE: Los Banos, Philippines; *Pueraria phaseoloides* Benth; C. T. Baker, No. 2799; Dec. 15, 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: Some of the older conidia have wide walls, so that the species would fit also in Helminthosporium. See key, page 282 for differences among the species on Pueraria.

**Cercospora pueraricola** Yamamoto

Trans. Sapporo Nat. Hist. Soc. **13:** 142. 1934

(Phytopath. Lab. Taihoku Imp. Univ. Contr. **26:** 142. 1934)

Leaf spots irregular, 2-10 mm. in diameter, dull gray to grayish brown, a slightly darker border; fruiting mostly epiphyllous, sometimes wholly hypophyllous; stromata dark brown, globular, 20-40$\mu$ in diameter; fascicles dense; conidiophores very pale olivaceous brown, uniform in color and width or mildly attenuated, rarely septate, not branched, not geniculate, straight to curved,

minute spore scar at the conic tip, 3-4.5 x 20-70$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate, straight to mildly curved, multiseptate, base obconic, tip subobtuse, 3-6 x 20-85$\mu$, or even 135$\mu$ in length.

TYPE: Taihoku, Formosa; *Pueraria thunbergiana* (Sieb. & Zucc.) Benth.; W. Yamamoto; Dec. 10, 1933.

DISTRIBUTION: Formosa, China, Mississippi (Plant Dis. Reporter 31: 188. 1947), Georgia, Alabama, North Carolina.

NOTE: See key, page 282 for differences among the species on Pueraria. Weimer and Luttrell describe the perfect stage as *Mycosphaerella pueraricola* (Phytopath. 38: 350. 1948).

**· Cercospora pulchella** Ramakrishnan

Proc. Indian Acad. Sci. Sect. B. 34: 163. 1951

Leaf spots angular, brown, minute, when numerous causing defoliation; fruiting hypophyllous; stromata present, at first subepidermal; fascicles dense; conidiophores pale brown, septa indistinct, geniculate near apex, 5-11 x 50-167$\mu$; conidia pale brown, obclavate, 1-2 septate, 8-13 x 31-78$\mu$.

HOST: *Indigofera pulchella* Roxb.

TYPE: Kodaikanal, Madras, India; *Indigofera pulchella;* K. V. Srinivasan; Dec. 24, 1949.

DISTRIBUTION: Madras.

NOTE: I have not seen this species. The description, giving abnormally wide conidiophores and conidia, does not appear to be that of a Cercospora.

**Cercospora pumila** H. & P. Sydow

Philipp. Jour. Sci. (Bot.) 8: 196. 1913

Leaf spots subcircular, 3-10 mm. in diameter, pale tan to almost gray, narrow brown to purple line border; fruiting epiphyllous; stromata medium brown, subglobular, 15-50$\mu$ in diameter; most fascicles dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, septation, branching, and geniculation lacking or indistinct, straight to slightly curved, minute spore scar at narrowly rounded tip, 3-4 x 5-25$\mu$; conidia hyaline to subhyaline, cylindro-obclavate, shortest ones may be distinctly cylindric, 2-5 septate, straight to mildly curved, base obconically truncate, tip obtuse, 2-4 x 25-65$\mu$ (Sydow says 88$\mu$).

TYPE: San José, Mindoro, Philippines; Derris sp. (aff. *D. elliptica* Benth.); P. W. Graff; Jan. 1912. Cotype distributed as Fungi Exotici Exs. No. 47.

DISTRIBUTION: Known only from the type locality.

**Cercospora radiata** Fuckel

Hedwigia 5: 24. 1866

*Cercospora brevipes* Penzig & Sacc., Syll. Fungorum 4: 438. 1886

*Cercospora budapestiensis* Penzes, Magy. Vrág. Növén. Vonatkozó Közlemének 1: 297. 1927

Leaf spots angular to irregular, 0.5-4 mm. in diameter, dark reddish brown, inclined to be convex on upper surface; fruiting epiphyllous; stromata dark brown to almost black, globular, 15-50$\mu$ in diameter; fascicles mostly dense, spreading or radiating; conidiophores pale to medium brown, paler toward the tip, fairly uniform in width, sparingly septate, not branched, only longest ones geniculate, otherwise almost straight, medium to large spore scar at the subtruncate tip,

3.5-6 x 15-100$\mu$, some collections show only short ones, 15-50$\mu$; conidia hyaline, acicular to obclavate, the shortest ones may be cylindric, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute to subobtuse, 2.5-5 x 20-105$\mu$.

HOST: *Anthyllis vulneraria* L. (*A. alpestris* Kit.) (*A. dillenii* Schult.) (*A. polyphylla* Kit.).

TYPES: Ca. Budenheim; *Anthyllis vulneraria;* Summer, 1865. Cotype distributed as Fungi Rhenani, No. 1519. (*C. brevipes*) Monte Generoso, Ital. bor.; *A. vulneraria;* O. Penzig. (*C. budapestiensis*) Budapest, Hungary; *A. polyphylla;* Antal Penzes.

DISTRIBUTION: Apparently common in western Europe from Italy to Sweden.

NOTE: When Saccardo described *C. brevipes,* he suggested that it might be a form of *C. radiata.* Lindau (Rabenhorst, Kryt.-flora **9**: 110. 1910) lists it as a synonym. When Penzes described *C. budapestiensis,* he stated that in part it was *C. radiata.* Saccardo described a *C. radiata* which later he changed to *C. galegae* (Syll. Fung. **15**: 84).

**Cercospora rautensis** C. Massalongo
Madonna Verona **3**: 19. 1909

*Cercospora coronillae-scorpioidis* Ferraris, Fl. it. Crypt. Hyph. p. 893
*Cercosporina coronillae-scorpioidis* (Ferr.) Sacc., Syll. Fung. **25**: 906. 1931.
*Cercospora coronillae-variae* Lobik, Bolezni Rast. **17**: 194: 1928

Leaf spots subcircular to angular, 1.5-3 mm. in diameter, grayish brown to gray center, reddish border; fruiting amphigenous but more abundant on the upper leaf surface; stromata brown, filling stomatal openings; fascicles 2-12 stalks; conidiophores pale brown, paler and more narrow toward the tip, septate, not branched, upper third undulate to geniculate, medium spore scar at the subtruncate tip, somewhat longer on the lower leaf surface, 3-5 x 20-100$\mu$; conidia hyaline to almost colored, acicular to cylindric, straight to mildly curved, indistinctly multiseptate, base truncate to obconically truncate, tip subobtuse, 3-5 x 35-100$\mu$.

HOSTS: *Coronilla varia* L., *Coronilla coronata* L., *Coronilla scorpioides* Koch.

TYPES: Nel bosco "delle Raute" presso il paesetto di Cogolo, Italy; *Coronilla varia;* C. Massalongo; August. (*C. coronillae-scorpioidis*) Nizza Monferrato, Piemonte, Italia bor.; *Cornilla scorpioides.* (*C. coronillae-variae*) Bezirk. v. Piatigorsk. am Steppenabhange d. Berges Verblud, bei d. Italienischen Kolonie, Russia; *Coronilla varia* L.; A. I. Lobik; June 17, 1923.

DISTRIBUTION: Italy, Hungary, Southern Russia.

NOTE: Lobik gives the measurements of the conidia as being 5.9-6.6 x 49.4-105.3$\mu$. Otherwise his description fits *C. rautensis.* The above description is taken in great part from a specimen sent from Hungary. Keissler (Ann. Mycol. **21**: 81. 1923) says that this species is very closely related to or identical with *C. fabae.*

**Cercospora rhynchosiarum** Petrak & Ciferri
Ann. Mycol. **30**: 332. 1932

Leaf spots circular to irregular, 2-8 mm. in diameter, brown, sometimes with a dark line border; fruiting epiphyllous; stromata present; fascicles dense; conidiophores pale to medium olivaceous brown, paler and more narrow toward

the tip, sparingly septate, not branched, straight to curved, rarely genicuate, small spore scar at the rounded to conic tip, 3-4 x 25-70$\mu$; conidia subhyaline to very pale olivaceous, obclavato-cylindric, straight to curved, 4-11 septate, ends inclined to be conic, 2-3.5 x 20-105$\mu$.

TYPE: Cordillera Septentrional, Prov. Santiago, Cuesta de Piedras, San Domingo; *Rhynchosia reticulata* DC.; E. L. Ekman, No. 3849; Dec. 9, 1930.

DISTRIBUTION: San Domingo, Delaware.

NOTE: I have not had an opportunity of studying the type. A. Commons collected a Cercospora on *Rhynchosia tomentosa* Hook. & Arn. in Delaware, Aug. 5, 1874 (Mycologia 41: 18. 1949). Prof. Sumstine kindly sent me a sample of this specimen. It apparently is identical with the San Domingo species.

**Cercospora Samaneae** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52); 55, 1942

Leaf spots none or indistinct discoloration on the upper surface; fruiting on the corresponding lower surface in irregular patches, sometimes covering almost the entire leaf surface, dark olivaceous to black; stromata absent or minute; nearly always nonfasciculate, rarely 3-7 stalks; conidiophores pale to medium dark olivaceous or olivaceous brown, usually short branches from procumbent hyphae, 3-4 x 10-50$\mu$, not geniculate, small spore scar at the rounded to conic tip; conidia similar in color, obclavate to almost linear, straight to curved, multiseptate, occasionally plainly guttulate, base subtruncate to rounded, tip subobtuse, 3-4 x 20-75$\mu$.

TYPE: Caracas, Venezuela; *Samanea saman* Merr.; A. S. Muller, No. 2095; Dec. 28, 1937.

DISTRIBUTION: Known only from the type locality.

**Cercospora scorpiuri** Thümen

Hedwigia 19: 134. 1880

TYPE: St. Clara, near Coimbra, Portugal; *Scorpiurus muricata* L.; F. Moller, No. 432; March, 1879.

NOTE: The dark-colored, thick-walled, wide conidia and conidiophores are not characteristic of Cercospora. This fungus perhaps should be classed as an Helminthosporium.

**Cercospora sensitivae** n. comb.

*Cercosporina sensitivae* Speg., Anal. Mus. Nac. B. Aires 20: 427. 1910

Leaf spots subcircular to irregular, 0.5-5 mm. in length, reddish to dingy brown; fruiting hypophyllous; stromata dark brown, 30-60$\mu$ in diameter; fascicles dense to very dense; conidiophores pale to medium brown, almost hyaline tip, uniform in width, indistinctly septate, not branched, variously curved to sinuous, rarely once geniculate, small spore scar at the rounded to conic tip, 4-5.5 x 15-70$\mu$, mostly 15-50$\mu$; conidia hyaline, cylindric or more nearly spindle shaped, long conic at each end, straight to mildly curved, 3-7 septate, 2-4 x 20-75$\mu$.

TYPE: In pratis Orám, Argentine; *Mimosa sensitiva* L.; Spegazzini.

DISTRIBUTION: Argentine and Colombia.

NOTE: I did not receive the type of this species, but the collection from Colombia fits the printed description closely. See also *C. hypsophila* for differences between the species on this host genus.

**Cercospora sesbaniae** P. Hennings
Ann. Mus. du Congo (Bot.) V-A, II. **2**: 104. 1907
*Cercospora agatidis* Foex, Bul. Soc. Mycol. France. **29**: 352. 1913

Leaf spots at first none, later slight yellowish irregular areas on the upper leaf surface; fruiting on the corresponding lower surface, scantily effuse, dark olivaceous, 0.5-3 mm. in extent; stromata slight, at most only a few pale brown cells; fascicles 2-20 stalks; conidiophores pale to very pale olivaceous brown, uniform in color, 1-4 septate, irregular in width or constricted at septa, not branched, not geniculate, longest ones bent or undulate, tip rounded bluntly or conic, with minute spore scar, 3-5 x 10-45$\mu$; conidia subhyaline to very pale olivaceous, cylindric, the longest ones may be slightly attenuated, straight or nearly so, 1-7 septate, occasionally constricted at septa, base rounded or bluntly obconic, tip obtuse, 3-5.5 x 20-70$\mu$.

HOSTS: Sesbania sp., S. *grandiflora* Poir. (*Agati grandiflora* Desv.).
TYPES: Kisantu, Kivango-Congo; Sesbania sp.; H. Vanderyst, No. 85; May 15, 1906. (*C. agatidis*) Cochinchine; *Agati grandiflora*.
DISTRIBUTION: Central Africa, India (Madras Presidency), Cochin-China.
NOTE: See Sydow and McRae, Ann. Cryptog. Exot. **2**: 269. 1929. for further notes on the species. Foex's species was not available for study, but his illustration (Fig. 3) is a very good representation of *C. sesbaniae*.

**Cercospora seymouriana** Winter
Bul. Torrey Bot. Club **10**: 50. 1883
(Also Hedwigia **22**: 70. 1883)

*Helminthosporium olivaceum* Berk. & Rav., Grevillea **3**: 102. 1875
*Cercospora olivacea* (Berk. & Rav.) Ellis, Jour. Mycol. **1**: 52. 1885
*Cercospora berkeleyi* Cooke, Grevillea **12**: 30. 1883

TYPES: (*Helminthosporium olivaceum*) Aiken, South Carolina; *Gleditschia triacanthos* L.; Ravenel, No. 1333. (*C. seymouriana*) Fulton Co., Ill.; A. B. Seymour, No. 1780.
NOTE: This is considered an Helminthosporium. Cooke described his species on September, 1883, after Winter had published the description of *C. Seymouriana* in May, 1883. In the Kew herbarium is a Ravenel collection from Darien, Ga. (Cooke No. 3360) on Tetranthera and labeled *C. berkeleyi*. Apparently this is identical with the specimen from which Thümen described *C. iteodaphnes* in 1880. Otth described a *Cercospora olivacea* in 1869, which accounts for Winter's changing the name.

**Cercospora simulans** Ellis & Kellerman
Jour. Mycol. **8**: 14: 1902

Leaf spots indefinite or angular, pale tan to brown, 1 mm. to large area in extent; on corresponding lower surface a scantily effuse reddish brown fruiting layer; stromata lacking; nonfasciculate to dense fascicles; conidiophores subhyaline to pale olivaceous, uniform in color, somewhat attenuated, multiseptate, branched, wavy to multigeniculate, often intertwined, small spore scar at subconic tip, 3.5-5 x 45-300$\mu$; conidia cylindric, hyaline to subhyaline, plainly 1-5 septate, straight or nearly so, base short to medium obconically truncate, tip obtuse, 4-6 x 10-40$\mu$.

TYPE: Gauley Mts., W. Va., *Amphicarpaea monoica* (L.) Ell. in Nutt.; A. W. Kellerman; Aug. 1901. *"Falcata comosa"* Kuntze.
DISTRIBUTION: West Virginia, Georgia.
NOTE: See also *C. monoica* for differences between the species on this host.

**Cercospora simulata** Ellis & Everhart
Jour. Mycol. 1: 64. 1885

Leaf spots indefinite or none; fruiting hypophyllous or sometimes epiphyllous, in large olivaceous to black effuse patches; stromata lacking; mostly fasciculate, 2-20 stalks, rarely almost coremoid in density; conidiophores dark brown, pale tip, fairly uniform in width, plainly multiseptate, not branched, upper third undulate or closely and mildly geniculate, small spore scar at subconic tip, 3-5 x 50-300$\mu$; conidia pale olivaceous, cylindro-obclavate, straight to mildly curved, 1-5, mostly 3-septate, base medium obconically truncate, tip obtuse, 3-7 x 20-80$\mu$.
HOSTS: *Cassia Marylandica* L., *C. alata* L.
TYPE: Pine Hills, Union Co., Ill.; *Cassia Marylandica;* Earle, No. 117; Sept. 22, 1884.
DISTRIBUTION: From Wisconsin to Arkansas and eastward; also reported from Venezuela, Colombia, Puerto Rico and Germany.
NOTE: The long fasciculate, dark, simple conidiophores and the 3-septate conidia, 3-7 x 20-80$\mu$ in size separate this species from the numerous others on Cassia.

**Cercospora sissoo** Sydow
Ann. Mycol. 31: 92. 1933

Leaf spots indistinct or none; fruiting hypophyllous, in closely aggregated groups of black pustules; stromata brown, globular, 40-110$\mu$ in diameter; fascicles very dense, diverging in all directions from the stromata; conidiophores pale olivaceous brown, paler and more narrow toward the tip, septation, branching and geniculation absent or indistinct, minute spore scar at the rounded tip, 3-4.5 x 5-30$\mu$; conidia hyaline, in mass faintly colored, cylindric, straight to mildly curved, 1-4 septate, base long obconically truncate, tip obtuse, 2.5-4 x 15-45$\mu$.
TYPE: Allahabad, India; *Dalbergia sissoo* Roxb.; R. N. Tandon and A. K. Mitra, No. 40; Febr. 20, 1930.
DISTRIBUTION: Known only from the type locality.

**Cercospora sojina** Hara
Nogyo Sekai, Tokyo 9: 28. 1915

*Cercospora daizu* Miura, Manchurian R. R. Agr. Exp. Sta. Bul. 11: 25. 1920
Leaf spots circular to subcircular, 0.5-5 mm. in diameter, dingy gray to tan, narrow brown to reddish border, may coalesce into large areas; fruiting amphigenous; stromata lacking or small, brown; conidiophores borne singly to very dense fascicles, sparingly septate, pale brown, uniform in color, slightly attenuated, straight to sinuous or with 1-12 geniculations, average of different collections 1-3, not branched, medium sized spore scar at subtruncate to rounded tip, 4-6.5 x 40-200$\mu$, some material shows only short ones; conidia hyaline, cylindric to cylindro-obclavate, rarely acicular, straight to mildly curved, multiseptate, base subtruncate to obconically truncate, tip obtuse, 4-8 x 20-80$\mu$, rarely 120$\mu$.

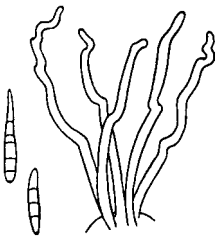


Fig. 139
*C. sojina*

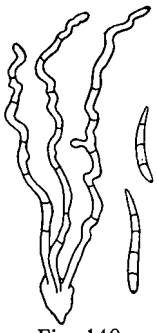


Fig. 140
*C. vanderysti*

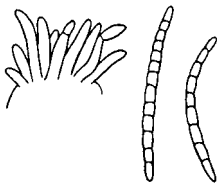


Fig. 141
*C. wildemanii*

HOSTS: *Glycine max* Merr. (*Soja max* [L.] Piper) (*Glycine soja* Sieb. and Zucc.) (*Glycine hispida* Maxim.), *Glycine javanica.*

TYPES: Kawaue, Gifu, Japan; *Glycine max;* K. Hara; (*C. daizu*) Tu-men-ling, South Manchuria; *Glycine hispida;* M. Miura; Aug. 19, 1918.

DISTRIBUTION: Apparently common in our southern states and in all other subtropical countries. L. J. Tyler collected it in New York State. A specimen was sent from China.

NOTE: I have not been able to study the type of this species, but Hara kindly sent me a collection he made at the same place in 1933. This specimen is identical with the species found on Glycine in the United States. See also Jour. Agr. Res. **36:** 811. 1928. The hyaline, cylindric, wide conidia separate this species from the others on Glycine (Soja). See also *C. glycines* and *C. canescens.* In American literature the Miura species has been misspelled *C. diazu.* See key, page 288.

**Cercospora solimani** Spegazzini

Anal. Soc. Scient. Argentine **16:** 167. 1883

Leaf spots suborbicular, 1-5 mm. in diameter, dark brown, sometimes with a slightly paler center or with a raised line border; fruiting amphigenous, visible to the unaided eye; stromata dark brown, medium in size to fairly large; fascicles dense, rather compact but not coremoid as Spegazzini drew them; conidiophores medium to dark brown, uniform in color and width, multiseptate, not branched, straight to slightly geniculate, a small spore scar at the blunt tip, 4-5 x 50-200$\mu$; conidia cylindric, longest ones almost obclavate, pale to medium olivaceous brown, 1-5, mostly 3-septate, rounded to obconically truncate base, blunt tip, 4-7.5 x 30-55$\mu$. A few conidia show faint echinulation so that the species is considered doubtful.

TYPE: Prope Caá-guazú, Paraguay; on some cultivated Leguminosae; B. Balansa, No. 3492 (Speg. 918); Jan., 1882.

DISTRIBUTION: Known only from the type locality.

**Cercospora sophorae** Sawada

Literature citation unknown

HOST: *Sophora flavescens* Ait.

TYPE: Baneta, Hualien Hsien, Taiwan (Formosa); *Sophora flavescens;* K. Sawada; Aug. 3, 1944.

NOTE: A specimen is deposited in the U.S.D.A. Mycological Herbarium. I could find no Cercospora present,—only some brown individual sporophores which seemed to arise from some of the large leaf mites present.

**Cercospora sphaeroidea** Spegazzini

Anal. Soc. Scient. Argentine **16**: 169. 1883

*Cercospora iponemensis* P. Henn., Hedwigia **48**: 18. 1909

Leaf spots subcircular to irregular, 1-5 mm. in diameter, pale tan to dark brown on upper surface, greenish to dull brown below; fruiting amphigenous; stromata globular, dark brown to almost black, very prominent, 50-250$\mu$ in diameter; fascicles exceedingly dense; conidiophores in mass dark colored, singly pale olivaceous brown, uniform in color, constricted at septa or otherwise slightly irregular in width, 0-1 septate, not branched, not geniculate, almost straight, small to medium spore scar at the bluntly rounded tip, 4-5.5 x 10-35$\mu$; conidia obclavato-cylindric, pale olivaceous, straight to mildly curved, 3-11 septate, base rounded to almost sharply obconic, tip blunt to conic, 4-5.5 x 20-125$\mu$.

HOSTS: *Cassia corymbosa* Lam., *C. delagoënsis* Harv., Cassia sp.

TYPES: San José de Flores, Buenos Aires, Argentine; *Cassia corymbosa;* C. Spegazzini, No. 911; April 15, 1880; (*C. iponemensis*) Iponema, Sao Paulo, Brazil; Cassia sp.; A. Puttemans, No. 732; April, 1903.

DISTRIBUTION: Argentine, Brazil, South Africa.

NOTE: The extremely large stromata, the exceedingly dense fascicles and many of the cylindric conidia with almost sharply obconic base separate this species from the others on Cassia. See key, page 279.

**Cercospora spilosticta** Sydow

Ann. Mycol. **28**: 217. 1930

*Cercospora pithecolobii* Sawada, Jour. Taihoku Soc. Agr. & For. **7**: 119. 1942

Leaf spots angular to irregular, 2-6 mm. in diameter or coalescing into larger areas, pale yellowish brown, more nearly gray on the under surface; fruiting hypophyllous, plainly visible, often as a band about the margin of the lesion; stromata dark brown to almost black, globular, 40-80$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, paler tip, uniform in width, rarely septate, not branched, not geniculate, straight to slightly curved, minute spore scar at the conic tip, 3-5 x 10-25$\mu$; conidia subhyaline to pale olivaceous, obclavato-cylindric, straight to mildly curved, 3-7 septate, base long obconically truncate to subtruncate, tip conic to blunt, 2-4.5 x 20-75$\mu$, rarely 110$\mu$.

HOSTS: *Pithecolobium ligustrinum* Klotsch (*P. lanceolatum* [H.B.K.] Benth.) *P. multiflorum* Benth., *P. lucidum* Benth.

TYPE: Inter La Victoria et Suata, Venezuela; *Pithecolobium lanceolatum;* H. Sydow, Nos. 368, 369; Jan. 29, 1928.

DISTRIBUTION: Several collections from Venezuela and one from Argentine. Apparently present in Formosa.

NOTE: Sawada gave such a brief description that the synonymy is not certain.

**Cercospora stevensii** Young

Mycologia **8**: 45. 1916

Leaf spots none or small indistinct reddish brown angular spots on upper surface; ferruginous effuse fruiting on corresponding lower surface, rarely also on

upper surface; stromata slight to prominent, dark brown; fascicles few stalks to very dense; conidiophores medium dark brown (in mass almost black), uniform in color and width, multiseptate, not branched, markedly sinuous or rarely 1-3 abruptly geniculate, small spore scar at subconic tip, 3-5 x 75-200$\mu$; conidia cylindric to obclavato-cylindric, subhyaline to pale olivaceous, straight to mildly curved, mostly 1-5 septate, base short obconically truncate, tip obtuse, 4-5 x 30-60$\mu$, rarely 6 x 70$\mu$.

HOSTS: Vouacapoua (Andira) sp., *A. inermis* H.B.K., *A. jamaicensis* Urb. (*Geoffraea jamaicensis* L.).

TYPE: Dos Bocas below Utuado, Puerto Rico; Andira sp.; F. L. Stevens, No. 6008; Dec. 30, 1913.

DISTRIBUTION: Material studied from Puerto Rico, Minas Geraes, and Colombia.

**Cercospora stizolobii** H. & P. Sydow

Ann. Mycol. **11**: 270. 1913

*Cercospora mucunae-ferrugineae* Yamamoto, Trans. Sapporo Nat. Hist. Soc. **13**: 141. 1934

*Cercospora mucunae-capitatae* Sawada, Formosa Agr. Res. Inst. Rept. **85**: 116. 1943

Leaf spots circular or confluent and irregular, 2-5 mm. in length, tan to brown, border dark reddish brown to black raised line; fruiting amphigenous but chiefly hypophyllous; stromata dark brown, a few cells to 40$\mu$ in diameter or rarely much elongated; fascicles mostly dense; conidiophores subhyaline to pale olivaceous brown, uniform in color, sometimes irregular in width, indistinctly multiseptate, longest ones branched, undulate or tortuous, rarely once abruptly geniculate, small spore scar at rounded tip, 3-4 x 10-40$\mu$, or even 80$\mu$; conidia cylindric to cylindro-obclavate, subhyaline to pale olivaceous, straight to mildly curved, 1-7 but usually 3-septate, base medium to long obconic, tip obtuse, 3.5-5 x 35-80$\mu$, rarely 130$\mu$.

HOSTS: Stizolobium sp., *S. aterrimum* Piper & Tracy, *S. deeringianum* Bort., *S. pruritum* (Wright) Piper, Mucuna sp., *M. capitata* Sweet (*S. capitatum* Kuntze), *M. ferruginea* Mats., *M. pruriens* DC. (*M. utilis* Wall.) (*Dolichos pruriens* Linn.).

TYPES: Los Banos, Philippines; Stizolobium sp.; M. B. Raimundo (C. F. Baker, No. 892); April 6, 1913; (*C. mucunae-ferrugineae*) Taihoku, Formosa; *Mucuna ferruginea;* W. Yamamoto; Dec. 3, 1933.

DISTRIBUTION: Probably in all tropic and subtropic countries. Studied material from the southern tier of states, as far north as North Carolina, and in northern South America, Central America, West Indies, Sierra Leone, South Africa, Southern Rhodesia, India, China, Philippines, and Japan. Apparently present in Formosa.

NOTE: *C. Mucunae,* the other species on this host, apparently does not occur in the United States. The Sawada species is described so poorly that its classification is not certain.

**Cercospora stylosanthis** Spegazzini

Anal. Soc. Scient. Arg. **16**: 169. 1883

Appearing on stems like a dried slime mold, reddish brown in color, covering at times more than an inch of surface, occasionally faintly marked with concentric

rings; stromata 50-200$\mu$ in length; fascicles extremely dense and compact; conidiophores in mass reddish brown, singly reddish olivaceous, not septate, not branched, not geniculate, irregular in width, straight to sinuous, 4-5 x 10-40$\mu$; conidia cylindric, yellowish or reddish olivaceous, straight to curved, 1-6 septate, sometimes noticeably constricted at septa, base obconically truncate, tip obtuse, 4.5-6 x 25-60$\mu$.

HOST: Stylosanthes sp.

TYPE: Caá-guazú, Paraguay; Stylosanthes sp.; B. Balansa, No. 3528; Jan. 1882.

DISTRIBUTION: See type.

NOTE: Compare *C. commonsii.* The Spegazzini collection doubtfully is a Cercospora.

**Cercospora szechuanensis** Tai

Lloydia **11**: 54. 1948

No definite leaf spots; fruiting effuse on the whole surface in a sooty layer, amphigenous, also on the stem; stromata present, 20-40$\mu$ wide; conidiophores in dense fascicles, straight to slightly curved or geniculate, subnodulose, 2-4 septate, brown, rarely branched, spore scars along the upper half and at the tip, prominently shouldered, 4-6 x 50-160$\mu$; conidia subhyaline, obclavate, straight to curved, up to 28 septate, 3.5-5 x 50-160$\mu$.

HOST: *Pisum sativum* L.

TYPE: Chengtu, Szechuan, China; *Pisum sativum;* Lee Ling, No. 56; Dec. 15, 1937.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen the type of this species, but the sooty effuse layer and subhyaline conidia as wide as 5$\mu$ certainly separate it from *C. pisa-sativae* and *C. lathyrina,* the other species on this host genus. See key, page 314.

**Cercospora tephrosiae** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 44. 1892

Leaf spots angular, 1-2.5 mm. in diameter, dark brown to almost black; fruiting chiefly hypophyllous; stromata lacking; conidiophores borne singly or in fascicles of 2-15, medium dark brown, uniform in color and width, multiseptate, not branched, straight to curved, sometimes 1-4 abruptly geniculate, medium sized spore scar at subconic tip, 3.5-5 x 15-150$\mu$; conidia obclavate, medium dark olivaceous brown, multiseptate, straight to mildly curved, base subtruncate to long obconically truncate, tip subobtuse, 3-5 x 40-130$\mu$.

HOSTS: *Tephrosia hispidula* (Michx.) Pers., *T. spicata* (Walt.) T. & G., *T. virginiana* Pers.

TYPE: Auburn, Ala.; *Tephrosia hispidula;* Geo. F. Atkinson; Sept. 14, 1891.

DISTRIBUTION: Several collections from Alabama. Dr. H. C. Greene sent me a Wisconsin specimen.

**Cercospora ternateae** Petch

Ann. Roy. Bot. Gard. Peradeniya, V. **4**: 306. 1909

*Cercospora pantoleuca* H. & P. Sydow, Philipp. Jour. Sci. (Botany) **8**: 284. 1913
*Cercospora clitoridis* Fragosa & Ciferri, Bol. Real. Soc. Espanola Hist. Nat. Madrid **25**: 456. 1925

Leaf spots circular to subcircular, 1-5 mm. in diameter, brown to black, later

with a gray center, similar spots on pods; fruiting amphigenous but chiefly epiphyllous; stromata slight; fascicles mostly 3-12 divergent stalks; conidiophores pale olivaceous brown, often with hyaline tip, usually attenuated, sparingly septate, not branched, 0-3 geniculate, medium spore scar at rounded to subtruncate tip, 3.5-6 x 20-125$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly septate, base truncate, tip subacute, 2-4 x 20-120$\mu$ (mostly 20-60$\mu$).

TYPES: Peradeniya; *Clitoria ternatea* L.; T. Petch, 2206; July, 1906; (*C. clitoridis*) Near Haina, Rep. Dominicana; *C. ternatea;* R. Ciferri; Jan. 2, 1926; (*C. pantoleuca*) Los Banos, Philippines; *C. ternatea;* C. F. Baker, No. 625; Febr. 1, 1913.

DISTRIBUTION: San Domingo, Trinidad, Puerto Rico, Jamaica, Barbados, New Ceylon, Venezuela, India, Philippines, Formosa, and possibly in other countries of similar latitudes.

NOTE: Ciferri's Mycoflora Domingensis Exsiccata No. 20 is labeled part of type even though the date on the packet is four years later than is the original description. I have not been able to examine the collection of 1925. This species differs from *C. clitoriae* in having acicular hyaline conidia, and fairly wide long conidiophores. Compare *C. cylindrospora* and *C. centrosemae*. See key, page 284.

**Cercospora thermopsidis** Earle

N. Y. Bot. Gard. Bul. 2: 348. 1902

Leaf spots indistinct or irregular yellowish blotches on upper surface; fruiting in dark olivaceous to sooty effuse patches on both leaf surfaces; stromata dark brown, globular to disc-shaped, 25-75$\mu$ in length; fascicles extremely dense; conidiophores pale olivaceous brown, paler near the tip, uniform in width, straight to curved, septation, geniculation and branching indistinct or lacking, small spore scar at conic tip, 3-4.5 x 20-100$\mu$; conidia singly hyaline to subhyaline, in masses pale olivaceous, cylindric to almost acicular, curved or undulate, septa indistinct, base truncate, tip obtuse to conic, 3-5 x 50-100$\mu$.

TYPE: Glenrock, Converse Co., Wyo.; *Thermopsis arenosa* A. Nels.; Aven Nelson, No. 4818; July 15, 1901.

DISTRIBUTION: Wyoming and Manitoba.

**Cercospora tomentosae** Hansford

Proc. Linnean Soc. London 1942-43: 59. 1943

Leaf spots subcircular to irregular, mostly vein limited, from small specks to half of the leaf, grayish brown to almost gray, no distinct border; fruiting hypophyllous; stromata none or slight, brown; fascicles 2-12 stalks; conidiophores medium brown, slightly paler toward the tip, uniform in width, sparingly septate, not branched, occasionally geniculate, almost straight, small spore scar at rounded tip, 4-5.5 x 50-200$\mu$; conidia obclavato-cylindric, subhyaline to pale olivaceous brown, 1-7 septate, straight to mildly curved, base obconically truncate, tip obtuse, 4-7 x 20-90$\mu$.

HOSTS: *Erythrina reticulata, E. tomentosa.*

TYPE: Gayaza, Uganda; *Erythrina tomentosa;* Hansford, No. 1170; April 1930.

DISTRIBUTION: Uganda, Minas Geraes (Brazil).

NOTE: See key, page 305.

**Cercospora traversiana** Saccardo

Ann. Mycol. **2**: 18. 1904

*Cercospora trigonellae* Maublanc, Bol. Agr. Sao Paulo. Ser. 16A. 4: 322. 1915
*Cercospora traversiana* var. *trigonellae coeruleae* Savul. & Sandu-Ville, Hedwigia **73**: 129. 1933

Leaf spots subcircular, 2-6 mm. in diameter, brown, immarginate; fruiting amphigenous; stromata small, brown; fascicles mostly 2-15 stalks; conidiophores pale to very pale olivaceous brown, paler toward the tip, fairly uniform in width, sparingly septate, not branched or only incipient ones, rarely geniculate, straight to mildly bent or curved, spore scars indistinct on rounded or sometimes subtruncate tip, 3-5.5 x 15-125$\mu$; conidia hyaline, acicular to almost cylindric, straight to curved, indistinctly multiseptate, base truncate, tip subacute to subobtuse, 3-5 x 25-125$\mu$ or even longer.

HOSTS: *Trigonella foenium graecum* L., *T. caerulea* Ser.

TYPES: Padova-in horto botanico; *Trigonella foenum-graecum;* G. B. Traverso; June, 1903. (Cotype distributed as D. Sacc. Mycotheca Italica No. 1390.) (*C. trigonellae*) Rio de Janeiro, Brazil; *Trigonella foenum graecum;* E. Rangel, No. 775; July, 1913; (*C. traversiana* var. *trigonellae coeruleae*) Prope Rosettiletea, dist. Tulcea, Roumania; *Trigonella coerulea;* Savulescu and Sandu-Ville; June 2, 1931.

DISTRIBUTION: Italy, Roumania, Austria, Brazil.

**Cercospora tuberosa** Ellis & Kellerman

Bul. Torrey Bot. Club **11**: 116. 1884

*Cercospora glaucescens* Wint., Hedwigia **23**: 171. 1884

Leaf spots small, angular, 1-3 mm. in diameter, often coalescing, rusty brown, immarginate; fruiting chiefly hypophyllous; stromata slight, brown; most fascicles dense; conidiophores pale olivaceous brown, uniform in color, attenuated, multiseptate, not branched, rarely once geniculate, usually straight, small spore scar at conic tip, 3-5 x 25-125$\mu$; conidia cylindric to cylindro-obclavate, pale olivaceous, straight or nearly so, 1-5 septate, base short obconic, tip obtuse, 3-5 x 20-110$\mu$.

HOST: *Apios tuberosa* Moench. (*Glycine Apios* L.)

TYPE: Manhattan, Kans.; *Apios tuberosa;* W. A. Kellerman, No. 613; Aug. 5, 1884; (*C. glaucescens*) Perryville, Missouri; *A. tuberosa;* C. H. Demetrio; summer, 1883.

DISTRIBUTION: From Ontario, Wisconsin, Kansas, Mississippi and eastward.

NOTE: Both species were published during October, 1884. Saccardo (Syll. Fung. **15**: 84) and Ellis (Jour. Mycol. **1**: 38. 1885) pointed out that the Winter species was a synonym. The types bear out this statement.

**Cercospora urariae** Sawada

Taiwan (Formosa) Agr. Res. Inst. Rept. **87**: 90. 1944

Leaf spots subcircular to irregular, 0.5-5 mm. in diameter (Sawada says 2-12), yellowish tan to gray on the upper surface, rust colored below; fruiting amphigenous; stromata brown, subglobular, 15-35$\mu$ in diameter; fascicles mostly dense; conidiophores on upper surface very short, on lower surface as large as 4-5 x 15-75$\mu$, pale to medium olivaceous brown, uniform in color and width or with pale rounded tip, not branched, not geniculate, straight to undulate, rarely septate;

conidia mostly cylindric, very pale olivaceous brown, 3-7 septate, straight to mildly curved, ends rounded or base obconically truncate, 3-7 septate, 3-5 x 25-75$\mu$.

HOST: *Uraria crinita* Desv. (*U. macrostachya* Wall.).

TYPE: Tainan, Taiwan (Formosa); *Uraria macrostachya;* K. Sawada; June 23, 1910.

DISTRIBUTION: Known only from the type locality.

NOTE: A part of the Sawada collection is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora vanderysti** P. Hennings

Anal. Mus. Congo Belge-Bot. Ser. V-A, Fasc. II. 2: 104. 1907

*Cercospora vignae-vexillatae* Baker and Dale, Mycol. Papers, C.-wealth Mycol. Inst. 33: 107. 1951

Leaf spots none or indistinct; fruiting in effuse, dingy gray to mouse-colored or rarely olivaceous layers on the lower leaf surface, often covering entire leaf blade; stromata lacking; nonfasciculate to dense, compact to widely divergent fascicles; conidiophores pale to medium yellowish olivaceous or olivaceous brown, uniform in color, multiseptate, constricted at septa or otherwise irregular in width, plainly branched, sinuous to crooked, seldom 1-5 geniculate, bluntly rounded tip, 4-6.5 x 30-140$\mu$ or even as long as 500$\mu$; conidia hyaline or oldest ones faintly olivaceous, cylindro-obclavate, straight to mildly curved, 1-5, usually 3-septate, base subtruncate to long obconically truncate, tip subobtuse, 4.5-6 x 20-75$\mu$.

HOSTS: *Vigna venulosa* Baker, *V. repens* Baker, *V. capensis* Walp. (*V. vexillata* (L.) Rich).

TYPE: Kisantu, Congo-Kwango, Africa; *Vigna venulosa;* H. Vanderyst, No. 182; May, 1906; (*C. vignae-vexillatae*) San Juan, Trinidad; *Vigna vexillata;* R. E. D. Baker, No. 1872; Febr. 5, 1948.

DISTRIBUTION: A second collection was made also at a Diba, May 13, 1907.

NOTE: The long, partly nonfasciculate conidiophores in effuse hypophyllous layers, and the wide, hyaline, obclavate conidia separate this species from the others on the Leguminosae. Mr. Baker kindly sent me some of his type material. Compare *C. canescens, C. cruenta,* and *C. dolichi* in key, page 288.

**Cercospora vataireae** P. Hennings

Hedwigia 48: 115. 1909

Leaf spots circular, 3-8 mm. in diameter, brown to almost black, often with a greenish margin, older ones may have pale brown center; fruiting chiefly epiphyllous; stromata dark brown, globular, 15-50$\mu$ in diameter; fascicles dense; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not branched, not geniculate, nearly straight, minute spore scar at rounded to conic tip, 3-4 x 10-30$\mu$; conidia pale olivaceous brown, obclavato-cylindric, straight to mildly curved, 1-9 septate, base rounded to obconically truncate, tip obtuse, 3-5 x 20-85$\mu$, mostly 25-50$\mu$ in length.

HOST: *Derris guianensis* Benth. (*Vatairea guianensis* Aubl.) (*Pterocarpus guianensis* Kuntze).

TYPE: Jardin Botanico Museu Goeldi, Pará; *Vatairea guianensis;* C. F. Baker, No. 204; Jan. 1908.

DISTRIBUTION: Known only from the type locality.

**Cercospora velutina** Ellis & Kellerman

Bul. Torrey Bot. Club 11: 122. 1884

Leaf spots none or indistinct; fruiting in black effuse patches on both leaf surfaces, sometimes including whole leaflet; stromata visible as minute dark tubercles, somewhat flattened, sometimes more than 200$\mu$ in length; fascicles exceedingly dense; conidiophores very pale olivaceous brown, tip almost hyaline, uniform in width, sinuous, septation, geniculation, branching, and spore scars indistinct or lacking, 2-3.5 x 20-60$\mu$; conidia linear (narrowly cylindric), subhyaline to very pale olivaceous, straight to curved, indistinctly multiseptate, base subtruncate to long obconically truncate, tip subobtuse, 2-3.5 x 40-100$\mu$.

HOSTS: *Baptisia leucophaea* Nutt. (*B. bracteata* Muhl.) *B. australis* R. Br., *B. leucantha* Torr. & Gray.

TYPE: Manhattan, Kansas; *Baptisia australis;* W. A. Kellerman, No. 622; Aug. 1884.

DISTRIBUTION: Studied material from Wisconsin, Missouri, and Kansas.

**Cercospora vignicola** Kawamura

Fungi (Siduoka). 1 (1): 14. 1931

TYPE: Hokozaki, Fukuoka, Japan; *Vigna Catiang* var. *sinensis;* Eikichi Kawamura.

NOTE: The extremely large thick walled conidia and coarse conidiophores are not characteristic of Cercospora. It should be classed as an Helminthosporium. (Olive, Mycologia 41: 355. 1949). Wei (Mycol. Papers. C.-wealth Mycol. Inst. 34: 1-10. 1950) makes it a synonym of *Corynespora cassiicola* (Berk. & Curtis) Wei. I do not think it resembles in any way *Corynespora melonis.*

**Cercospora voandzeiae** Bouriquet

Encyclopedie Mycologique 12: 357. 1946

Leaf spots indistinct, at least at first; fruiting effuse, grayish, chiefly hypophyllous, rarely epiphyllous, in minute patches to large part of leaf surface; stromata brown, filling stomatal openings; fascicles divergent, sometimes dense; conidiophores brown, septate, geniculate, showing spore scars plainly, up to 6 x 85$\mu$ in size; conidia hyaline, obclavate, 3-5 septate, straight to mildly curved, obconically truncate base, subacute tip, 4-5.25 x 30-65$\mu$.

HOST: *Voandzeia subterranea* Thou.

TYPE: Tananarive, Madagascar; *Voandzeia subterranea;* G. Bouriquet; March, 1936.

DISTRIBUTION: Madagascar. Snowden of Uganda reported what may have been the same species on *V. subterranea.*

NOTE: I have not been able to study this species, so cannot say how it differs from others on such closely related hosts as Phaseolus and Vigna.

**Cercospora wildemanii** Sydow

Anal. Mus. Congo Belge-Bot. Ser. V. Fasc. 1. 3: 21. 1909

Leaf spots subcircular, or when along the edge of the leaf, much elongated, 6-10 mm. in diameter or even 25 mm. in length, a small central area white bordered by a wide zone of almost jet black, on the lower surface the center is tan to brown; fruiting hypophyllous; stromata subglobose, dark brown, 15-40$\mu$; fascicles

usually dense; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, not septate, not geniculate, mostly only slightly elongated cells on the stromatal periphery, larger ones 4-6 x 5-25$\mu$, or when conidia are persistent appearing much longer; conidia pale to medium olivaceous brown, cylindric, straight to strongly curved, closely and plainly septate, ends rounded or base obconic, 5-6.5 x 40-120$\mu$.

TYPE: Kiduma, Belgian Congo; Dolichos sp.; H. Vanderyst; Febr. 28, 1907.
DISTRIBUTION: Known only from the type locality.
NOTE: The wide, colored, cylindric conidia, and the very short conidiophores in fascicles from a small stroma separate this from other species on the Leguminosae.

**Cercospora wisteriae** Muller & Chupp
Arch. Inst. Biol. Vegetal. Rio de Janeiro **3**: 97. 1936

Leaf spots subcircular to angular, 1-5 mm. in diameter, youngest ones pale yellow, older ones with dark brown center and yellowish or orange margin, fully mature spots may show a white center in the brown area; fruiting amphigenous, scant, occurring mostly in the white centers; stromata slight, usually a few brown cells; fascicles a few stalks to dense, divergent; conidiophores pale olivaceous brown, paler and more narrow toward the tip, 0-1 septate, straight to undulate, not branched, not to mildly geniculate, 1-3 spore scars at or near the tip, 2.5-4 x 5-45$\mu$; conidia subhyaline to pale olivaceous, narrowly obclavate or almost cylindric, straight to mildly curved, indistinctly multiseptate, base obconic to subtruncate, tip conic, 1.5-3 x 20-75.

HOST: Wistaria sp. (Wisteria sp.)
TYPE: Vicosa-Escola, Minas Gerais, Brazil; Wisteria sp.; A. S. Muller, No. 756; March 12, 1934.
DISTRIBUTION: Known only from the type locality.

**Cercospora zebrina** Passerini
Hedwigia **16**: 124. 1877

*Cercospora helvola* Sacc., Michelia **2**: 556. 1882.
*Cercospora stolziana* Magnus, Die Pilze von Tirol. (etc.) p. 558. 1905
*Cercospora helvola* var. *zebrina* Ferraris, Fl. Ital. Crypt. **1** (8): 423

Leaf spots subcircular to linear or sometimes angular, and bounded by the leaf veins, dark brown to almost black, may coalesce and include most of the leaflet; fruiting amphigenous; stromata lacking or a few brown cells; fascicles mostly 3-30 stalks; conidiophores pale to medium dark olivaceous brown, uniform in color, attenuated, sparingly septate, not branched, straight, sinuous, or repeatedly and abruptly geniculate, medium spore scar at rounded to subtruncate tip, 3-5 x 20-105$\mu$; conidia hyaline, acicular to almost linear, straight to curved, indistinctly multiseptate, base truncate, tip subacute to subobtuse, 2-5 x 40-120$\mu$, rarely 6 x 215$\mu$.

HOSTS: Trifolium sp., *T. agrarium* L., *T. alpestre* L., *T. arvense* L., *T. dubium* Sibth., *T. hybridum* L., *T. incarnatum* L., *T. medium* L., *T. pratense* L., *T. repens* L., *T. rubrum* Larr., *T. procumbens* L.
TYPES: Paman, Italy; *Trifolium medium;* G. Passerini; summer, 1875 (Cotype distributed as Rabenhorst, Fungi europaei No. 2277); (*C. helvola*) Selva,

North Italy; *Trifolium alpestre;* Treviso; (*C. stolziana*) Insbruck, Austria; *Trifolium repens;* Stolz.

DISTRIBUTION: Apparently almost as widespread as is Trifolium, excepting in the extreme northern limits of the hosts. It has been reported as far north as Alberta, Canada.

NOTE: It is possible that there are two species on Trifolium. But after examining numerous slides, it appears that some conidiophores which have not borne conidia may be straight, non-geniculate and with rounded tip without spore scar. Other mounts show subtruncate tips with large spore scars, and still others reveal repeatedly and abruptly geniculate conidiophores. The gradations among these appear uniform enough to consider all the collections on Trifolium as one species. See notes under *C. davisii, C. latens,* and *C. medicaginis.*

**Cercospora zonata** Winter

Hedwigia **23**: 191. 1884

*Cercospora viciae* Ellis & Holway, Jour. Mycol. **1**: 5. 1885
*Cercospora fabae* Fautry, Rev. Mycol. **13**: 13. 1891
*Cercosporina fabae* (F.) Tak. & Suzuki, Sci. Bul. Alum. Assoc. Mie. Imp. Col. Agr. For. No. 1. 1929

Leaf spots subcircular to angular, often concentrically zonate, 2-12 mm. in diameter, brown to gray, dark brown line border; fruiting amphigenous; stromata few dark cells or up to 30$\mu$ in diameter, dark brown; fascicles dense, rarely almost coremoid; conidiophores near base medium dark brown, in mass dark, toward tip much paler and more narrow, longer ones occasionally septate, not branched, rarely geniculate, small spore scar at rounded to subtruncate tip, 3-5 x 10-80$\mu$, mostly 10-40$\mu$; conidia hyaline to subhyaline, cylindric to cylindro-obclavate, usually 3-septate, straight or nearly so, base subtruncate to long obconic, tip conic, 2.5-4.5 x 40-125$\mu$.

HOSTS: *Vicia faba* L. (*Faba minor* Roxb.) (*Faba vulgaris* Moench), *V. caroliniana* Walt., *V. minor* Clamercy, *V. sativa* L.

TYPES: Near Coimbra, Portugal; *Vicia faba;* Moller; Febr., 1883; (*C. Viciae*) Iowa; *Vicia sativa;* Holway; Aug. 7, 1884; (*C. fabae*) Cote-d'Or, France; *Faba minor;* F. Fautrey; June 29, 1890. Cotype distributed as Roumeguere Fungi Selecti exsiccati No. 5588.

DISTRIBUTION: In all subtropical and temperate countries and states as far north as Wisconsin, England, Germany, and Japan.

NOTE: I have not been able to find the type, but a collection labeled, *C. zonata,* made in Bavaria, Oct. 1903 by J. E. Weiss, and distributed in several exsiccati apparently is the same as the American collection of *C. viciae.* Most of the collections have very little fruiting so that a comparative study is difficult (Ann. Mycol. **2**: 193. 1904). Keissler (Ann. Mycol. **21**: 81. 1923) has already pointed out that *C. fabae* is a synonym of *C. zonata.* (See also Trans. Brit. Mycol. Soc. **17**: 195. 1932). He believed that *C. rautensis* also was the same, but this seems incorrect. Hara named *C. vicina* in Japan, but I have found neither the original description nor any authentic material and Dr. Togashi (May 1, 1941) writes that he was unable to locate material or a description. J. J. Davis (Wisc. Acad. Trans. **24**: 297. 1929) reports *C. viciae* on *Lathyrus venosus* Muhl., *L. ochroleucus* Hook and *L. palustris* L. These appear to be *C. lathyrina.*

**Cercospora asparagi** Saccardo

Michelia **1**: 88. 1878

*Cercospora caulicola* Wint., Jour. Mycol. **1**: 125. 1885. (same in Hedwigia **24**: 203. 1885)

*Cercosporina asparagicola* Speg., Anal. Mus. Nac. Buenos Aires **20**: 424. 1910

On branches and needles, small oval to elliptic spots, 1-4 mm. in length, centers pale tan to dingy gray, and with a fairly wide reddish brown margin; stromata often elongate, up to 100$\mu$ in length; fascicles mostly dense; conidiophores pale brown or olivaceous brown, not branched, rarely geniculate, sparingly septate, rounded tip, sometimes with visible spore scars, 4-5 x 10-65u; conidia acicular, hyaline, truncate base, obtuse to subobtuse tip, straight to mildly curved, septa mostly indistinct, 2.5-5 x 35-130u.

HOST: *Asparagus officinalis* L.

TYPES: Venice, Italy; *Asparagus officinalis;* Treviso; Sept., 1875; cotype distributed as Saccardo, Mycotheca Veneta, No. 1052; (*C. caulicola*) Perryville, Missouri; *Asparagus officinalis;* C. H. Demetrio; Sept., 1883; cotype distributed as Rabenhorst-Winter, Fungi europaei No. 3591; (*Cercosporina asparagicola*) In hortis, La Plata, Argentine; *Asparagus officinalis;* C. Spegazzini.

DISTRIBUTION: Sparingly present in most southern countries where asparagus is grown. Reported definitely in Italy, southern Russia, Japan, Argentine, Brazil and in the U. S. as far north as Maryland and Nebraska.

NOTE: Saccardo says the conidiophores measure 5-6 x 150u, but all the specimens studied, including cotype, show relatively short ones. His drawing (F. Ital. No. 70) shows long tortuous conidiophores with short, knob-like branches. Nothing of this kind was observed in the cotype or other collections examined.

**Cercospora Chinensis** Tai

Sci. Repts. Nat. Tsing Hua Univ. B. **2**: 428. 1937

Leaf spots circular to much elongated between the parallel veins, 2-30 mm. in length, pale tan to dingy gray, with a fairly wide, dark purple margin; fruiting amphigenous; stromata globular, dark brown, 20-50$\mu$ in diameter; fascicles dense, often compact; conidiophores medium brown, paler and more narrow toward the tip, multiseptate, rarely branched, 0-1 geniculate, medium spore scar at the rounded to truncate tip, 4-6 x 20-150$\mu$; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute to subobtuse, 2-4 x 50-150$\mu$.

HOST: *Polygonatum officinale* All.

TYPE: China; *Polygonatum officinale;* F. L. Tai; 1934.

DISTRIBUTION: Known only from the type locality.

NOTE: L. R. Hesler sent me a specimen from Tennessee with cylindric colored conidia, and which seems to be a new species.

CERCOSPORAE ON YUCCA

A. Conidia hyaline, cylindric, 3-5.5 x 15-70$\mu$; spots indistinct; fruiting effuse, on scape, pedicels and perianth; conidiophores in dense to very dense fascicles, 4-6.5 x 10-35$\mu$, pale in color.
Y. RUPICOLA *C. floricola*

AA. Conidia colored.

B. Conidia obclavate, base obconic, 2.5-5 x 35-90$\mu$; fruiting closely crowded black pustules; fascicles usually not dense; conidiophores 3-5 x 10-50$\mu$, pale in color.
YUCCA spp. *C. concentrica*

BB. Conidia cylindric, base subtruncate, 4-6.5 x 25-90$\mu$; fruiting indistinct, amphigenous; fascicles usually dense; conidiophores 4-5.5 x 10-60$\mu$, dark brown.
YUCCA sp., Y. GLORIOSA *C. yuccae*

**Cercospora concentrica** Cooke & Ellis
Grevillea **5**: 90. 1877

Spots rather indefinite on the brown dried leaf or on the stem; fruiting amphigenous, appearing as closely aggregated minute black bodies, usually accompanied by large globular black pycnidia or perithecia; stromata none to small; fascicles mostly not dense; conidiophores very pale olivaceous brown, sparingly septate, not geniculate, not branched, spore scars indistinct, tip rounded, 3-5 x 10-50$\mu$, often difficult to distinguish from procumbent threads; conidia very pale olivaceous, obclavate, base obconic, tip subacute, straight to much curved, septa not distinct, 2.5-5 x 35-90$\mu$.

HOSTS: *Yucca filamentosa* L., *Y. gloriosa* L.

TYPE: Newfield, N. Jer.; *Yucca filamentosa;* J. B. Ellis, No. 2150; June 14, 1874.

DISTRIBUTION: Since this has been confused with other species on Yucca, it is impossible to determine the distribution of the fungus. Material has been studied from New Jersey and Iowa. It has been reported also from Alabama and Georgia.

NOTE: Since the type of this species and the type of *C. yuccae* are accompanied by large pycnidia or perithecia, they have been considered identical, but they differ in type of leaf spot, color and septation of conidiophores, and shape and color of the conidia. See key above.

**Cercospora cordylines** P. Hennings
Hedwigia **41**: 117. 1902

*Cercospora cordylines* Speg., Rev. Mus. La Plata **15**: 45. 1908

Leaf spots circular, 2-5 mm. in diameter or coalescing into large irregular areas, tan to dark reddish brown, dark to black margin; fruiting amphigenous; stromata prominent, globular, dark brown to black, 50-125$\mu$ in diameter; fascicles dense to very dense, divergent; conidiophores pale olivaceous brown, in mass dark, uniform in color and width, sparingly septate, not branched, 0-1 geniculate, straight to slightly curved, small spore scar at rounded to conic tip, 3-5 x 10-60$\mu$, mostly not over 40$\mu$; conidia pale olivaceous brown, cylindric, straight or nearly so, multiseptate, ends rounded to subconic, 4-5.5 x 15-75$\mu$ or even 175$\mu$.

HOST: *Cordyline dracaenoides* Kunth.

TYPES: Botanical garden, Sao Paulo, Brazil; *Cordyline dracaenoides;* P. Hennings, No. 286; Mar. 16, 1901. The Spegazzini species was collected at the same place by A. Usteri, No. 14; Sept. 1905.

DISTRIBUTION: Known only from the type locality.

NOTE: The types show these collections to be identical. See also Saccardo, Syll. Fung. **22**: 1430. 1913.

**Cercospora dianellae** Sawada

Citation unknown

Leaf spots irregular, 0.5-6 mm. in length or coalescing into elongated areas, at first various shades of red, but finally changing to a dingy gray; fruiting epiphyllous, appearing as closely aggregated black pustules; stromata black, subcircular, 40-125$\mu$ in diameter; fascicles dense, fairly divergent; conidiophores medium to dark reddish brown, uniform in color and width, or conic tip sometimes almost hyaline, seldom septate, not branched, rarely geniculate, straight to undulate, 2-4 x 10-60$\mu$; conidia subhyaline to pale fuligenous, obclavate to almost cylindric, straight to mildly curved, 1-5 septate, bluntly rounded ends, 3-5 x 20-65$\mu$.

HOST: *Dianella nemorosa* Lam. (*D. ensifolia* DC.).

TYPE: Taipeh, Taiwan (Formosa); *Dianella ensifolia;* E. Kurosawa; Dec. 7, 1919.

DISTRIBUTION: Known only from the type locality.

NOTE: Some of the Sawada collection is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora dispori** Togashi & Maki

Trans. Sapporo Nat. Hist. Soc. **17**: 98. 1942

Leaf spots subcircular, reddish brown, soon entire leaflet turns brown or almost black; fruiting amphigenous, visible as numerous minute black pustules; stromata dark brown to almost black, 20-40$\mu$ in width; most fascicles dense; conidiophores medium dark brown, pale tip, irregular in width, mostly straight, 0-1 geniculate, not branched, tip rounded to subtruncate, 4-6 x 10-50$\mu$ or even as wide as 7.5$\mu$; conidia hyaline, acicular to almost cylindric, inclined to be straight, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse, 4-5.5 x 25-120$\mu$.

HOST: *Disporum smilacinum* A. Gray var. *ramosum* K. Nakai.

TYPE: Mt. Ehiko, Pref. Fukuoka, Japan; *Disporum smilacinum* var. *ramosum;* Y. Maki; Sept. 22, 1940.

DISTRIBUTION: Known only from the type locality.

**Cercospora dracaenae** Hansford

Proc. Linnean Soc. London **1942-43**: 56. 1943

Leaf spots circular and up to 5 mm. in diameter or coalescing into irregular areas as large as 30 mm., brown with white center and sometimes with a yellow halo, zonate; fruiting amphigenous; stromata dark, erumpent, about 30$\mu$ in diameter; conidiophores borne singly or in diverging fascicles of 2-20, olivaceous, multiseptate, nodular or geniculate toward the tip, not branched, as large as 5-6 x 180$\mu$; conidia hyaline, acicular, straight to curved, 4-9 septate, base truncate, tip acute, 3-4 x 100-180$\mu$.

HOST: *Dracaena ugandensis* Baker.

TYPE: Mukono, Uganda; *Dracaena ugandensis;* Hansford No. 1982.

DISTRIBUTION: Uganda.

NOTE: I did not see this species.

## CERCOSPORAE ON ALLIUM

A. Conidia pale olivaceous brown, cylindric, 7 x 40$\mu$; conidiophores short, branched, pale brown.

A. VICTORIALIS *C. victorialis*

AA. Conidia hyaline.
B. Conidia acicular, multiseptate, 3-5 x 50-150$\mu$; leaf spots distinct; fruiting not effuse; conidiophores 4.5-6 x 40-300$\mu$.
ALLIUM *spp.* *C. duddiae*
BB. Conidia cylindric, 1-4 septate, 3.5-4 x 20-50$\mu$; leaf spots indistinct; fruiting effuse; conidiophores 4.5 x 20-70$\mu$.
A. NIGRUM *C. sancti-marini*

**Cercospora duddiae** Welles

Phytopath. 13: 362. 1923

Leaf spots numerous, circular to elongate, 0.5-5 mm. in length, at first brownish with a yellow margin, but in wet weather covered with an effuse olivaceous fruiting layer; stromata slight or none; fascicles 2-15 divergent stalks; conidiophores pale to medium brown, slightly paler and rarely attenuated toward the tip, mostly not geniculate, multiseptate, sometimes branched, large spore scar at subtruncate tip, 4.5-6 x 40-300$\mu$; conidia hyaline, acicular, truncate base, subacute tip, septa indistinct, straight to mildly curved, 3-5 x 50-150$\mu$.

HOSTS: *Allium cepa* L., *A. sativum* L.

TYPE: Los Banos, Laguna, Philippines; *Allium cepa* and *A. sativum;* C. B. Welles.

DISTRIBUTION: Philippines, Sierra Leone, Minas Geraes, and apparently Central America. I am not sure that it has been collected in the United States.

NOTE: *C. victorialis* described from Siberia, probably grows in a cooler climate than does *C. duddiae.* Besides it has short conidiophores, and colored conidia with obconic base. See key above.

**Cercospora floricola** Heald & Wolf

Mycologia 3: 17. 1911

No distinct spots formed; fruiting in olivaceous to almost black effuse patches on scape, flower pedicels, and outer divisions of the perianth; fruit formation may be hindered; stromata mostly loosely aggregated brown cells; fascicles dense to very dense, and closely enough together to form an almost continuous layer; conidiophores pale to very pale olivaceous brown, straight to slightly curved, sometimes thickened near base, not septate, not geniculate, not branched, medium spore scar at rounded tip, 4-6.5 x 10-35$\mu$; conidia hyaline, cylindric, straight or nearly so, truncate to subtruncate base, bluntly rounded tip, 1-5 but mostly 3 septate, 3-5.5 x 15-70$\mu$.

HOST: *Yucca rupicola* Scheele.

TYPE: Austin, Texas; *Yucca rupicola;* Heald & Wolf, No. 1438; June 19, 1909.

DISTRIBUTION: Known only from the type locality.

NOTE: The hyaline conidia with truncate base separate this species from others on Yucca. See key, page 343.

**Cercospora gloriosae** Sydow

Ann. Crypt. Exot. 2: 266. 1929

Leaf spots subcircular, yellowish to tan, from small specks to large part of leaf area; fruiting amphigenous but more abundant on the lower leaf surface; stromata small, dark brown; fascicles 2-10 divergent stalks; conidiophores pale to medium brown, fairly uniform in color and width, sparingly septate, not branched, 0-2 geniculate, not always straight, subtruncate tip, 4-6 x 15-90$\mu$,

mostly 15-50$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly septate, base truncate, tip subacute, 2-4 x 20-100$\mu$.

HOST: *Gloriosa suberba* L., *G. virescens.*

TYPE: Pusa, Bihar, India; *Gloriosa suberba;* P. C. Kar, No. 2259; Sept. 15, 1908.

DISTRIBUTION: India, Uganda.

NOTE: Hansford (Proc. Linn. Soc. London **1942-43**: 34. 1943) records the fungus on *G. virescens* in Uganda.

**Cercospora hemerocallidis** Tehon

Mycologia **16**: 139. 1924

Leaf spots circular to subcircular, 1-6 mm. in diameter, pale tan to dingy gray center, fairly wide dark red margin, sometimes lower surface uniformly reddish or reddish brown; fruiting distinctly amphigenous; stromata filling stomatal openings, dark olivaceous brown; fascicles dense to very dense; conidiophores pale olivaceous brown near the base and almost or quite hyaline at the tip, slightly attenuated, septation and spore scars indistinct or lacking, not branched, sinuous or sometimes mildly geniculate, rounded tip, 2-3.5 x 10-40$\mu$, rarely as large as 4 x 60$\mu$; conidia linear to narrowly obclavate or even acicular, straight or mildly curved, hyaline to subhyaline, base subtruncate or sometimes truncate, tip subacute, septa indistinct, 2-4 x 30-120$\mu$.

HOST: *Hemerocallis fulva* L.

TYPE: Boomfield, Johnson Co., Ill.; *Hemerocallis fulva;* P. A. Young, No. 2897; July 25, 1922.

DISTRIBUTION: Studied material from Illinois and from Bermuda.

NOTE: *C. amaryllidis, C. pancratii,* and *C. hymenocallidis* resemble this species closely, but in each case there are sufficient differences to justify keeping them separate.

**Cercospora hostae**

Hori, S. Chinese parasitic fungi collected by Ching Yiu Keo. Ann. Phytopath Soc. Japan **14**: 66. 1921. (no description given.)

HOST: *Hosta sieboldiana* Engler.

NOTE: (Letter received from S. Hori, Nov. 11, 1931).

"Cercospora respectively on Nelumbium and Hosta was collected by a Chinese student, Chim Yiu Keo, and it was in preparation to publish with joint authority.

"Soon after my retire of the Station, however, Chim has returned to China and it seems very probable that he has been carried all specimen he collected to China. In the herbarium of the Station the Chinese specimens are not found to be preserved.

"As *Cerc. nelumbii* Hori and *Cerc. hostae* Hori are now only an unpublished herbarium name, you may describe your fungi without concerning above names, and I should hope you to do so, I am

(Signed)

S. Hori"

**Cercospora liliicola** Richon

Catalogue Champignons Marne, No. 2032. 1889

HOST: *Lilium candidum* L.

TYPE: St. Armand, Marne, France; *Lilium candidum;* Charles Richon.
NOTE: Saccardo (Syll. Fungorum **10**: 566. 1892) changed it to Cercosporella, because all of the fruiting is hyaline.

**Cercospora Liriopes** Tai

Sci. Repts. Nat. Tsing Hua Univ. B. **2**: 431. 1937

Leaf spots circular, 1.5-5 mm. in diameter, tan to dingy gray center, dull reddish brown raised margin; fruiting amphigenous; stromata globular, dark brown to almost black, 25-75 mm. in diameter; most fascicles dense; conidiophores medium olivaceous brown, uniform in color and width, rarely branched, septate, or geniculate, rounded tip, variously curved to sinuous, 2-4 x 5-55$\mu$; conidia pale olivaceous brown, narrowly obclavate to obclavato-cylindric, straight to mildly curved, indistinctly multiseptate, base obconic, tip subobtuse, 2.5-4 x 20-105$\mu$.

HOSTS: *Liriope spicata* Lour. (*Liriope graminifolia* Baill.), Ophiopogon sp.
TYPE: Wusih, Kiangsu Prov., China; *Liriope graminifolia;* C. T. Wei, No. 210; Oct. 4, 1930. (Cotype) Ophiopogon sp.; Sept. 19, 1931; same place as above.
DISTRIBUTION: Known only from the type locality.
NOTE: Index Kewensis places these host genera in the family Haemodoraceae.

**Cercospora maianthemi** Fuckel

Hedwigia **5**: 30. 1866

Leaf spots large pale tan areas with a yellowish margin, at first circular, then including much of the leaf surface; fruiting amphigenous, sooty effuse patches scattered over the tan areas; stromata pale brown to almost black, globular, 30-70$\mu$ in diameter; fascicles dense to very dense, divergent; conidiophores pale olivaceous brown, in mass dark, uniform in color, irregular in width, multiseptate, not branched, often markedly undulate, occasionally once geniculate and rarely multigeniculate, medium to large spore scar at bluntly rounded tip, 5-7 x 50-135$\mu$; conidia cylindric to obclavato-cylindric, subhyaline to very pale olivaceous brown, straight or nearly so, mostly 3-10 septate, subtruncate base, bluntly rounded tip, 5-7 x 40-140$\mu$.

HOST: *Maianthemum convallaria* Weber (*Maianthemum canadense* Desf.) (*M. bifolium* DC.) (*Smilacina bifolia* Schult. var. *canadensis* Gray) (*Unifolium canadense* Greene) (*Smilacina canadensis* Pursh) (*Unifolium dilatatum* Greene).
TYPE: In Jura Colleg. Amic; *Maianthemum bifolium;* Mortheir; Summer, 1866; cotype distributed as Fungi Rhenani No. 1631.
DISTRIBUTION: United States, as far south as Pennsylvania and Ohio, and as far west as Wisconsin. Also present in France, Switzerland, North Italy, Austria, Hungary, Germany, Belgium, Denmark, Sweden, Siberia, and Poland.
NOTE: Baümler (Zool.-Bot. Ges. Wien. Verh. **38**: 717. 1888) describes the variety, *paridis.* This has no relationship with *C. maianthemi* and is a synonym of *C. paridis.* Fuckel used the same description in Jährb. Nassau. Ver. Naturkunde **23**: 353. 1869.

CERCOSPORAE ON SMILAX

A. Conidia distinctly obclavate, almost straight; conidiophores medium to dark in color, in divergent fascicles of 2-20; stromata small, black.

B. Conidia medium dark in color, long obconically truncate base, 4-6 x 20-160$\mu$; conidiophores rarely branched, 3.5-5 x 30-150$\mu$, mostly 30-70$\mu$; fruiting chiefly hypophyllous.

*C. petersii*
(*C. smilacis* Thümen [by Peck])

BB. Conidia pale in color, short obconically truncate base, 3.5-5 x 30-160$\mu$; conidiophores not branched, 4-6 x 30-300$\mu$; fruiting amphigenous.

*C. mississippiensis*

AA. Conidia cylindro-obclavate to obclavato-cylindric or spindle shaped, pale in color; conidiophores pale.

B. Conidia mostly curved, base long obconically truncate so that spore is spindle shaped, 4-7.5 x 30-150$\mu$, usually 30-70$\mu$; conidiophores very long (up to 250$\mu$), undulate to tortuous, medium in color; fruiting chiefly hypophyllous.

*C. miyakei*

BB. Conidia almost straight, not spindle shaped; conidiophores rarely as long as 100$\mu$, not tortuous, pale in color; fruiting amphigenous.

C. Stromata large, 30-100$\mu$, pycnidial-like; conidia pale in color, 4-5.5 x 20-85$\mu$.

*C. pycnidioides*
(*C. smilacina* Speg.)

CC. Stromata small, 20-60$\mu$; conidia subhyaline to very pale in color, 3-5 x 35-135$\mu$.

*C. smilacis*
(*C. smilacina* Sacc.)
(*C. smilacis* var. *asperae*)

**Cercospora mississippiensis** Tracy & Earle
Bul. Torrey Bot. Club **22**: 179. 1895

Leaf spots circular, 2-5 mm. in diameter, dark reddish brown, older ones with pale center; fruiting amphigenous, visible as minute black pustules under the hand lens; stromata small, dark brown to almost black; fascicles 2-20 diver-

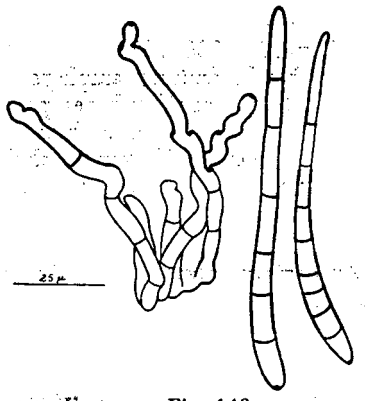



Fig. 142
*C. mississippiensis*

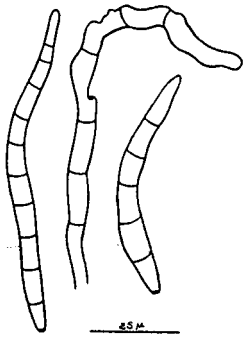



Fig. 143
*C. miyakei*

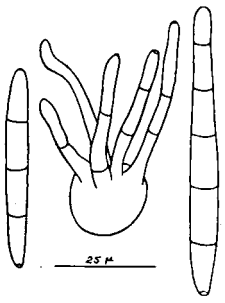



Fig. 144
*C. pallidissima*

gent stalks; conidiophores medium olivaceous brown, slightly paler tip, irregular in width, sparingly septate, not branched, curved to tortuous, 0-5 abruptly geniculate, 4-6 x 30-300$\mu$, some collections showing only those 30-80$\mu$ in length; conidia pale olivaceous to medium olivaceous brown, obclavate, straight to mildly curved, multiseptate, rounded to long obconically truncate base, tip subacute, 4-5.5 x 35-165$\mu$.

HOSTS: Smilax sp.; *S. bona-nox* L., *S. glauca* Walt., *S. hispida* Muhl., *S. lanceolata* L., *S. laurifolia* L., *S. rotundifolia* L.

TYPE: Starkville, Miss.; *Smilax glauca* (and *S. rotundifolia*); S. M. Tracy, Oct. 28, 1893.

DISTRIBUTION: From Wisconsin to Texas and eastward.

NOTE: See the key above for differences among the species on Smilax. Overholts (Ann. Missouri Bot. Gard. **14**: 425. 1927) lists *C. mississippiensis* as a synonym of *C. smilacis*.

**Cercospora miyakei** P. Hennings

Bot. Jahrb. von Engler **37**: 166. 1906

Leaf spots circular to angular, 2-6 mm. in diameter, often bounded by the leaf veins, uniformly pale brown or with a tan center, occasionally almost black; fruiting amphigenous but chiefly hypophyllous; stromata dark brown, globose, 25-40$\mu$ in diameter; fascicles sometimes dense; conidiophores medium brown, fairly uniform in color, slightly attenuated or irregular in width, plainly multiseptate, sparingly branched, straight to curved, often strongly multigeniculate, small spore scar at the conic to rounded tip, 3.5-5.5 x 60-250$\mu$; conidia medium olivaceous brown, obclavato-cylindric, 5-12 septate, straight to mildly curved, base long obconically truncate, tip obtuse, frequently catenulate, 4-7.5 x 30-150$\mu$.

HOST: *Smilax herbacea* L. var. *nipponica* Max.

TYPE: Meguro near Tokyo, Japan; *Smilax herbacea* var. *nipponica;* J. Miyake, No. 9; Oct. 9, 1904.

DISTRIBUTION: Known only from the type locality.

NOTE: This could well be a Helminthosporium for at least some of the older conidia show thick walls and pronounced septa. See key, page 349.

**Cercospora montenegrina** Bubak

Bot. Közlemenyek **14**: 82. 1915

*Cercosporina montenegrina* (Bubak) Sacc., Syll. Fung. **25**: 909. 1931

Leaf spots linear, 2-3 mm. in length, dark to black; fruiting amphigenous; stromata large, tubercle-like, black; fascicles very dense; conidiophores pale to very pale olivaceous, paler and more narrow toward the tip, septate, not branched, not geniculate, straight to undulate, 5.5-7 x 20-40$\mu$; conidia filiform to slightly attenuated, hyaline, straight to curved, 3-5 septate, base obconic, tip subobtuse, 3-3.5 x 35-55$\mu$.

HOST: *Anthericum ramosum* L.

TYPE: ad monasterium, Piva, Montenegro; *Anthericum ramosum;* J. Rohlena.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen this species.

**Cercospora pallidissima** sp. nov.

Maculae suborbiculares vel irregulares, 5-15 mm. diam., obscure griseae, in epiphyllo saepe zonula angusta atro-rubra cinctae; caespituli amphigeni; stro-

mata globosa, atro-fusca, 30-70$\mu$ diam.; conidiophora laxe fasciculata vel fere carentia, pallide olivaceo-brunnea, apicem versus angusta et subhyalina, vix septata, haud geniculata, simplicia, recta vel leniter curvata, 2.5-5 x 5-30$\mu$; conidia subhyalina vel pallidissime flavo-olivacea, subobclavata, 3-7 septata, recta vel leniter curvata, ad basim subtruncata, ad apicem subobtusa, 2-4.5 x 30-70$\mu$.

Leaf spots large, subcircular to irregular, 5-15 mm. in diameter, dull gray to tan, with a narrow dark reddish brown line border; fruiting plainly amphigenous but more abundant on the lower leaf surface; stromata globose, dark brown, 30-70$\mu$ in diameter, pycnidial-like in appearance; fascicles 2-15 divergent stalks, or conidia borne on peripheral cells without distinct stalks; conidiophores pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not geniculate, not branched, straight or slightly curved, rounded to conic tip, 2.5-5 x 5-30$\mu$; conidia subhyaline to very pale yellowish olivaceous, cylindro-obclavate or occasionally distinctly obclavate, 3-7 septate, straight to mildly curved, base obconically truncate, tip subobtuse, 2-4.5 x 30-70$\mu$.

HOST: Smilax sp.

TYPE: Bosque dos Jequitibas, Campinas, Sao Paulo, Brazil; Smilax sp.; A. P. Viegas & A. R. Teixeira, No. 4276; Sept. 5, 1943.

DISTRIBUTION: Known only from the type locality.

NOTE: The almost hyaline conidia, which are sessile or borne on very short conidiophores, separate this from the other species on Smilax. See key, page 349.

**Cercospora paridis** Eriksson

Hedwigia **22**: 158. 1883

*Cercospora majanthemi* var. *paridis* Bäumler, Zool.-Bot. Gesell. Wien. Verhandl. **38**: 717. 1888

Leaf spots circular to oval, 3-10 mm. in diameter, pale tan to greenish brown, on distinct border; fruiting hypophyllous, visible as closely aggregated black pustules; stromata brown, at times as long as 80$\mu$; fascicles dense to very dense, compact; conidiophores pale olivaceous brown, uniform in color and width, sparingly septate, not branched, 0-3 geniculate or straight, subtruncate tip, 4-6 x 40-120$\mu$; conidia hyaline, cylindro-obclavate, 4-7 septate, nearly straight, base long obconically truncate, tip obtuse, 4-7 x 25-70$\mu$.

HOST: *Paris quadrifolia* L.

TYPES: Experimental field near Holmiam, Denmark; *Paris quadrifolia;* Jakob Eriksson; July 12, 1882; (var. *paridis*) Hungary; *P. quadrifolia;* J. A. Bäumler.

DISTRIBUTION: Appears common in Europe from the Alps to southern Sweden and as far east as central Russia.

**Cercospora petersii** (Berkeley & Curtis) Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 57. 1892

*Helminthosporium petersii* Berk. & Curt., Grevillea **3**: 102. 1875

*Cercospora smilacis* de Thuemen (By Peck) N. Y. State Mus. Rept. **33**: 29. 1880

Leaf spots circular, 2-5 mm. in diameter, at first dark purple to almost black, later the center becomes tan to pale brown, often with a narrow pale line margin; fruiting chiefly hypophyllous, when plentiful appearing under hand lens core-

mium-like; stromata a few dark brown cells to medium in size; fascicles 2-25 divergent stalks or bases compact; conidiophores medium to dark brown, tip

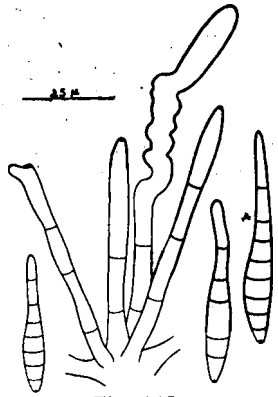


Fig. 145
*C. petersii*

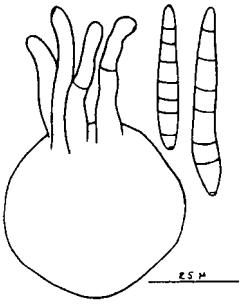


Fig. 146
*C. pycnidioides*

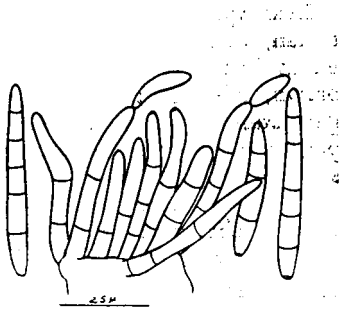


Fig. 147
*C. smilacina*

slightly paler, uniform in width, plainly multiseptate, not or rarely branched, straight or upper third sinuous to 1-7 geniculate, medium spore scar at rounded to short conic tip, 3.5-5 x 30-150$\mu$, mostly 30-70$\mu$; conidia pale to medium olivaceous brown, obclavate, sometimes wide dark base and pale narrow beak (Alternaria-like in outline), straight to mildly curved, 2-9 septate, base rounded to long obconically truncate, tip subobtuse, 4-6 x 20-90$\mu$, mostly 30-60$\mu$.

HOSTS: *Smilax glauca* Walt., *S. rotundifolia* L. Berkeley (Grevillea 3: 102. 1874) reports it also on *Laurus benzoin* (*Benzoin aestivale* Nees), but the fungus probably was *C. unicolor*. *C. petersii* has been reported on other Smilax species, but a study of herbarium specimens did not show more than the two host species.

TYPES: South Carolina; *Smilax glauca;* Peters, No. 4942; (*C. smilacis*) Wading River, Long Island; *S. glauca;* C. H. Peck; Sept. 1879.

DISTRIBUTION: Florida to Mexico, and as far north as Ohio and Cayuga Lake Basin, N. Y.

NOTE: Saccardo (Syll. Fung. 4: 476. 1886) lists *C. smilacis* Peck as a synonym of *C. smilacina* Sacc. See the key, page 349, for differences among the species on Smilax. In the Atkinson herbarium at Cornell University is a specimen labeled *Cercospora confusa* Atk., on *Smilax glauca*. It seems not to have been described. It is the same as *C. petersii*.

**Cercospora polygonati** Rostrup

Bot. Tidsskr. 26: 314. 1905

HOST: *Polygonatum multiflorum* All.

TYPE: Baggesvogn Wood, Vendsyssel, Jutland; *Polygonatum multiflorum;* E. Rostrup; Sept. 1, 1902.

NOTE: The type shows only echinulate conidia, resembling those of an Heterosporium.

**Cercospora polygonati-maximowiczii** Togashi

Japanese Jour. Bot. **2**: 75. 1924

HOST: *Polygonatum officinale* All. var. *maximowiczii.*

TYPE: Kitami Prov., Rishiri Island, Japan; *Polygonatum officinale* var. *maximowiczii;* K. Togashi; Aug. 4, 1922.

NOTE: The conidia have thick walls and very evident septa, which are not characteristic of Cercospora. It probably should be classed as an Helminthosporium.

**Cercospora pycnidioides** n. comb.

*Cercospora smilacina* Speg., Revista del Museo de La Plata **15**: 46. 1908

Leaf spots circular, 1-5 mm. in diameter, pale tan center, broad dark brown border; fruiting amphigenous, plainly evident to the unaided eye; stromata large, pycnidial-like, globular, dark brown to black, 30-100$\mu$ in diameter; fascicles dense and compact when arising from the stromata, or single stalks when arising from procumbent threads between the stromata; conidiophores in mass medium to dark brown, singly pale olivaceous brown, slightly paler and more narrow toward the tip, straight to undulate, sparingly septate, not branched, not geniculate, blunt tip, 3-5 x 10-60$\mu$ (Spegazzini says hypophyllous ones 5-6 x 75-120$\mu$); conidia pale olivaceous brown, obclavato-cylindric or shortest ones wedge shaped, straight or almost so, 3-7 septate, base short obconic or obconically truncate, tip obtuse, 4-5.5 x 20-85$\mu$, or rarely 100$\mu$.

HOST: Smilax sp.

TYPE: Sao Paulo, Brazil; Smilax sp.; A. Usteri, No. 953.

DISTRIBUTION: Known definitely only from the type locality. Reported almost world-wide in the literature, but all labeled specimens examined were some other species.

NOTE: The change of name was required because it had been used twice previously. See the key, page 349, separating the species on Smilax.

**Cercospora sancti-marini** n. comb.

*Cercosporina sancti-Marini* Sacc., Atti e Mem. R. Accad. di sc. lett. ed arti Padova **33**: 178. 1917

Leaf spots indistinct; fruiting sparingly effuse, brown; stromata present; fasciculate; conidiophores very pale olivaceous, paler toward the tip, not branched, mildly geniculate, 4.5 x 60-70$\mu$; conidia cylindric, hyaline, typically 4-septate, ends rounded, 3.5-4 x 45-50$\mu$.

HOST: *Allium nigrum* L.

TYPE: Dogama, Rep. S. Marino, Italia; *Allium nigrum.*

DISTRIBUTION: Known only from the type locality.

NOTE: I have not been able to procure material of this species. Saccardo says that the conidial stage is accompanied by a perithecial stage, possibly *Sphaerella allicina* or *S. Schoenoprasi.* See key, page 346, for differences among the species on Allium.

**Cercospora smilacinae** Ellis & Everhart

Bul. Torrey Bot. Club **27**: 577. 1900

Leaf spots indistinct or very pale tan, sometimes with a bright reddish brown margin, 2-3 mm. in diameter; fruiting in scantily effuse sooty layers, amphigenous; stromata globular to elongate, dark brown, from a few cells to 100$\mu$ in length;

conidiophores borne singly as branches from procumbent threads between the stromata, or in fascicles on the stromata, medium brown, uniform in color, variously curved or bent, irregular in width, septate, not geniculate, bluntly rounded tips, 3-4.5 x 10-30$\mu$; conidia subhyaline to faintly olivaceous, obclavato-cylindric, straight to mildly curved, 3-7 septate, long obconically truncate base, blunt tip, 3-5 x 20-100$\mu$.

HOSTS: *Smilacina sessilifolia* Nutt., *S. stellata* (L.) Desf.

TYPE: Latah Co., Idaho; *Smilacina sessilifolia;* Robert M. Horner, No. 1293; July, 1899.

DISTRIBUTION: Idaho and Colorado.

NOTE: Clements distributed Cryptogamae Formationum Coloradensium No. 69, labeled *Cercospora vagnerae* n. sp. on *Smilacina* (*Vagnera*) *stellata.* This is the same as *C. Smilacinae.* This apparently was never published. Since Saccardo (Michelia 2: 364. 1881) used the name C. *smilacina,* originating from Smilax, the above name is doubtfully retained. The question of changing the name of the species on Smilacina should be answered by the Committee on nomenclature.

**Cercospora smilacis** de Thuemen

Hedwigia 19: 135. 1880

*Cercospora smilacina* Sacc., Michelia 2: 364. 1881

*Cercospora smilacis* var. *asperae* Frag., Trab. Mus. Nac. Madrid Ser.-Bot. 9: 66. 1916

Leaf spots subcircular to irregular, 1-12 mm. in length, variable in color, mostly dark reddish brown with a black or a tan line margin; fruiting amphigenous; stromata dark, 20-60$\mu$ in diameter; fascicles 2-20 spreading stalks; conidiophores pale olivaceous to rather dark olivaceous brown, uniform in color and width, sparingly septate, not branched, smooth to 1-3 abruptly geniculate, straight to undulate or when very long, tortuous, small spore scar at rounded to conic tip, 2.5-4.5 x 15-65$\mu$ or rarely as long as 250$\mu$; conidia obclavato-cylindric to obclavate, pale olivaceous, straight to mildly curved, 3-12 septate, base rounded to short obconically truncate, tip subobtuse, 3-5 x 35-100$\mu$.

HOSTS: *Smilax aspera* L., *S. excelsa* L., *S. herbacea* L., *S. hispida* Muhl., *S. mauritanica* Poir., Smilax sp.

TYPES: Near Coimbra, Portugal; *Smilax mauritanica;* F. Moller; May, 1878; cotype distributed as Mycoth. Univ. No. 1768; (*C. smilacina* Sacc.) Collioure Galliae; *Smilax aspera;* O. Debeaux; cotype distributed as F. Gallici No. 723; (var. *asperae*) Barcelonia; *Smilax aspera;* Fr. Sennen; Sept. 20, 1915.

DISTRIBUTION: Seemingly almost world wide. Specimens misnamed in many herbaria.

NOTE: See the key, page 349, for separation of the species on Smilax. See Ann. Epiphyt. n.s. 13: 43-55. 1947 for a note on the variety, asperae.

**Cercospora streptopi** Dearness & Bartholomew

Mycologia 9: 363. 1917

Leaf spots angular, 1-5 mm. in diameter, or occasionally coalescing and including a large part of the leaf, indistinct yellowish to faint olivaceous, stippled with minute black fruiting pustules on both surfaces; stromata globular, dark brown to black, filling stomatal openings or enlarged to 50$\mu$ in diameter; fascicles dense; conidiophores pale brown near base, tip almost hyaline, uniform in di-

ameter or clavate, indistinctly 1-4 septate, not branched, rarely once geniculate, usually straight, small spore scar at rounded to conic tip, 2-4 x 10-65$\mu$; conidia cylindric, hyaline to subhyaline, straight to mildly curved, 1-7 septate, base long obconic, tip rounded or when spore is catenulate, similar to base, 3-6 x 20-70$\mu$.

HOSTS: *Streptopus distortus* Michx. [*Streptopus amplexifolius* (L.) DC.] *Disporum oregonum* (Wats.) B. H., *D. trachycarpa* Benth. & Hook., Disporum sp.

TYPE: Duckabush River, Wash.; *Streptopus amplexifolius;* E. Bartholomew, No. 4857; Aug. 1912; cotype distributed as Fung. Columb. 5004.

DISTRIBUTION: Material studied from Tennessee, Montana, Oregon and Washington.

**Cercospora subsanguinea** Ellis & Everhart

Jour. Mycol. 4: 4. 1888

HOST: *Maianthemum convallaria* Weber (*Smilicina canadensis* Pursh).

TYPE: British Columbia; *Smilacina canadensis;* Macoun, No. 12; Oct. 6, 1887.

NOTE: The type shows this to be a Ramularia and verifies the statement of Davis (Wisc. Acad. Sci. 22: 168. 1926).

**Cercospora togashiana** Katsuki

Annals Phytopath. Soc. Japan 15: 144. 1951

Leaf spots indistinct to brownish areas that may be small or include most of the leaf; fruiting effuse, grayish olivaceous; stromata none, nonfasciculate to pseudofascicles, mostly hypophyllous; conidiophores curved to sharply bent, irregular in width, 4-6 x 30-150$\mu$, branches from procumbent threads, sometimes branched, multiseptate, occasionally constricted at septa, slightly geniculate, olivaceous brown, uniform in color, irregular in width; conidia cylindric to almost obclavate, mostly mildly curved, 3-8 septate, subhyaline to pale olivaceous, base truncate, tip obtuse, 4-6 x 30-100$\mu$.

HOST: *Ophiopogon japonicus.*

TYPE: Niiwamura, Minamisaitama, Saitama Pref., Japan; *Ophiopogon japonicus;* Y. Urasawa; July 1, 1950.

DISTRIBUTION: Japan.

**Cercospora victorialis** de Thuemen

Hedwigia 21: 172. 1882

Leaf spots suborbicular, yellowish tan, or when covered with the effuse fruiting, appearing dark olivaceous; conidiophores pale brown, sparingly septate, branched, erect, rather wide, short; conidia fusiform, curved, acute at both ends, 2-4 septate, pale olivaceous brown, 7 x 40$\mu$.

HOST: *Allium victorialis* L.

TYPE: Alpine woods of "Kerlygan" Mt., Asiatic Siberia; *Allium victorialis;* Martianoff.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not been able to find material of this species. It is doubtfully a Cercospora. See key, page 345, for differences among the species on Allium.

**Cercospora yuccae** Cooke

Grevillea 7: 35. 1878

Leaf spots oval to elongate, brown, sometimes bulging on upper surface, or with a raised line border, brown to dingy gray on lower surface, 2-6 x 8-30 mm.

in extent; fruiting amphigenous; stromata large, globular, black, resembling pycnidia, 30-125$\mu$ in diameter; fascicles dense or sometimes nonfasciculate; conidiophores borne on stromata or on procumbent threads between stromata, dark brown, plainly multiseptate, sometimes constricted at septa, sparingly geniculate, spore scar not visible at bluntly rounded tip, 4-5.5 x 10-60$\mu$; conidia cylindric to obclavato-cylindric, subhyaline to medium olivaceous brown, nearly straight, 1-3 septate, base subtruncate to obconically truncate, tip obtuse, 4-6.5 x 25-90$\mu$.

HOSTS: Yucca sp., Y. *gloriosa* L.

TYPE: Darien, Georgia; Yucca sp.; H. W. Ravenel, No. 292 (Cooke 2516); cotype distributed as Ravenel, Fungi Americani No. 292.

DISTRIBUTION: Georgia, Alabama, and Kansas.

NOTE: The wide, dark cylindric conidia separate this species from the others on Yucca. The name, *C. yuccagena* Cooke (Iowa State Col. Jour. Sci. **3**: 316. 1929) is a typographical error. Saccardo (Syll. Fung. **4**: 479. 1886) says this is a synonym of *C. concentrica,* but the type materials prove his statement incorrect. See key, page 344.

**Cercospora Lini** Ellis & Everhart
Jour. Mycol. **3**: 16. 1887

Part or all of the leaflet may turn brown; fruiting showing as minute black pustules on both leaf surfaces; small brown stromata filling stomatal openings or 15-40$\mu$ in diameter; fascicles dense, fairly compact; conidiophores pale olivaceous brown, uniform in color and width, septa indistinct, rarely branched or once geniculate, longer ones undulate, tip conic with minute spore scar, 3-4 x 20-50$\mu$; conidia pale olivaceous, narrowly obclavate, straight to curved, septa indistinct, base sharply obconic, tip subacute, 2-3.5 x 40-70$\mu$.

HOST: *Linum virginianum* L.

TYPE: Faulkland, Del.; *Linum virginianum;* A. Commons, No. 248; Aug. 2, 1886.

DISTRIBUTION: Several collections from Delaware.

CERCOSPORAE ON LOBELIACEAE

A. Conidia colored, cylindric, 2.5-5 x 20-60$\mu$; fruiting effuse.
LOBELIA, ISOTOMA — *C. effusa*

AA. Conidia hyaline, acicular, 3-5 x 20-100$\mu$; fruiting not effuse.

B. Conidiophores rather irregular in width, branched occasionally, 4-6 x 40-150$\mu$; conidia distinctly acicular, with acute tips.
LOBELIA — *C. lobeliae*

BB. Conidiophores regular in width, not branched, 4-5 x 25-80$\mu$ or rarely longer; conidia sometimes obclavate, subobtuse tip.
SIPHOCAMPYLUS — *C. siphocampyli*

**Cercospora effusa** (Berkeley & Curtis) Ellis
Jour. Mycol. **1**: 53. 1885

*Cladosporium effusum* B. & C., Grevillea **3**: 106. 1875
*Cercospora ochracea* Sacc. & Malbr., Michelia **2**: 128. 1880
*Cercospora lobeliaecola* Solheim, Ill. Univ. Biol. Monogr. **12**: 64. 1929

Leaf spots indistinct to distinct, angular, reddish brown; fruiting when abund-

ant, in ocherous to reddish brown or ferruginous effuse layers on the lower leaf surface, often covering entire surface of leaflet; stromata none to small; nonfasciculate to very dense fascicles; conidiophores pale fuligenous to ferruginous, plainly multiseptate and branched, curved or bent in various ways, often intertwined, not geniculate, small spore scar at rounded or conic tip, 3.5-5.5 x 40-125$\mu$; conidia cylindric, rounded to obconic base, rounded to conic tip, straight or nearly so, subhyaline to very pale fuligenous or ferruginous, 0-5, but mostly 2-3 septate, 2.5-5 x 20-60$\mu$.

HOSTS: *Lobelia amoena* Michx., *L. cardinalis* L., *L. inflata* L., *L. puberula* Michx., *L. siphilitica* L., *L. urens* L., *Isotoma longiflora* (L.) Presl.

TYPES: Pennsylvania; *Lobelia syphilica;* Dr. Michener, No. 1225; 1852; cotype distributed as Curtis sheet 324; (*C. ochracea*) Eburense, Dep. de l'Eure, France; *Lobelia urens;* A. Malbranche.

DISTRIBUTION: From Wisconsin and Iowa to Texas and eastward. Also collected in France and Trinidad.

NOTE: In their description, Berkeley and Curtis mention as the first host *Polygonum punctatum,* followed by several species of Lobelia and *Nabalus altissima.* For this reason Solheim feels that the species on Polygonum should be known as *C. effusa* and the one on Lobelia be given a new name. Since they describe the effuse fruiting as ferruginous instead of olivaceous, as is true of the one on Polygonum and judging from the packets in the Kew Herbarium, the one on *Lobelia syphilica* appears to be considered the type. Ellis, too, must have thought the one on Lobelia should be *C. effusa.* Therefore, it seems logical to continue using the name *C. effusa* for the one on Lobelia and *C. polygonorum* for the olivaceous one on Polygonum. The other species, *C. Lobeliae,* on Lobelia has hyaline acicular conidia. The type of *C. tupae* Speg. has two-celled echinulate conidia and therefore is not a Cercospora. *C. effusa* has been reported on *Chenopodium bushianum* Aellen (Univ. of Missouri Studies **22**(3): 11. 1948), but it probably was *C. dubia.* See key above.

**Cercospora lobeliae** Kellerman & Swingle

Jour. Mycol. **5**: 75. 1889

Leaf spots circular, 2-4 mm. in diameter, pale tan to almost gray, with light brown border; fruiting amphigenous; stromata mostly a few brown cells; fascicles mostly not dense, rarely 10-20 stalks; conidiophores medium brown near base, pale brown near tip, multiseptate, branched occasionally, 1-6 mildly to abruptly geniculate, sometimes attenuated upward from each geniculation or irregular in width, large spore scar at subtruncate tip, 4-6 x 40-150$\mu$; conidia acicular, hyaline, straight to curved, septa indistinct, truncate base, subacute tip, 3-4.5 x 50-175$\mu$.

HOSTS: *Lobelia amoena* Michx., *L. spicata* Lam., *L. syphilitica* L.

TYPE: St. George, Pottawatomie Co., Kansas; *Lobelia syphilitica;* Kellerman and Swingle, No. 1492; Sept. 29, 1888.

DISTRIBUTION: Studied material from Kansas, Alabama, and Brazil. It has been reported also from Wisconsin, Indiana, Texas, Illinois, Maryland, (Plant Dis. Reporter **32**: 416. 1948).

NOTE: See also *C. effusa* and key, page 356 for differences between the two species on this host genus.

**Cercospora siphocampyli** Chupp & Viégas
Bol. Soc. Brasileira Agron. 7: 367. 1944

Leaf spots subcircular, 0.5-5 mm. in diameter, yellowish tan, irregular dark purple border; fruiting chiefly hypophyllous; stromata small, a few brown cells to 25$\mu$ in diameter; on lower leaf surface fascicles 2-15 spreading stalks, on upper surface dense, compact; conidiophores pale to medium brown, paler near the tip, fairly uniform in width, 1-7 septate, not branched, 0-3 abruptly geniculate, straight to curved, subtruncate tip, 4-5 x 25-150$\mu$, mostly 25-80$\mu$; on upper leaf surface, 5-25$\mu$ in length; conidia hyaline, acicular or slightly attenuated from the center toward the base, mildly curved, indistinctly multiseptate, base truncate, tip subacute, 3-5 x 20-75$\mu$, shortest ones only slightly attenuated.

HOST: *Siphocampylus cinerascens* Wimmer.

TYPE: Agr. Exp. Sta., Monte Alegre, Sao Paulo, Brazil; *Siphocampylus cinerascens;* A. P. Viégas and A. S. Lima, No. 4354; Dec. 8, 1943.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 356.

**Cercospora tupae** Spegazzini
Fungi Chilenses p. 187. 1910

HOST: *Lobelia tupa* L.

TYPE: Valdivia, Chile; *Lobelia tupa;* C. Spegazzini, No. 959; 1909.

NOTE: Spegazzini both in the publication and on the type questions the genus. The type shows one-septate conidia, much constricted at the septum, the basal cell usually being the larger. The surface is minutely echinulate. Some of the spores are angular, resembling slightly in shape a grain of buckwheat. The fungus certainly is not a Cercospora. It probably should be classed as an Heterosporium.

**Loganiaceae**

A. Conidiophores very short, 4-4.5 x 5-25$\mu$; conidia cylindric, straight, 4-5.5 x 20-90$\mu$.
STRYCHNOS — *C. strychni*

AA. Conidiophores mostly longer than 25$\mu$; conidia obclavate, slightly curved.
B. Conidiophores 3.5-5 x 10-40$\mu$, rarely 75$\mu$; conidia 2.5-4.5 x 20-100$\mu$.
CYNOCTONUM — *C. torta*
BB. Conidiophores 3.5-6 x 40-120$\mu$; conidia 3.5-5 x 25-75$\mu$.
BUDDLEIA — *C. buddleiae*

**Cercospora buddleiae** Yamamoto
Trans. Nat. Hist. Soc. Formosa **26**: 279. 1936

Leaf spots angular to irregular, 2-11 mm. in length, often vein limited, brown to reddish brown, with a narrow raised line border; fruiting hypophyllous; stromata slight, brown, filling stomatal openings; fascicles sometimes dense; conidiophores pale to medium olivaceous brown, slightly paler and more narrow toward the tip, 2-8 septate, occasionally constricted at the septa, rarely short branches, straight to strongly curved, undulate to geniculate, small spore scar at the rounded tip, 3.5-6 x 40-120$\mu$; conidia pale olivaceous, obclavate, straight to mildly curved, 1-7 septate, base obconically truncate, tip subobtuse, 3.5-5 x 25-75$\mu$.

HOST: *Buddleia madagascariensis* Lam., *B. insignis* Carr.

TYPE: Horto Botanico, Taihoku, Formosa; *Buddleia madagascariensis;* W. Yamamoto; Febr. 2, 1934.
DISTRIBUTION: Formosa, Japan.
NOTE: Material of this species has not been available for study. Some of the type material is deposited in the U.S. Dept. Agr. Mycological Herbarium, but I could find no fruiting on it. Shigetaka Katsuki sent me a specimen from Japan in 1952, and which was like the type Yamamoto sent me but had very short conidiophores. See key above.

**Cercospora strychni** Sydow

Ann. Crypt. Exot. **2** (3-4): 269. 1929

Leaf spots rectangular to irregular, vein limited, 0.5-5 mm. in diameter, pale tan to dingy gray, dark line margin; fruiting hypophyllous; stromata dark brown, filling stomatal openings or globular and up to 40$\mu$ in diameter; fascicles dense; conidiophores pale to medium olivaceous brown, paler and more narrow toward the tip, straight, not septate, not geniculate, not branched, bluntly rounded tip, 4-4.5 x 5-25$\mu$; conidia subhyaline to very pale olivaceous brown, cylindric, straight, 1-7 septate, base obconically truncate, tip obtuse, 4-5.5 x 20-90$\mu$.

HOST: *Strychnos nux-vomica* L.
TYPE: Bhubaneshwar, Cuttuck, Orissa, India; *Strychnos nux-vomica;* E. J. Butler, No. 2281; Dec. 1912.
DISTRIBUTION: Known only from the type locality.
NOTE: See key, page 358.

**Cercospora torta** Tracy & Earle

Bul. Torrey Bot. Club **28**: 187. 1901

Leaf spots none or indefinite; fruiting in olivaceous to sooty effuse patches on lower leaf surface, 2-4 mm. in extent; stromata filling stomatal openings, brown; fascicles dense, or sometimes nonfasciculate; conidiophores pale olivaceous brown, uniform in color, shorter ones attenuated, sparingly septate, not branched, undulate to 1-3 mildly geniculate, small spore scar at conic tip, 3.5-5 x 10-40$\mu$, rarely 75$\mu$; conidia very pale olivaceous, narrowly obclavate, almost linear, mildly curved, multiseptate, base rather sharply obconic, tip subacute to subobtuse, 2.5-4 x 20-100$\mu$.

HOST: *Mitreola petiolata* Torr. & Gray [*Cynoctonum mitreola* (L.) Britton] (*C. petiolatum* J. F. Gmel.)
TYPE: Ocean Springs, Miss.; *Cynoctonum petiolata;* Tracy and Lloyd, No. 590; Sept. 15, 1900.
DISTRIBUTION: Studied material from Mississippi and Texas.
NOTE: A collection made by Tharp, Aug. 2, 1920, in Texas, and listed in some herbaria under *C. cynoctonie,* undoubtedly is the same species. See key, page 358.

**Cercospora loranthi** McAlpine

Proc. Linnean Soc. N. S. Wales **28**: 96. 1903

Leaf spots orbicular, 1-2 mm. in diameter, dark brown, raised pustule-like, inclined to be confluent; fruiting amphigenous; stromata present; fascicles dense; conidiophores dark olivaceous, sparingly septate, straight to slightly flexuous, not branched, 4-5 x 15-40$\mu$; conidia pale olivaceous, cylindro-obclavate, straight to

curved, base somewhat bulbous, 5-8 septate, ends rounded, 4-4.5 x 60-150$\mu$, averaging 60-80$\mu$.

HOST: *Loranthus pendulus* Sieber.

TYPE: Dandemong Creek, Victoria, Australia; *Loranthus pendulus;* C. French, Jr.; Nov. 1902.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not yet seen this species.

**Cercospora struthanthi** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 57. 1942

Leaf spots circular, 5-20 mm. in diameter, grayish brown to almost black, bordered by a narrow pale brown raised line; fruiting amphigenous, often in a dark effuse layer over the entire spot; stromata pale to dark brown, globular, 30-80$\mu$ in diameter; fascicles dense to very dense; conidiophores slightly elongated cells over the periphery of the stroma or sometimes elongated to 3-5 x 10-20$\mu$, pale brown swollen base, almost hyaline narrow tip, not septate, not geniculate, not branched, tip rounded or conic; conidia subhyaline to very pale olivaceous, obclavato-cylindric, straight or nearly so, 1-12 septate, base obconically truncate, tip rounded to conic, 2-3.5 x 15-70$\mu$.

HOST. Struthanthus sp.

TYPE: El Valle, Caracas, Venezuela; Struthanthus sp.; A. S. Muller, No. 3991; April 15, 1941.

DISTRIBUTION: Known only from the type locality.

**Lythraceae**

A. Conidia acicular, hyaline, 2-4 x 50-125$\mu$; conidiophores rarely branched, 3-5 x 25-70.

AMMANNIA — *C. ammanniae*

AA. Conidia not acicular, mostly colored or at least subhyaline; conidiophores not branched.

B. Conidiophores often longer than 75$\mu$ and showing geniculations, medium to dark in color.

C. Conidiophores 3-4.5 x 30-200$\mu$; fruiting effuse, ferrugineous; conidia cylindric, very pale, 3-4.5 x 20-50$\mu$, 1-3 septate.

LYTHRUM — *C. lythri*

CC. Conidiophores 2-3.5 x 40-150(225)$\mu$; fruiting not effuse; conidia cylindro-obclavate, pale, 3.5-5.5 x 20-80$\mu$, 3-10 septate.

WOODFORDIA — *C. sydowiana*

BB. Conidiophores rarely as long as 75$\mu$, not geniculate, pale to very pale.

C. Fruiting mostly epiphyllous; conidiophores 3-5 x 15-50$\mu$ or in extreme cases 5-75$\mu$, pale in color.

D. Conidia linear, subhyaline to very pale, 2-3.5 x 40-130$\mu$, with subtruncate base; stromata 60-120$\mu$; fascicles very dense.

WOODFORDIA — *C. woodfordiae*

DD. Conidia cylindro-obclavate, sometimes hyaline or colored only in mass, 2.5-5 x 25-95$\mu$, base obconic; stromata 20-40$\mu$; fascicles mostly dense.

NESAEA — *C. nesaeae*

CC. Fruiting amphigenous; conidiophores 2-3.5$\mu$ in width, subhyaline to very pale in color.

D. Conidia obclavate to spindle shaped, subhyaline to pale, 2-3.5 x 20-85$\mu$; conidiophores 5-50$\mu$ in length; stromata 15-40$\mu$; fascicles usually dense.
LAGERSTROEMIA *C. lythracearum*

DD. Conidia filiform to obclavate, colored only in mass, 3-4.5 x 50-100$\mu$; conidiophores 7-15$\mu$ in length; stromata 60-120$\mu$; fascicles very dense.
CUPHEA *C. cupheae*

**Cercospora ammanniae** Tharp
Mycologia 9: 107. 1917

Leaf spots circular to subcircular, grayish brown with purplish raised margin above and rusty brown below, 1-2 mm. in diameter; fruiting amphigenous; most fascicles not dense; small brown stromata; conidiophores pale olivaceous brown, sparingly septate and geniculate, rarely slightly branched, small spore scars near or at the tip, 3-5 x 25-70$\mu$; conidia hyaline, acicular, truncate base, subobtuse tip, indistinctly multiseptate, straight to curved, 2-4 x 50-125$\mu$.

HOST: *Ammannia latifolia* L. (*A. coccinea* Rottb.)
TYPE: Austin, Texas; *Ammannia coccinea;* B. C. Tharp; Sept.-Dec. 1914.
DISTRIBUTION: Known only from the type locality.
NOTE: See key above.

**Cercospora cupheae** Sydow
Ann. Mycol. 37: 428. 1939

Leaf spots angular to irregular, 2-10 mm. in diameter, yellowish brown to grayish brown on upper surface, with greenish tinge below; fruiting amphigenous, but more abundant on lower surface; stromata globular to flattened, dark olivaceous brown, 30-60$\mu$ in diameter; fascicles very dense; conidiophores subhyaline, not branched, not septate, not geniculate, 2-3 x 7-15$\mu$; conidia filiformi-obclavate, in mass olivaceous brown, singly hyaline to subhyaline, base truncate, tip subacute, straight to strongly curved, indistinctly multiseptate, 3-4.5 x 50-100$\mu$.

HOSTS: *Cuphea strigulosa* HBK., *C. spicata* Cav. (*C. racemosa* Spreng.)
TYPE: Mindo, Prov. Pichincha, Ecuador; *Cuphea strigulosa;* H. Sydow, No. 308; Nov. 5, 1937.
DISTRIBUTION: Ecuador and Mexico.
NOTE: I have not seen this type. Plunkett's collections in Mexico fit the description closely. See key above.

**Cercospora grisleae** Sydow
Ann. Mycol. 28: 212. 1930

HOST: *Grislea secunda* L.
TYPE: La Victoria, Venezuela; *Grislea secunda;* H. Sydow, No. 390; Jan. 28, 1928.
NOTE: The conidia being thick-walled and with prominent septa, and the conidiophores being very dark, the species is not considered a Cercospora. It fits more nearly an Helminthosporium.

**Cercospora lythracearum** Heald & Wolf
Mycologia 3: 18. 1911
*Cercospora lagerstroemiae* H. & P. Sydow, Ann. Mycol. 12: 203. 1914

*Cercospora lagerstroemiae-subcostatae* Sawada, Desc. Catal. Formosan F. Part V. Rept. **51**: 129. 1931

*Cercospora lagerstroemiicola* Sawada, Formosa, Agr. Res. Inst. Rept. 85: 112. 1943

Leaf spots circular, 3-10 mm. in diameter, pale brown to dingy gray or dark olivaceous, often with a green fringe on the otherwise browned leaves, then fading into a yellowish halo; fruiting amphigenous; small dark brown globular stromata, 15-40$\mu$ in diameter; fascicles mostly dense; conidiophores very pale olivaceous, often only elongated cells on periphery of stroma, longer ones slightly wavy, not septate, not branched, at times 1-2 mildly geniculate, rounded tip with minute spore scars, 2-3.5 x 5-50$\mu$; conidia obclavate to cylindro-obclavate, sometimes almost spindle shaped, subhyaline to pale olivaceous, mostly curved, septa indistinct, base long obconically truncate, tip subobtuse to subacute, 2-3.5 x 20-85$\mu$.

HOSTS: *Lagerstroemia indica* L., *L. flos-reginae* Retz. (*L. speciosa* Pers.) *L. subcostata* Koehne.

TYPES: Austin, Texas; *Lagerstroemia indica;* Heald and Wolf, No. 466; Nov. 9, 1908; (*C. lagerstroemiae*) Mt. Maquiling, near Los Banos, Laguna Prov., Philippines; *Lagerstroemia speciosa;* M. B. Raimundo, No. 2054; Nov. 10, 1913; (*C. lagerstroemiae-subcostatae*) Formosa; *Lagerstroemia subcostata;* K. Sawada; (*C. lagerstroemiicola*) Formosa; *Lagerstroemia subcostata;* K. Sawada.

DISTRIBUTION: Studied material from Formosa, Philippines, Texas, Trinidad, and Puerto Rico. Also reported from India and Uganda.

NOTE: When Heald and Wolf described this species, they considered it the same as the one which appears on *Punica granatum*. The two do appear similar in many respects, but they differ in color and size of spots, location and appearance of fruiting (as seen under the hand lens) size of stromata, length of conidiophores, and shape, color, and width of conidia. It is true that all these differences are present in only slight degrees, and may be overlooked by one who does not examine the specimen critically. These differences together with the fact that Lagerstroemia and Punica are in separate host families, cause me to consider the species on the two hosts as distinct, the one being *C. lythracearum* and the other *C. punicae* Hennings. Wolf (Jour. Agr. Res. **35**: 465. 1927) described the perfect stage of the species on Punica and named it *Mycosphaerella lythracearum*. If my opinion is correct, it probably should have been named *M. punicae*.

**Cercospora lythri** (Westendorp) Niessl

Hedwigia **15**: 1. 1876

*Cladosporium lythri* Westendorp, Bul. Acad. Roy. de Belg. II. **21**: 240. 1854

*Cercospora sanguinea* Fuckel, Hedwigia **5**: 30. 1866; also in Symbolae Mycol. p. 354. 1869

Leaf spots none or indistinct; fruiting amphigenous, effuse, ferrugineous to almost olivaceous, sometimes covering the entire leaflet; stromata lacking or dark brown, slight; nonfasciculate or fascicles 2-12 spreading stalks; conidiophores medium to dark brown, uniform in color, slightly more narrow toward the tip, multiseptate, not branched, tortuous, upper third undulate to mildly multigeniculate, very narrowly rounded tip, 3-4.5 x 30-200$\mu$; conidia subhyaline to very pale olivaceous, cylindric, straight or nearly so, 1-3 septate, rounded ends, 3-4.5 x 20-50$\mu$.

HOSTS: *Lythrum salicaria* L., *L. alatum* Pursh.
TYPES: Belgium; *Lythrum salicaria;* Westendorp, No. 1091; (*C. sanguinea*) Ca. Budenheim; autumn, 1866; cotype distributed as Fungi Rhenani No. 1630.
DISTRIBUTION: In western Europe from Italy to Germany. Davis (Wisc. Acad. Trans. **14**: 96. 1903) reports the fungus in Wisconsin. His specimen definitely shows that it is identical with the European material.
NOTE: I prefer Westendorp's name for the conidial stage on Lythrum. See key, page 360.

**Cercospora nesaeae** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **45**: 170. 1893

*Cercospora decodontis* Tehon & Daniels, Mycologia **17**: 246. 1925.

Leaf spots circular to angular, 1-3 mm. in diameter, tan to reddish brown, border narrow, dark brown; fruiting epiphyllous; stromata brown, globular, 20-40$\mu$ in diameter; some of the fascicles dense; conidiophores sparingly septate, pale olivaceous brown, slightly paler and more narrow in upper half, not geniculate, rarely suddenly bent near tip, not branched, minute spore scar at conic tip, 3-4 x 15-50$\mu$, rarely as large as 5 x 75$\mu$; conidia cylindro-obclavate, subhyaline or almost colored, straight to mildly curved, 2-5 septate, base long obconic, tip obtuse, 2.5-4 x 25-75$\mu$, rarely 5 x 95$\mu$.

HOST: *Nesaea verticillata* HBK. (*Decodon verticillatum* [L.] Ell.)
TYPES: Milford, Del.; *Nesaea verticillata;* A. Commons, No. 1984; Sept. 1, 1892; (*C. Decodontis*) Wolf Lake, Union Co., Ill.; *Decodon verticillatum;* P. A. Young, No. 17196; Aug. 16, 1922.
DISTRIBUTION: Illinois, New Jersey, and Delaware.
NOTE: See key, page 360.

**Cercospora sydowiana** n. comb.

*Cercospora woodfordiae* Sydow, Ann. Crypt. Exot. **2**: 271. 1929

Leaf spots circular to irregular, 3-10 mm. in diameter, dull rusty brown; fruiting chiefly hypophyllous; stromata small, a few dark brown cells; fascicles 2-12 diverging stalks; conidiophores pale to medium brown, fairly uniform in color and width, multiseptate, not branched, straight to tortuous or 1-3 abruptly geniculate, rounded tip, 2-3.5 x 40-150$\mu$ or even 225$\mu$; conidia pale olivaceous, cylindro-obclavate, straight, 3-10 septate, base rounded to obconically truncate, tip obtuse, 3.5-5.5 x 20-80$\mu$.

HOST: *Woodfordia floribunda* Salisb.
TYPE: Puttimari, Kamrup, Assam, India; *Woodfordia floribunda;* M. Taslim, No. 2271; Febr. 28, 1912.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. woodfordiae* Petch and key, page 360 for differences among the species on this host genus.

**Cercospora woodfordiae** Petch

Ann. Roy. Bot. Gard. Peradeniya **7** (part 4): 320. 1922

Leaf spots circular, 0.5-2 mm. in diameter, white with a reddish brown margin, olivaceous on the lower surface; fruiting epiphyllous; stromata subglobose, dark brown, 60-120$\mu$ in diameter; fascicles very dense, compact; conidiophores in mass dark brown, singly pale, uniform in color and width, longest ones septate, not branched, not geniculate, straight, rounded tip, 3.5-5 x 10-65$\mu$ or merely slightly

elongated cells on the periphery of the stromata; conidia narrowly linear, subhyaline to very pale olivaceous, sinuous to strongly curved, indistinctly multiseptate, base subtruncate, tip subobtuse, 2-3.5 x 40-130$\mu$. The conidia often are persistent and make the conidiophores appear very long.

HOST: *Woodfordia floribunda* Salisb.

TYPE: Peradeniya; *Woodfordia floribunda;* T. Petch, No. 5757; Jan. 1918.

DISTRIBUTION: Known only from the type locality.

NOTE: *Cercospora woodfordiae* Sydow is distinct from this species, and since it was published later is named *C. sydowiana.* See key, page 360.

**Cercospora kadsurae** Togashi and Katsuki
Bot. Magazine, Tokyo **65**: 22. 1952

Leaf spots subcircular, 3-8 mm. in diameter, with raised line border, dark reddish brown to almost gray; fruiting amphigenous but chiefly hypophyllous; stromata small, brown; fascicles dense, compact; conidiophores pale olivaceous brown, uniform in color and width, undulate, not geniculate, not branched, septa none or indistinct, tip conic, 2-3.5 x 10-30$\mu$; conidia pale olivaceous, cylindric, straight to curved, indistinctly multiseptate, base subtruncate, tip conic, 2-3.5 x 30-70$\mu$.

HOST: *Kadsura japonica* Dunal.

TYPE: Yakushima Island, Pref. Kagoshima, Japan; *Kadsura japonica;* S. Katsuki; Oct. 19, 1949.

DISTRIBUTION: Japan.

NOTE: Dr. Togashi sent me a small portion of the type material.

**Cercospora liriodendri** Ellis & Harkness
Bul. Torrey Bot. Club 8: 27. 1881

*Cercospora magnoliae* Ellis & Hark., Bul. Torrey Bot. Club 8: 27. 1881

HOSTS: *Liriodendron tulipifera* L., *Magnolia virginiana* L. (*M. glauca* L.)

TYPES: Vineland, New Jersey; Liriodendron; J. B. Ellis; Oct. 1880; (*C. Magnoliae*) Newfield, New Jersey; *Magnolia glauca;* J. B. Ellis; Nov. 1880.

NOTE: The thick-walled, almost pear-shaped conidia with 1-3 septa are not characteristic of Cercospora. The fungus might fit into several named genera, but seems most nearly akin to Brachysporium. In the New York Botanical Garden Herbarium is a specimen labelled *Cercospora glauca* E. & E. Newfield, N. J.; *Magnolia glauca;* Sept. 23, 1883. It is identical with the Liriodendron fungus.

## CERCOSPORAE ON THE MALPIGHIACEAE

A. Conidia hyaline, acicular, base truncate, 4-5 x 40-200$\mu$; conidiophores slightly branched, 4-6 x 300-350$\mu$.
BANISTERIA *C. castri*

AA. Conidia colored, rarely acicular, base not truncate.
B. Leaf spots usually indistinct; fruiting effuse; stromata lacking; conidiophores mostly nonfasciculate.
C. Conidia cylindric, 1-5 septate, 3-5.5 x 20-55$\mu$; conidiophores 4-6 x 20-100$\mu$.
PEIXOTOA *C. peixotoae*
CC. Conidia obclavate, usually more than 1-5 septate and longer than 55$\mu$.

D. Conidia 3-5.5 x 35-200$\mu$, multiseptate; conidiophores 3-6 x 10-80$\mu$; fruiting ferrugineous in color.
BUNCHOSIA *C. cormfoliae*

DD. Conidia 2-4 x 25-70$\mu$, 3-6 septate; conidiophores 3-4.5 x 15-60$\mu$; fruiting not ferrugineous in color.
BYRSONIMA *C. byrsonimatis*

BB. Leaf spots distinct; fruiting not effuse; stromata present; conidiophores mostly in dense fascicles.

C. Conidia acicular to obclavate, 4-5.5 x 40-130$\mu$; conidiophores 4-6 x 40-200$\mu$.
HIPTAGE *C. hiptages*

CC. Conidia obclavato-cylindric, rarely longer than 75$\mu$; conidiophores 20-100$\mu$ in length.

D. Conidiophores 4-6.5$\mu$ in width; conidia 5-8 x 20-75$\mu$.
BUNCHOSIA *C. bunchosiae*

DD. Conidiophores 3-4.5 in width; conidia 3.5-6 x 30-75$\mu$.
STIGMAPHYLLON *C. stigmaphyllonis*

**Cercospora bunchosiae** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 38. 1942

Leaf spots circular to subcircular, 2-8 mm. in diameter, mostly with three zones, the center gray, then dark brown, and a third of burnt sienna which gradually fades into the healthy tissue; fruiting amphigenous; stromata globular, 15-60$\mu$ in diameter, dark brown; fascicles dense; conidiophores pale to medium brown, fairly uniform in color, clavate or irregular in width, multiseptate, constricted at some septa, seldom branched, undulate or rarely geniculate, small spore scar at the rounded tip, 4-6.5 x 30-100$\mu$; conidia pale to medium olivaceous, obclavato-cylindric or occasionally obclavate, straight to mildly curved, rather closely and plainly septate, base long obconically truncate, tip obtuse, 5-8 x 20-75$\mu$.

HOST: *Bunchosia glandulifera* H.B.K.
TYPE: Caracas, Venezuela; *Bunchosia glandulifera;* A. S. Muller, No. 2210; July 15, 1938.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. cormfoliae* and key above for differences between the species on Bunchosia.

**Cercospora byrsonimatis** Maublanc
Bul. Soc. Mycol. d. France **36:** 40. 1920

Leaf spots rather indefinite irregular discolorations on the upper surface, lesions below coalescing into large brown to gray areas, singly 0.5-2 mm. in diameter; fruiting hypophyllous, sometimes slightly effuse; stromata lacking; nonfasciculate to fascicles of 2-10 spreading stalks; conidiophores mostly short branches from procumbent threads, very pale to pale yellowish olivaceous, uniform in color, irregular in width, sparingly septate, not geniculate, tip conic, 3-4.5 x 15-60$\mu$; conidia subhyaline to very pale olivaceous, obclavate, straight to mildly curved, indistinctly 3-6 septate, base obconic to obconically truncate, tip subacute, 2-4 x 25-70$\mu$.

HOST: Byrsonima sp.
TYPE: Bello Horizonte, Brazil; Byrsonima sp.; M. A. Maublanc.

DISTRIBUTION: Brazil, Venezuela, and Colombia.
NOTE: See key, page 365.

**Cercospora castri** Viégas

Bol. da Soc. Brasil. de Agron. 8: 16. 1945

Leaf spots subcircular, 5-10 mm. in diameter, dark brown; fruiting epiphyllous; conidiophores fasciculate, erect, base enlarged, brown, apex almost hyaline, cylindric, geniculate, slightly branched, septate, 4-6 x 300-350$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, some cells enlarged, base truncate, tip subacute, 4-5 x 40-200$\mu$.

HOST: *Banisteria metallicolor* A. Juss.
TYPE: Bosque dos Jequitibás, Campinas, Sao Paulo, Brazil; *Banisteria metallicolor;* A. P. Viégas, No. 4226; June 27, 1943.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen this species. See key, page 364.

**Cercospora cormfoliae** sp. nov.

Maculae typicae nullae, sed decolorationes epiphyllas indeterminatas flavidas efficiens; caespituli effusi, hypophylli, ferruginei; stromata carentia; conidiophora nonfasciculata, aequabiliter pallide olivaceo-brunnea, haud geniculata, fortiter torta, 3-6 x 10-80$\mu$; conidia pallide flavo-olivacea, obclavata, recta vel leniter curvata, multiseptata, ad basim subtruncata, ad apicem subacuta, 3-5.5 x 35-200$\mu$.

Leaf spots none or indistinct; fruiting effuse, hypophyllous, ferrugineous, 0.5-2 mm. in extent; stromata lacking; nonfasciculate; conidiophores branches from procumbent threads, pale to very pale olivaceous brown, uniform in color, irregular in width, not geniculate, tortuous, intertwined, small spore scar at rounded to conic tip, 3-6 x 10-80$\mu$; conidia pale yellowish olivaceous, obclavate, straight to mildly curved, multiseptate, base long obconically truncate, tip subacute, 3-5.5 x 35-200$\mu$.

HOST: *Bunchosia cormfolia* H.B.K.
TYPE: Along River near Cali, Dept. Del Valle, Colombia; *Bunchosia cormfolia;* C. E. Chardon, No. 432; June 8, 1929.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. bunchosiae* and key, page 365 for differences between the species on this host genus.

**Cercospora hiptages** Petch

Ann. Roy. Bot. Gard. Peradeniya **6**: 251. 1917

Leaf spots circular, 4-15 mm. in diameter, reddish brown or occasionally almost orange in color and with a yellow halo; fruiting chiefly hypophyllous; stromata dark brown, 20-40$\mu$ in diameter; fascicles partly dense, divergent; conidiophores medium olivaceous brown, uniform in color, multiseptate, constricted at septa or otherwise irregular in width, at times attenuated upward, sparingly geniculate, not branched, large spore scar at the subtruncate tip, 4-6 x 40-200$\mu$; conidia subhyaline to pale olivaceous, acicular to obclavate, straight to mildly curved, base truncate, tip subacute, 4-5.5 x 40-130$\mu$.

HOST: *Hiptage madablata* Gaertn.
TYPE: Peradeniya; *Hiptage madablata;* T. Petch, No. 3079; June, 1910.
DISTRIBUTION: Known only from the type locality.
NOTE: See key, page 365.

**Cercospora peixotoae** Chupp & Viégas
Bol. da Soc. Brasil. de Agron. **8**: 43. 1945

Leaf spots none or indistinct yellowish areas on the upper surface; fruiting effuse, dark olivaceous to almost black, hypophyllous, 2-5 mm. in extent; stromata lacking; nonfasciculate; conidiophores single branches from procumbent threads, pale to medium brown, uniform in color, irregular in width, multiseptate, straight to tortuous, not geniculate, tip bluntly rounded to conic, 4-6 x 20-100$\mu$; conidia pale to very pale olivaceous, oldest ones may be medium dark, cylindric, 1-5 septate, straight or nearly so, occasionally catenulate, base rounded to short obconic, tip blunt, 3-5.5 x 20-55$\mu$. (Viégas says 40-90$\mu$)

HOST: *Peixotoa macrophylla* Gris.
TYPE: Near Sao Simao, Sao Paulo, Brazil; *Peixotoa macrophylla;* A. P. Viégas, No. 3342; Febr. 29, 1940.
DISTRIBUTION: Known only from the type locality.
NOTE: See key, page 364.

**Cercospora stigmaphyllonis** Baker & Dale
Mycol. Papers, C.-wealth Mycol. Inst. **33**: 106. 1951

Leaf spots circular to irregular, 1-10 mm. in diameter or coalescing into larger areas, dark brown to almost black, with a wide orange or burnt sienna margin; fruiting amphigenous; stromata 30-100$\mu$ in diameter, subglobular to irregular, dark brown; fascicles dense to very dense, compact; conidiophores pale olivaceous brown, uniform in color and width or with pale upper fourth, multiseptate, sparingly branched, rarely geniculate, longer ones bent outward near the rounded to conic tip, 3-4.5 x 20-100$\mu$ or appearing even longer when conidia are persistent; conidia subhyaline to pale olivaceous, obclavate to obclavato-cylindric, straight to strongly curved, 1-5 septate, base rounded to bluntly obconic, tip obtuse, 3.5-6 x 30-75$\mu$.

HOST: *Stigmaphyllon convolvulifolium* (Cav.) Juss.
TYPE: Tabaquite forest, Trinidad; *Stigmaphyllon convolvulifolium;* R. E. D. Baker, No. 1357; March 9, 1947.
DISTRIBUTION: Several collections from Trinidad.
NOTE: See key, page 365.

**Cercospora abelmoschi** Ellis & Everhart
Jour. Inst. Jamaica **1**: 347. 1893

*Cercospora hibisci* Tracy & Earle, Bul. Torrey Bot. Club **22**: 179. 1895
*Cercospora hibisci-manihotis* P. Hennings, Hedwigia **43**: 146. 1904
*Cercospora hibisci-cannabini* Sawada, Catalogue of Formosan Fungi **2**: 153. 1922

Leaf spots indistinct or none; fruiting effuse, sooty to dark olivaceous, from mere specks in area to large part of lower leaf surface; stromata lacking or a few large brown cells; nonfasciculate to dense fascicles; conidiophores pale to medium olivaceous brown, plainly multiseptate, sometimes branched, sparingly geniculate, sinuous, uniform in color, irregular in width, tip conic with small spore scar, 3-5.5 x 20-140$\mu$; conidia obclavate to cylindric, pale olivaceous or olivaceous brown, straight to much curved, 1-8 plainly septate, base obconic, tip subobtuse, 3-7 x 20-90$\mu$, rarely only short 1-3 septate conidia present.

HOSTS: *Hibiscus cannabinus* L. (*H. aspera* Hook.), *H. esculentus* L. (*Abel-*

*moschus esculentus* [L.] Moensch.), *H. manihot* L. (*Abelmoschus manihot* Medic.), *H. sabdariffa* L., *H. syriacus* L.

TYPES: Col. White Garden, "Half Way Tree," Jamaica; okra; Theo. D. Cockerell, No. 56; (*C. hibisci*) New Orleans, La.; *Hibiscus esculentus;* S. M. Tracy; Nov. 4, 1894; (*C. hibisci-manihotis*) Tokyo, Nishiarai, Japan; *Hibiscus manihot;* N. Nambu, No. 15; Oct. 19, 1900; (*C. hibisci-cannabini*) Formosa; *Hibiscus syriacus;* K. Sawada.

DISTRIBUTION: Probably as widespread as are the hosts. I have studied material from Mississippi, Louisiana, North Carolina, Alabama, Puerto Rico, San Domingo, Jamaica, Trinidad, Formosa, and Japan. Also reported from Mauritius, Barbados, Uganda.

NOTE: The first two types of this species show conidiophores only 10-40$\mu$ long. For a further description of *C. hibisci* see Mycologia **23**: 378. 1931. It probably would fit also as an Helminthosporium. See the key for separation of the species on Hibiscus. I did not see Sawada's type, but a collection from Formosa on *H. cannabinus,* Sept. 20, 1922, plainly was *C. hibisci.* I do not know why his type was listed on *H. syriacus.* A collection on *H. sabdariffa* from Japan sent me in 1952, and resembling more nearly the description of *C. hibisci-cannabini* by Sawada than anything I had seen before, makes me doubt that it is a synonym. It may be a distinct species, having short conidiophores in compact fascicles and long narrow obclavate conidia, 2-3.5 x 25-125$\mu$.

**Cercospora abutilonicola** sp. nov.

Maculae typicae nullae, sed decolorationes epiphyllas indeterminatas flavidas; caespituli hypophylli, effusi, olivacei; stromata carentia; conidiophora nonfasciculata vel dense fasciculata, pallidissime olivaceo-brunnea, sursum pallidiora et attenuata, vix septata et geniculata, fortiter ramosa, curvata vel torta, 2-4 x 10-70$\mu$; conidia subhyalina vel pallidissime olivacea, obclavato-cylindrata, recta vel curvata, 3-9 septata, ad basim subtruncata, ad apicem acuta, 2-4 x 25-110$\mu$.

Leaf spots indefinite or none; fruiting in irregular effuse olivaceous patches, amphigenous; stromata lacking or small, dark brown, up to 25$\mu$ in diameter; nonfasciculate to dense fascicles; conidiophores pale to very pale olivaceous brown, almost hyaline tip, attenuated upward or irregular in width, sparingly septate, copiously branched, rarely geniculate, curved or crooked, minute spore scar at the conic tip, 2-4 x 10-70$\mu$; conidia subhyaline to pale olivaceous, obclavato-cylindric, straight to curved, 3-9 septate, base mostly long obconically truncate, tip conic, 2-4 x 25-110$\mu$.

HOST: *Abutilon graveolens* Wight & Arn. (*A. hirtum* [Lam.] Sweet).

TYPE: Martin Pena, Puerto Rico; *Abutilon hirtum;* Mel T. Cook; June 3, 1930.

DISTRIBUTION: Several collections from Puerto Rico.

NOTE: See also *C. avicennae* for differences between the species on Abutilon.

**Cercospora abutilonis** Tehon & Daniels

Mycologia **17**: 246. 1925

HOST: *Abutilon avicenna* Gaertn. (*A. theophrasti* Medic.)

TYPE: Spring Valley, Bureau Co., Ill.; *Abutilon theophrasti;* C. L. Porter, No. 963; Aug. 17, 1922.

NOTE: Mounts made from type material showed only the presence of a Colletotrichum, and as the setae and conidia of this resembled the description and

drawing of conidiophores and conidia of the suggested *C. abutilonis*, it is being considered as a Colletotrichum.

**Cercospora althaeina** Saccardo

Michelia 1: 269. 1878

*Cercospora kellermanii* Bubak, Jour. Mycol. 9: 3. 1903
*Cercospora ramularia* Siemaszko, Bul. du Mus. du Caucase. 12: 28. 1919
*Cercospora althaeina* var. *Althaea-officinalis* Savul. + Sandu, Hedwigia 73: 127, 128. 1933

Leaf spots circular, angular, or irregular, 1-5 mm. in diameter, olivaceous to grayish brown, sometimes dingy gray with brown margin, often coalescing into large areas; fruiting chiefly epiphyllous; stromata a few dark brown cells to 30$\mu$ in diameter; some fascicles dense, mostly 5-18 spreading stalks; conidiophores subhyaline to pale olivaceous brown, rarely medium dark brown, tip almost hyaline, attenuated or swollen in one or more places, multiseptate, rarely branched, 1-4 or more abrupt geniculations, longest ones may be variously curved, medium spore scar at subtruncate tip, 4-6.5 x 20-50$\mu$, rarely as long as 300$\mu$; conidia hyaline, acicular to almost cylindric, straight to slightly curved, indistinctly multiseptate, base truncate, tip subacute, 3-5 x 40-100$\mu$, occasionally as long as 200$\mu$.

HOSTS: *Althaea ficifolia* Cav., *A. officinalis* L., *A. rosea* Cav. H. C. Greene of Wisconsin records it on *Napaea dioica* L.

TYPES: a Selva, Italy; *Althaea rosea;* autumn, 1876; (*C. kellermanii*) Columbus, Ohio; *Althaea rosea;* W. A. Kellerman, No. 64; June 9, 1901; (*C. ramularia*) M. Aceskho, Circassia; *Althaea ficifolia;* W. Siemaszko; (var. *althaea-officinalis*) Near Comana, dist. Vlasca, Roumania; *Althaea officinalis;* Sept. 29, 1931.

DISTRIBUTION: Apparently in all countries within the latitudes of southern Manitoba to northern Argentine.

NOTE: Examination of material leads me to believe that the reports of *C. althaeina* on Abutilon, Callirhoë, Malva, Hibiscus, and Modiola are incorrect. See also *C. nebulosa* for the differences between the two species on Althaea. Kellerman in September 1884 collected a Cercospora on *Abutilon avicenna*, which Ellis labeled *C. avicennae* E. + K. But because it resembled *C. althaeina* so closely the species was never described. I think it is distinct. Tharp (Mycologia 9: 107. 1917) adds to the description of *C. althaeina*, verifying the longer conidia and conidiophores.

**Cercospora avicennae** sp. nov.

Maculae numerosae, orbiculares vel angulatae, 0.5-2 mm. diam., saepe confluentes, rubro-brunneae; caespituli amphigeni; stromata carentia vel 40$\mu$ diam., globosa, atrofusca; conidiophora laxe vel dense fasciculata, aequabiliter brunnea, fere recta, multiseptata, simplicia, ad apicem subtruncata, 4-5.5 x 20-200$\mu$; conidia hyalina, anguste obclavata, recta vel curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2.5-4 x 40-200$\mu$.

Leaf spots numerous, circular to angular, 0.5-2 mm. in diameter or coalescing to form large spots, uniformly reddish brown or with pale center and brown margin; fruiting amphigenous, more abundant on upper surface; stromata absent or globular, dark brown, up to 40$\mu$ in diameter; fascicles 2-30 stalks; conidiophores pale to medium dark olivaceous brown, fairly uniform in color and width, mostly straight, sometimes slightly curved or 1-2 geniculate, multiseptate, not branched, medium to large spore scar at subtruncate tip, 4-5.5 x 20-200$\mu$; conidia hyaline,

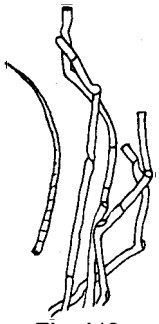


Fig. 148
*C. avicennae*

acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2.5-4 x 40-200$\mu$.

HOST: *Abutilon avicenna* Gaertn. (*A. theophrasti* Medic.)

TYPE: Manhattan, Kansas; *Abutilon avicenna;* W. A. Kellerman; Sept. 1884.

DISTRIBUTION: Kansas, Missouri, and Virginia. I also received a specimen from China.

NOTE: Ellis who placed the specimen in his herbarium under the name, *C. avicennae,* finally was inclined to consider this as *C. althaeina.* It differs in a number of characters from the other acicular species on the Malvales. Will cross inoculation still show them to be distinct? The type is in the New York Botanic Garden. See also *C. abutilonicola.*

## CERCOSPORAE ON HIBISCUS

A. Conidia colored, cylindro-obclavate, with obconic to rounded base.
  B. Conidiophores dark colored, not tortuous, 150-1000$\mu$ in length, borne singly; conidia 3-5 x 20-80$\mu$, rarely hyaline. *C. hibiscina*
  BB. Conidiophores pale to medium in color, usually tortuous or geniculate, rarely longer than 150$\mu$, nonfasciculate to fasciculate; conidia 3-7 x 25-90$\mu$. *C. abelmoschi*

AA. Conidia hyaline, base truncate.
  B. Conidia cylindric, tip blunt; conidiophores very short. *C. brachypoda*
  BB. Conidia acicular, tip acute; conidiophores short or long. *C. malayensis*

### **Cercospora brachypoda** Spegazzini

Anal. Soc. Cient. Argentina 13: 28. 1882

Leaf spots circular to irregular, 2-10 mm. in diameter, reddish brown; fruiting hypophyllous; stromata usually filling stomatal openings, pale fuligenous; conidiophores apparently mostly slightly elongated cells on surface of the stroma, but sometimes elongated to 2-3.5 x 5-20$\mu$, hyaline to subhyaline, very difficult to see under the microscope, not or rarely geniculate, not branched, not visibly septate; conidia cylindric, hyaline to subhyaline, straight to mildly curved, 2-4 septate, base truncate to subtruncate, tip bluntly rounded, 2-3.5 x 25-65$\mu$.

HOST: Hibiscus sp.

TYPE: prope la Recoleta, Argentine; Hibiscus sp.; C. Spegazzini, No. 927; Febr. 1881.
DISTRIBUTION: Reported in Louisiana, Puerto Rico, and Argentine.
NOTE: *C. brachypoda* might be listed also as a Ramularia. This has been reported also on *H. esculentus* but I was not able to prove the statement. See key above.

**Cercospora gossypina** Cooke
Grevillea **12**: 31. 1883

Leaf spots circular to subcircular, 0.5-10 mm. in diameter, dingy gray with purple border to uniformly brown, often zonate; fruiting amphigenous, more prominent on upper surface; stromata a few large brown cells; fascicles 2-10 stalks or rarely with as many as 30; conidiophores medium brown, paler and more narrow near the tip which has a medium sized spore scar, plainly multiseptate, not branched, 0-5 mildly or 0-2 abruptly geniculate, 4-6.5 x 75-250$\mu$, rarely as large as 8.5 x 400$\mu$; conidia hyaline, acicular, straight to curved, truncate base, subacute tip, septa indistinct, 2.5-4 x 60-130$\mu$.
HOSTS: Gossypium sp., *G. barbadense* L., *G. herbaceum* L., (*G. hirsutum* L.), *G. indicum* Lam.
TYPE: Aiken, S. Carolina; Gossypium sp.; H. W. Ravenel, No. 583.
DISTRIBUTION: Probably wherever cotton is grown intensively. It has been found in all our southern states, and reported from China and Uganda.
NOTE: The perfect stage of this is given as *Mycosphaerella gossypina* (Bot. Gaz. **16**: 261. 1891; also Bul. Torrey Bot. Club **18**: 300. 1891).

**Cercospora hibiscina** Ellis & Everhart
Proc. Acad. Nat. Sci. Phila. **47**: 438. 1895

Leaf spots rarely formed; fruiting in numerous minute olivaceous to dark effuse patches on lower leaf surface; stromata lacking; nonfasciculate or on upper with 2-5 in fascicle; conidiophores dark brown, sometimes paler toward the tip, plainly multiseptate, not or rarely geniculate, sparingly branched, straight to much curved, 3-4.5 x 150-1000$\mu$; conidia obclavate to cylindric, hyaline to pale olivaceous brown, 2-7, mostly 3 septate, obconic base, subacute to subobtuse tip, straight to curved, 3-5 x 20-80$\mu$.
HOSTS: *Hibiscus cannabinus* L. (*H. aspera* Hook.), *H. tiliaceus* L.
TYPE: Acapulco, Mexico; *Hibiscus tiliaceus;* E. Palmer, No. 328; 1895.
DISTRIBUTION: I studied material from Mexico, Mona Island, India, and Puerto Rico. Also reported from China and Uganda.
NOTE: For a further description of this species see Mycologia **23**: 382. 1931. The dark colored, extremely long, mostly nonfasciculate conidiophores separate this from the other species on Hibiscus. See key, page 370.

CERCOSPORAE ON SIDA

A. Conidia colored, base not truncate nor subtruncate.
  B. Fruiting effuse, hypophyllous; conidia 4-6.5 x 60-180$\mu$; conidiophores 3-5 x 50-125$\mu$. *C. micranthae*
  BB. Fruiting not effuse, amphigenous; conidia 3-4.5 x 20-120$\mu$; conidiophores 2-3.5 x 10-25$\mu$. *C. sidae*
AA. Conidia hyaline, base truncate or subtruncate.

B. Fruiting effuse, hypophyllous; conidiophores medium dark in color, branched, 4-5 x 20-300$\mu$; conidia 3-4.5 x 30-100$\mu$. *C. sidaecola*

BB. Fruiting not effuse, amphigenous; conidiophores pale in color, not branched, 3.5-5 x 50-400$\mu$; conidia 2.5-4 x 50-200$\mu$. *C. hyalospora*

**Cercospora hyalospora** Muller & Chupp

Arquiv. Inst. Biol. Veg. Rio de Janeiro 1: 218. 1935

Leaf spots subcircular, 2-4 mm. in diameter, brown, occasionally with gray centers and usually with a narrow black line margin; fruiting amphigenous; stromata absent or only a few brown cells; fascicles 2-12 spreading stalks, rarely compact; conidiophores pale olivaceous brown (one collection almost subhyaline), slightly paler and more narrow toward the tip, multiseptate, not branched, 0-2 geniculate, straight to curved or sinuous, medium spore scar at the subtruncate tip, 3.5-5 x 50-400$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2.5-4 x 50-200$\mu$.

HOST: Sida sp.

TYPE: Vicosa, Escola, Minas Geraes, Brazil; Sida sp.; A. S. Muller, No. 539; May 20, 1933.

DISTRIBUTION: Brazil and Venezuela.

NOTE: See also *C. sidaecola* for differences between the species with hyaline acicular conidia on this host genus. See key above.

**Cercospora malachrae** Heald & Wolf

Mycologia 3: 19. 1911

*Cercospora malachrae* Young, Mycologia 8: 45. 1916

Leaf spots white to yellowish gray, 1-4 mm. in diameter, wide purplish border; fruiting amphigenous, on upper surface usually with less dense fascicles and short (20-40$\mu$) conidiophores, and on lower surface, dense fascicles and long stalks (50-155$\mu$); stromata mostly lacking; conidiophores medium brown near the base, pale toward the tip, slightly attenuated, multiseptate, not branched, 0-6 mildly or abruptly geniculate, large spore scar at subtruncate tip, 4-6 x 20-155$\mu$; conidia acicular, hyaline, straight to curved, indistinctly multiseptate, truncate base, longer ones with acute tip, 2-5 x 25-120$\mu$.

HOSTS: *Malachra capitata* L. (*M. rotundifolia* Schrank, *M. alceifolia* Jacq.), *M. fasciata* Jacq., *Urena lobata* L.

TYPES: Victoria, Texas; *Malachra capitata;* Heald & Wolf, No. 2347; Sept. 1, 1909; (*C. malachrae* Young) San Sebastian, Puerto Rico; *Malachra rotundifolia;* F. L. Stevens, No. 5199; Febr. 22, 1913.

DISTRIBUTION: Studied material from Venezuela, Brazil, Trinidad, San Domingo, Puerto Rico, and Texas. It probably is present wherever the hosts are plentiful.

**Cercospora malayensis** Stevens & Solheim

Mycologia 23: 394. 1931

Leaf spots circular to irregular, 3-30 mm. in length, tan to dingy gray, usually with a purple or red border; fruiting amphigenous, when abundant causing dark effuse areas over part of the discolored portions; stromata none to dark brown, globular, 50$\mu$ in diameter; fascicles compact to divergent, 5-20 stalks; conidio-

phores pale to medium dark olivaceous brown, multiseptate, straight, tortuous or 1-7 geniculate, not branched, medium spore scar at conically truncate tip, fairly uniform in color and width, 3-5.5 x 25-260$\mu$, some specimens show only short ones; conidia hyaline, acicular, straight to slightly curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse, 2-5 x 25-150$\mu$, or even 270$\mu$.

HOSTS: *Hibiscus abelmoschus* L. (*Abelmoschus moschatus* Medic.), *H. cannabinus* L. (*H. aspera* Hook), *H. esculentis* L. [*Abelmoschus esculentus* (L.) Moensch.], *H. manihot* L. (*Abelmoschus manihot* Medic.), *H. rosa-sinensis* L., *H. sabdariffa* L., Hibiscus sp., *H. tiliaceus* L.

TYPE: Mt. Maquiling, near Los Banos, Prov. Laguna, Philippines; *Hibiscus esculentis;* C. F. Baker, No. 120; Jan. 1914.

DISTRIBUTION: Almost coextensive with Hibiscus. Material was sent me from Virginia, Alabama, Texas, Oklahoma, Missouri, Sao Paulo, Minas Geraes, Venezuela, Trinidad, Jamaica, Salvador, South Africa (Transvaal), Japan, Formosa and the Philippines.

NOTE: This is the only species reported on Hibiscus and having acicular conidia. At first I was inclined to believe there were two species, but seeing so many intergradations I have decided it is only one quite variable species. Some specimens show only short conidiophores, others only long; some with compact fascicles, others spreading; some rather dark colored, and others pale. In every instance the conidia appear alike. Dr. Togashi sent me a specimen from Japan with normal conidia, but the conidiophores resembled those of *C. hibiscina.* See key, page 370.

**Cercospora malvarum** Saccardo

Michelia **2**: 365. 1881

Leaf spots numerous, small, circular, 0.5-3 mm. in diameter, at first olivaceous, later center may turn slightly grayish; fruiting amphigenous; stromata small, mostly a few brown cells; some of the fascicles dense; conidiophores very pale olivaceous brown, not branched, straight to mildly geniculate, septa indistinct, large spore scar at subtruncate tip, 4-5.5 x 40-220$\mu$; conidia hyaline, acicular to almost cylindric, straight to curved, indistinctly multiseptate, truncate base, acute to subobtuse tip, 2-4 x 40-200$\mu$.

HOSTS: *Malva moschata* L., *M. rotundifolia* L.

TYPE: Quevillense (prope Rouen) France; *Malva moschata;* Letendre, No. 1371.

DISTRIBUTION: Apparently widely distributed in Europe and North America, but often confused with *C. althaeina* and *C. nebulosa.* See Fungi Columbiani No. 2313.

NOTE: See also differences between the two species on Malva. Fresenius changed *Cylindrosporium major* to *Cercospora malvae.* But this Cylindrosporium is so vague, that no idea can be obtained of what it really is.

**Cercospora malvastri** Mendoza

Philipp. Jour. Sci. **75**: 171. 1941

Leaf spots circular, 0.5-2 mm. in diameter, brown to dark brown; fruiting amphigenous; stromata present; fascicles dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, multiseptate, not branched, reticulate, flexuous, 4-5 x 20-115$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute to subobtuse, 3-4 x 20-125$\mu$.

HOST: *Malvastrum tricuspidatum* A. Gray (*M. coromandelinum* [L.] Garcke).

TYPE: Luzon, Manila, Philippines; *Malvastrum coromandelinum;* Mendoza, No. 55,417.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen this species, so am not sure in what ways it differs from other acicular forms on the Malvaceae.

**Cercospora malvicola** Ellis & Martin

Amer. Nat. **16**: 810. 1882

*Cercospora polymorpha* Bubak, Sitz-Königl. Böhm. Ges. Wissensch. Math.-Natur. Classe XII. 1903: 21

Leaf spots circular to irregular, 2-3 mm. in diameter, yellowish tan to dingy gray, immarginate; fruiting amphigenous; stromata mostly a few cells, yellowish olivaceous, color of macerated leaf tissue and sometimes difficult to find; nonfasciculate to dense fascicles, when conidiophores are borne singly, closely grouped so that they may produce pseudo-fascicles; conidiophores pale yellowish olivaceous, uniform in color, attenuated or occasionally slightly swollen tip, indistinctly or rarely septate, rarely branched, sometimes 1-2 geniculations near or at the tip, producing pseudobifircation, spore scars usually small, 3-4.5 x 15-35$\mu$, reported as long as 115$\mu$; conidia hyaline, acicular, obclavate or even cylindric, straight to slightly curved, indistinctly multiseptate, base truncate to subtruncate, tip mostly subobtuse, 3-5 x 20-125$\mu$.

HOSTS: *Malva moschata* L., *M. rotundifolia* L., *M. sylvestris* L.

TYPES: West Chester, Pa.; *Malva rotundifolia;* Geo. Martin, No. 1334a; Aug. 1881; (*C. polymorpha*) Montenegro; *Malva sylvestris;* F. Bubak; July 18, 1901.

DISTRIBUTION: Rather common in Northeastern United States. It has been confused with other species, so that its distribution is not well known.

NOTE: Saccardo (Syll. Fung. **4**: 440. 1886) states that this is a synonym of *C. althaeina,* but the type shows this statement to be wrong. Several authors mistakenly record this species on *Althaea rosea. C. malvicola* differs from all the other species reported on the Malvaceae, because of its relatively short yellowish olivaceous conidiophores, which are often in pseudo-fascicles, and arising from stromata of a similar color. See *C. malvarum* for differences between the species on Malva.

**Cercospora micranthae** Muller & Chupp

Arch. Inst. Biol. Veg. Rio de Janeiro **3**: 95. 1936

Leaf spots indistinct or none, at least at first; fruiting effuse, gray to olivaceous brown, chiefly hypophyllous, 2-4 mm. in extent or covering almost entire leaflet; stromata lacking; nonfasciculate to compact dense fascicles; conidiophores arising mostly as branches from procumbent threads, pale olivaceous brown, uniform in color, irregular in width, branched, multiseptate, not geniculate, tortuous, bluntly rounded tip, 3-5 x 50-125$\mu$; conidia pale olivaceous, cylindro-obclavate, straight to mildly curved, 5-11 septate, base bluntly obconic, tip obtuse, 4-6.5 x 60-180$\mu$.

HOSTS: *Sida cordifolia* L., *S. micrantha* A. St. Hil.

TYPE: Cataguazes, Minas Gerais; *Sida micrantha;* A. S. Muller and O. Drummond, No. 881; Jan. 25, 1935.

DISTRIBUTION: The 3 states in Brazil: E. Santo, Minas Gerais, Sao Paulo, and in Venezuela, Trinidad, and San Domingo.

NOTE: See key, page 371.

**Cercospora modiolae** Tharp

Mycologia 9: 111. 1917

*Cercospora althaeina* var. *modiolae* Atk., Jour. Elisha Mitchell Sci. Soc. 8: 60. 1892

*Cercospora atkinsonii* Stevens & Solheim, Mycologia 23: 388. 1931

Leaf spots circular, 0.5-2 mm. in diameter, gray center, dark margin; fruiting amphigenous; stromata slight; conidiophores mostly 2-10 in loose fascicles, pale to medium brown, multiseptate, 0-4 mildly to abruptly geniculate, medium to large spore scar at subtruncate tip, not branched, 4.5-6 x 40-110$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute to subacute, 3.5-5.5 x 50-140$\mu$.

HOSTS: *M. multifida* Moench. (*Modiola caroliniana* G. Don.)

TYPES: Austin, Texas; *Modiola caroliniana;* Lewis & Tharp; Fall, 1914; (var. *Modiolae*) Auburn, Ala.; *Modiola multifida;* Geo. F. Atkinson; 1890.

DISTRIBUTION: Alabama and Texas.

NOTE: This may finally prove to be a synonym of one of the acicular hyaline spored species previously described on the Malvaceae. The differences are only slight, and may be due to host reactions rather than being specific.

**Cercospora nebulosa** Saccardo

Nuov. Giorn. Bot. Ital. 8: 189. 1876

On stems; spots oval to elliptic, dark gray to almost black; fruiting showing as minute black pustules just visible to the unaided eye; stromata globular, dark brown, 20-40$\mu$ in diameter; some fascicles dense; conidiophores pale to very pale olivaceous brown, almost hyaline tip, uniform in width, sparingly septate, not geniculate, not branched, large spore scar at the subtruncate tip, 4-6 x 10-60$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2.5-4 x 20-80$\mu$, rarely as large as 5 x 120$\mu$.

HOST: *Althaea rosea* L.

TYPE: Selva, North Italy; *Althaea rosea;* Treviso; Sept. 1875. Cotype distributed as Sacc. Mycotheca Veneta, No. 599 and de Thümen Mycotheca Universalis No. 583.

DISTRIBUTION: Southern Europe, Cyprus, Turkestan, and India. It has been reported from North America (Seymour, Host Index, p. 504, 1929) but I was unable to find any American collections.

NOTE: See also *C. althaeina* for differences between the species on this host genus.

**Cercospora pavoniae** Petrak & Ciferri

Ann. Mycol. 30: 327. 1932

Leaf spots indistinct or none; fruiting effuse, olivaceous, chiefly hypophyllous; stromata small, dark brown; fascicles 2 stalks to dense, divergent to compact; conidiophores pale to medium brown, uniform in color, clavate, straight to undulate or sinuous, multiseptate, rarely branched, not geniculate, bluntly rounded tip, 4-6 x 20-130$\mu$; conidia subhyaline to very pale olivaceous, cylindric, straight to strongly curved, 3-9 septate, base long obconically truncate, tip obtuse, 4-6.5 x 20-100$\mu$.

HOSTS: Pavonia sp.

TYPE: Valle del Cibao, Santiago, San Domingo; Pavonia sp.; R. Ciferri, No. 4156; March 2, 1931.
DISTRIBUTION: San Domingo, Puerto Rico, Venezuela.

**Cercospora praecincta** comb. nov.

*Cercospora althaeina* var. *praecincta* Davis, Wisc. Acad. Trans. **18**: 260. 1915

Leaf spots circular to subcircular or angular, 4-10 mm. in diameter, surrounded by a dark purplish or almost black zone; fruiting amphigenous but chiefly on upper leaf surface; stromata dark, globular, 20-70$\mu$ in diameter; fascicles dense to very dense; conidiophores pale to medium brown, uniform in color, somewhat attenuated, not or rarely septate, not branched, rarely 1-2 abruptly geniculate, medium spore scar at subtruncate tip, 4-6 x 10-25$\mu$, occasionally as long as 75$\mu$; conidia acicular, often only slightly attenuated, hyaline, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse, 3-5 x 40-100$\mu$.

HOSTS: *Callirhoë involucrata* A. Gray, *C. triangulata* (Leavenw.) Gray, Callirhoë sp.

TYPE: Grant County, opposite Bridgeport, Wisc.; *Callirhoë triangulata;* J. J. Davis; July 31, 1914.

DISTRIBUTION: Wisconsin, Kansas.

NOTE: This species does not resemble *C. althaeina.* There are many acicular species on the Malvaceae, and which differ only slightly in a rather large number of characters. Therefore, until detailed cross inoculations can be made, they are considered distinct.

**Cercospora sidae** (P. Hennings) Marchal & Steyaert n. comb.

*Cercosporella sidae* P. Henn., Ann. Mus. du Congo **2**: 230. 1908
*Cercospora sidae* Marchal & Stey., Bul. Soc. Roy. Bot. Belg. **61**: 167. 1929
*Cercospora sidae* (P. Henn.) Petrak, Ann. Mycol. **30**: 334. 1932

Leaf spots subcircular, 3-7 mm. in diameter, brown to reddish brown, often with a yellowish or yellowish brown margin, sometimes indistinctly zonate; fruiting amphigenous; stromata filling stomatal openings, brown; fascicles dense; conidiophores pale olivaceous brown, septation, geniculation, and branching not visible, delicately rounded tips, 2-3.5 x 10-25$\mu$ (Petrak and Ciferri give 3.5-5 x 18-55$\mu$); conidia hyaline to pale olivaceous brown, obclavato-cylindric, straight to mildly curved, 3-13 septate, base bluntly obconic, tip obtuse, 3-4.5 x 20-120$\mu$.

HOSTS: *Sida cordifolia* L., Sida sp.

TYPES: (*C. sidae* M. & St.) Prov. de l'Equateur-Combe, Congo Belge; Sida sp.; J. Ghequiere, No. 1131; June 1925; (*C. sidae* [P. Henn.] Petrak) Road to Janico, Santiago, San Domingo; *Sida cordifolia;* Ciferri and Ekman, No. 3914; Nov. 16, 1930.

DISTRIBUTION: Belgian Congo, San Domingo.

NOTE: I did not see the specimen which Hennings labeled *Cercosporella sidae,* but am taking the statement of Petrak that it was a Cercospora. The Marchal and Steyaert collection is identical with Ciferri's material from San Domingo. See also *C. micranthae* for differences between the two species with colored conidia on Sida. See key, page 371.

**Cercospora sidaecola** Ellis & Everhart
Jour. Mycol. **5**: 72. 1889

*Cercospora densissima* Speg., Anal. Mus. Nac. B. Aires. Ser. 2. **3**: 341. 1899

Leaf spots indistinct or none; fruiting in dark olivaceous effuse patches on lower leaf surface, 2-5 mm. in extent; stromata lacking; mostly nonfasciculate, rarely fascicles of 2-6 stalks; conidiophores medium dark reddish brown, uniform in color and width, multiseptate, branched, rarely multigeniculate, small to medium spore scar at rounded tip, 4-5 x 20-300$\mu$; conidia hyaline, acicular to obclavate, straight to curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse to subacute, 3-4.5 x 30-100$\mu$.

HOSTS: *Sida rhombifolia* L., *S. spinosa* L.

TYPES: Pointe a la Hache, La.; *Sida spinosa;* A. B. Langlois, No. 1555; Nov. 12, 1888; (*C. densissima*) Buenos Aires, Argentine; *Sida rhombifolia;* C. Spegazzini, No. 935; Febr. 27, 1892.

DISTRIBUTION: Studied material from Louisiana, Argentine, Sao Paulo, and Minas Geraes. Also reported from San Domingo.

NOTE: See also *C. hyalospora* and key, page 372 for differences between the two species with acicular, hyaline conidia on this host genus.

**Cercospora sphaeralceicola** n. comb.

*Cercosporina sphaeralceicola* Speg., Anal. Mus. Nac. B. Aires. **20**: 427. 1910

Leaf spots subcircular, 1-5 mm. in diameter, dull brown, no distinct margin; fruiting amphigenous; stromata lacking or small, brown; nonfasciculate to dense fascicles; conidiophores pale to medium brown, paler and more narrow toward the tip, multiseptate, sparingly branched, 1-3 geniculate, tortuous, medium spore scar at the subtruncate tip, 4-5 x 50-400$\mu$, or occasionally short swellings 6$\mu$ in width; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 4-5 x 50-400$\mu$.

HOST: *Sphaeralcea patagonica* Speg. (*Malva patagonica* Niederl.)

TYPE: La Plata, Argentine; *Sphaeralcea patagonica;* C. Spegazzini, No. 4051; Nov. 5, 1904.

DISTRIBUTION: Known only from the type locality.

NOTE: Among all the acicular conidial species on the Malvaceae, there are only minor differences. This resembles *C. modiolae* most closely, but has distinctly longer, branched, slightly darker conidiophores, and differs in other ways.

**Cercospora urenae** Viégas & Chupp
Bol. da Soc. Brasil. de Agron. **8**: 56. 1945

Leaf spots indistinct or none; fruiting effuse, olivaceous, amphigenous but more abundant on the lower leaf surface; stromata lacking or slight; nonfasciculate to dense fascicles; conidiophores pale olivaceous brown, uniform in color, irregular in width, sparingly septate, copiously branched, tortuous, rarely geniculate, conic tip, 3-5 x 15-75$\mu$; conidia pale olivaceous, obclavato-cylindric, straight to mildly curved, 1-5 septate, base sharply obconic to obconically truncate, tip blunt, 3-5 x 20-80$\mu$.

HOST: *Urena lobata* L.

TYPE: Est. Exp. de Ribeirao Preto, Campinas, Brazil; *Urena lobata;* K. P. Krug and A. S. Costa, No. 703; May 30, 1935.

DISTRIBUTION: Several collections from Brazil.

**Cercospora calatheae** Viégas & Chupp

Bol. da Soc. Brasil. de Agron. 8: 13. 1945

Leaf spots circular, 0.5-3 mm. in diameter, pale brown, tan, or dingy gray surrounded by a dark brown margin; fruiting chiefly hypophyllous; stromata lacking or consisting of the enlarged brown basal cells of the conidiophores which are borne singly or in fascicles of 2-15, pale to medium olivaceous brown, slightly paler toward the tip, uniform in width, plainly multiseptate, not branched, 0-2 geniculate, straight or nearly so, medium spore scar at the subtruncate tip, 4-6.5 x 40-250$\mu$; conidia hyaline, acicular to cylindric, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip obtuse to subobtuse, 4-6.5 x 30-200$\mu$.

HOST: Calathea sp.

TYPE: Cunha, Sao Paulo, Brazil; Calathea sp.; A. P. Viégas and J. Kiehl, No. 3029; April 13, 1939.

DISTRIBUTION: Known only from the type locality.

**Cercospora thaliae** Ellis & Langlois

Jour. Mycol. 6: 36. 1890

HOST: *Thalia dealbata* Fras.

TYPE: St. Martinsville, La.; *Thalia dealbata;* A. B. Langlois, No. 2130; Oct., 1889.

NOTE: Since an occasional conidium may be minutely echinulate, and all of them are thick walled, and fairly dark, the fungus is not considered a Cercospora. In all respects excepting echinulation it resembles Coryneum. If not placed in this genus, it should be classed as an Heterosporium.

**Cercospora aciotidis** sp. nov.

Maculae irregulares, 0.5-4 mm. diam., rubrae vel rubro-brunneae; caespituli hypophylli; stromata minutissima; conidiophora laxe fasciculata, aequabiliter brunnea, 3-9 septata, ramosa, 0-1 geniculata, recta vel torta, ad apicem acuta, 4-5.5 x 20-85$\mu$; conidia subhyalina vel pallidissime olivacea, obclavato-cylindrata, recta vel leniter curvata, 3-7 septata, ad basim subtruncata, ad apicem acuta vel obtusa, 3.5-5 x 20-95$\mu$.

Leaf spots irregular, 0.5-4 mm. in length, center red to reddish brown, fading away indefinitely into the healthy tissue; fruiting hypophyllous; stromata a few brown cells; fascicles 2-12 stalks, spreading to compact; conidiophores pale to medium brown, uniform in color, irregular in width, 3-9 septate, frequently once branched near the base, 0-1 geniculate, straight to tortuous, conic tip, 4-5.5 x 20-85$\mu$; conidia subhyaline to very pale colored, obclavato-cylindric, straight to mildly curved, 3-7 septate, base obconically truncate, tip conic to obtuse, 3.5-5 x 20-95$\mu$.

HOST: *Aciotis indecora* (Bonpl.) Triana.

TYPE: Near Buonaventura, Dept. del Valle, Colombia; *Aciotis indecora;* C. E. Chardon, No. 217; May 8, 1928.

DISTRIBUTION: Known only from the type locality.

**Cercospora curta** Sydow

Ann. Mycol. 37: 429. 1939

Leaf spots suborbicular to angular, 1-3 mm. in length, various shades of brown;

fruiting epiphyllous; stromata dark brown, subglobular, 60-80$\mu$ in diameter; fascicles dense, compact; conidiophores in mass dark, singly pale to very pale in color, paler and more narrow toward the tip, not septate, not branched, not geniculate, tip conic, 3.5-5 x 10-20$\mu$; conidia narrowly obclavate to obclavato-cylindric, more or less curved, subhyaline to very pale olivaceous, 3-8 septate, base subtruncate, tip subobtuse, 5-7 x 60-85$\mu$, near the tip being 2-3$\mu$ in width, often guttulate.

HOST: *Brachyotum ledifolium* Triana.

TYPE: Ad declivitatis montis, Pichincha, Quito, Ecuador; *Brachyotum ledifolium;* H. Sydow, No. 164; Sept. 30, 1937.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen this species.

**Cercospora dissotidis** Chupp & Doidge

Bothalia 4: 884. 1948

Leaf spots none or indistinct; fruiting hypophyllous, effuse, dark olivaceous or almost brown, 2-10 mm. in extent; stromata lacking; mostly nonfasciculate; conidiophores branches from procumbent threads, pale olivaceous brown, uniform in color, irregular in width, multiseptate, rarely geniculate, bluntly rounded tip, 4-6 x 10-150$\mu$; conidia pale to very pale olivaceous brown, cylindric, straight to mildly curved, 1-5 septate, base long obconic, tip obtuse, 4.5-6 x 20-65$\mu$.

HOST: *Dissotis incana* Triana.

TYPE: Union of South Africa; *Dissotis incana;* A. O. D. Mogg, No. 11651.

DISTRIBUTION: Known only from the type locality.

**Cercospora erythrogena** Atkinson

Jour. Elisha Mitchell Sci. Soc. 8: 65. 1892

Leaf spots none or irregular brown areas; when spots are present fruiting amphigenous; when not present fruiting effuse in faint grayish or mouse-colored areas on lower leaf surface; stromata none or slight; nonfasciculate to dense fascicles; conidiophores when young pale fuligenous, but becoming medium dark with age, plainly septate and branched, sinuous, crooked or 1-5 abruptly geniculate, tip rounded, small spore scars sometimes present, 2.5-4 x 10-70$\mu$; conidia cylindro-obclavate, pale olivaceous, straight to mildly curved, base subtruncate to obconic, tip subobtuse, indistinctly multiseptate, 2.5-4 x 30-100$\mu$.

HOSTS: *Rhexia mariana* L., *R. nashii* Small, *R. virginica* L., Rhexia sp.

TYPE: Auburn, Ala.; *Rhexia mariana;* Geo. F. Atkinson, No. 1541; July 22, 1890. Cotypes Rhexia sp.; No. 1819; Oct. 1890; also *Rhexia virginica;* No. 2066; Aug. 29, 1891.

DISTRIBUTION: In most of the southern states and at least as far north as Delaware and Tennessee. Also reported from Colombia.

NOTE: In some herbaria is a packet labeled *Cercospora rhexiae* Tracy, No. 1940; Biloxi, Miss.; Aug. 11, 1921, collected by S. M. Tracy. It is identical with *C. erythrogena.*

**Cercospora gracilenta** Sydow

Ann. Mycol. 28: 211. 1930

Leaf spots circular, 3-6 mm. in diameter, pale tan, very thin and papery, at times with a wide dark border; fruiting chiefly hypophyllous; stromata dark

brown, globular to flattened, 20-35$\mu$ in diameter; fascicles dense, spreading to compact; conidiophores very pale olivaceous or olivaceous brown, uniform in color, irregular in width, 1-5 septate, not branched, slightly geniculate, straight to tortuous, conic tip, 3-4.5 x 30-100$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate, straight to mildly curved, 3-9 septate, base rounded to obconic, tip subobtuse, 3.5-5 x 25-90$\mu$.

HOST: *Arthrostemma campanulare* (Naud.) Triana.

TYPE: El Limon, Valle de Puerto La Cruz, Venezuela; *Arthrostemma campanulare;* H. Sydow, No. 312; Jan. 20, 1928.

DISTRIBUTION: Known only from the type locality.

**Cercospora leandrae** Sydow

Ann. Mycol. **37**: 430. 1939

Leaf spots circular to angular, 3-10 mm. in diameter, brown to gray, with a narrow dark line margin; fruiting hypophyllous; stromata dark olivaceous brown, globular, 35-50$\mu$ in diameter; fascicles dense; conidiophores pale to medium olivaceous brown, slightly paler and more narrow toward the tip, 0-2 septate, not branched, straight to curved or tortuous, not to strongly geniculate, conic tip, 3.5-4.5 x 30-70$\mu$; conidia narrowly obclavato-cylindric, subhyaline, 3-10 septate, base subtruncate, tip rounded bluntly, straight to curved, 3-5 x 45-140$\mu$.

HOST: *Leandra subseriata* Cogn.

TYPE: Guapulo, Pichincha, Ecuador; *Leandra subseriata;* H. Sydow, No. 25; Sept. 9, 1937.

DISTRIBUTION: Ecuador, Colombia.

NOTE: The specimen from Colombia was incorrectly labeled "Miconia sp.," but the fungus resembled closely Sydow's description.

**Cercospora melastomatis** Patouillard

Bul. Soc. Mycol. France. **9**: 160. 1893

Leaf spots circular, 1-5 mm. in diameter, brown to deep purple, often with a minute white center; fruiting epiphyllous; stromata dark brown, globular, 30-75$\mu$, resembling an enclosed fruiting body; conidiophores borne singly or in fascicles of 2-3, dark brown, almost hyaline tip, irregular in width, multiseptate, sparingly branched, straight to tortuous, not geniculate, tip rounded to conic, 4-5 x 50-200$\mu$; conidia pale to medium dark olivaceous brown, cylindric or obclavato-cylindric, pluriseptate, straight to mildly curved, rounded ends, 4.5-6 x 25-75$\mu$.

HOST: Melastoma sp.

TYPE: Pululahua, Ecuador; Melastoma sp.; G. De Lagerheim; Febr.

DISTRIBUTION: Known with certainty only in the type locality.

NOTE: This might also be considered an Helminthosporium.

**Cercospora melastomobia** Yamamoto

Trans. Nat. Hist. Soc. Formosa **26**: 283. 1936

Leaf spots suborbicular, 0.5-4 mm. in diameter, white or gray center, various shades of brown to purplish border, occasionally with a yellow halo; fruiting always epiphyllous; stromata dark, 22-33 x 29-42$\mu$ in transverse section; fascicles dense; conidiophores pale to medium olivaceous brown, paler and more narrow toward the tip, sparingly septate, rarely branched, not geniculate, subflexuous to torulose, tip subtruncate, 3.5-6 x 10-50$\mu$; conidia narrowly cylindric, subhyaline

to very pale olivaceous, 7-15 septate, straight to strongly curved, base subtruncate, tip subobtuse, 2.5-4 x 80-150$\mu$.

HOST: *Melastoma candidum* D. Don.

TYPE: Taihoku, Formosa; *Melastoma candidum;* W. Yamamoto; May 6, 1934.

DISTRIBUTION: Known only from the type locality.

## CERCOSPORAE ON MICONIA

A. Conidia wide, short, and mostly 3-septate, 4-8 x 25-45$\mu$; conidiophores dark brown, sometimes in dense fascicles, 3.5-5 x 50-130$\mu$.
M. THEAEGANS *C. miconiicola*

AA. Conidia rarely wider than 5$\mu$, 20-100$\mu$ in length, multiseptate; conidiophores pale to medium in color.

B. Conidiophores 3.5-6 x 20-100$\mu$, nonfasciculate to dense fascicles, uniformly pale olivaceous brown; conidia 3-5.5$\mu$ in width.
MICONIA sp. *C. miconiae*

BB. Conidiophores within the limits of 2-4.5 x 5-40$\mu$; conidia within the limits of 2-4.5$\mu$ in width.

C. Conidiophores very pale olivaceous brown, almost hyaline tip, 2-3.5 x 5-25$\mu$; conidia 2-3.5 x 20-100$\mu$; fruiting epiphyllous; fascicles very dense, compact.
M. AURICULATA *C. mirandensis*

CC. Conidiophores uniformly medium dark olivaceous, 2-4.5 x 10-40$\mu$; conidia 2-4.5 x 20-100$\mu$; fruiting amphigenous; nonfasciculate to dense fascicles, not compact.
M. IMPETIOLARIS *C. tamoneae*

### **Cercospora miconiae** Fragosa & Ciferri

Rep. Dom. Est. Agr. Moca. Ser. B-Bot. Bul. 11: 68. 1927

Leaf spots circular to irregular, 2-6 mm. in diameter, reddish brown, sometimes with indistinct pale center, on dried leaf; fruiting hypophyllous; stromata none to a few pale brown cells, usually in the stomatal openings; nonfasciculate to dense fascicles; conidiophores uniformly pale olivaceous or olivaceous brown, irregular in width, multiseptate, branched, crooked, not or 1-3 geniculate, small spore scar at rounded to conic tip, 3.5-6 x 20-100$\mu$; conidia pale olivaceous, obclavate, mildly curved, faintly multiseptate, long obconic base, subacute tip, 3-5.5 x 40-100$\mu$.

HOST: Miconia sp.

TYPE: San Domingo; Miconia sp.; R. Ciferri; Jan. 10, 1926.

DISTRIBUTION: San Domingo, Trinidad, Colombia, and Brazil.

NOTE: See key above for differences among the species on Miconia.

### **Cercospora miconicola** sp. nov.

Maculae orbiculares, 2-4 mm. diam., centro pallide brunneae vel griseae, plerumque corona purpurea limitae; caespituli amphigeni; stromata atra, globosa, 20-35$\mu$ diam.; conidiophora laxe vel dense fasciculata, atro-brunnea, sursum pallidiora et attenuata, 1-5 septata, simplicia, 0-3 geniculata, recta vel torta, ad apicem acuta, 3.5-5 x 50-130$\mu$; conidia pallide olivacea, obclavata, 1-5 septata, recta vel fortiter flexuosa, utrimque obtusa, 4-8 x 25-45$\mu$.

Leaf spots circular, 2-4 mm. in diameter, tan to gray center, wide dark purple

border; fruiting amphigenous; stromata spherical, dark to black, 20-35$\mu$ in diameter; fascicles 8-20 spreading stalks; conidiophores dark brown, paler and slightly more narrow toward the tip, 1-5 septate, not branched, 0-3 geniculate, straight to tortuous, conic tip, 3.5-5 x 50-130$\mu$, mostly about 4 x 80$\mu$; conidia pale olivaceous, obclavate, sometimes suddenly attenuated near the center, 1-5 usually 3 septate, straight, curved or crooked, base rounded to short obconically truncate, tip obtuse, 4-8 x 25-45$\mu$, mostly 5-6 x 30-40$\mu$.

HOST: *Miconia theaegans* (Bonpl.) Cogn.

TYPE: Ferrocarril de Gerardot, Dept. Cundinamarca, Colombia; *Miconia theaegans;* C. E. Chardon and J. A. B. Nolla, No. 579; June 21, 1929.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 381 for differences among the species on this host genus.

**Cercospora mirandensis** sp. nov.

Maculae angulatae, minutae, saepe confluentes, atro-rubrae vel rubro-brunnea, centro tandem expallentes; caespituli epiphylli; stromata globosa, atro-fusca, 30-75$\mu$ diam.; conidiophora densissime fasciculata, pallide olivaceo-brunnea, sursum pallidiora et attenuata, vix septa, simplicia, haud geniculata, recta vel leniter curvata, 2-3.5 x 5-25$\mu$; conidia pallidissime olivacea, obclavata, recta vel leniter curvata, spurie multiseptata, ad basim subtruncata, ad apicem subacuta, 2-3.5 x 20-90$\mu$.

Leaf spots angular to irregular, small or coalescing into large areas, center tan to dingy gray, wide dark red or reddish brown margin; fruiting epiphyllous; stromata globular, dark brown, 30-75$\mu$ in diameter; fascicles very dense, compact; conidiophores very pale olivaceous brown, almost hyaline rounded to conic tip, not or rarely septate, not branched, not geniculate, straight to slightly curved, 2-3.5 x 5-25$\mu$; conidia pale to very pale olivaceous, obclavate to almost linear, straight to mildly curved, indistinctly multiseptate, base subtruncate to obconically truncate, tip subacute, 2-3.5 x 20-90$\mu$, rarely swollen to 5$\mu$ in width.

HOST: *Miconia auriculata* DC. (*Miconia ibaguensis* (Bonpl.) Triana).

TYPE: Edo Miranda, Venezuela; *Miconia ibaguensis;* H. H. Whetzel and A. S. Muller, No. 3093; April 13, 1939.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 381 for differences among the species on Miconia.

**Cercospora monochaeti** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 51. 1942

Leaf spots circular, 0.5-2 mm. in diameter, uniformly dark purple or occasionally with a brown center; fruiting hypophyllous; stromata none to large, black, 75-300$\mu$ in diameter; nonfasciculate to very dense fascicles, divergent; conidiophores medium dark brown, uniform in color and width, plainly multiseptate, sparingly branched, rarely once geniculate, straight or slightly curved, small spore scar at rounded to conic tip, 3-4.5 x 50-300$\mu$, easily broken in mounting; conidia subhyaline to very pale olivaceous, cylindric to obclavato-cylindric, straight to mildly curved, 3-7 septate, base long obconically truncate, tip obtuse, 5-7 x 40-75$\mu$.

HOST: Monochaetum sp.

TYPE: Chirgua Edo Carabobo, Venezuela; Monochaetum sp.; M. F. Barrus, No. 3695; Dec. 16, 1939.

DISTRIBUTION: Known only from the type locality.
NOTE: Compare with the following species.

**Cercospora monochaeticola** sp. nov.

Maculae angulatae, 2-7 mm. diam., rubro-brunneae, corona purpurea cinctae; caespituli epiphylli; stromata atro-fusca, globosa, 20-60$\mu$ diam.; conidiophora densissime fasciculata, pallidissime olivaceo-brunnea, sursum subhyalina, vix septata, simplicia, haud geniculata, curvata vel torta, 1.5-3 x 10-55$\mu$; conidia subhyalina vel pallidissime olivacea, anguste cylindrata, leniter vel fortiter curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 1.5-3 x 30-85$\mu$.

Leaf spots mostly rectangular, 2-4 x 2-7 mm. in size, reddish brown, with a dark brown to purplish border; fruiting epiphyllous; stromata dark brown, globular, 20-60$\mu$ in diameter; fascicles dense to very dense, compact; conidiophores pale to very pale olivaceous brown, tip almost hyaline, fairly uniform in width, rarely septate, not branched, not geniculate, curved to tortuous, narrowly rounded tip, 1.5-3 x 10-55$\mu$, or when conidia are persistent, as they usually are, appearing much longer; conidia subhyaline to very pale olivaceous, narrowly linear or very mildly attenuated, slightly to strongly curved, indistinctly multiseptate, base truncate, tip conically acute, 1.5-3 x 30-85$\mu$.

HOST: *Monochaetum polyneurum* Triana.
TYPE: Mérida, Road from Timotes, Venezuela; *Monochaetum polyneurum;* Carlos Chardon, No. 964; Aug. 29, 1932.
DISTRIBUTION: Known only from the type locality.
NOTE: Compare with the species above.

**Cercospora tamoneae** sp. nov.

Maculae orbiculares, in epiphyllo pallide brunneae vel griseae, 0.5-3 mm. diam., in hypophyllo rubrae vel rubro-brunneae, 3-10 mm. diam.; caespituli amphigeni; in epiphyllo stromata numerosa; conidiophora dense fasciculata, simplicia, in hypophyllo stromata carentia, conidiophora nonfasciculata, ramosa, olivacea, saepe sursum attenuata, curvata vel torta, ad apicem acuta, 2-4.5 x 10-40$\mu$; conidia pallidissime olivacea, cylindrata vel obclavata, recta vel leniter curvata, spurie septata, ad basim subtruncata, ad apicem acuta, 2-4.5 x 25-100$\mu$.

On the upper leaf surface only the center of the spot is visible, pale brown, tan or gray, 0.5-3 mm. in diameter, circular, in transmitted light showing wide orange colored border, on lower surface this center is red or reddish brown with a wide dark brown to black border, 3-10 mm. in diameter; fruiting amphigenous; on lower surface stromata lacking or a few dark cells and mostly nonfasciculate; on upper leaf surface fascicles mostly dense, on lower surface mostly single branches from procumbent threads on leaf hairs, rarely 2-5 stalks in pseudo-fascicles; conidiophores on lower surface medium dark olivaceous, uniform in color and width, on upper surface when in fascicles pale olivaceous brown, much paler and slightly attenuated toward the tip, when in fascicles not branched, sparingly septate, occasionally once abruptly geniculate, variously curved or tortuous, minute spore scar at conic tip, 2-4.5 x 10-40$\mu$; conidia very pale olivaceous, cylindric to distinctly obclavate, straight to slightly curved, septa indistinct, base subtruncate to long obconically truncate, tip usually conic, 2-4.5 x 25-100$\mu$.

HOST: *Tamonea impetiolaris* (Sw.) Britton (*Miconia impetiolaris* D. Don.)

TYPE: Outskirts of Bonao, Province of La Vega, San Domingo; *Miconia impetiolaris;* Carlos E. Chardon, No. 894; July 31, 1937.
DISTRIBUTION: Several collections from San Domingo.
NOTE: See key, page 381 for differences among the species on this host genus.

**Cercospora tibouchinae** Viégas

Bol. da Soc. Brasil. de Agron. **8**: 55. 1945

HOST: Tibouchina sp.
TYPE: Faz. Taquaral, Campinas, Sao Paulo; Tibouchina sp.; H. P. Krug and A. S. Costa, No. 605; Febr. 25, 1935.
NOTE: The type material, the description, and the illustrations show this to be a typical Cylindrosporium.

**Meliaceae**

A. Conidia subhyaline to pale olivaceous, not acicular, base rounded to obconically truncate.
  B. Conidiophores 1-5 septate, 3-5 x 20-70$\mu$, slightly branched; fascicles 2-10 stalks; fruiting effuse; conidia cylindro-obclavate, 3-5 x 30-70$\mu$.
  DIDYMOCHETON *C. Didymochetonis*
  BB. Conidiophores rarely septate, 2-4 x 5-20$\mu$, not branched; fascicles very dense; fruiting not effuse; conidia narrowly cylindric, 3-4 x 25-80$\mu$.
  MELIA *C. subsessilis*
AA. Conidia hyaline, acicular, base truncate.
  B. Conidiophores 4-5 x 20-50$\mu$, pale olivaceous brown, hyaline tip; conidia 2-4 x 40-120$\mu$.
  MELIA *C. Meliae*
  BB. Conidiophores 4.5-7 x 50-250$\mu$, pale to medium brown, uniform in color; conidia 2.5-4 x 40-200$\mu$.
  MELIA *C. meliicola*

**Cercospora congoensis** H. & P. Sydow

Ann. Mycol. **10**: 84. 1912

HOST: Melia sp.
TYPE: Kisantu, Congo, Africa; Melia sp.; H. Vanderyst; 1910.
NOTE: Since the conidiophores are coarse (5-8 x 30-100$\mu$) and clavate, and the conidia wide (7-12 x 35-75$\mu$) and thick walled, I am considering this fungus as being an Helminthosporium. The Botanical Museum at Stockholm, Sweden, kindly sent me type material of nearly all the species which P. Sydow helped to describe. Later I was able to visit the Riiksmuseum and study his types in more detail.

**Cercospora didymochetonis** Wakefield

Kew Bull. of Misc. Information **1931** (4): 205. 1931

Leaf spots indistinct yellowish areas on the upper surface; fruiting on corresponding lower surface, effuse, olivaceous, sparse, 0.5-2 mm. in extent; stromata lacking or a few olivaceous cells; fascicles 2-10 spreading stalks; conidiophores pale olivaceous, uniform in color or with pale conic tip, irregular in width or attenuated, 1-5 septate, sparingly branched, rarely mildly geniculate, straight, undulate or crooked, 3-5 x 20-70$\mu$; conidia subhyaline to pale olivaceous, cylindro-

obclavate, 3-7 septate, straight to mildly curved, base subtruncate to obconically truncate, tip subobtuse, 3-5 x 30-70$\mu$.

HOST: *Dysoxylum richii* C. DC. (*Didymocheton richii* A. Gray).

TYPE: Fiji; *Didymocheton richii;* W. Greenwood, No. 18; July, 1922.

DISTRIBUTION: Known only from the type locality.

NOTE: In 1938 I was permitted to study the Cercospora types and many other species present in the Kew Herbarium. Miss Wakefield, Mr. E. W. Mason and Dr. G. R. Bisby were delightfully kind to me on that occasion. See key, page 384.

**Cercospora meliae** Ellis & Everhart

Jour. Mycol. 3: 16. 1887

*Cercospora leucosticta* Ellis & Ev., Jour. Mycol. 4: 53. 1888

Leaf spots circular to angular, 0.5-2.5 mm. in diameter, white center, narrow dark reddish brown line border; fruiting amphigenous; stromata a few pale brown cells to 30$\mu$ in diameter; fascicles sometimes dense; conidiophores pale olivaceous brown near base, and hyaline to subhyaline near tip, often distinctly attenuated, septa indistinct or lacking, not branched, upper half may have numerous minute geniculations or have many small spore scars without geniculations, small spore scar at rounded or subtruncate tip, 4-5 x 20-50$\mu$; conidia hyaline, acicular, straight or mildly curved, indistinctly multiseptate, truncate base, acute tip, 2-4 x 40-120$\mu$.

HOST: *Melia azedarach* L.

TYPES: Pointe a la Hache, La.; *Melia azedarach;* A. B. Langlois, No. 791; Sept. 17, 1886; (*C. leucosticta*) St. Martinsville, La.; *Melia azedarach;* A. B. Langlois, No. 792; Nov. 17, 1886.

DISTRIBUTION: Reported from the Gulf States, Formosa, China, and India. In some instances it has been confused with *C. subsessilis.* The only specimens I was able to study came from Alabama and Louisiana. It is reported also from Florida.

NOTE: *C. Meliae* has been reported from India and China, but all the specimens received were *C. subsessilis.* None of the *Cercospora leucosticta* material which I studied showed very good fruiting, but it seems that the note Ellis placed in the packet of Langlois collection, No. 792, Sept. 1886, Plaz. Co., La.—"I am now inclined to abandon *C. leucosticta* as only a sterile form of *C. meliae*"—is correct. The hyaline, acicular conidia and pale colored, relatively short conidiophores separate *C. meliae* from the other species on this host genus. See key, page 384.

**Cercospora meliicola** Spegazzini

Ann. Mus. Nac. de B. Aires 20: 440. 1910

Leaf spots suborbicular, 1-5 mm. in diameter, dingy white, border slightly raised; fruiting amphigenous, visible as a slight darkening of the white areas; stromata globular, dark brown, 15-40$\mu$ in diameter; fascicles 2-15 spreading stalks; conidiophores pale to medium brown, uniform in color and width, multiseptate, not branched, straight to curved, often not geniculate but at times may be almost rachis-like, large spore scar at the subtruncate tip, 4.5-7 x 50-250$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2.5-4 x 40-200$\mu$.

HOST: *Melia azedarach* L.

TYPE: Oran, Salta, Argentine; *Melia azedarach;* C. Spegazzini, No. 944; March, 1905.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 384 for differences among the species on Melia. O. Zagatto, April 12, 1935 collected a Cercospora on *Owenia dulcis* in Sao Paulo, Brazil. It may be a new species but at present resembles the Spegazzini species so closely that no new name can be given without detailed study on more material than now is available.

**Cercospora subsessilis** H. & P. Sydow

Ann. Mycol. **11**: 329. 1913

*Cercoseptoria domingensis* Ciferri, Ann. Mycol. **36**: 231. 1938

Leaf spots circular to angular, 2-5 mm. in diameter, sometimes zonate, tan, gray, or pale brown, each zone being bounded by a dark brown line; fruiting hypophyllous; stromata globular, pale olivaceous to dark brown, 30-65$\mu$ in diameter; fascicles very dense, compact; conidiophores very pale yellowish olivaceous, tip narrow, hyaline, not septate, not branched, not geniculate, straight to slightly undulate, 2-4 x 5-20$\mu$; conidia subhyaline to faintly olivaceous, often appearing hyaline when not in mass, narrowly cylindric or slightly attenuated, straight to mildly curved, 3-9 septate, ends rounded or base short obconically truncate, 2-4 x 25-80$\mu$.

HOSTS: *Melia azedarach* L., *M. azadirachta* L. (*Azadirachta indica* A. Juss.), *Swietenia mahogani* Jacq.

TYPES: Government Farm, Coimbatore, Madras Presidency, India; *Melia azedarach;* W. McRae, No. 197; Sept. 21, 1911; (*C. domingensis*) Valle del Cibao, Santiago, San Domingo; same host; R. Ciferri; July 14, 1931.

DISTRIBUTION: Studied material from India, Ceylon, China, Japan, Philippines, San Domingo, Mona, Mississippi, and Texas.

NOTE: The almost sessile, faintly colored conidia separate this from the other species on Melia. Ciferri's type has another fasciculate fungus, which later may prove to be an Helminthosporium. Dr. C. E. Chardon sent me a collection from Mona Island on *Swietenia mahogani* that resembles this species so closely that I am considering it also as *C. subsessilis.* Dr. Togashi sent me the specimen from Japan. See key, page 384.

**Cercospora undulata** (Bernard) Saccardo

Syll. Fungorum **22**: 1415. 1913

*Ramularia undulata* Bernard, Bul. Dept. L'Agr. Indes Néerlandaises (Buitenzorg) **11**: 47. 1907

HOST: *Aglaia odorata* Lour.

TYPE: in a garden at Buitenzorg; *Aglaia odorata;* Ch. Bernard.

NOTE: Bernard's drawings show wide thick walled conidia, characteristic of Helminthosporium rather than of Cercospora.

**Menispermaceae**

A. Conidia colored, only rarely subhyaline.

B. Conidia 2-4 x 20-100$\mu$ or less in size; conidiophores pale in color; fascicles dense; stromata 15-50$\mu$.

C. Conidiophores 2-3.5 x 15-90$\mu$, rarely branched; conidia subcylindric, with obconic base, pale in color.
COCCULUS *C. cocculicola*

CC. Conidiophores slightly enlongated cells on the periphery of the stromata, not branched; conidia obclavate, subhyaline to very pale in color, with subtruncate base.
CISSAMPELOS *C. kampalensis*

BB. Conidia 3.5-5 or 4-6$\mu$ in width; conidiophores pale to medium in color.

C. Nonfasciculate or fascicles of 2-12 stalks; fruiting olivaceous, effuse; conidiophores 4-6 x 60-200$\mu$, slightly branched; conidia 3.5-5 x 40-115$\mu$, obclavate.
COCCULUS .. *C. trilobi*

CC. Fascicles mostly dense; conidiophores rarely longer than 100$\mu$; conidia 4-6 x 20-80$\mu$ or longer.

D. Conidiophores when hypophyllous nonfasciculate, branched, up to 135$\mu$ in length; when epiphyllous in dense fascicles, 3-4.5 x 10-25$\mu$; conidia medium dark, obclavate.
MENISPERMUM *C. menispermi*

DD. Conidiophores in dense fascicles; mostly hypophyllous, not branched, 3-5 x 10-65$\mu$.

E. Conidia cylindric, 2-7 septate, obconically truncate base; conidiophores medium dark; fruiting partly effuse.
COCCULUS *C. cocculi*

EE. Conidia obclavate, 3-11 septate, obconic base; conidiophores pale in color; fruiting not effuse.
CISSAMPELOS *C. pareirae*

AA. Conidia hyaline.

B. Conidia distinctly acicular, truncate base, 2-3.5 x 25-150$\mu$; conidiophores 3-5 x 20-200$\mu$, medium dark in color.
MENISPERMUM *C. manevalii*

BB. Conidia not acicular, base not truncate, conidiophores subhyaline to very pale in color, 3.5-6 x 30-100$\mu$ or longer.

C. Conidia subcylindric, 4-6 x 20-60$\mu$, 3-5 septate, base subtruncate to obconically truncate; conidiophores rarely branched.
DIOSCOREOPHYLLUM *C. dioscoreophylli*

CC. Conidia mostly obclavate, 5-7.5 x 20-65$\mu$, 3-7 septate, base obconic; conidiophores not branched.
TINOSPORA *C. tinosporae*

**Cercospora Cocculi** Sydow
Ann. Crypt. Exot. 2: 264. 1929

*Cercospora Cocculi* Sawada, Jour. Taihoku Soc. Agr. and Forestry 7: 118. 1942

Leaf spots on upper surface indistinct or angular to irregular, 0.5-2.5 mm. in diameter, brown to almost black; on corresponding lower surface scantily effuse, slightly darkened or olivaceous fruiting layer; stromata small, dark; fascicles dense; conidiophores pale to medium dark olivaceous brown, occasionally paler toward the tip, irregular in width, 0-3 septate, variously crooked or curved, occasionally branched, rarely geniculate, rounded to conic tip, 3.5-5 x 20-60$\mu$; conidia cylindric or ranging from clavate to obclavate, straight to mildly curved,

pale to very pale olivaceous brown, 2-7 septate, ends rounded bluntly, 4-6 x 20-125$\mu$.

HOSTS: *Cocculus trilobus* DC., *C. villosus* DC.

TYPES: Pusa, India; *Cocculus villosus;* Inayat Khan, No. 2286; May 1, 1911; (*C. Cocculi* Sawada) Taipeh, Taiwan (Formosa); *Cocculus trilobus;* E. Kurosawa; Jan. 11, 1920.

DISTRIBUTION: Several specimens sent from India. Also present in Formosa and Japan.

NOTE: See also *C. cocculicola* and *C. trilobi.* The Sawada type is in the U. S. D. A. Mycological Herbarium. This species has denser fascicles, darker conidiophores, and coarser conidia than those of *C. trilobi.* Katsuki sent from Japan a specimen labeled *C. cocculi* Sawada. It had sigmoid conidia and was otherwise distinct. See key above.

**Cercospora cocculicola** Ray

Mycologia **34**: 558. 1942

Leaf spots subcircular to angular, 0.5-4 mm. in diameter, dark reddish brown, often with a wide irregular burnt-sienna margin and a dull gray center; fruiting amphigenous but more abundant on the lower leaf surface; stromata globular, black, 15-40$\mu$ in diameter; fascicles mostly dense; conidiophores pale olivaceous brown, in mass rather dark, uniform in color and width, sparingly septate, rarely branched, undulate, tortuous or 1-3 geniculate, minute spore scar at rounded to conic tip, 2-3.5 x 15-90$\mu$; conidia pale yellowish olivaceous, obclavato-cylindric, the longest ones distinctly obclavate, straight to curved, indistinctly multiseptate, base obconic, tip rounded to conic, 2-3.5 x 20-100$\mu$.

HOST: *Cocculus carolinus* DC.

TYPE: College Nursery, Stillwater, Oklahoma; *Cocculus carolinus;* W. W. Ray; July, 1941.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. cocculi* and *C. trilobi,* and key, page 387.

**Cercospora dioscoreophylli** P. Hennings

Bot. Jahrbücher von Engler **34**: 56. 1905

Leaf spots angular, vein-bounded, dark brown on the upper surface; fruiting on corresponding lower surface, effuse, fuligenous; stromata slight or none; conidiophores borne singly or in partly dense fascicles, subhyaline to very pale olivaceous brown, uniform in color, irregular in width, mutiseptate, slightly branched, straight to tortuous or multigeniculate, bluntly rounded tip, 3.5-6 x 30-130$\mu$; condia hyaline, obclavato-cylindric, straight to curved, 3-5 septate, base long obconic to subtruncate, tip obtuse, 4-6 x 20-60$\mu$.

HOST: *Dioscoreophyllum volkensii* Engl.

TYPE: Ost.-Usambara: in Schluchten bei Amani, Africa; *Dioscoreophyllum volkensii;* A. Engler, No. 811; Sept. 19, 1902.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 387.

**Cercospora kampalensis** Hansford

Proc. Linnean Soc. London **1942-3**: 57. 1943

Leaf spots subcircular to irregular, 5-10 mm. in diameter, gray with a pale

brown margin, resembling sunscald; fruiting plainly amphigenous; stromata subglobular, pale to medium yellowish brown, 25-50$\mu$ in diameter; fascicles dense; conidiophores the slightly elongated peripheral cells of the stromata; conidia subhyaline or rarely very pale olivaceous, cylindro-obclavate, straight to curved, 3-7 septate, base subtruncate, tip subobtuse, 2-4 x 20-90$\mu$.

HOST: *Cissampelos mucronata.*

TYPE: Kampala, Uganda; *Cissampelos mucronata;* C. G. Hansford, No. 917; March, 1928.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. pareirae* and key, page 387 for the differences between the species on Cissampelos.

**Cercospora manevalii** sp. nov.

Maculae angulatae vel irregulares, minutae vel saepe confluentes et magnae, in epiphyllo atro-fuscae, in hypophyllo griseo-brunneae; caespituli hypophylli; stromata minuta, atro-fusca; conidiophora laxe fasciculata, pallide brunnae, sursum pallidiora, fere recta, vix geniculata, multiseptata, simplicia, ad apicem subtruncata, 3-5 x 20-200$\mu$; conidia hyalina, anguste obclavata, recta vel leniter, curvata, spurie, multiseptata, ad basim truncata, ad apicem subacuta, 2-3.5 x 25-150$\mu$.

Leaf spots angular to irregular, 0.5 mm. in diameter to large irregular areas when confluent, upper surface dark brown to almost black, no distinctive border, on lower surface grayish brown to lead colored; fruiting hypophyllous; stromata none to small, dark brown or almost black, up to 30$\mu$ in diameter; fascicles 3-15 spreading stalks; conidiophores pale brown, sometimes medium dark near base and very pale tip, uniform in width, multiseptate, mostly straight, rarely once geniculate, not branched, medium sized spore scar at subtruncate tip, 3-5 x 20-200$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute to subacute, 2-3.5 x 25-150$\mu$.

HOST: *Menispermum canadense* L.

TYPE: Columbia, Missouri; *Menispermum canadense;* W. E. Maneval; Oct. 2, 1923.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. menispermi* and key, page 387 for differences between the two species on this host.

**Cercospora menispermi** Ellis & Holway

Jour. Mycol. 4: 6. 1888

Leaf spots circular to irregular, 2-5 mm. in diameter, dark brown to almost black, with an occasional slight yellowing about the margin; fruiting chiefly hypophyllous; stromata lacking or up to 40$\mu$ in diameter; conidiophores borne singly or sometimes in dense fascicles, apparently on upper surface only dense fascicles with short conidiophores (10-25$\mu$) while on lower leaf surface mostly nonfasciculate and as long as 135$\mu$, pale olivaceous brown, uniform in color but irregular in width, indistinctly multiseptate, branched, undulate or bent, 1-6 geniculate, small spore scar at conic tip, 3-4.5 x 10-135$\mu$; conidia pale to medium olivaceous, obclavate, almost straight, mostly 1-5 septate, rarely closely and repeatedly septate, long obconic base, obtuse tip, 4-6 x 30-80$\mu$, reported up to 140$\mu$ in length.

HOST: *Menispermum canadense* L.
TYPE: Decorah, Iowa; *Menispermum canadense;* E. W. D. Holway; June, 1886.
DISTRIBUTION: From Manitoba to Texas and eastward; also reported from India and China.
NOTE: See also *C. manevalii* and key, page 387 for the other species on this host. Miura (Fl. Manchuria pt. 3, p. 528. 1928) applies the name, *Cercosporiopsis menispermi.* His description of the genus is identical for that of Cercospora, therefore is considered a synonym. He changes to this genus also, *C. gotoana, C. canescens, C. personata, C. profusa, C. vitis, C. araliae,* and *C. miurae.* He transferred the following species to Cercosporina: *C. chenopodii, C. physalidis,* and *C. apii,* and adds *Cercosporina beticola* (Sacc.) Nakata, *C. sojaena* Hara, *C. kikuchii* Mats. & Tomoy. and *C. ricinella* (Sacc. et Berl.) Speg.

**Cercospora pareirae** Spegazzini
Anal. Mus. Nac. B. Aires **20**: 440. 1910

Leaf spots subcircular, 2-10 mm. in diameter, dark reddish brown, rather indistinct on old dried leaves; fruiting amphigenous but sometimes hypophyllous or epiphyllous only; stromata medium to dark brown, globular, 20-50$\mu$; fascicles dense; conidiophores in mass medium dark, singly pale olivaceous brown, almost hyaline tip, fairly uniform in width, 0-3 septate, almost straight, not branched, rarely geniculate, conic tip, 3-5 x 10-50$\mu$; conidia pale olivaceous, obclavate, 3-11 septate, straight to mildly curved, base long obconic, tip subobtuse, 3-5.5 x 35-125$\mu$.

HOST: *Cissampelus pareira* L. (*C. mucronata* A. Rich.).
TYPE: Tucumán, Argentine; *Cissampelus pareira;* C. Spegazzini, No. 945; April 15, 1906.
DISTRIBUTION: Argentine, Transvaal.
NOTE: The South African collection resembled very closely the type material, which had long obclavate conidia instead of short cylindric ones as Spegazzini stated. See key, page 387.

**Corcospora tinosporae** H. & P. Sydow
Ann. Mycol. **14**: 372. 1916

Leaf spots irregular, 0.5-7 mm. in diameter, yellow to brown on the upper surface and grayish brown to gray below; fruiting amphigenous but chiefly hypophyllous; stromata dark brown, subglobular, ranging from a few cells to 60$\mu$ in diameter; most fascicles dense; conidiophores subhyaline to very pale fuligenous, tip hyaline, uniform in width, indistinctly multiseptate, not branched, seldom geniculate, bluntly rounded tip, 4-6 x 30-100$\mu$; conidia hyaline, obclavate or rarely irregular in shape, 3-7 septate, straight to strongly curved, obconic base, subobtuse tip, 5-7.5 x 20-65$\mu$.

HOSTS: *Tinospora reticulata* Miers, *T. cordifolia* Miers.
TYPE: Prov. of Bulacan, Luzon, Philipp.; *Tinospora reticulata;* M. Ramos, No. 21803; Sept. 1913.
DISTRIBUTION: Philippines, India.
NOTE: Ajrekar (J. Univ. Bombay **3**: 65. 1935) describes the perfect stage as *Mycosphaerella tinosporae,* but he also mentions a Phoma stage in the cultures, which confuses his statement somewhat. (See also Mundkur, Sci. Monogr. Coun. Agric. Res. India **12**: 1. 1938.). See key, page 387.

**Cercospora trilobi** sp. nov.

Maculae typicae nullae sed discolorationes epiphyllas indeterminatas flavidas efficiens; caespituli exigue effusi hypophylli, olivacei; stromata carentia aut minuta; conidiophora unica aut laxe fasciculata, pallide olivaceo-brunnea, 3-11 septata, vix ramosa, interdum geniculata, recta vel leniter curvata, ad apicem acuta, 4-5 x 30-200$\mu$; conidia cylindrato-obclavata, pallidissime olivacea, fere recta, 5-9 septata, utrimque obtusa, 3.5-5 x 40-105$\mu$.

Leaf spots indistinct or lacking; fruiting scantily effuse, hypophyllous, olivaceous; stromata none or filling stomatal openings; conidiophores borne singly or in fascicles of 2-12, pale to medium olivaceous brown, uniform in width and color, 3-11 septate, branched occasionally, rarely geniculate, straight to mildly curved, conic tip, 4-5 x 30-200$\mu$; conidia cylindro-obclavate, pale to very pale olivaceous, straight or nearly so, 5-9 septate, base obconic, tip obtuse, 3.5-5 x 40-105$\mu$.

HOST: *Cocculus trilobus* DC.

TYPE: Wusih, Kiangsu Prov., China; *Cocculus trilobus;* C. T. Wie, Field No. 878; Oct. 18, 1933.

DISTRIBUTION: Known only from the type collection.

NOTE: See key, page 387 for differences among the species on this host genus. See note under *C. cocculi.*

## CERCOSPORAE ON FICUS

A. Conidia hyaline.

B. Conidia cylindric to spindle-shaped, 1-3 septate, 4-5.5 x 15-35$\mu$; Rhytisma-like stromata; conidiophores 4.5-7 x 10-40$\mu$ (not a true Cercospora).
FICUS (UROSTIGMA) *C. urostigmatis*

BB. Conidia mostly acicular, 2-4 x 40-200$\mu$; stromata slight or none.

C. Fruiting chiefly epiphyllous; conidiophores sometimes strongly geniculate, 4-5.5 x 20-70$\mu$.
F. ELASTICA *C. elasticae*

CC. Fruiting chiefly hypophyllous; conidiophores 0-2 geniculate, 3-5.5 x 50-300$\mu$.
F. CARICA *C. ficina*

AA. Conidia colored.

B. Leaf spots very large, with strongly marked concentric rings that resemble annular rings in trees; conidia cylindric, 2-3.5 x 25-60$\mu$; conidiophores borne singly, 3.5-5 x 100-500$\mu$.
F. HISPIDA *C. annulata*

BB. Leaf spots not marked with annular-like rings; conidia obclavate; conidiophores not longer than 150$\mu$.

C. Conidia narrow, 2-4 x 30-180$\mu$; fruiting chiefly epiphyllous; stromata 30-70$\mu$; fascicles dense to very dense; conidiophores 2.5-4 x 10-30$\mu$.
FICUS spp. *C. fici*

CC. Conidia relatively wide; fruiting chiefly hypophyllous.

D. Leaf spots distinct; fruiting not effuse; stromata present; conidia 5-7.5 x 20-65$\mu$; conidiophores fasciculate, not branched, 4.5-6 x 10-70$\mu$.
F. CARICA *C. bolleana*

DD. Leaf spots often indistinct; fruiting effuse; stromata absent; conidia 3.5-6 x 25-100$\mu$; conidiophores nonfasciculate, branched, 2.5-4 x 25-150$\mu$.
FICUS sp. *C. rufula*

**Cercospora annulata** Cooke
Grevillea 8: 95. 1879

Leaf spots circular, 10-75 mm. in diameter, dingy gray to tan, marked with rings that resemble the annular rings of a log; fruiting hypophyllous; stromata lacking; conidiophores borne singly, pale to medium brown, paler and more narrow toward the tip, multiseptate, not branched, rarely geniculate, narrowly rounded tip, 3.5-5 x 100-500$\mu$; conidia cylindric, subhyaline to very pale olivaceous, indistinctly multiseptate, rounded ends, 2-3.5 x 25-60$\mu$.

HOST: *Ficus hispida* L.
TYPE: Calcutta, India; *Ficus hispida;* J. Scott.
DISTRIBUTION: Known only from the type locality.
NOTE: The peculiarly zonate, extremely large spots and the very long conidiophores separate this species from the others on Ficus. See key above.

**Cercospora artocarpi** H. & P. Sydow
Ann. Mycol. 12: 202. 1914

Leaf spots irregular between veins, extending from leaf margin to midrib, 10-20 mm. in extent, yellowish to dark brown; fruiting plainly epiphyllous; stromata globular, dark to black, 20-60$\mu$ in diameter; fascicles dense, divergent; conidiophores medium to dark brown, uniform in color and width, 3-7 septate, not branched, straight to mildly curved, upper fourth sometimes undulate to geniculate, narrowly rounded tip, 3.5-5 x 40-125$\mu$; conidia pale to very pale olivaceous, obclavato-cylindric, straight to curved, 3-7 septate, base rounded to obconically truncate, tip obtuse, 3.5-5 x 30-75$\mu$.

HOST: *A. incisa* L. (*Artocarpus communis* Forst.)
TYPE: Los Banos, Philippines; *Artocarpus communis* (*A. incisa*); M. B. Raimundo (C. F. Baker, No. 2608); Jan. 15, 1913.
DISTRIBUTION: Known only from the type locality.

**Cercospora bolleana** (de Thuemen) Spegazzini
Michelia 1: 475. 1879

*Septosporium bolleanum* de Thuemen, Oestrr. Bot. Zeitschr. 27: 12. 1877
*Cercospora sycina* Sacc., Mycotheca Veneta 1564. 1881

Leaf spots pale to dark brown, mostly angular, ranging in size from numerous minute rusty-colored speckles to large brown areas; fruiting chiefly hypophyllous; stromata none to fairly prominent; some fascicles dense; conidiophores medium dark olivaceous brown, fairly uniform in color, straight or nearly so, not or rarely geniculate, bluntly rounded tip, inconspicuously septate, not branched, spore scars small when present, 4.5-6 x 10-70$\mu$, mostly 10-40$\mu$ long; conidia broadly obclavate, ends bluntly rounded, base sometimes obconic, straight or mildly curved, olivaceous or olivaceous brown, 1-5 septate, sometimes constricted at septa, 5-7.5 x 20-65$\mu$. (This species often mixed with *C. Fici* which has thin long conidia).

HOST: *Ficus carica* L.

TYPES: Görz, Istria, Italy; *Ficus carica;* C. Bolle; Autumn, 1876; (*C. sycina*) Belluno, Italy; *Ficus carica;* C. Spegazzini; Sept. 1878.
DISTRIBUTION: Reported in most of the southern tier of states, and in San Domingo, Spain, and Italy.
NOTE: Higgins (Amer. Jour. Bot. 7: 435. 1920) describes the perfect stage as *Mycosphaerella bolleana.* In the New York Botanical Garden Herbarium is a specimen labeled *C. bothana* on fig. It is *C. bolleana.* See key, page 391.

**Cercospora bremeri** Petrak
Sydowia 2: 312. 1948

HOST: *Morus nigra* L.
TYPE: Adana, Turkey; *Morus nigra;* G. Karel; Oct. 14, 1947.
NOTE: This seems identical with *Cercospora snelliana* I. Reichert, and *Cercospora kusanoi* Sawada, both of which are considered an Helminthosporium. H. & P. Sydow described the same fungus as *Clasterosporium mori,* Mém. Herb. Bois. 1900 (4): p. 6.

**Cercospora broussonetiae** Chupp & Linder
Mycologia 29: 27. 1937

Leaf spots indistinct or none; fruiting amphigenous, more abundant on the lower surface, effuse, dark olivaceous; stromata when present dark brown to almost black, subglobular, 30-70$\mu$ in diameter; nonfasciculate to dense fascicles, fasciculation mostly on the upper leaf surface; conidiophores pale to medium yellowish brown, uniform in color, irregular in width, plainly and often closely septate, occasionally constricted at septa, branched, not geniculate, curved or crooked, rather freely intertwining, tip bluntly rounded to conic, 4-6 x 50-150$\mu$; conidia pale to medium yellowish olivaceous or brown, cylindric, straight to strongly curved, plainly and often closely septate, ends bluntly rounded to long conic, 4-5.5 x 40-90$\mu$.

HOSTS: Broussonetia sp., *B. papyrifera* Vent.
TYPE: Ta Tseh Tsuen Yung Hsien, Prov. Kwangsi, China; Broussonetia sp.; S. Y. Cheo, No. 2900; Oct. 17, 1933.
DISTRIBUTION: China. Also reported from Florida (P. Dis. Reporter Suppl. 148: 270. 1944.).

**Cercospora cannabina** Wakefield
Bul. Misc. Inform. Kew Bot. Gard. 1917: 314. 1917

Leaf spots circular to oblong, 2-10 mm. in length, brown, occasionally with raised or depressed margins; fruiting hypophyllous, effuse, olivaceous; stromata lacking; nonfasciculate or in fascicles of 2-6 stalks; conidiophores single branches from procumbent threads, very pale yellowish olivaceous, uniform in color, irregular in width, 0-7 septate, not geniculate, curved to tortuous, intertwined, tip rounded to conic, 3-5 x 10-85$\mu$; conidia very pale yellowish olivaceous, cylindric, straight to strongly curved, 3-10 septate, base obconic, tip obtuse, 3.5-5 x 30-65$\mu$ or even 90$\mu$.

HOST: *Cannabis sativa* L.
TYPE: Kipayo, Uganda; *Cannabis sativa;* R. Dummer, No. 1320; Dec. 1914.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. cannabis* for differences between the species on Cannabis.

**Cercospora cannabis** Hara et Fukui

A list of Japanese fungi hitherto unknown, Third Edition, 1927

*Cercosporina cannabis* Hara, Pathology of Crop Plants, p. 195. 1928.

Leaf spots circular to irregular, small, yellowish brown to brown; fruiting hypophyllous; stromata none or a few brown cells; fascicles 2-12 stalks; conidiophores pale brown, uniform in color, slightly attenuated, straight, curved, or more rarely 1-2 geniculate, sparingly septate, not branched, medium sized spore scar at rounded to subtruncate tip, 3.5-5.5 x 10-100$\mu$; conidia hyaline, acicular, shortest ones cylindric, straight to mildly curved, indistinctly multiseptate, base truncate, tip of longer ones acute to subacute, 2-4 x 20-90$\mu$.

HOST: *Cannabis sativa* L.

TYPE: Japan; *Cannabis sativa.*

DISTRIBUTION: Type collected in Japan. Specimen sent by Maneval from Missouri, by Greene from Wisconsin, and by Thirumalachar from India.

NOTE: Although I have not seen the type, Hara's description fits the American specimens closely. The other species on Cannabis, *Cercospora cannabina* Wakef., has colored conidia and branched conidiophores.

**Cercospora cantuariensis** Salmon & Wormald

Jour. of Botany (London) **61**: 134. 1923

Leaf spots definite, circular, a grayish to white center 1-5 mm. in diameter bordered by a dark purplish brown line and then a yellowish zone; fruiting amphigenous; stromata lacking or one to three very large brown cells; conidiophores borne singly, pale to very pale olivaceous brown, paler and more narrow toward the tip, 1-7 septate, straight, not geniculate, not branched, tip obtuse to conic, 8-20 x 25-200$\mu$, mostly short; conidia pale to very pale olivaceous brown, cylindric, straight to mildly curved, 5-19 septate, ends rounded to conic, 10-21 x 135-510$\mu$, averaging 13.5 x 250$\mu$.

HOST: *Humulus lupulus* L.

TYPE: Canterbury, Kent, England; *Humulus lupulus;* H. Wormald; September, 1922.

DISTRIBUTION: Several collections in Kent, England.

NOTE: This is such an unusual species that it should be transferred to a genus of its own. For convenience sake it is left at present in the genus, Cercospora. See also *C. humuli* for differences between the species on this host genus.

**Cercospora castilloae** Sawada

Jour. Taihoku Soc. Agr. & Forestry **7**: 26. 1943

Also Formosa (Taiwan) Agr. Res. Inst. Rept. **86**: 167. 1943

Spots mostly along the margin of the leaf, subcircular to irregular, 0.5-12 mm. in diameter, dull brown to almost gray, fading into the normal leaf color; fruiting amphigenous, more easily seen on the upper leaf surface; stromata none or a few dark cells; fascicles 2-12 divergent stalks; conidiophores pale fuligenous, uniform in color and width, mostly straight, 1-5 septate, 0-1 geniculate, not branched, subtruncate to rounded tip, 4-6 x 30-125$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to mildly curved, base truncate, tip acute, 2-4.5 x 40-180$\mu$.

HOST: *Castilloa elastica* Cerv.
TYPE: Chia-i, Taiwan (Formosa); *Castilloa elastica;* K. Sawada; Nov. 10, 1909.
DISTRIBUTION: Known only from the type locality.
NOTE: Some of the cotype has been deposited in the U. S. D. A. Mycological Herbarium.

**Cercospora cecropiae** Muller & Chupp

Arquiv. Inst. Biol. Veg. Rio de Janeiro 1: 216. 1935

Leaf spots none or indistinct; fruiting effuse, olivaceous, hypophyllous (rarely epiphyllous and then in dense fascicles); stromata lacking; nonfasciculate; conidiophores short branches from procumbent threads, very pale yellowish to olivaceous, uniform in color, irregular in width, sparingly septate, not geniculate, straight to undulate or even intertwined, tip rounded to conic, 3-4 x 10-30$\mu$; conidia cylindric to obclavato-cylindric, straight to mildly curved, hyaline to subhyaline, 3-5 septate, base obconically truncate, tip obtuse to conic, 2.5-4 x 20-65$\mu$.

HOST: Cecropia sp.
TYPE: Vicosa-Escola, Minas Geraes, Brazil; Cecropia sp.; A. S. Muller, No. 626; June 21, 1933.
DISTRIBUTION: Known only from the type locality.

**Cercospora cladophora** Sawada

Formosa Agr. Res. Inst. Rept. **87**: 81. 1944

Leaf spots 0.5-5 mm. in diameter; fruiting hypophyllous; conidiophores yellow brown, 3-7 septate, 4-5 x 89-118$\mu$; conidia hyaline to light gray, 2-3 septate, 3-4.5 x 18-47$\mu$.

HOST: *Ficus septica* Burm.
TYPE: Unknown.
DISTRIBUTION: Formosa (Taiwan).
NOTE: The above description by Sawada is not detailed enough to compare the species with others on Ficus or even to be sure that it is a true Cercospora.

**Cercospora elasticae** Zimmerman

Inst. Bot. de Buitenzorg Bul. **10**: 17. 1901

Leaf spots grayish brown, 2-4 mm. in diameter to large blotches, indistinct on old dried leaves; fruiting epiphyllous; stromata lacking or a few large brown cells; conidiophores borne singly or in fascicles of 2-10, pale brown, paler and more narrow toward the tip, sparingly septate, not branched, straight to tortuous, occasionally multigeniculate and then appearing rachis-like, medium spore scar at the subtruncate tip, 4-5.5 x 20-70$\mu$ or rarely much longer; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 40-125$\mu$, or in a moist chamber as wide as 5$\mu$ and much longer.

HOST: *Ficus elastica* Roxb.
TYPE: In a garden, Buitenzorg, Java; *Ficus elastica;* J. H. Koorders.
DISTRIBUTION: Java, Venezuela.
NOTE: Zimmerman described the conidia as chocolate-colored, but Koorders (Verh. K. Akad. Wetensch. II. **13**: 161-264. 1907) illustrates the acicular conidia, and indicates that they are hyaline. See key, page 391.

**Cercospora fatouae** P. Hennings

Hedwigia **43**: 146. 1904

Leaf spots indistinct or none, sometimes irregular yellowish brown areas on the upper leaf surface; fruiting in the corresponding areas on the lower surface, dark olivaceous, effuse, including minute tufts to half the leaf surface; stromata lacking or a few pale cells; nonfasciculate to dense fascicles; conidiophores pale to very pale yellowish brown or olivaceous, uniform in color, irregular in width, plainly multiseptate, branched sparingly or when single arising as branches from the procumbent threads, not geniculate, straight to curved or tortuous, conic tip, 3.5-6 x 20-120$\mu$; conidia subhyaline to pale olivaceous, narrowly linear to almost acicular, plainly multiseptate, straight to mildly curved, base subtruncate or rarely almost obconic, tip conic, 2.5-5 x 30-120$\mu$.

HOSTS: *Fatoua pilosa* Gaud., *F. villosa* Nakai, *F. japonica* Bl.

TYPE: Koishikama, Tokyo, Japan; *Fatoua pilosa* var. *subcordata* Rupr.; N. Nambu, No. 7; Oct. 23, 1899. (This is in the Berlin Herbarium and marked as the type)—Tokyo, Maguro, Japan; N. Nambu, No. 14; Nov. 1900. (This is given as the type in the publication). (Bot. Jahrb. von Engler **32**: 45. 1903).

DISTRIBUTION: Japan, China, Formosa.

**Cercospora fici** Heald & Wolf

Mycologia **3**: 16. 1911

?*Cercospora fici-caricae* Sawada, Dept. Agr. Res. Inst. Formosa **2**: 11, 151. 1922
?*Cercospora ficicola* v. Bond-Mont., Acta Inst. Bot. Acad. Sci. U.R.S.S. Ser. 2. **3**: 755. 1936

Leaf spots angular to irregular, 1-8 mm. in length, grayish brown to dingy gray center with brown margin on upper surface, ferruginous on lower leaf surface; fruiting chiefly epiphyllous; stromata black, globular, 30-70$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, in mass dark, tip almost hyaline, not attenuated, septation, geniculation, branching and spore scars not visible, 2.5-4 x 10-30$\mu$; conidia narrowly obclavate to cylindro-obclavate, hyaline to olivaceous, straight to mildly curved, septa indistinct, base mostly long obconic, tip subacute, 2-4 x 30-180$\mu$.

HOSTS: *Ficus carica* L., *F. radicans* Desf., *F. repens* Rottl., *F. scandens* Roxb., *F. sycomorus* L., *F. urceolaris.*

TYPES: Cuero, Texas; *Ficus carica;* Heald & Wolf, No. 2593; Sept. 3, 1909; (*C. Fici-caricae*) Taipeh, Formosa; *Ficus carica;* K. Sawada; Nov. 18, 1914; (*C. ficicola*) Calidaris, U.S.S.R.; *Ficus scandens, F. radicans;* June 13, 1933.

DISTRIBUTION: Possibly widespread in the Southern States and in tropical and subtropical countries but so much of the herbarium material on Ficus is misnamed that it is difficult to determine range.

NOTE: *C. Fici* often accompanies other species on this host, and therefore has been a source of confusion in the proper identification of species. The combination of narrow obclavate conidia, and short pale conidiophores separates this species from the others on Ficus. I have not seen the Sawada or Bondartzeva-Monteverde collections, but their descriptions and drawings of short conidiophores and narrow long conidia fit *C. fici* closely. See key, page 391.

**Cercospora fici-harlandii** Sawada

Formosa Agr. Res. Inst. Rept. **85:** 106. 1943

Leaf spots 2-5 mm. in diameter; fruiting hypophyllous; fascicles averaging 2.3 stalks; conidiophores 7-8 septate, 4-5 x 102-162$\mu$; conidia hyaline, 1-3 septate, 3-5 x 19-36$\mu$.

HOST: *Ficus harlandi* Benth.

TYPE: Unknown.

DISTRIBUTION: Formosa (Taiwan).

NOTE: This description resembles so closely the one Sawada gives for *C. cladophora* that one cannot help wondering if the two are not the same. It is impossible to compare the few characters given above with those of fully described genera on Ficus.

**Cercospora fici-septicae** Sawada

Formosa Agr. Res. Inst. Rept. **85:** 106. 1943

Leaf spots 2-10 mm. in diameter; fruiting hypophyllous; conidiophores brown, 1-4 septate, 2.5-3 x 24-44$\mu$; conidia pale olive, 1-3 septate, 3.5-4 x 11-18$\mu$.

HOST: *Ficus septica* Burm.

TYPE: Unknown.

DISTRIBUTION: Formosa (Taiwan).

NOTE: The description is too brief to be certain, but apparently the fungus with conidia 11-18$\mu$ in length is not a Cercospora.

**Cercospora ficina** Tharp

Mycologia **9:** 109. 1917

Leaf spots angular to irregular, ferruginous on both surfaces, 1-5 mm. in extent; fruiting chiefly hypophyllous; stromata slight or none; fascicles mostly not dense; conidiophores pale or rarely medium olivaceous brown, paler near tip, which is slightly attenuated, multiseptate, sometimes 1-2 mildly geniculate, spore scar of medium size, not branched, 3.5-5.5 x 50-300$\mu$; conidia acicular to obclavate, hyaline, straight to mildly curved, truncate base, subobtuse to subacute tip, septa indistinct, 2.5-4 x 60-200$\mu$.

HOST: *Ficus carica* L., *F. urceolaris.*

TYPE: Rockdale, Texas; *Ficus carica;* B. C. Tharp; Oct. 31, 1914.

DISTRIBUTION: Texas, Uganda.

NOTE: The hyaline acicular conidia separate this species from all others on Ficus. Hansford (Proc. Linn. Soc. London **1942-3:** 34. 1943) reports the fungus on *F. urseolaris* from Uganda. See key, page 391.

**Cercospora humuli** S. Hori

Jour. Botany (London) **61:** 135. 1923

*Cercospora humuli-japonici* Sawada, Formosa Agr. Res. Inst. Rept. 85: 697. 1943; also Formosa Agr. Rev. **38:** 696. 1942

Leaf spots angular, 1-5 mm. in diameter, tan to reddish brown; fruiting amphigenous, effuse, olivaceous; stromata brown, globular, 20-40$\mu$ in diameter; fascicles dense, divergent; conidiophores pale to very pale olivaceous brown, slightly paler tip, irregular in width, straight, curved or flexuous, 0-2 nodulose, 0-2 septate, rarely branched, rounded to conic tip, 3-4.5 x 10-55; conidia subhyaline to

very pale olivaceous, obclavato-cylindric, straight to mildly curved, 4-11 septate, base subtruncate to obconic, tip obtuse to conic, 2.5-4 x 35-120$\mu$.

HOSTS: *Humulus japonicus* Sieb. & Zucc., *H. lupulus* L.

TYPE: Nishigahara, Tokyo, Japan; *Humulus japonicus;* S. Hori; Sept. 28, 1915. (Hori sent me a specimen dated Sept. 25, 1915).

DISTRIBUTION: Common in the vicinity of Tokyo. Apparently present also in Formosa.

NOTE: See also *C. cantuariensis* for differences between the two species on Humulus. I did not see the Sawada specimen but his brief description seems to fit *C. humuli.*

**Cercospora kallarensis** Ramakrishnan, T. S. et K.

Proc. Indian Acad. Sci. Sect. B. **28:** 68. 1948

Spots amphigenous, circular or irregular, 0.2-0.5 mm. in diameter, isolated or crowded, groups delimited by veins, brown; conidiophores hypophyllous, coremoid, densely tufted, one cluster in each spot; originating from a small stroma, unbranched, 3-6 septate, 4-6 x 100-150$\mu$; conidia narrowly obclavate, light olive brown, 1-3 septate, apex obtuse, 3-6 x 20-60$\mu$ (Authors' description).

HOST: Ficus sp.

TYPE: Kallar, Coimbatore, India; Ficus sp.; T. S. and K. Ramakrishnan; Aug. 7, 1947.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not been able to study this species, but both the description and the drawings indicate that it is an Isariopsis and not a Cercospora.

**Cercospora Kusanoi** Sawada

Dept. Agr. Govern. Res. Inst. Formosa, Rept. **35:** 109. 1928

*Cercospora flexuosa* Tanaka, (Citation unknown).

*Clasterosporium mori* H. & P. Sydow, Mém. Herb. Boiss. **1900** (4): 6.

HOST: *Morus alba* L.

TYPE: Otowa, Pr. Tokyo, Japan; *Morus alba;* Kusano.

NOTE: The very dark, closely septate, thick walled conidia are characteristic of Helminthosporium, and not of Cercospora. This seems to be the same as Reichert described in 1921 under the name *Cercospora snelliana.*

**Cercospora maclurae** Ellis & Everhart

Jour. Mycol. **8:** 72. 1902

HOST: *Maclura aurantiaca* Nutt.

TYPE: Tuskegee, Ala.; *Maclura aurantiaca;* Geo. Carver, No. 269; Nov., 1901.

NOTE: Because of the thick walled, Alternaria-shaped conidia, it is not considered a Cercospora, but Pseudocercospora.

## CERCOSPORAE ON MORUS

A. Conidia colored, obclavate; fruiting hypophyllous.

B. Leaf spots distinct; fruiting not effuse; stromata 20-80$\mu$; fascicles dense; conidiophores 1.5-3 x 5-25$\mu$; conidia 2-3.5 x 25-70$\mu$.

M. ALBA M. RUBRA — *C. missouriensis*

BB. Leaf spots indistinct; fruiting effuse; stromata none or slight; fascicles 2-7 stalks; conidiophores 3-5 x 15-90$\mu$; conidia 3-5 x 20-70$\mu$.
M. ALBA, M. ACIDOSA, MORUS sp. *C. mori*

AA. Conidia hyaline, acicular; fruiting amphigenous.
B. Fascicles very dense; conidiophores 2-3.5 x 5-30$\mu$; conidia 2-3.5 x 25-125$\mu$.
M. ALBA, M. RUBRA, MORUS sp. *C. moricola*
BB. Fascicles 2-10 stalks; conidiophores 5-6.5 x 75-200$\mu$; conidia 2.5-5 x 60-225$\mu$.
M. ALBA *C. morina*

**Cercospora missouriensis** Winter
Hedwigia **24**: 258. 1885

*Cercospora pulvinulata* Sacc. & Wint., Hedwigia **24**: 205. 1885; also Atti R. Ist. Ven. Sci. Lett. Arti. ser. 6. **3**: 728. 1885

Leaf spots circular to subcircular, 2-10 mm. in diameter or coalescing into large areas, dull brown to almost black, sometimes with a yellow halo; fruiting hypophyllous; stromata pale to medium brown, 20-80$\mu$ in diameter; fascicles dense; conidiophores subhyaline to pale fuligenous, longest ones slightly undulate, uniform in color and width, septation, geniculation, branching and spore scars absent or not evident, tip rounded, 1.5-3 x 5-25$\mu$; conidia subhyaline to chlorine, linear to narrowly obclavate, straight to curved, septa indistinct, base rather sharply obconic to obconically truncate, tip obtuse, 2-3.5 x 25-70$\mu$.

HOSTS: *Morus alba* L., *M. rubra* L.

TYPE: Missouri; *Morus rubra;* Demetrio, No. 8.

DISTRIBUTION: Mississippi Valley as far north as Nebraska; also Switzerland, Roumania, New South Wales, Crimea, Japan, and Formosa.

NOTE: Winter changed the species name because Cooke had already described a *C. pulvinula* on Ilex. A number of herbarium specimens bearing this name really are *C. moricola* with hyaline acicular conidia and long conidiophores. Savulescu (Herb. Mycologicum Romanicum No. 188) has distributed *C. pulvinulata* forma *angulosa*. This apparently is only a mixture of *C. moricola* and *C. missouriensis,* which at times may also be found true in this country. Kellerman repeats the description of *C. pulvinulata* in Jour. Mycol. **1**: 106. 1885. See key above for differences among the species on Morus.

**Cercospora mori** Hara
Jour. of the Sericultural Assoc. of Japan **27**: (314): 227 (Arabic 19). 1918
*Cercospora mori* Marchal & Steyaert, Bul. Soc. Roy. Bot. de Belg. **61**: (n.s. **11**): 166. 1929

Leaf spots indistinct or none; fruiting hypophyllous, very scantily effuse, olivaceous to dark in color, 0.5 mm. in extent to large areas of leaf surface; stromata none or a few brown cells; nonfasciculate or 2-7 spreading stalks in fascicles; conidiophores pale olivaceous brown to yellowish brown, uniform in color, irregular in width, plainly multiseptate, constrictions at some septa, branched, not geniculate or occasionally 1-3 mildly or once abruptly geniculate, conic to rounded tip, 3-5 x 15-90$\mu$; conidia obclavate or shortest ones almost cylindric, very pale olivaceous, straight to mildly curved, 2-7 septate, base rounded to almost obconic, tip obtuse, 3-5 x 20-70$\mu$.

HOSTS: *Morus acidosa* Griff., *M. alba* L., Morus sp.

TYPES: Japan; cultivated mulberry leaves; collector (Japanese name); date: Sept. 6th year of Emperor (Japanese); (Marchal & Steyaert) Kinshasso, Prov. Congo-Kasai, Belgian Congo; Morus sp.; J. Ghesequiete, No. 1120; June 1, 1926.

DISTRIBUTION: Belgian Congo, Japan, Formosa, China, Alabama.

NOTE: See key, page 398.

**Cercospora moricola** Cooke

Grevillea **12**: 30. 1883

Leaf spots circular to irregular, 1-8 mm. in diameter, gray to tan center, dark purple to black border; fruiting amphigenous but more abundant on lower surface; stromata almost lacking to medium in size; fascicles very dense; conidiophores very pale brown, tip almost hyaline, longest ones undulate or bent, not branched, septa not visible, rarely geniculate, 2-3.5 x 5-30$\mu$; conidia acicular, sometimes almost cylindric, hyaline, straight to mildly curved, septa indistinct, base truncate, tip subacute to subobtuse, 2-3.5 x 25-125$\mu$.

HOSTS: *Morus alba* L., *M. rubra* L., Morus sp.

TYPE: Aiken, S. Car.; *Morus rubra;* H. W. Ravenel, No. 587 (Cooke 2679).

DISTRIBUTION: Mississippi to Wisconsin and eastward. Also reported from England, Italian Somaliland, and Minas Geraes.

NOTE: Many herbarium specimens of Morus are wrongly labeled, for *C. missouriensis, C. moricola* and *C. morina* have generally been confused. Atkinson states: ". . . . possibly identical with *Phloeospora mori.* Does not seem to differ from *C. pulvinata.*" (Cornell Univ. Bul. 3 (1): 41. 1897). The very dense fascicles, short conidiophores, and hyaline, acicular conidia separate this species from the others on Morus. See key, page 398.

**Cercospora morina** sp. nov.

Maculae maximae, plerumque venulis limitatae, griseo-brunneae vel sordide griseae; caespituli atri, amphigeni, plerumque epiphylli; stromata subglobosa, atro-fusca, 10-25$\mu$ diam.; conidiophora laxe fasciculata, brunnea, sursum pallidiora, multiseptata, recta vel curvata, simplicia, 0-3 geniculata, ad apicem subtruncata, 5-6.5 x 75-200$\mu$; conidia hyalina, anguste obclavata, recta vel curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2.5-5 x 60-225$\mu$.

Leaf spots very large, extending from margin to midrib, bounded on the sides by the veins, grayish brown to dingy gray; fruiting slightly darkening some of the areas, amphigenous, but more abundant on the upper leaf surface; stromata subglobular, very dark brown, 10-25$\mu$ in diameter; fascicles 2-10 stalks; conidiophores medium dark brown, paler toward the tip, uniform in width, multiseptate, straight to curved, not branched, 0-3 geniculate, large spore scar at the subtruncate tip, 5-6.5 x 75-200$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2.5-5 x 60-225$\mu$.

HOST: *Morus alba* L.

TYPE: Vicosa-Escola, Minas Geraes; *Morus alba;* A. S. Muller, No. 897; April 20, 1935.

DISTRIBUTION: Known only from the type locality.

NOTE: The long, dark, wide conidiophores and the hyaline, acicular conidia separate this species from the others on Morus. See key, page 398.

**Cercospora rubrocincta** Patouillard

Bul. Trimest. Soc. Mycol. de France **31**: 77. 1915

HOST: Ficus sp.

TYPE: Cho Gank, Tonkin, French Indo China; Ficus sp.; M. Duport, No. 32; 1914.

NOTE: This has mostly 1-septate conidia, so is not a Cercospora. Even though it has dense, rarely almost coremoid, fascicles, it fits in other characters Clasterosporium more closely than any of the other genera with this type of conidium.

**Cercospora rufula** Sydow

Ann. Mycol. **21**: 91. 1923

Leaf spots circular to irregular, 5-25 mm. in diameter, reddish brown; fruiting hypophyllous; stromata lacking; nonfasciculate; conidiophores pale to very pale olivaceous brown, uniform in color, irregular in width, sparingly septate, branched, not geniculate, straight to variously curved or bent, 2.5-4$\mu$ in width and of indeterminate length; conidia pale to very pale olivaceous, cylindro-obclavate, straight to mildly curved, indistinctly multiseptate, base long obconically truncate, tip obtuse to conic, 3.5-6 x 25-100$\mu$.

HOST: Ficus sp.

TYPE: Batu lima, Sandakan, North Borneo; Ficus sp.; M. Ramos, No. 2202; Nov. 19, 1920.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 392 for differences among the species on Ficus.

**Cercospora snelliana** I. Reichert

Bot. Jahrb. von Engler **56**: 724. 1921

*Cercospora bremeri* Petrak, Sydowia **2**: 312. 1948

HOST: *Morus alba* L., *M. nigra* L.

TYPE: Prope Bahtim apud Kahirahm, Egypt; *Morus alba;* Snell; Nov. 1913. (*bremeri*) Adana, Turkey; *M. nigra;* G. Karel; Oct. 14, 1947.

NOTE: The type shows this plainly to be an Helminthosporium. It has dark colored, thick-walled, cylindric conidia.

**Cercospora urostigmatis** P. Hennings

Hedwigia **41**: 117. 1902

Leaf spots circular to irregular, 2-5 mm. in diameter, dark brown, inclined to be concave on the upper surface; fruiting chiefly hypophyllous; Rhytisma-like stromata, black; fascicles scattered over the stroma, mostly dense; conidiophores subhyaline to pale fuligenous, rarely dark, uniform in color and width, oldest ones septate, not branched, not geniculate, straight to slightly curved, bluntly rounded tip, 4.5-7 x 10-40$\mu$; conidia hyaline, cylindric to spindle-shaped, mostly 1-3 septate, straight to mildly curved, base obconic, tip obtuse, 4-5.5 x 15-35$\mu$.

HOST: Urostigma sp.

TYPE: Mattos Serra da Cantareira, Sao Paulo, Brazil; Urostigma sp.; A. Puttemans, No. 187; April 3, 1901.

DISTRIBUTION: Brazil, Venezuela.

NOTE: Urostigma in Engler and Prantl is given as a subgenus of Ficus. The Hennings species should not be listed as a Cercospora, but apparently as a Didymaria. See key, page 391.

**Cercospora vanieriae** Chupp & Linder

Mycologia 29: 32. 1937

Leaf spots none or indistinct; fruiting effuse, olivaceous, on lower surface 0.5$\mu$ in extent to large part of leaf surface, on upper surface in minute pustules, 0.5-2 mm. in diameter; stromata rarely present; nonfasciculate to dense fascicles; conidiophores pale yellowish olivaceous to olivaceous brown, uniform in color, irregular in width, multiseptate, often constricted at septa, straight, undulate, or tortuous, 0-3 geniculate, branched, bluntly rounded tip, 4-6 x 50-110$\mu$; conidia pale to medium olivaceous, obclavate, straight to mildly curved, 5-11 septate, base long obconically truncate, tip subacute to subobtuse, 3.5-5.5 x 50-100$\mu$.

HOSTS: Vanieria sp., *V. tricuspidata* Hu = *Maclura tricuspidata* Cavr.

TYPE: Sze Nan Hsien, Prov. Kweichow, China; Vanieria sp.; S. Y. Cheo, No. 338; Aug. 27, 1931.

DISTRIBUTION: Known only from the type locality.

**Cercospora musae** Zimmerman

Centralbl. f. Bakt. II. 8: 219. 1902

*Cercospora musae* Massee, Roy. Bot. Gard., Kew Bul. Misc. Inform. 1914: 159. 1914

Leaf spots subcircular to elliptic or linear, most often with a dingy gray center and a fairly wide purple to red border, sometimes uniformly brown or brownish red, 2-50 mm. in length, mostly 4-12 mm.; fruiting amphigenous but much more abundant on the upper surface; stromata subglobular, dark brown to black, 15-35$\mu$ in diameter; fascicles dense; conidiophores pale to very pale olivaceous or olivaceous brown, paler and more narrow toward the tip, septation, geniculation and branching absent or rare, straight to undulate, tip rounded narrowly, 2-3.5 x 5-25$\mu$ or when conidia are persistent appearing much longer; conidia pale to very pale olivaceous, cylindric to obclavato-cylindric, straight to curved or undulate, ends rounded to conic, indistinctly 3-5 or more septate, 2-4 x 10-80$\mu$, rarely as large as 5 x 110$\mu$.

HOSTS: Musa sp., *Musa paradisiaca* var. *sapientum* Kuntze (*M. sapientum* L.), *M. paradisiaca* L.

TYPE: Buitenzorg, Java; *Musa sapientum;* A. Zimmerman.

DISTRIBUTION: Probably almost coextensive with the host. I examined material from Puerto Rico, San Domingo, Trinidad, New South Wales, Honduras, Venezuela, Colombia, Fiji Islands, Formosa, Rhodesia, and several countries of Central America. It also has been reported from Ceylon, China, Uganda, and South Africa.

NOTE: Zimmerman did not designate a type but merely stated that the fungus was abundant in the vicinity of Buitenzorg, Java, on *Musa sapientum.* Leach (Trop. Agr. Trinidad 18: 91. 1941.) reports the perfect stage as *Mycosphaerella musicola.* See also *C. musaecola.*

**Cercospora muscaecola** Sawada

Formosa Agr. Res. Inst. Rept. **85**: 116. 1943

*Cercospora musae liukiuensis* Sawada (Literature unknown)

Leaf spots indistinct or none; fruiting effuse, hypophyllous, dark olivaceous to almost gray or black, in areas ranging from minute to 50 mm. in extent; stromata lacking; nonfasciculate or in compact to diverging fascicles of 2-12 stalks; conidiophores pale to medium dark olivaceous brown, uniform in color and width or slightly attenuated toward the conic tip, 1-7 septate, straight to variously bent, sometimes branched, occasionally geniculate, 4-7 x 25-150$\mu$; conidia pale fuligenous, obclavate to obclavato-cylindric, 1-9 septate, straight to curved, base obconically truncate, tip obtuse, 4-7 x 20-150$\mu$.

HOSTS: *Musa chinensis* Sweet (*M. cavendishii* Lambert), *M. liukiuensis* (?).
TYPE: Taipeh, Taiwan, (Formosa); *Musa cavendishii;* K. Sawada; July 1, 1909.
DISTRIBUTION: Several collections from Formosa.
NOTE: See also *C. musae.* Specimens of *C. musaecola* and *C. musae-liukiuensis* are deposited in the Mycological herbarium of the U. S. Bureau of Plant Industry. I do not know the type of the latter species, but I studied a collection made by Y. Fujikuro, Dec. 18, 1911, on *Musa liukiuensis.*

**Cercospora musarum** Ashby

Bul. Dept. Agr. Jamaica n.s. **2**: 109. 1913

HOSTS: *Musa paradisiaca* L. var. *sapientum* Kuntze.
TYPE: Jamaica; Banana; S. F. Ashby. The exact type was not listed.
NOTE: Ashby later changed the name to *Helminthosporium torulosum* (Sydow) Ashby (Imperial Bur. of Mycol. List **2**: 35. Dec. 31, 1928). It certainly is not a Cercospora.

**Cercospora penicillus** Ellis & Everhart

Jour. Mycol. **4**: 115. 1888

*Cercospora dispersa* Ellis & Ev., Jour. Mycol. **4**: 115. 1888
*Cercospora myricae* Tracy & Earle, Bul. Torrey Bot. Club **23**: 206. 1896

Leaf spots indistinct; fruiting very scanty in slightly darkened irregular effuse patches on lower leaf surface; gray to pale brown spots bearing perithecia may appear on the upper surface of the same leaf, but apparently are not connected with the Cercospora; stromata none to globular, black, 20-50$\mu$ in diameter; nonfasciculate and conidiophores borne on procumbent threads or in fascicles of 2-20 arising from the stroma; conidiophores medium dark brown or olivaceous brown, plainly multiseptate, uniform in width and color, straight, not geniculate, rarely with short narrow branches near the tip resembling slightly Penicillium, minute spore scar at rounded tip, 4-5.5 x 50-150$\mu$; conidia obclavate to cylindro-obclavate, pale olivaceous, straight to mildly curved, indistinctly multiseptate, base long obconic or obconically truncate, tip obtuse to subobtuse, 3-5.5 x 30-125$\mu$.

HOST: *Myrica cerifera* L.
TYPE: Newfield, N. J.; *Myrica cerifera;* J. B. Ellis; June, 1888; (*C. myricae*) Ocean Springs, Miss.; *Myrica cerifera* var. *media;* S. M. Tracy and L. S. Earle; March 7, 1896.
DISTRIBUTION: New Jersey and Mississippi.
NOTE: *C. penicillus* and *C. dispersa* were described on the same page and from

the same place. The type *C. penicillus* has a stroma, while that of *C. dispersa* shows mostly nonfasciculate fruiting; but in all other respects they are the same.

**Myrsinaceae**

A. Conidia hyaline, acicular, 4-4.5 x 120-200$\mu$; conidiophores 5-6 x 40-200$\mu$. *Stylogyne* *C. stylogynis*

AA. Conidia not acicular, subhyaline to pale in color.

B. Conidiophores in compact, dense fascicles, very short, 2-4.5 x 5-25$\mu$; conidia obclavato-cylindric, base subtruncate, 2.5-4.5 x 40-130$\mu$. *Maesa* *C. maesae*

BB. Conidiophores partly nonfasciculate, longer than 25$\mu$; conidia with rounded to conic ends.

C. Leaf spots lacking; fruiting effuse, hypophyllous; conidiophores 4-5 x 30-50$\mu$; conidia 4-4.5 x 70-125$\mu$, 3-8 septate. *Geissanthus* *C. scamba*

CC. Leaf spots distinct; fruiting amphigenous, effuse below and in dense fascicles on upper surface; conidiophores 4-5 x 40-130$\mu$; conidia 3-4.5 x 35-55$\mu$, 2-4 septate. *Rapanea* *C. rapaneae*

**Cercospora maesae** Hansford

Proc. Linnean Soc. London **1942-3**: 57. 1943

Leaf spots circular, 5-10 mm. in diameter, grayish brown, surrounded by a dark brown zone up to 4 mm. in width; fruiting epiphyllous, evident as minute black pustules; stromata subglobular, dark brown, 20-35$\mu$; fascicles dense, compact; conidiophores in mass medium dark brown, singly very pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not geniculate, not branched, straight to mildly curved, tip narrowly subtruncate, 2-4.5 x 5-25$\mu$; conidia subhyaline to pale olivaceous, obclavato-cylindric, occasionally distinctly attenuated, often strongly curved, indistinctly multiseptate, base subtruncate to long obconically truncate, tip conic, 2.5-4.5 x 40-130$\mu$.

HOST: *Maesa lanceolata* Forsk.

TYPE: Kampala, Uganda; *Maesa lanceolata;* C. G. Hansford, No. 1306; July, 1930.

DISTRIBUTION: Known only from the type locality. See key above.

**Cercospora rapaneae** Sydow

Ann. Mycol. **37**: 432. 1939

Leaf spots distinct, suborbicular, 2-4 mm. in diameter, reddish brown, sometimes with a raised line border, occasionally zonate; fruiting amphigenous, on upper surface with prominent stromata, 70-150$\mu$ in diameter, on lower surface mostly effuse, dark olivaceous; nonfasciculate below, very dense fascicles above; conidiophores dull brown or olivaceous brown, paler and more narrow toward the tip, 2-8 septate, not branched and almost straight when fasciculate, branched and tortuous when nonfasciculate, not geniculate, bluntly rounded or conic tips, 4-5 x 40-130$\mu$; conidia subhyaline, cylindro-obclavate, 2-4 septate, straight to variously curved, ends rounded obtusely, 3-4.5 x 35-55$\mu$.

HOST: Myrsine (*Rapanea jelskii* [Zhr.] Mez.).

TYPE: Hacienda San Antonio, near Banos, Prov. Tungurahua, Ecuador; *Rapanea jelskii;* H. Sydow, No. 682; Jan. 6, 1938.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen material of this species. See key, page 404.

**Cercospora scamba** Sydow
Ann. Mycol. 37: 432. 1939

Leaf spots none or indistinct yellowing on the upper surface; fruiting hypophyllous, effuse, dark olivaceous brown; stromata lacking; nonfasciculate to fasciculate; conidiophores pale olivaceous brown, uniform in color, irregular in width, 0-4 septate, branched, not geniculate, variously curved or tortuous, intertwined, conic tip, 4-5 x 30-50$\mu$ or much longer; conidia very pale olivaceous, tip may be hyaline, cylindric or narrowly linear, often strongly curved, 3-8 septate, ends rounded to conic, 4-4.5 x 70-125$\mu$.

HOST: *Geissanthus serrulatus* (Willd.) Mez.
TYPE: Pichincha, near Quito, Ecuador; *Geissanthus serrulatus;* H. Sydow, No. 162, Sept. 29, 1937.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen material of this species. See key, page 404.

**Cercospora stylogynis** Viégas
Bragantia 7: 113. 1947

Leaf spots amphigenous, scattered, 1-10 mm. in diameter, brown margin, gray center, slightly depressed, irregular in outline; fruiting amphigenous; stromata globose, brown, 20-120$\mu$; fascicles dense, dark brown; conidiophores brown, cylindric, sparingly septate, truncate tip, 5-6 x 40-200$\mu$, often long on lower leaf surface, and short on upper surface; conidia acicular, hyaline, straight to curved, indistinctly multiseptate, base truncate, tip acute, 4-4.5 x 120-200$\mu$.

HOST: *Stylogyne ambigua* (Mart.) Mez.
TYPE: Campinas, S. Paulo, Brazil; *Stylogyne ambigua;* A. P. Viégas; July 2, 1944.
DISTRIBUTION: Sao Paulo, Brazil.
NOTE: I have not seen the species.

**Cercospora campinensis** Chupp & Viégas
Bol. da Soc. Brasil. de Agron. 8: 14. 1945

Leaf spots subcircular to irregular, 1-4 mm. in diameter, gray center, dark reddish line margin, on lower surface uniformly red to purplish; fruiting hypophyllous; stromata slight, dark brown; fascicles few stalks to dense, divergent; conidiophores medium dark olivaceous, uniform in color and width, sparingly septate, not branched, variously curved or bent, upper half occasionally multigeniculate, conic tip, 3-4 x 40-200$\mu$; conidia subhyaline to very pale olivaceous, obclavate to obclavato-cylindric, straight to mildly curved, 1-5 septate, base long obconically truncate, tip conic, 3-5.5 x 25-90$\mu$.

HOST: Myrtaceae.
TYPE: Near Mogy-Mirim, Sao Paulo, Brazil; Myrtaceae; A. P. Viégas and A. S. Costa, No. 3727; Febr. 27, 1941.
DISTRIBUTION: Known only from the type locality.

**Cercospora epicoccoides** Cooke & Massee
Grevillea **19**: 91. 1891

Leaf spots indistinct dark reddish, irregular areas on the upper leaf surface; fruiting epiphyllous, visible as black pustules; stromata large, black, globular; fascicles dense to very dense, divergent; conidiophores medium to dark brown, uniform in color, irregular in width, sparingly septate, not branched, not geniculate, straight to variously curved, bluntly rounded tip, 3-5 x 5-20$\mu$ or rarely slightly longer; conidia medium dark olivaceous brown, cylindric to spindle shaped, 2-5 septate, base sharply obconic to obconically truncate, tip conic to obtuse, straight to mildly curved, 3.5-5 x 30-60$\mu$.

HOST: Eucalyptus sp., *E. globulus* Lab.

TYPE: Victoria, Australia; Eucalyptus sp.; J. M. Martin, No. 600.

DISTRIBUTION: Known only from the type localty. The species has been reported from various countries, but all the specimens examined proved to be *C. eucalypti* (Marchionatto, Physis **15**: 133. 1939, Formosa Agr. Rés. Inst. Rept. **85**: 104. 1943, and others).

NOTE: See also *C. eucalypti* for differences between the two species on this host genus. The dark colored fruiting and the very dense fascicles easily distinguish this species.

**Cercospora eucalypti** Cooke and Massee
Grevillea **18**: 7. 1889

Leaf spots subcircular to irregular, 2-8 mm. in diameter, pale brown to almost gray, occasionally with a wide purple border; fruiting indistinctly amphigenous; stromata either lacking on the lower leaf surface or subglobular, brown, or 15-30$\mu$ in diameter on upper surface; nonfasciculate on lower leaf surface to dense, compact fascicles on upper surface; conidiophores subhyaline to very pale yellowish olivaceous, uniform in color and width, sparingly septate, rarely once geniculate, curved to tortuous, branched slightly, bluntly rounded tip, 2-3.5 x 10-30$\mu$ or longer; conidia subhyaline or very pale olivaceous, narrowly cylindric or slightly attenuated, straight to mildly curved, indistinctly 1-3 septate, base subtruncate to long obconically truncate, tip conic, 2-3.5 x 20-65$\mu$.

HOSTS: Eucalyptus sp., *E. globulus* Lab., *E. robusta* Sm., *E. rostrata* Schl., *E. ficifolia*.

TYPE: Victoria, Australia; Eucalyptus sp.; J. M. Martin, No. 436; May, 1884.

DISTRIBUTION: Australia, Formosa, Minas Geraes (Brazil), Argentine, Peru, Belgian Congo, India.

NOTE: Both the Formosa and Brazil collections are on *E. globulus*. See also *C. epicoccoides* for differences between the two species on this host genus. Both the Formosa and Peru material had been labeled, *C. epicoccoides*. The nonfasciculate conidiophores and almost hyaline conidia make *C. eucalypti* easy to identify.

**Cercospora eugeniae** (Rangel) n. comb.

*Cercosporina eugeniae* Rangel, Arch. Mus. Nacion. do Rio de Janeiro **18**: 163. 1916

*Cercosporina sphaerellae eugeniae* (Rangel) Sacc., Syll. Fung. **25**: 912. 1931

*Cercospora eugeniae* Sawada, Formosa Agr. Res. Inst. Rept. **85**: 104. 1943

Leaf spots circular to irregular, 0.5-4 mm. in diameter or rarely much larger,

either white with a purple border or uniformly brown, often dehiscing leaving irregular ragged holes; fruiting amphigenous, chiefly epiphyllous; stromata dark brown, globular and 20-60$\mu$ in diameter or elongate and up to 100$\mu$ in length; fascicles dense, spreading; conidiophores subhyaline to very pale olivaceous brown, paler and more narrow toward the tip or irregular in width, sparingly septate, not branched, not geniculate, straight to curved or tortuous, bluntly rounded tip, 3-5 x 10-40$\mu$, rarely 60$\mu$; conidia subhyaline to very pale olivaceous, obclavato-cylindric, the longest ones may be distinctly obclavate, mostly 3-5 septate, base obconically truncate, tip obtuse, 2-4 x 20-85$\mu$.

HOSTS: *Eugenia javanica* Lam., *E. monticola* DC. (*E. auxillaris* [Sw.] Willd.), *E. uniflora* L., Eugenia sp.

TYPES: Paqueta prope Rio de Janeiro, Brazil; *Eugenia uniflora;* E. Rangel; (*C. eugeniae* Sawada) Tainan, Taiwan (Formosa); *Eugenia javanica;* K. Sawada; May 10, 1931.

DISTRIBUTION: Brazil, Bermuda, Formosa.

NOTE: Saccardo apparently changed the name because Rangel had stated that this species was the conidial stage of *Mycosphaerella eugeniae* Rehm. I did not see the Sawada collection, and his description is too meager to be sure that it is a synonym.

**Cercospora myrticola** Spegazzini

Anal. Soc. Sci. Argentine **16**: 167. 1883

*Cercospora myrti* Eriksson, Bïd Till. Kann. om vara odlade Vaxters s jukdomar, Stockholm p. 79. No. 8. 1885; Revue Mycol. **8**: 60. 1886

*Cercospora myrti* var. *epiphylla* Sacc. (Myco. Ital. 1586)

*Cercospora saccardiana* Scalia, Atti d. Accad. Gioenia Sci. Nat. Catania IV. **14**: 35. 1901

*Cercospora amadelpha* Sydow, Ann. Mycol. **30**: 89. 1932

Leaf spots circular to angular, 3-10 mm. in diameter, yellowish tan to rusty brown, sometimes with a darker margin; fruiting epiphyllous; stromata dark brown to black, globular, 15-40$\mu$, or rarely as large as 75$\mu$; fascicles dense, compact; conidiophores subhyaline to pale fuligenous, sometimes slightly attenuated and the tip a shade paler than the base, sparingly septate, not branched, not geniculate, a small spore scar at the rounded tip, mostly straight, 2-3.5 x 10-40$\mu$, or even as large as 5 x 50$\mu$; conidia narrowly linear, rarely with enough attenuation to be obclavate, subhyaline to pale olivaceous, straight to moderately curved, septa indistinct, base subtruncate to obconically truncate, tip subacute to subobtuse, 2-3.5 x 20-85$\mu$, rarely as large as 4.5 x 100$\mu$.

HOSTS: Myrtaceae, *Myrtus communis* L. (*M. Italica* Mill.), *Blepharocalyx* (*Myrtus*) *divaricatus* (Berg.) Ndz.

TYPES: Caáguazú, Paraguay; Myrtaceae; B. Balansa, Nos. 3472 and 3473; Jan., 1882; (*C. myrti*) Stockholm, Sweden; *Myrtus communis* var. *laurifolia;* J. Eriksson; July 20, 1884; (var. *epiphylla*) Horto Botanico, Padova, Italy; *Myrtus communis* var. *latifolia;* G. B. Traverso; April, 1904; (*C. saccardiana*) Catania, Sicily; *Myrtus communis;* G. Scalia, No. 789; Febr., 1901; (*C. amadelpha*) Panguipulli, Prov. Valdivia, Chile; *Blephacalyx divaricatus;* H. Sydow, No. 1769; April, 1924.

DISTRIBUTION: Brazil, Chile, Paraguay, South Africa, England, Greece, Italy, Sicily, Palestine, Montenegro, Austria, Germany, Sweden, Russia.

NOTE: The narrowly linear conidia with subtruncate base and the short delicate conidiophores in densely compact fascicles are taken as a basis in combining all these species. See also *C. usteriana* and *C. campinensis* for differences among the species on Myrtaceae.

**Cercospora psidii** Rangel

Bol. Agr. Sao Paulo, Serie 16A, 4: 324. 1915

Leaf spots angular to irregular, 1-4 mm. in diameter, brown, purple border, occasionally with a white speck in the center; fruiting epiphyllous; stromata globular, dark brown, 30-50$\mu$; fascicles very dense, compact; conidiophores in mass fairly dark, singly very pale olivaceous brown, paler and more narrow toward the tip, not septate, not branched, not geniculate, slightly undulate, tip conic to narrowly rounded, 2-3 x 5-30$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate, straight to mildly curved, 3-7 septate, base rounded to obconic, tip subobtuse, 2-3.5 x 20-80$\mu$.

HOST: *Psidium araca* Raddi.

TYPE: S. S. Francisco, near Niteroy, Brazil; *Psidium araca;* E. Rangel, No. 715; May, 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. sawadae* for differences between the species on Psidium.

**Cercospora sawadae** Yamamoto

Jour. Soc. Trop. Agr. Formosa **6**: 607. 1934

*Cercospora psidii* Sawada, Agr. Exp. Sta., Govern. Formosa. Bul. **2**: 161. 1922

Leaf spots none or indistinct; fruiting effuse, hypophyllous, causing irregular dark patches on the lower leaf surface; stromata lacking; nonfasciculate; conidiophores arising as single branches from procumbent threads, subhyaline to very pale olivaceous brown, uniform in color and width, sparingly septate, rarely geniculate, straight to slightly curved, tip conic, 2-4 x 10-50$\mu$ or sometimes much longer; conidia subhyaline to very pale olivaceous, obclavato-cylindric, occasionally catenulate, 3-5 septate, base rounded to obconic, tip obtuse, 2.5-5 x 25-90$\mu$.

HOST: *Psidium guajava* L.

TYPE: Taihoku, Formosa; *Psidium guajava;* W. Yamamoto; Febr. 13, 1934. The exact type of Sawada's is not given.

DISTRIBUTION: Formosa, Minas Geraes (Brazil).

NOTE: See also *C. psidii* Rangel for differences between the species on this host type.

**Cercospora usteriana** Spegazzini

Rev. d. Mus. d. la Plata **15**: 46. 1908

Leaf spots indistinct or none, slight darkening of the pubescent, lower leaf surface; fruiting hypophyllous; stromata, when present subglobular, dark brown, 30-100$\mu$ in diameter; nonfasciculate on leaf hairs or in very dense compact fascicles from the stromata; conidiophores in mass dark brown, singly pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, branched only when nonfasciculate, not geniculate, straight to undulate, tip subtruncate to rounded, 3-4.5 x 10-50$\mu$; conidia very pale olivaceous, cylindric, straight to strongly curved, mostly 3-septate, base subtruncate to long obconically truncate, tip obtuse, 4-6.5 x 15-60$\mu$. (Spegazzini says 30-100$\mu$ and conidiophores 40-80$\mu$).

HOST: Myrtaceae.

TYPE: Horto Botanico, Sao Paulo, Brazil; Myrtaceae; A. Usteri, No. 145; Sept., 1905 (Speg. 954).
DISTRIBUTION: Known only from the type locality.
NOTE: This species has been reported also on Psidium, but identity is not certain. See also *C. myrticola* and *C. campinensis* for differences among the species on Myrtaceae.

**Nyctaginaceae**

A. Condia colored, not acicular; fruiting effuse.
  B. Conidia fairly dark in color, cylindric, 4-6.5 x 15-60$\mu$; conidiophores nonfasciculate branches, 4-6 x 15-90$\mu$.
    SALPIANTHUS *C. Boldoae*
  BB. Conidia pale, obclavate, 3-4 x 50-125$\mu$; conidiophores fasciculate, not branched, 3-5 x 10-40$\mu$.
    OXYBAPHUS *C. Oxybaphi*
AA. Conidia hyaline, acicular; fruiting not effuse; conidiophores slightly branched.
  B. Conidiophores 4.5-6 x 50-125$\mu$, pale to medium in color, uniform in color and width; conidia 3-5 x 40-140$\mu$.
    MIRABILIS *C. Mirabilis*
  BB. Conidiophores 3.5-5.5 x 20-130$\mu$, medium dark, paler and more narrow toward the tip; conidia 2-4.5 x 20-120$\mu$.
    C. Fruiting epiphyllous, mealy in appearance, sometimes nonfasciculate.
      BOERHAAVIA *C. furfurella*
    CC. Fruiting amphigenous, not mealy in appearance, fasciculate.
      SALPIANTHUS *C. Salpianthi*
(The last three species are separated only by minor differences and may finally prove identical.)

**Cercospora boldoae** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 38. 1942

Leaf spots indistinct or none; fruiting dark olivaceous, effuse, hypophyllous, small areas to much of the leaf surface; stromata lacking; mostly nonfasciculate; conidiophores very pale to medium olivaceous brown, uniform in color, irregular in width, plainly multiseptate, constricted at septa, branched, slightly geniculate, straight to tortuous, conic tip, 4-6 x 15-90$\mu$; conidia concolorus, cylindric, 1-5 septate, straight to mildly curved, ends rounded to conic, frequently catenulate, 4-6.5 x 15-65$\mu$.
HOST: *Cryptocarpus globosus* H.B.&K. (*Salpianthus purpurascens* [Cav.] H.&A.) (Boldoa).
TYPE: Rancho Grande, Rd Maracaya, Ocumare, Aragua, Venezuela; *Salpianthus purpurascens;* H. H. Whetzel, No. 3158; Mar. 24, 1939.
DISTRIBUTION: Known only from the type locality.
NOTE: See *C. salpianthi* and key above for differences.

**Cercospora furfurella** Spegazzini
Anal. Soc. Cient. Argentina 26: 72. 1888

*Cercospora boehraaviae* Canonaco, Boll. Studi Inform. R. Giardino Coloniale Palermo **14**: 20 (reprint). 1936
Leaf spots none to dark purple or almost black with gray center, 0.5-4 mm. in

diameter; fruiting amphigenous but chiefly epiphyllous, when abundant causing a mealy or scurfy layer, hence the specific name; stromata small, brown, sometimes lacking; some fascicles dense; conidiophores olivaceous brown, medium dark below, pale above, longest ones attenuated, septate and 1-3 geniculate, tip subtruncate with medium sized spore scar, mildly branched, 4-5.5 x 20-60$\mu$, rarely 115$\mu$ long; conidia acicular to obclavate, hyaline, straight to curved, septa indistinct, truncate base, subacute to subobtuse tip, 2-4.5 x 30-120$\mu$.

HOSTS: *Boerhavia discolor* HBK., *B. repens* L. (*B. coccinea* Mell.), *B. scandens* L. (*Commicarpus scandens* [L.] Standley).
TYPES: Guarapi, Paraguay; *Boerhaavia discolor;* B. Balansa, No. 4105 (Speg. No. 924); Dec. 1883; (*C. boehraaviae*) Cheren, Erythraea; *B. repens;* 1935.
DISTRIBUTION: West Indies and some parts of South America, possibly also in Central America. Erythraea.
NOTE: Canonaco states that he is making a new species because Spegazzini says *C. furfurella* has no definite spots. Furthermore the fruiting does not have the same measurements as his own collection. The type shows that both statements are incorrect. Canonaco misspelled the genus name of the host. See key, page 410.

**Cercospora mirabilis** Tharp

Mycologia **9**: 111. 1917

Leaf spots circular, 1-5 mm. in diameter, pale brown to tan with dark brown to almost black border; fruiting amphigenous; stromata lacking or small; fascicles mostly 4-10 stalks; conidiophores pale to medium brown, fairly uniform in color and width, multiseptate, sometimes with short branches, straight to multigeniculate, medium spore scar at rounded to subtruncate tip, 4.5-6 x 50-125$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute to subacute, 3-5 x 40-140$\mu$.

HOST: *Mirabilis jalapa* L.
TYPE: Austin, Texas; *Mirabilis jalapa;* B. C. Tharp; Oct. 30, 1915.
DISTRIBUTION: Texas and France.
NOTE: See key, page 410.

**Cercospora oxybaphi** Ellis & Halsted

Jour. Mycol. **4**: 8. 1888

Leaf spots indistinct, slight darkening on both leaf surfaces 2-5 mm. in extent; fruiting amphigenous, scantily effuse, sooty; stromata none to small, dark; most fascicles dense; conidiophores medium dark fuligenous, 0-3 septate, uniform in color, irregular in width, not branched, sometimes curved or undulate, rarely geniculate, rounded tip, spore scars indistinct, 3-5 x 10-40$\mu$; conidia narrowly obclavate, subhyaline to pale olivaceous, straight to curved, septa indistinct, base long obconic, tip subacute, 3-4 x 50-125$\mu$.

HOSTS: *Oxybaphus nyctagineus* (Michx.) Sweet (*Alliona nyctaginea* Michx.), *O. hirsutus* Sweet, *O. angustifolius* Sweet, Oxybaphus sp.
TYPE: Iowa City, Iowa; *Oxybaphus nyctagineus;* A. S. Hitchcock; June, 1887.
DISTRIBUTION: Iowa, Kansas, Illinois, Wisconsin, and New Jersey.
NOTE: I did not find the type of this species. See key, page 410.

**Cercospora salpianthi** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 55. 1942

Leaf spots circular to angular, 1-4 mm. in diameter, tan to gray, with a purplish brown border; fruiting amphigenous; stromata a few dark brown cells; fascicles 2-20 divergent stalks; conidiophores medium dark brown, paler and more narrow toward the tip, multiseptate, rarely branched, 0-5 geniculate, straight to tortuous, medium spore scar at the subtruncate tip, 3.5-5.5 x 20-130$\mu$; conidia hyaline, acicular, mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4.5 x 20-120$\mu$.

HOST: *Cryptocarpus globosus* H.B.&K. (*Salpianthus purpurascens* [Cav.] H.&A.).
TYPE: Maracay, Edo. Aragua, Venezuela; *Salpianthus purpurascens;* M. F. Barrus, No. 3509; Oct. 16, 1939; (Cotype) H da Cura Edo. Carabobo, Venezuela; A. S. Muller, No. 3475; Sept. 2, 1939.
DISTRIBUTION: Known only from the type localities.
NOTE: See also *C. boldoae* and key, page 409 for differences between the two species.

**Cercospora californiensis** sp. nov.

Maculae orbiculares, 3-6 mm. diam., pallide brunneae; caespituli epiphylli, fuliginei, tenuiter effusi; stromata minuta; conidiophora laxe fasciculata, pallide brunnea, sursum pallidiora, 1-5 septata, fere recta, ad apicem subtruncata, 4-6.5 x 25-90$\mu$; conidia hyalina, anguste obclavata, fere recta, spurie multiseptata, ad basim truncata, ad apicem subacuta, 2.5-4 x 20-100$\mu$.

Leaf spots circular, 3-6 mm. in diameter, cupped upward or downward, pale brown to tan, immarginate; sparse sooty fruiting epiphyllous; stromata a few large brown cells in the stomatal openings; fascicles 2-12 stalks; conidiophores pale to medium brown, paler tip, 1-5 septate, uniform in width, straight or occasionally once geniculate, large spore scar at subtruncate tip, 4-6.5 x 25-90$\mu$; conidia hyaline, acicular or rarely obclavate, nearly straight, indistinctly multiseptate, truncate base, subacute tip, 2.5-4 x 20-100$\mu$.

HOST: Nymphaea sp.
TYPE: Los Angeles, Cal.; Nymphaea sp.; O. A. Plunkett; Oct. 1, 1928.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. nymphaeacea* for differences between the species on this host genus.

**Cercospora nymphaeacea** Cooke & Ellis

Grevillea **6**: 89. 1878

*Cercospora exotica* Ellis & Ev., Proc. Acad. Nat. Sci. Phila. **45**: 463. 1893
*Cercospora nelumbonis* Tharp, Mycologia **9**: 111. 1917

Leaf spots circular, 0.5-8 mm. in diameter, often cupped upward or downward, pale brown to tan, sometimes with dark to black margin; fruiting dark effuse in center of spot, sometimes greenish like a Penicillium, epiphyllous; stromata small, globular, dark, 15-40$\mu$ in diameter, or lacking; nonfasciculate to dense fascicles; conidiophores pale olivaceous brown, paler and more narrow toward the tip, septa not visible, rarely once geniculate, not branched, small spore scar at subtruncate or rounded tip, 2.5-4 x 10-50$\mu$, appearing much longer when persistent conidia are present; conidia narrowly obclavate to linear, hyaline to sub-

hyaline, in mass slightly colored, straight to variously curved, septa indistinct, subtruncate to obconically truncate base, subacute tip, 2-3.5 x 25-125$\mu$.

HOSTS: *Nymphaea odorata* Ait., *Nelumbium luteum* Willd., *N. speciosum* Willd., *Nymphaea* sp., *Nuphar advena* Ait., *Nuphar japonica* DC.

TYPES: Newfield, New Jersey; *Nymphaea odorata;* J. B. Ellis, No. 2684; (*C. exotica*) Chicago, Ill.; cultivated water lily; E. F. Smith; Oct., 1892; ( *C. nelumbonis*) Palestine, Texas; *Nelumbo lutea;* Lewis & Tharp, No. 184; Oct. 31, 1914.

DISTRIBUTION: Sparingly present from Texas to Maine and from Long Island to California; also in San Domingo, Jamaica, Brazil, Japan, and India.

NOTE: Atkinson (Jour. Elisha Mitchell Sci. Soc. 8: 54. 1892) wrote this *C. Nymphaeacea* E.+E. and a few workers have followed him in this mistake. See also *C. californiensis* for differences between the two species on Nymphaea. Hori (Ann. Phytopath. Soc. Japan. 1: 66. 1921) reported *Cercosporina Nelumbi* on 3 named species of Nelumbium: *N. nelumbo* Karst., *N. speciosum* Willd., *N. nuciferum* Gaertn. His species was never published because the specimens were lost (letter of Nov. 31, 1931 addressed to me). Specimens I received apparently were identical with *C. Nymphaeacea.*

**Cercospora choristigmatis** H. & P. Sydow

Mem. Herb. Boissier 8 (4): 2. 1900

also Anal. Mus. Nac. Hist. Nat. Buenos Aires 24: 179. 1913

Leaf spots indistinct brownish areas on the upper leaf surface; fruiting scantily effuse on the corresponding lower surface, dingy red to almost blood red in color, 1-5 mm. in extent, rarely dark pustules on the upper surface; stromata pale to dark brown, filling the stomatal openings; fascicles usually dense; conidiophores pale olivaceous brown, uniform in color, uniform in width unless constricted at the septa, 1-3 septate, not branched, not geniculate, longer ones curved or undulate, tip rounded, 4-5.5 x 10-65$\mu$; conidia subhyaline to pale olivaceous, cylindro-obclavate, straight to mildly curved, indistinctly multiseptate, base long obconically truncate, tip subobtuse, 3.5-5 x 25-85$\mu$.

HOST: *Choristigma stuckertianum* Kurtz (Schopfia).

TYPE: Cordoba, Argentine; *Choristigma stuckertianum;* T. Stuckert, No. 6749; April, 1899.

DISTRIBUTION: Known only from the type locality.

**Cercospora adusta** Heald & Wolf

Mycologia 3: 14. 1911

Leaf spots large, often 10-20 mm. in diameter, circular, center brown with a wide pale brown margin, center on both leaf surfaces may be blackened by the fruiting of the fungus; stromata slight to rather prominent; fascicles mostly not dense; conidiophores pale olivaceous brown, multiseptate, not branched, sparingly geniculate, large spore scar at subtruncate tip, 4-5.5 x 25-150$\mu$; conidia hyaline, acicular, variously curved or undulate, base truncate, tip long drawn out, acute, 1.5-3.5 x 50-350$\mu$.

HOSTS: *Ligustrum ovalifolium* Hassk. (*L. japonicum* Hort.) (*L. californicum* Hort.)

TYPE: Falfurrias, Texas; *Ligustrum ovalifolium;* Heald and Wolf, No. 2471; Sept. 14, 1909.

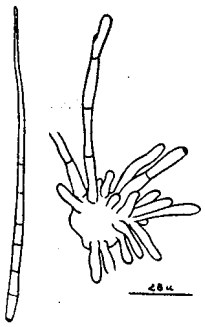


Fig. 149
*C. adusta*

DISTRIBUTION: Southern tier of states from Florida to Texas.
NOTE: This species differs from *C. ligustri* in having large leaf spots, brown instead of gray, much longer conidia and conidiophores, and with distinctly acicular conidia instead of cylindric ones. The two are sometimes found in the same mount. See also *C. ligustricola.*

**Cercospora amurensis** Zilling

Acta. Inst. Acad. Sci. U.R.S.S. II (Pl. Crypt.) 3: 696. 1936

Leaf spots subcircular to angular, 2.5-3 mm. in diameter, yellowish brown, margin brown; fruiting hypophyllous, minute dark pustules; stromata present; fasciculate; conidiophores dark olivaceous, 0-1 septate, straight or nearly so, not branched, not geniculate, 4.5-6 x 25-60$\mu$; conidia pale olivaceous, cylindric or slightly attenuated, 3-4 septate, 4-5.5 x 35-70$\mu$.
HOST: *Syringa amurensis* Rupr.
TYPE: Asia orientalis, Distr. Vladivostok; *Syringa amurensis;* M. K. Zilling; July 14, 1928.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen this species. See key below for differences among the species on Syringa.

**Syringa**

A. Conidia plainly colored, cylindric, 4-5.5 x 35-70$\mu$; conidiophores dark in color, 4.5-6 x 25-60$\mu$. *C. amurensis*
AA. Conidia hyaline or very faintly colored, 2-3.5 x 25-120$\mu$; conidiophores pale to medium in color, 4-6 x 30-150$\mu$.
  B. Conidia narrowly linear or sometimes slightly attenuated, hyaline to very faintly colored. *C. lilacis*
  BB. Conidia acicular to obclavate, hyaline. *C. macromaculans*

**Cercospora chionanthi** Ellis & Everhart

Field Col. Mus. Bot. ser. 1: 94. 1896

Leaf spots large, dark brown to almost black, circular to angular; fruiting epiphyllous, not effuse; on blackened fruit, fruiting effuse over part or all of the surface, affected fruit spotted and shriveled; stromata black, globular to irregular, 20-70$\mu$ in diameter; fascicles dense; conidiophores medium dark fuligenous

brown, multiseptate, not or mildly geniculate, upper half wavy, not branched, small spore scar at rounded or sometimes conic tip, 3.5-5 x 20-100$\mu$ (rarely longer); conidia pale olivaceous, obclavate to cylindro-obclavate, straight to mildly curved, 1-5 septate, base obconic to obconically truncate, tip mostly obtuse, 4-5 x 20-65$\mu$.

HOST: *Chionanthus virginica* L.

TYPE: Short Creek, Fayette Co., W. Virginia; *Chionanthus virginica;* L. W. Nuttall, No. 1852; Sept. 12, 1895.

DISTRIBUTION: Collected in West Virginia and New Jersey.

NOTE: See also following species.

Cercospora **chionanthi-retusi** Togashi & Katsuki

Sci. Repts. Yokohama Nat. Univ. Sect. II. 1: 1. 1952

Leaf spots angular, vein-limited, 1-6 mm. in diameter, on upper surface grayish brown, and on the lower very pale brown, often confluent; fruiting amphigenous, mostly epiphyllous, abundant; stromata dark brown to black, globose, 25-60$\mu$ in diameter; fascicles dense; conidiophores pale fuligenous, not geniculate, not branched, not septate, straight to slightly sinuous, 2.5-3 x 15-30$\mu$; conidia hyaline, cylindric to cylindro-obclavate, straight to mildly curved, base obconic, tip acute, 2-6 septate, not constricted at the septa, 2.5-3 x 30-50$\mu$.

HOST: *Chionanthus retusus* Lindl. & Paxt.

TYPE: Fukuoka (city), Pref. Fukuoka, Japan; *Chionanthus retusus;* S. Katsuki; Oct. 16, 1951.

DISTRIBUTION: Japan.

NOTE: See also *C. chionanthi.*

**Cercospora cladosporioides** Saccardo

Michelia 2: 556. 1882

Leaf spots none or indistinct; fruiting effuse, hypophyllous, olivaceous brown, similarly effuse on fruit but appearing dark to ferrugineous; stromata very large, irregular in shape, olivaceous to almost black; fascicles very dense; conidiophores pale olivaceous, uniform in color and width, sparingly septate, rarely branched or geniculate, straight to curved or tortuous, tip conic to obtuse, 3-5 x 20-60$\mu$ (Saccardo says 200-300$\mu$); conidia subhyaline to very pale olivaceous, cylindric, straight to mildly undulate, 1-5 septate, ends rounded bluntly or base subtruncate, 4-6 x 25-65$\mu$.

HOST: *Oleo europaea* L.

TYPE: Euganeis, north Italy; *Oleo europaea; P.* Saccardo; autumn.

DISTRIBUTION: Italy, Algeria, California (Phytopath. 34: 257. 1944) and possibly China.

NOTE: Atkinson lists (Herb. No. 1173) *C. cladosporioides* on Benjoin. This, however, does not appear the same and may finally prove to be a new species. In North American Fungi, E.+E. No. 2472, *C. cladosporioides* is listed on *Prunus laurocerasus.* Mounts made of this showed it to be some superficial fungus, which was not like a Cercospora, and which disappeared when the leaf was cooked in a KOH solution. Ho (Lignan Agr. Jour. 2: 50.) describes a Cercospora on olive and which has large stromata, dense fascicles, short conidiophores, and cylindric conidia, 3.5-5 x 60-100$\mu$. This may be the same species.

**Cercospora forestierae** West

Mycologia **37**: 76. 1945

Leaf spots subcircular to irregular in shape, 0.5-10 mm. in diameter or coalescing into large areas, at first dark reddish brown, the center changing to tan or gray in the older spots; fruiting amphigenous but chiefly hypophyllous, under the hand lens showing as numerous closely aggregated minute pustules; stromata brown, subglobular, filling the stomatal openings or as large as 50$\mu$ in diameter; fascicles dense, compact to divergent; conidiophores pale olivaceous to medium brown, slightly paler and more narrow toward the tip, curved to tortuous, 0-3 geniculate, not branched, conic tip, 3-6 x 15-80$\mu$ or even as long as 120$\mu$; conidia subhyaline to pale olivaceous brown, obclavate, shortest ones cylindric, straight to mildly curved, multiseptate, bluntly rounded ends, 3-6 x 25-110$\mu$.

HOSTS: *Forestiera acuminata* (Michx.) Poir., Forestiera sp.

TYPE: Along Suwanee River near Hart Springs, Florida; *Forestiera acuminata;* Erdman West, No. 2652; Oct. 1, 1943.

DISTRIBUTION: Texas, Florida.

NOTE: The Texas collection was not mature, so that the conidiophores were shorter and paler than those of the Florida collection.

**Cercospora fraxinea** Ellis & Everhart

Jour. Mycol. **4**: 4. 1888

TYPE: Manhattan, Kansas; W. T. Swingle, No. 954; July 1887.

NOTE: The host at first was mistakenly reported as Fraxinus. It later was found to be Asclepiadora, and the fungus, *Cercospora asclepiadorae* E. & K. (Jour. Mycol. **4**: 83. 1888).

**Cercospora fraxini** Ellis & Kellerman

Jour. Mycol. **1**: 2. 1885

HOST: Fraxinus sp.

TYPE: Manhattan, Kansas; Fraxinus sp.; W. A. Kellerman; Sept. 1884.

NOTE: This same fungus has been described under the name, *Cylindrosporium fraxini* E.+E. (Syll. Fung. **10**: 499. 1892). It is almost if not quite devoid of color.

**Cercospora fraxini** (DeCandolle) Saccardo

Syll. Fungorum **4**: 471. 1886

*C. fraxini* f. *microspora* Fautrey, Rev. Mycol. **13**: 82. 1891

*C. fraxini* f. *longispora* Roumeguere, Rev. Mycol. **13**: 82. 1891

NOTE: This fungus was first described by DeCandolle (Flora Fr. VI. 163. 1815) on *Fraxinus excelsior* L. as *Asteroma fraxini.* I did not see the type of this fungus, but a collection by de Thuemen had marked on the packet "=*Venturia fraxini.*" The fungus evidently is a Fusicladium. Var. *longispora* (Roum. F. exs. prec. Gallici No. 5692) and Var. *microspora* (No. 5691) apparently are the same fungus and are not species of Cercospora.

**Cercospora fraxinites** Ellis & Everhart

Jour. Mycol. **3**: 20. 1887

Leaf spots subcircular to irregular, 3-7 mm. in extent, on upper surface dull grayish brown to reddish brown, usually with a slightly darker margin, on lower

surface rust colored blotches without a distinct border; fruiting epiphyllous, visible as numerous minute black pustules; stromata globular to elongate, black or dark fuligenous, 20-60$\mu$ in diameter; fascicles very dense; conidiophores subhyaline to very pale fuligenous, delicate, wavy, septation and branching not visible, rarely once mildly geniculate, sometimes with minute spore scar at rounded tip, 1.5-3 x 8-30$\mu$; conidia narrowly linear, sometimes mildly attenuated, straight or curved, subhyaline, in mass faintly colored, long obconic base, tip subacute, septa indistinct, 1.5-3 x 20-60$\mu$.

HOSTS: Fraxinus sp., *F. lanceolata* Borkh. (*F. pennsylvanica* var. *lanceolata* Sarg.) (*F. viridus* Michx.)

TYPE: Bohemia Pl. W. La.; Fraxinus sp.; A. B. Langlois, No. 809; Dec. 11, 1896.

DISTRIBUTION: Gulf States.

NOTE: The subhyaline, narrowly linear (cylindric) conidia separate this species from the others on Fraxinus.

**Cercospora jasminicola** Muller & Chupp

Arch. Inst. Biol. Veg. Rio de Janeiro **3**: 93. 1936

*Cercospora odoratissimi* Sawada, Formosa Agr. Res. Inst. Rept. **85**: 110. 1943

*Cercospora jasmini* Sawada, Taihoku Soc. Agr. & Forestry, Jour. **7**: 119. 1942

Leaf spots subcircular to irregular, 4-8 mm. in diameter, reddish brown, often with a slightly darker border; fruiting amphigenous, rarely only hypophyllous, visible under hand lens as minute black pustules; stromata pale to dark brown, globular, filling stomatal openings to 40$\mu$ in diameter; most fascicles dense; conidiophores pale to very pale olivaceous brown, tip almost hyaline and narrow, sparingly septate, rarely geniculate, not branched, straight to sinuous, bluntly rounded tip, 2-4 x 5-50$\mu$, mostly 5-25$\mu$; conidia pale to very pale olivaceous, obclavato-cylindric, indistinctly septate, straight to mildly curved, base obconically truncate, tip subobtuse, 2-4 x 20-100$\mu$, usually 20-65$\mu$.

HOSTS: *Jasminum grandiflorum* L., *J. odoratissimum* L., *J. rigidum* Zenk., Jasminum sp., *J. Officinale* L.

TYPE: Ana Florencia, Minas Geraes, Brazil; Jasminum sp.; A. S. Muller, No. 764; March 28, 1934.

DISTRIBUTION: Various collections from Sao Paulo and Minas Geraes; one from Guatemala, and another from India. Apparently also present in Formosa.

NOTE: Although Sawada recorded no type and gave only incomplete descriptions, the few characters he mentions fit the South American collections. C. G. Hansford (Proc. Linnean Soc. London **1943-44**: 121. 1944) also describes a *Cercospora jasminicola* Hansford, but questions the genus. His type is: Entebbe Road, Uganda; *Jasminum dichotomum* Vahl; Hansford, 3200. There are no definite leaf spots; fruiting effuse, hypophyllous, dark, velvety. Conidiophores are in small spreading fascicles, dark brown, branched, up to 6 x 250$\mu$ in size. The conidia are obclavate and with a very long, narrow, pale, apical beak, olivaceous, as large as 10 x 200$\mu$. It does not sound like a Cercospora, but not having seen the material, I am not certain.

**Cercospora ligustri** Roumeguere

Rev. Mycol. **5**: 177. 1883

Leaf spots circular, pale tan to grayish, sometimes with purplish to black bor-

der, faintly zonate, 2-5 mm. in diameter; fruiting chiefly epiphyllous, usually following some pycnidial form; stromata may be present, dark brown, globular, 20-40$\mu$ in diameter; fascicles mostly not dense, often single stalks; conidiophores pale olivaceous brown, sparingly septate, rarely constricted at septa, uniform in width and color, not branched, not or once mildly geniculate, medium spore scar at rounded tip, 4-6 x 20-40$\mu$; conidia cylindric to spindle shaped, straight or slightly curved, plainly 1-3 septate, base long obconically truncate to subtruncate, tip obtuse, subhyaline to pale olivaceous brown, 3-6 x 20-65$\mu$.

HOSTS: *Ligustrum lodense* Glogau, *L. vulgare* L.
TYPE: Environs de Capendu, France; *Ligustrum vulgare;* C. Roumeguere; March 1883; cotype distributed as Roum. F. Gallici 2521.
DISTRIBUTION: Studied material from Texas, Mississippi, and France. Also reported from Japan.
NOTE: See also *C. adusta* and *C. ligustricola* for differences among the species on this host genus. At various herbaria I made mounts of Roumeguere's Fungi Gallici Exs. 2521 (cotype) but could find no fruiting on any of the specimens.

**Cercospora ligustricola** Tai

Leaf spots definite, orbicular or irregular, sometimes confluent, 1.5-5 mm. in diameter, with a raised purplish-black border, ashy center; fruiting hypophyllous; stromata absent; conidiophores in loose fascicles or solitary, 1-5, straight or curved, more or less flexuous, 1-6 septate, sometimes constricted at septa, not branched, scars terminal, 7-10 x 130-265$\mu$; conidia olivaceous, obclavate to cylindro-clavate, often abruptly constricted at the middle, 5-10 septate, not constricted at the septa, 16-20 x 70-110$\mu$.

HOST: *Ligustrum lucidum* Ait.
TYPE: Chengtu, Szechuan, China; *Ligustrum lucidum;* Lee Ling; March 1941.
DISTRIBUTION: Reported only from the type locality.
NOTE: See also *C. adusta* and *C. ligustri.* I have not seen specimens of this species. Tai's description indicates that it is not a Cercospora. The conidiophores and conidia are far too wide.

**Cercospora lilacis** (Desmaz.) Saccardo
Syll. Fung. **4**: 471. 1886

*Exosporium lilacis* Desmaz., Ann. Sci. Nat. 3 ser. **11**: 364. 1849
*Cercospora lilacis* Sacc., Michelia **2**: 128. 1880

Leaf spots subcircular to elongate, dull brown to almost gray, usually with a ferruginous line margin, 5-12 mm. in length; fruiting amphigenous; stromata dark brown, globular, 30-60$\mu$ in diameter; fascicles rarely dense; conidiophores medium olivaceous brown, fairly uniform in color and width, multiseptate, not branched, 0-2 mildly to abruptly geniculate, small spore scar at rounded tip, 4-6 x 50-160$\mu$; conidia subhyaline to very pale olivaceous brown, linear to very narrowly obclavate, straight to curved, septa indistinct, base subtruncate, tip subacute, 2-3.5 x 40-100$\mu$, (reported as long as 187$\mu$).

HOSTS: *Syringa vulgaris* L., Syringa sp., *S. persica* L.
TYPE: Petit a Arras, France; *Syringa vulgaris;* M. Le President; autumn, 1849.
DISTRIBUTION: Reported in European countries as far north as Belgium, Germany, and Central Russia; in northern South America; in Bermuda; and in

many of our southern states. Once reported as far north as Minnesota (U.S.D.A. Bul. 1366: 100. 1926.).

NOTE: Zilling in 1936 (Acta Inst. Bot. Acad. Sci. U.R.S.S. ser. 2. **1936**: 679. 1936.) described *C amurensis* on Syringa in the Far East. His description is much like that of *C. lilacis*, excepting that he gives the measurements for the conidia as 4.7-5.6 x 36-70$\mu$. If his measurements are given correctly, it certainly must be a new species. See also, *C. macromaculans*, and key, page 413.

**Cercospora lumbricoides** Turconi & Maffei

Atti Ist. Bot. R. Univ. Pavia ser. 2. **12**: 330. 1915

Leaf spots circular to oblong, yellowish, slightly zonate, narrow reddish brown margin; fruiting hypophyllous; small brown stromata; some fascicles dense; conidiophores brown, septate, not branched, sometimes mildly geniculate, 4-6 x 30-60$\mu$; conidia cylindric or occasionally mildly attenuated, pluriseptate, variously curved or undulate (lumbriciform), brown, both ends rounded, 4-6 x 80-200$\mu$.

HOST: Fraxinus sp.

TYPE: Vautepec, Estado de Morelos, Mexico; Fraxinus sp.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not been able to study material of this species. Its lumbriciform conidia separate this species from the others on Fraxinus.

**Cercospora macromaculans** Heald & Wolf

Mycologia **3**: 18. 1911

Leaf spots brown, 5-12 mm. in diameter, central or marginal, subcircular to irregular, occasionally with gray center and frequently zonate, finally entire leaf may die and drop; fruiting amphigenous; stromata subglobular, dark brown, 30-60$\mu$ in diameter; fascicles dense, divergent to compact; conidiophores pale to medium brown, paler and more narrow toward the tip, multiseptate, 0-2 geniculate, straight to curved or tortuous, tip rounded to subtruncate, 4-6 x 50-160$\mu$; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to obconically truncate, tip subacute, 2-3.5 x 25-120$\mu$, reported as long as 187$\mu$.

HOSTS: *Syringa vulgaris* L., Syringa sp.

TYPE: Kerrville, Texas; Syringa sp. (lilac); F. D. Heald and F. A. Wolf, No. 1603; July 27, 1909.

DISTRIBUTION: Texas, Wisconsin.

NOTE: See key, page 413.

**Cercospora osmanthi-asiatici** Sawada

Formosa Agr. Res. Inst. Rept. **85**: 118. 1943

HOST: *Osmanthus asiaticus* Nak.

NOTE: Sawada did not give a complete enough description to classify the specimen correctly. His brief statement regarding the conidia indicates that the fungus may be a Didymaria. "Leaf spots 1-5 mm. in diameter, brown; conidiophores chiefly epiphyllous, nonseptate, olive gray, 3 x 17-22$\mu$; conidia pale olive, 1-3 septate, 2.5-3 x 26-45$\mu$."

**Cercospora puttemansii** P. Hennings
Hedwigia **41**: 117. 1902

Leaf spots subcircular, 2-4 mm. in diameter, or entire margin of leaf may be included, gray to grayish brown on upper surface, on lower surface rusty brown, then gradually turning gray; fruiting hypophyllous, scanty, in the gray areas; stromata lacking or a few brown cells; fascicles not dense, 1-10 stalks, spreading; conidiophores pale to medium brown, paler and more narrow toward the tip, multiseptate, not branched, 0-5 geniculate, straight to slightly curved, medium spore scar at the narrowly subtruncate tip, 4-6 x 25-150$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2-3.5 x 25-120$\mu$.

HOST: *Nyctanthes arbor-tristis* L.
TYPE: Hort. Bot., Sao Paulo, Brasil; *Nyctanthes arbor-tristis;* Ars. Puttemans, No. 297; July 5, 1901.
DISTRIBUTION: Known only from the type locality.

**Cercospora superflua** Ellis & Holway
Jour. Mycol. **2**: 2. 1886

TYPE: Decorah, Iowa; E. W. D. Holway; Aug. 16, 1885.
NOTE: The host at first was determined as a Fraxinus, but later (Jour. Mycol. **4**: 83. 1888) was found to be Gymnocladus and the fungus to be identical with the named species, *C. gymnocladi,* which actually is an Helminthosporium.

**Cercospora texensis** Ellis & Galloway
Jour. Mycol. **4**: 116. 1888

Leaf spots circular, 1-2 mm. in diameter, center gray, border purple; fruiting amphigenous; fascicles 5-20 stalks; conidiophores brown, 0-3 septate, straight to mildly geniculate, not branched, medium spore scar at subtruncate tip, 4 x 35-50$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip subacute, 2-3 x 70-110$\mu$.

HOST: *Fraxinus lanceolata* Borkh. (*F. viridis* Michx.) (*F. pennsylvanica* var. *lanceolata* Sarg.)
TYPE: Brazos Co., Texas; *Fraxinus viridis;* Prof. Le Brunk.
DISTRIBUTION: Known only from the type locality.
NOTE: I was unable to find the type or any other specimen of this species for study. The hyaline, acicular conidia separate this species from the others on Fraxinus.

**Cercospora oliniae** Verwoerd & Dippenaar
S. Afr. Jour. Sci. **27**: 326. 1930

Leaf spots circular, 0.5-3 mm. in diameter, brown, occasionally with minute white center, or with yellow halo; fruiting hypophyllous, appearing as large black pustules; stromata subglobular, 75-500$\mu$ in diameter, very pale olivaceous to medium brown; fascicles extremely dense, compact; conidiophores subhyaline to very pale olivaceous, uniform in color and width, indistinctly septate, not branched, not geniculate, straight to variously curved, conic tip, 2-4 x 10-55$\mu$; conidia concolorous, cylindric, rarely slightly enlarged near the base, indistinctly septate, straight to undulate, ends rounded or base subtruncate, 2.5-4 x 20-75$\mu$.

HOST: *Olinia cymosa* Thunb.

TYPE: Stellenbosch, S. Afr.; *Olinia cymosa;* B. J. Dippenaar, No. 391 (van der Byl, No. 2583); March, 1929.

DISTRIBUTION: Known only from the type locality.

**Cercospora didymospora** Ellis & Bartholomew

Erythea **4**: 28. 1896

HOSTS: *Oenothera biennis* L., *O. fremontii* Watson.

TYPE: Rooks Co., Kansas; *Oenothera fremontii;* Elam Bartholomew, No. 1506; July 14, 1894.

NOTE: This fungus has densely compact fascicles of very short conidiophores and brown, ovate to almost obclavate conidia, 0-3, mostly 1-septate. This would place it in Coryneum.

**Cercospora epilobii** Schneider

On packet, 1872; also Michelia **2**: 642. 1882

*Ramularia montana* Speg., Michelia **2**: 169. 1880

*Cercospora montana* (Speg.) Sacc., Syll. Fung. **4**: 453. 1886

*Cercospora therryana* Roum., Rev. Mycol. **4**: 219. 1882

HOSTS: *Epilobium montanum* L., *E. angustifolium* L., (*E. spicatum* Lam.), (*Chamaenerion angustifolium* Schur.), *E. adenocaulon* Haussk., *E. alpinum* L., *E. hirsutum* L., *E. latifolium* L., *E. tetragonum* L.

TYPES: Austria; *Epilobium montanum;* autumn, 1872; cotype distributed as de Thuemen F. Austriaci 532; (*C. montana*) Sylva alpina, Consiglio, Italy; *Epilobium montanum;* Carolus Spegazzini; Aug. 1879; cotype distributed as Speg. Decades Myc. Italicae No. 104; (*C. therryana*) Environs de Lyon, France; *Epilobium spicatum* and *Epilobium angustifolium;* J. Therry, No. 5833; Aug. 1882; cotype distributed as C. Roumeguere F. Gallici Exsiccati 2264.

NOTE: The dense fascicles of short, hyaline to colored conidiophores and the 0-3, mostly 1-septate, ovate, hyaline conidia place this in Didymaria rather than in Cercospora.

**Cercospora fuchsiae** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 45. 1942

Leaf spots circular to angular, 2-8 mm. in diameter, pale to medium dark brown, the older spots with a pale center or with concentric rings and a dark line margin; fruiting chiefly epiphyllous; stromata a few cells to 30$\mu$ in diameter, dark brown; fascicles 3-20 diverging stalks; conidiophores pale to medium dark brown, paler and sometimes more narrow toward the tip, plainly multiseptate, slightly branched, 0-2 geniculate or undulate, straight to curved, medium spore scar at the subtruncate tip, 4-5.5 x 30-130$\mu$; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to long obconically truncate, tip subacute to subobtuse, 2-3.5 x 20-75$\mu$.

HOST: Fuchsia sp., *F. integrifolia* Cambess.

TYPE: El Valle, Caracas, Venezuela; Fuchsia sp.; A. S. Muller, No. 3540; Oct. 18, 1939.

DISTRIBUTION: Guatemala, Venezuela and Sao Paulo, Brazil.

**Cercospora gaurae** Kellerman & Swingle

Jour. Mycol. **5**: 75. 1889

Leaf spots dark purple to almost black, 2-10 mm. in diameter, circular to angular; fruiting amphigenous; stromata slight or none; fascicles dense; conidiophores pale brown, rarely septate, not geniculate, not branched, slightly attenuated, minute spore scar at rounded tip, 2-3.5 x 15-40$\mu$; conidia narrowly obclavate to almost linear, straight or nearly so, pale olivaceous, septa indistinct, base subtruncate to short obconic, tip subobtuse, 2-3.5 x 30-65$\mu$, rarely 100$\mu$ long.

HOSTS: *Gaura biennis* L., *G. sinuata* Nutt.

TYPE: Columbus, Kansas; *Gaura biennis;* Kellerman and Swingle, No. 1491; July 12, 1887.

DISTRIBUTION: Kansas, Oklahoma, and Texas. Also reported from New York.

**Cercospora gayophyti** Ellis & Everhart

Bul. Torrey Bot. Club **24**: 474. 1897

HOST: *Gayophytum diffusum* Torr. & Gray.

TYPE: Yosemite, California; *Gayophytum diffusum;* J. J. Davis; June 15, 1895.

NOTE: The densely compact fascicles of short pale conidiophores and the hyaline 1-septate conidia place this fungus in Didymaria rather than in Cercospora.

**Cercospora jussiaeae** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 50. 1892

Leaf spots circular, 2-7 mm. in diameter, pale brown to gray center, brown margin; fruiting amphigenous; stromata composed of a few brown cells; fascicles 5-15 spreading stalks; conidiophores pale brown, uniform in color or sometimes with almost hyaline tip, often strongly attenuated, sparingly septate, not branched, 0-1 geniculate, tip conic to subtruncate, 3-5 x 5-25$\mu$; conidia hyaline to very pale olivaceous, cylindric to narrowly obclavate, straight to strongly curved, multiseptate, base short obconically truncate to almost conic, tip subobtuse to subacute, 2-4 x 20-150$\mu$, mostly 20-80$\mu$.

HOSTS: *Jussiaea decurrens* DC., *J. pilosa* H.B. & K. (*J. leptocarpa* Nutt.), *J. peruviana* L., *J. suffructicosa* L., *J. repens* L., Jussiaea sp.

TYPES: Auburn, Alabama; *Jussiaea leptocarpa;* B. M. Duggar, No. 2159; Sept. 2, 1891; *Jussiaea decurrens;* G. F. Atkinson, No. 2191; Sept. 29, 1891.

DISTRIBUTION: Alabama, Oklahoma, Texas, Venezuela, Transvaal.

NOTE: At first glance *C. jussiaeae* and *C. ludwigiae* appear almost identical, but the width, length, and depth of color of the conidia and conidiophores and bases of conidia and tips of conidiophores are distinct enough to consider them as separate species. The three collections sent from Venezuela were not exactly like Atkinson's type and yet were not different enough to be considered, at least at present, as a separate species. I have not been able to study *C. jussiaeae-repentis* Sawada but record it here as distinct because of the wide conidia. The Sawada description fits fairly closely the type of *C. ludwigiae* var. *japonica* P. Hennings.

**Cercospora jussiaeae-repentis** Sawada

Formosa, Dept. of Agr. Govern. Res. Inst. Report **35**: 108. 1928

Leaf spots circular, distinct, 2-7 mm. in diameter, pale brown center, darker brown margin; fruiting amphigenous; stromata small; fascicles 9-16 stalks; conid-

iophores pale olivaceous brown, erect, straight or slightly bent, branched when few in a fascicle, septate, spore scars present, 3.5-5 x 20-55$\mu$; conidia hyaline, obclavate or wedge-shaped, 1-6 septate, constricted at the septa, mildly bent near the tip, 3.5-6 x 30-75$\mu$.

HOST: Jussiaea sp.
TYPE: Formosa; Jussiaea sp.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. jussiaeae* for differences between the species on this host genus. I have not seen this species, but consider it distinct because of the wide conidia. The compound name should not have been used because such a form denotes complete identity with *C. jussiaeae,* excepting that of pathogenicity.

## CERCOSPORAE ON OENOTHERA

A. Conidia colored, cylindro-obclavate, 2-3.5 x 25-120$\mu$; conidiophores in dense fascicles, 2-4.5 x 15-40$\mu$.
OENOTHERA spp. *C. oenotherae*
AA. Conidia hyaline, acicular to obclavate; fascicles not dense.
B. Conidiophores 4-6 x 8-30$\mu$; conidia 2-3.5 x 35-75$\mu$.
O. SINUATA *C. oenotherae-sinuatae*
BB. Conidiophores 3-6 x 60-125$\mu$; conidia 3-4 x 60-160$\mu$.
OENOTHERA sp. *C. lingii*

### **Cercospora lingii** Tai

Lloydia **11**: 49. 1948

Leaf spots angular or irregular, often confluent, ashy gray, definite, with an indefinite purple zone, usually along the edge of the leaf, 1-3 mm. wide; fruiting amphigenous; stromata absent; conidiophores in loose fascicles of 2-12, straight or geniculate, denticulate near the apex, 0-5 septate, brown, 3-6 x 60-125$\mu$; conidia hyaline, acicular to obclavate, with truncate base, straight to mildly curved, 8-15 septate, 3-4 x 60-160$\mu$.

HOST: Oenothera sp.
TYPE: Chengtu, Szechuan, China; Oenothera sp.; Lee Ling, No. 116; Nov. 10, 1941.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen the type of this species. Tai's description seems to differ from those for *C. oenotherae* and *C. oenotherae-sinuatae.* See key above.

### **Cercospora ludwigiae** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 58. 1892

Leaf spots circular to irregular, 0.5-3 mm. in diameter, dingy gray to buff center and reddish brown to bright red margin; fruiting amphigenous but chiefly epiphyllous; small brown stromata; most fascicles dense, sometimes compact; conidiophores erect, straight, pale to medium brown near the base, upper half paler in color, uniform in width or attenuated, sparingly septate, 0-1 mildly or abruptly geniculate, not branched, small rounded to subconic tip, 3-5 x 10-60$\mu$; conidia narrowly obclavate, subhyaline to pale olivaceous, variously curved, indistinctly multiseptate, base long obconically truncate to obconic, tip subacute, 2-3.5 x 30-140$\mu$.

HOSTS: *Ludwigia alternifolia* L., *L. polycarpa* S. & P.
TYPE: Auburn, Alabama; *Ludwigia alternifolia;* G. F. Atkinson, No. 2190; Sept. 29, 1891.
DISTRIBUTION: Alabama, Wisconsin.
NOTE: See also *C. yoshinagiana* for differences between the species on Ludwigia. See note under *C. jussiaeae.*

**Cercospora oenotherae** Ellis & Everhart
Proc. Acad. Nat. Sci. Phila. **46**: 380. 1894
also Field Columbian Mus. **1**: 94. 1896

Leaf spots circular to elongate, 3-7 mm. in length, pale to dark brown or olivaceous brown, reddish brown margin; fruiting amphigenous; stromata small, brown; fascicles dense; conidiophores pale olivaceous brown, fairly uniform in color, somewhat attenuated toward the tip, longest ones slightly undulate or once geniculate, mostly non-septate, not branched, small to medium spore scar at rounded to subtruncate tip, 2-4.5 x 15-40$\mu$; conidia cylindro-obclavate, straight to curved, pale olivaceous, indistinctly multiseptate, base obconic to obconically truncate, tip subobtuse, 2-3.5 x 25-120$\mu$.
HOSTS: *Oenothera biennis* L., *O. speciosa* Nutt. (*Hartmannia speciosa* [Nutt.] Small), *O. lamarckiana* Ser.
TYPE: Fayette Co., W. Va.; *Oenothera biennis;* L. W. Nuttall, No. 599; Oct. 6, 1894.
DISTRIBUTION: West Virginia, Missouri, Kansas, Texas, Alabama and Japan.
NOTE: See key, page 422.

**Cercospora oenotherae-sinuatae** Atkinson
Cornell Univ. Bul. 3 (1): 46. 1897

Leaf spots minute red pin points, or slightly larger and then with a white center, 0.33-1.5 mm. in diameter; fruiting amphigenous; stromata slight or lacking; fascicles mostly 2-7 stalks; conidiophores pale to medium olivaceous brown, uneven in length, irregular in width, not or rarely septate, not geniculate, not branched, spore scars indistinct, broadly rounded tip, 4-6 x 8-30$\mu$; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute, 2-3.5 x 35-75$\mu$.
HOST: *Oenothera sinuata* L. (*O. laciniata* Hill).
TYPE: Auburn, Alabama; *Oenothera sinuata;* G. F. Atkinson; Sept. 4, 1890.
DISTRIBUTION: Alabama, North Carolina.
NOTE: The hyaline, acicular conidia separate this species from *C. oenotherae;* and the very short conidiophores, from *C. lingii.* See key, page 422.

**Cercospora yoshinagiana** n. comb.

*Cercospora ludwigiae* var. *japonica* P. Hennings, Bot. Jahrbücher v. Engler **34**: 605. 1905

Leaf spots dull brown or reddish brown, immarginate, difficult to detect on dried herbarium specimens, subcircular to irregular, 2-5 mm. in extent; fruiting chiefly epiphyllous; stromata small, brown, often only a few cells; fascicles 2-15 divergent to compact stalks; conidiophores medium brown, uniform in color and width, multiseptate, not branched, rarely geniculate, closely undulate to tortuous, conic tip, 3-4 x 20-125$\mu$; conidia pale to medium olivaceous or olivaceous brown,

narrowly obclavate, shortest ones almost cylindric, straight to strongly curved, multiseptate, base long obconically truncate, tip subacute, 3-4 x 30-100$\mu$.

HOST: *Ludwigia prostrata* Roxb.

TYPE: Tonohama, Johimura, Prov. Tosa, Japan; *Ludwigia prostrata;* T. Yoshinaga, No. 45 (No. 200997); Nov. 1903.

DISTRIBUTION: Several collections from Japan.

NOTE: See also *C. ludwigiae,* which it does not resemble. Hennings spells it *C. ludwigii* Atk. The cotype material sent me from Japan appeared immature with mostly short conidiophores and very pale colored conidia. Other collections were more nearly mature, so that the description was taken from these.

**Cercospora helminthostachydis** P. Hennings

Hedwigia **47**: 265. 1908

Leaf spots on upper surface irregular to indistinct brownish areas, 2-4 mm. in extent; on corresponding lower surface closely aggregated black pustules; stromata dark brown, subglobular, 30-75$\mu$ in diameter; fascicles dense to very dense, spreading to compact; conidiophores in mass dark brown, singly pale to medium olivaceous brown, uniform in color, irregular in width, sparingly septate, not branched, not geniculate, straight to sinuous, tip rounded to conic, 3-5 x 10-65$\mu$; conidia pale to very pale olivaceous, cylindric, 3-7 septate, almost straight, ends rounded or base obconic, 4-6 x 40-100$\mu$.

HOST: *Helminthostachys zeylanica* Hook.

TYPE: Davao, Mindanao, Philippines; *Helminthostachys zeylanica;* Copeland, No. 543; March, 1904.

DISTRIBUTION: Known only from the type locality.

**Orchidaceae**

A. Conidia hyaline, acicular, 3.5-5 x 30-130$\mu$; conidiophores pale to medium, 4-6 x 10-45$\mu$.
EPIPACTIS — *C. epipactidis*

AA. Conidia pale olivaceous, not acicular.

B. Conidiophores much branched, 3-5.5 x 50-200$\mu$, medium dark; conidia 3-5 x 35-100$\mu$; fruiting effuse; sometimes nonfasciculate, hypophyllous.
ODONTOGLOSSUM — *C. odontoglossi*

BB. Conidiophores not branched, rarely longer than 60$\mu$; fruiting not effuse; fasciculate, mostly epiphyllous.

C. Stromata small; fascicles not dense; conidiophores medium dark; conidia cylindric, 3-5 x 30-150$\mu$.
CYPRIPEDIUM — *C. cypripedii*

CC. Stromata large; fascicles very dense; conidiophores pale; conidia obclavate, 2.5-5 x 25-100$\mu$.
ANGRAECUM, ODONTOGLOSSUM — *C. angraeci*

**Cercospora angraeci** Feuilleaubois & Roumeguere

Rev. Mycol. **5**: 177. 1883

Leaf spots circular, 2-5 mm. in diameter, black, larger ones with a raised margin; fruiting chiefly epiphyllous; stromata dark brown, globular to elongate, 30-100$\mu$ in length; fascicles dense to very dense, divergent to compact; conidiophores in mass dark olivaceous brown, singly pale olivaceous, uniform in color, attenu-

ated toward the tip, sparingly septate, not branched, not geniculate, straight to variously curved, tip rounded bluntly, 3-5 x 10-60$\mu$; conidia pale olivaceous, obclavate, straight to mildly curved, indistinctly multiseptate, base subtruncate to long obconically truncate, tip subobtuse, 2.5-5 x 25-100$\mu$.

HOSTS: *Angraecum fragrans* Thou., *Odontoglossum crispum* Lindl. (*O. alexandrae* Batem.) Odontoglossum sp.

TYPE: Island of Bourbon; *Angraecum fragrans;* Rev. Fr. Zetiques; Oct. 1882.

DISTRIBUTION: Island of Bourbon, France, England.

NOTE: A specimen apparently of this species was received from Enfield, England, on Odontoglossum. It did not resemble *C. odontoglossi.* Roumeguere's material sent to various herbaria shows almost no fruiting. The description was taken from another collection. See key above.

**Cercospora cypripedii** Ellis & Dearness

Can. Inst. Trans. **6**: 637. 1899

Leaf spots usually long dark brown to black streaks between the veins, 1-3 mm. wide and sometimes half the length of the leaf; fruiting amphigenous, although chiefly on the upper surface; stromata a few large cells to 40$\mu$ in diameter, dark brown; fascicles mostly 5-15 stalks; conidiophores medium dark brown, uniform in color, attenuated toward the tip, sparingly septate, not geniculate, not branched, small spore scar at rounded or conic tip, slightly sinuous, 3-5 x 10-40$\mu$; conidia cylindric to obclavato-cylindric, straight or nearly so, pale olivaceous, 3-6 septate, short obconically truncate base, subobtuse tip, 3-5 x 30-150$\mu$.

HOSTS: *Cypripedium candidum* Muhl., *C. humile* Salisb. (*C. acaule* Ait.), *C. parviflorum* Salis. var. *pubescens, C. pubescens* Willd., *C. spectable* Salisb. (*C. hirsutum* Mill.), *C. reginae* Walt.

TYPE: Shore of Lake Huron, near Southampton and Komoka, Ontario; *Cypripedium spectable* and *C. pubescens;* John Dearness, No. 2883; Aug. 20, 1898.

DISTRIBUTION: Northern United States and southern Canada, at least as far west as Wisconsin.

NOTE: This species has been reported from Russia on *Epipactis latifolia* (Mat. Mik. Fitop. Rossii **1**: 7. 1915), but apparently it was *C. epipactidis.* See key above.

**Cercospora epipactidis** C. Massalonga

Ann. Mycol. **9**: 256. 1911

Leaf spots elongate, interveinal, reddish brown; fruiting hypophyllous, visible under a hand lens as minute black pustules; stromata irregular, dark brown, slight to 50$\mu$ in diameter; some fascicles dense, divergent; conidiophores pale to medium brown, paler and more narrow toward the tip, sparingly septate, ont branched, straight or mildly geniculate, medium spore scar at the subtruncate tip, 4-6 x 10-45$\mu$ or occasionally as long as 100$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip subacute, 3.5-5 x 30-130$\mu$.

HOSTS: *Epipactis latifolia* All., *E. palustris* Crantz.

TYPE: S. Michele, pr. Veronam; *Epipactis palustris; C. Massalonga;* Aug. 1910.

DISTRIBUTION: Italy, Germany, Russia.

NOTE: See key, page 424.

**Cercospora odontoglossi** Prillieux & Delacrois

Bul. Soc. Mycol. France. **9**: 271. 1893

Leaf spots none or indistinct browning on upper surface; fruiting in dark olivaceous patches on lower leaf surface, may cover entire surface; stromata lacking; conidiophores mostly borne singly but sometimes in fascicles of 2-7, medium dark brown, plainly multiseptate, often constricted at septa, usually very crooked, branched, many abrupt geniculations some of which have incipient branches, irregular in width, or wider near the tip, which is bluntly rounded and without spore scar, 3-5.5 x 50-200$\mu$; conidia obclavate, pale olivaceous, straight to mildly curved, indistinctly multiseptate, base subtruncate or long obconically truncate, tip subacute, 3-5 x 35-100$\mu$.

HOSTS: *Odontoglossum citrosmum* Lindl. (*O. pendulum* Batem.), *O. crispum* Lindl., Odontoglossum sp.

TYPE: In greenhouses, Versailles, France; *Odontoglossum crispum;* Ed. André.

DISTRIBUTION: France and Massachusetts.

NOTE: Dr. David Linder sent me an excellent specimen from Prides Crossing, Beverly Farms, Mass., September 1933. See key, page 424.

**Cercospora averrhoae** Petch

Ann. Roy Bot. Gard., Peradeniya **6**: 249. 1917

Leaf spots circular, 1-4 mm. in diameter, white center and dark purple to brown margin; fruiting plainly amphigenous; stromata lacking or a few brown cells; fascicles 2-8 spreading stalks; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, 1-3 septate, not branched, rarely geniculate, medium spore scar at the subtruncate tip, 5-6.5 x 10-60$\mu$ or even 120$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 30-150$\mu$.

HOST: *Averrhoa carambola* L.

TYPE: Peradeniya, Ceylon; *Averrhoa carambola;* T. Petch, No. 4997; March, 1917.

DISTRIBUTION: Ceylon, China, and possibly the Philippines.

NOTE: See also *C. wellesiana* for differences between the two species on this host. T. H. Ho describes his collection from China as having conidiophores measuring 4-7.5 x 30-85$\mu$ and conidia 4-5.25 x 20-92$\mu$. If the description of *C. averrhoi* Welles (Philipp. Jour. Sci. **19**: 749. 1921) is accepted, it would be a synonym of the Petch species. But the cotype shows a distinct fungus, the name of which therefore is changed to *C. wellesiana.*

**Cercospora biophyti** H. & P. Sydow

Philipp. Jour. Sci. (Botany) **8**: 284. 1913

At first leaf spots indistinct or none, later the edges turn reddish brown and finally the whole leaflet is included; fruiting effuse, hypophyllous, sooty in appearance; stromata lacking or a few brown cells; nonfasciculate to dense fascicles, divergent; conidiophores pale to medium olivaceous brown, uniform in color, irregular in width, plainly multiseptate, often constricted at septa, branched near the base, variously curved or bent, rarely geniculate, tip conic to obtuse, 4-5.5 x 20-150$\mu$; conidia concolorous, cylindric to spindle shaped, when much bent, resembling a Fusarium spore, plainly 3-7 septate, ends blunt to long conic, plainly vacuolate, 4-6 x 30-65$\mu$.

HOST: *Biophytum sensitivum* DC.
TYPE: Luzon, Los Banos, Philippines; *Biophytum sensitivum;* C. F. Baker, No. 617; Jan. 7, 1913.
DISTRIBUTION: Several collections from Los Banos.
NOTE: The type has shorter and more nearly fasciculate conidiophores than does C. F. Baker's collection (F. Malayana No. 16) of Aug. 1913.

**Cercospora oxalidiphila** (Spegazzini Ined.) Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 52. 1942

*Cercospora corniculatae* Hansford, Proc. Linn. Soc. 1942-3: 56. 1943

Leaf spots subcircular, 1-8 mm. in diameter or including whole leaflet, grayish to brown or even greenish, occasionally with a small dark brown center; fruiting chiefly hypophyllous; stromata lacking or a few dark brown cells; conidiophores borne singly or in fascicles of 2-10, pale brown, paler and slightly more narrow toward the tip, sparingly septate, rarely branched, longest ones curved, 0-3 geniculate, subtruncate tip, 4-6 x 20-200$\mu$; conidia hyaline, acicular, shortest ones almost cylindric, mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4.5 x 40-125$\mu$.

HOSTS: *Oxalis barrelieri* L., *O. intermedia* A. Rich, *O. corniculata, O. stricta* L., Oxalis sp.
TYPE: Riachuelo, Buenos Aires, Argentine; Oxalis sp.; C. Spegazzini, No. 962; February, 1880. (*corniculatae*) Kampala, Uganda; *O. corniculata;* Hansford, No. 1262.
DISTRIBUTION: Wisconsin, Argentine, Minas Geraes, Venezuela, Trinidad, Puerto Rico and Uganda.
NOTE: Spegazzini did not describe this because he could not find the conidiophores. There was very little fruiting on the type which was sent me. See also *C. oxalidis* for differences between the two species on this host genus.

**Cercospora oxalidis** Muller & Chupp
Arquiv. Inst. Biol. Veg. Rio de Janeiro 1: 218. 1935

Leaf spots subcircular, large, olivaceous, or when on brown leaf, tan; fruiting amphigenous, indistinct; stromata lacking; nonfasciculate; conidiophores borne as branches from procumbent threads, which often are closely septate and much constricted at septa, very pale olivaceous brown, paler and strongly attenuated toward the tip, sparingly septate, not geniculate, mostly straight, narrowly rounded or conic tip, 2.5-4 x 15-50$\mu$; conidia hyaline, acicular to obclavate or the shortest ones cylindric, straight to mildly curved, indistinctly multiseptate, base truncate to long obconically truncate, tip subobtuse to acute, 1.5-3 x 15-75$\mu$.

HOST: Oxalis sp.
TYPE: Vicosa-Escola, Minas Geraes; Oxalis sp.; A. S. Muller, No. 63; Nov. 14, 1929.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. oxalidiphila* for differences between the two species on this host species.

**Cercospora wellesiana** n. comb.

*Cercospora averrhoi* Welles, Philipp. Jour. Sci. 19: 749. 1921

Leaf spots circular to irregular, 2-5 mm. in diameter, pale to dark brown, yel-

lowish to yellowish brown margin; fruiting chiefly epiphyllous; stromata globular, 15-25$\mu$ in diameter, pale brown; fascicles dense; conidiophores very pale olivaceous brown, paler and more narrow toward the rounded to conic tip, not septate, not branched, not geniculate, longest ones undulate, 2-3.5 x 5-20$\mu$; conidia hyaline to subhyaline or rarely almost colored, cylindric to very narrowly obclavate, straight to mildly curved, septa not visible, ends conic to blunt, 1.5-3 x 20-55$\mu$.

HOST: *Averrhoa carambola* L.

TYPE: College of Agr., Los Banos, Philippines; *Averrhoa carambola;* C. G. Welles; July 6, 1921.

DISTRIBUTION: Known only from the type locality.

NOTE: see also *C. averrhoae* Petch for differences between the species on this host genus. Welles' published description would make it seem that he had a synonym of *C. averrhoae* Petch. It is possible that his large brown conidiophores may have been the setae of a Colletotrichum which are present and resemble his drawings. But he describes and illustrates conidia which are not shaped like those of either species, and are much larger than those found with his collection.

**Cercospora acrocomiae** Stevenson

Insular Agr. Exp. Sta. Puerto Rico (Rio Piedras). Ann. Rep. **1916-17**: 89. 1917

Pinnae of older leaves are affected, so that parts or the whole leaf may finally be killed, single spots 8-20 x 3-6 mm., or coalescing into large irregular areas, often with a central oval gray area enclosed by a dark brown band, with an outer irregular reddish brown area; fruiting chiefly hypophyllous; stromata dark to black, 40-100$\mu$ in diameter; fascicles very dense; conidiophores dark fuligenous brown, septate, not geniculate, straight, curved, or tortuous, sometimes wider near the tip or irregular in width, not branched, spore scars absent or indistinct, 4-8 x 30-70$\mu$; conidia dark fuligenous brown, straight to slightly curved, clavato-cylindric to slightly attenuated toward the tip, obtuse ends, septa distinct, 3-9 in number, 5-10 (8-12) x 30-120$\mu$.

HOST: *Acrocomia media* O. F. Cook.

TYPE: Rio Piedras, Puerto Rico; *Acrocomia media;* John A. Stevenson, No. 6604; July 1917, and other collections.

DISTRIBUTION: Puerto Rico.

NOTE: Plainly an Exosporium. The conidia are very wide, dark colored, and thick walled, the stromata large and the fascicles very dense.

**Cercospora calamicola** P. Hennings

Hedwigia **42**: 88. 1903

HOST: *Calamus caryotoides* A. Cunn.

TYPE: Wälder bei Cairns, N. Queensland; *Calamus caryotoides;* E. Pritzel, No. 78; May, 1902.

NOTE: Although the conidia of this species are very pale in color, their unusually thick walls and width are characteristic of Helminthosporium, and not of Cercospora.

**Cercospora elaedis** Steyaert

Bul. Soc. Bot. Belg. **80**: 35. 1948

Leaf spots circular, dark brown, margin distinct, surrounded by an orange

colored zone; mycelium internal; fruiting hypophyllous; small stromata; fascicles 2-7 diverging stalks, emerging from stomata; conidiophores erect, dark brown, septate, flexuous, base swollen, conidial scars distinct, 5-7 x 185-250$\mu$; conidia acicular to obclavate, yellowish brown, tip pale colored to hyaline and sometimes falcate, 6-9 septate, 6-10 x 125-187$\mu$, and 4-5$\mu$ wide two-thirds of the way from the apex.

HOST: *Elaeis guineensis* Jacq.

TYPE: Kodoro, Congo Belge; *Elaeis guineensis;* B. 141 (332); Sept. 19, 1942.

DISTRIBUTION: Belgian Congo.

NOTE: I have not seen this specimen. It has unusually wide conidia for a Cercospora. It would be interesting to know if there is a true species of this fungus on the Palmaceae.

**Cercospora licualae** H. & P. Sydow

Philipp. Jour. Sci. (Bot.) **9**: 188. 1914

*Cercospora virens* Saccardo, Boll. Orto. Bot. Napoli. **6**: 62. 1921

HOSTS: *Licuala spinosa* Thunb., Licuala sp.

TYPES: Taytay, Palawan, Philippines; *Licuala spinosa;* E. D. Merrill, No. 8748; April, 1913; (*C. virens*) Island of Singapore, Straits Settlement; Licuala sp.; C. F. Baker, No. 407; Oct. 1917.

NOTE: The cotypes have poor fruiting and are further unsatisfactory because of the presence of other fungi. Apparently the two are identical and are not Cercospora. Their lack of spores makes it difficult to determine whether the fungus should be considered an Helminthosporium or not. I wrote to Dr. Merrill, to the Philippines, and to other sources for material but could locate no additional specimens.

**Cercospora palmicola** Spegazzini

Anal. Soc. Cient. Argentina **26**: 72. 1888

HOST: *Cocos australis* Mart.

TYPE: In sylvis Guarapí, Paraguay; *Cocos australis;* B. Balansa, No. 4070; Oct. 5, 1883.

NOTE: The conidia are pale to very pale in color, but are wide and the oldest ones are plainly thick walled. The fungus, therefore, is considered as an Helminthosporium. Moreau (Rev. Mycol., Paris, **12** [Suppl. colon. 1]: 37-38. 1947.) describes *C. palmicola* f. *stilbacea.* I am not sure whether it agrees with the Spegazzini species or if it is a true Cercospora. Moreau's drawings represent some other genus.

**Cercospora palmivora** (Sacc.) Nannizzi

Atti R. Accad. Fisiocritici in Siena X. **2**: 491. 1927

*Cercospora preisii* Bubak, Ann. Mycol. **2**: 400. 1904

HOSTS: *Phoenix canariensis* Hort. (*P. tenuis* Versch.), *P. reclinata* Jacq., *Phoenix* sp.

TYPES: Missouri Bot. Gard.; *Phoenix canariensis;* Wm. Trelease; (*C. preisii*) Bohemia; Phoenix sp.; Fr. Bubak.

NOTE: The dark colored, thick walled, wide conidia are not characteristic of Cercospora. Saccardo (Missouri Bot. Gard. Ann. Rept. **9**: 159. 1898) first described it as *Exosporium palmivorum* and Bubak's first name for it was *E.*

*preisii*. The large stromata and very dense fascicles would indicate that Saccardo's classification was correct. The species has been reported on many species of Phoenix. Hughes (Commonwealth Mycol. Inst. Papaers 49: 13. 1952) renames the fungus *Stigmina palmivora*.

**Cercospora bocconiae** Chupp

Monographs Univ. P. Rico Ser. B. 2: 243. 1934

Leaf spots subcircular, 2-8 mm. in diameter, dingy gray, wide brown to purplish border, on lower surface brownish; fruiting epiphyllous; stromata slight; fascicles dense, compact to almost coremoid; conidiophores uniformly pale to very pale olivaceous, clavate, septa indistinct, not branched, rarely geniculate, medium spore scar at the conically truncate tip, straight to variously curved, 2-4 x 40-125$\mu$; conidia concolorous, obclavato-cylindric, difficult to distinguish from detached conidiophores, indistinctly multiseptate, straight to mildly curved, base obconically truncate, tip obtuse, 3-5 x 20-70$\mu$.

HOST: *Bocconia frutescens* L.

TYPE: Road from Timotes to Chachopo, Mérida, Venezuela; *Bocconia frutescens;* Chardon & Toro, No. 977; Aug. 29, 1932.

DISTRIBUTION: Known only from the type locality.

**Cercospora papaveri** Nakata

Chosen No-kai Ho **13**: 33. 1918

also Jour. Agr. Exp. Sta. Gov.-Gen. Chosen. **15**: 65. 1928

Leaf spots circular to subcircular, uniformly dark brown to black or with a gray center, finally the entire leaf turns brown; fruiting amphigenous; fasciculate, not dense; conidiophores dark brown, slightly paler and more narrow toward the tip, 2-5 septate, not branched, 0-2 geniculate, 5-9 x 60-92$\mu$; conidia obclavate, dark yellowish brown, 5-7 septate, straight to mildly curved, base obconically truncate, tip subacute, 5-9 x 50-115$\mu$.

HOST: *Papaver somniferum* L.

TYPE: Chosen; *Papaver somniferum;* K. Nakata.

DISTRIBUTION: Apparently common in Formosa.

NOTE: Dr. Togashi kindly sent me a translation of the description and the drawings from which Nakata's illustrations were reproduced. I have not studied the species. The width of the conidia and conidiophores is rather unusual for a Cercospora. See also *C. papavericola* for differences between the two species on this host genus.

**Cercospora papavericola** n. comb.

*Cercospora papaveris* Sawada (Original description unknown)

*Cercospora papaveri* Muller & Chupp, Arch. Inst. Biol. Veg. Rio de Janeiro **3**: 95. 1936

Leaf spots circular to irregular, 3-8 mm. in diameter, dark brown to almost black, rarely with a gray center; fruiting amphigenous; stromata lacking or only a few brown cells; fascicles 2-12 spreading stalks; conidiophores pale to medium olivaceous brown, paler near the tip, uniform in width, multiseptate, not branched, sparingly geniculate, straight to variously curved, subtruncate tip, 4-6 x 75-350$\mu$; conidia hyaline, acicular, usually strongly curved, indistinctly multiseptate, base truncate, tip acute, 2-5.5 x 50-200$\mu$.

HOSTS: Papaver sp., *P. somniferum* L., cultivated poppy.
TYPE: Vicosa-Escole, Minas Geraes, Brazil; Papaver sp.; A. S. Muller, No. 655; Dec. 14, 1933.
DISTRIBUTION: Minas Geraes, Alabama (Stevenson, Plant Dis. Reporter **26**: 280. 1942), Florida, Texas.
NOTE: See also *C. papaveri* for differences between the two species on this host genus. The K. Sawada collection in Formosa was labeled: Tsao-yea-ton, Nantoa, Taichung, Taiwan, March 26, 1920. A specimen is in the Mycological Herbarium of the U. S. Dept. Agr.

**Cercospora sanguinariae** Peck

N. Y. State Mus. Nat. Hist. Ann. Rept. **33**: 29. 1880

Leaf spots show as large green blotches in dried herbarium material, rather indistinct on green foliage, a minute brown speck about which extends a gray to tan zone, sometimes zonate, 10-30 mm. in diameter; fruiting amphigenous, often appearing as a faint gray mold; stromata lacking; mostly nonfasciculate; conidiophores arising singly or rarely 2-3 from procumbent branched tortuous threads, plainly multiseptate, medium dark brown, variously bent or curved, sometimes 1 to many mild geniculations, medium spore scar at rounded tip, 4-5.5 x 20-150$\mu$; conidia hyaline to subhyaline, cylindric to obclavato-cylindric, straight or nearly so, 4-8 septate, base truncate to subtruncate, tip obtuse, 3.5-6 x 20-75$\mu$.

HOST: *Sanguinaria canadensis* L.
TYPE: Jamesville, N.Y.; *Sanguinaria canadensis;* C. H. Peck; Aug. 1879.
DISTRIBUTION: Studied material from Pennsylvania, New York, Indiana, and Wisconsin. Also reported from Missouri, Delaware, Maryland, and Texas.

**Cercospora whetzelii** Chupp

Jour. Dept. Agr. P. Rico **15**: 16. 1931

Leaf spots subcircular to irregular, 2-6 mm. in diameter, grayish to yellowish brown with darker margin on upper surface, brown to olivaceous without margin on lower surface, indistinct on dried brown leaf; fruiting amphigenous, grayish, effuse when abundant; stromata lacking or slight; fascicles dense to very dense, rarely stalks borne singly; conidiophores pale fuligenous, sometimes paler and wider near the tip, sparingly septate, not branched, straight to curved, occasionally 1-2 geniculate, small spore scar at bluntly rounded tip, 5-7 x 15-70$\mu$; conidia cylindric, hyaline, straight, mostly one septate, few constricted at septa, base rounded to long obconic, tip bluntly rounded, 5-9 x 15-35$\mu$.

HOSTS: *Argemone mexicana* L., *A. platyceras* Link & Otto.
TYPE: Ponce, Puerto Rico; *Argemone mexicana;* C. E. Chardon, No. 1161; July 10, 1925.
DISTRIBUTION: Puerto Rico, Venezuela.
NOTE: The two-celled hyaline conidia place this in Didymaria rather than in Cercospora.

**Passifloraceae**

(Passiflora)

A. Conidia hyaline, acicular, truncate base, subacute tip, 2.5-4 x 40-250$\mu$.
B. Stromata lacking or only a few cells; conidiophores in fascicles of 2-10,

slightly branched, uniform in diameter, straight, 4-5 x 100-400$\mu$; fruiting hypophyllous, almost effuse.

*C. passifloricola*

BB. Stromata 15-80$\mu$ in length; fascicles often dense; conidiophores attenuated, not branched, rarely straight.

C. Fruiting mostly epiphyllous; fascicles 5-20 stalks; conidiophores often with much wider base (8$\mu$), not geniculate, 4-6.5 x 10-75$\mu$, pale in color.

*C. regalis*

CC. Fruiting amphigenous; fascicles dense to very dense; conidiophores only slightly attenuated, 0-5 geniculate, 4-5 x 50-250$\mu$, pale to medium in color.

*C. granadillae*

AA. Conidia colored or sometimes subhyaline, base rarely truncate, mostly obtuse or conic tip.

B. Conidia 3.5-6$\mu$ in width; stromata lacking or slight; often nonfasciculate; conidiophores branches from procumbent threads to loosely fasciculate, irregular in width; conidia pale in color; fruiting effuse, dark olivaceous.

C. Conidia obclavate, 40-150$\mu$ in length; conidiophores 4-6 x 30-150$\mu$, pale in color.

*C. biformis*

CC. Conidia cylindric, 20-60$\mu$ in length; conidiophores 3-4.5 x 20-300$\mu$, medium in color.

*C. fusco-virens*

BB. Conidia 2-4$\mu$ in width; stromata present; fascicles mostly dense; conidiophores rarely branched; fruiting not effuse.

C. Conidiophores long, medium dark colored, 3.5-5 x 50-250$\mu$, 0-3 geniculate, multiseptate; conidia subhyaline, cylindro-obclavate, almost acicular, 30-100$\mu$ in length; fascicles 2-12 stalks.

*C. truncatella*

CC. Conidiophores short, pale to very pale, not geniculate, sparingly septate; conidia pale to very pale, cylindric; fascicles dense to very dense.

D. Conidiophores rarely branched, 3-4 x 10-55$\mu$; conidia 30-120$\mu$, 1-9 septate.

*C. passiflorae*

DD. Conidiophores not branched, 2-3.5 x 5-15$\mu$; conidia 25-55$\mu$, 1-7, mostly 3-septate, hyaline to pale colored.

*C. calospilea*

**Cercospora biformis** Peck

Bul. Torr. Bot. Club 36: 156. 1909

Leaf spots none or indistinct; fruiting in dark olivaceous to almost black patches on the lower leaf surface; stromata lacking or only a few cells; nonfasciculate to dense fascicles; conidiophores pale brown or olivaceous brown, multiseptate, branched, sinuous to multigeniculate, tip rounded with small spore scar, sometimes curved or intertwined, 4-6 x 30-150$\mu$; conidia obclavate to cylindro-obclavate, pale olivaceous, straight to mildly curved, plainly multiseptate, base long obconically truncate to rounded, tip obtuse, 3.5-5.5 x 40-150$\mu$, rarely 300$\mu$.

HOSTS: *Passiflora incarnata* L., (?) *P. sexflora* A. Juss.

TYPE: Batesville, Ark.; *Passiflora incarnata;* E. Bartholomew, No. 3972; Oct. 7, 1908.

DISTRIBUTION: Specimens examined from Alabama, Arkansas, Oklahoma, and Tennessee. Also reported from San Domingo and Puerto Rico.

NOTE: This species has been much confused with *C. fusco-virens.* Solheim and Stevens' description (Mycologia **23:** 380. 1931) of *C. biformis* sounds very much like that of *C. fusco-virens,* while Atkinson's description (Jour. Elisha Mitchell Sci. Soc. **8:** 63. 1892) of *C. fusco-virens* undoubtedly is that of *C. biformis.* The symptoms and signs of the two species on the hosts are alike, but Peck's species has appreciably paler conidiophores, and longer, more nearly obclavate conidia. It may be true that each species of Passiflora has a distinct Cercospora. A study of the available specimens indicates this, although I have not examined enough host species to be sure of that statement. See key above.

**Cercospora calospilea** Sydow

Ann. Mycol. **37:** 428. 1939

Leaf spots distinct, angular, 2-10 mm. in length, deep reddish brown; fruiting hypophyllous; stromata 25-35$\mu$; fascicles dense; conidiophores pale olivaceous, paler and more narrow toward the tip, 0-1 septate, rarely branched, not geniculate, 2-4 x 5-25$\mu$; conidia hyaline to subhyaline or in mass very pale olivaceous, cylindro-obclavate, occasionally strongly vacuolate, indistinctly 1-7 septate, straight to mildly curved, base obconic, tip blunt to conic, 2-4 x 20-60$\mu$. The collection from Venezuela had fairly dark olivaceous conidia.

HOST: *Passiflora ligularis* Juss.

TYPE: Pr. Banos, Prov. Tungurahua, Ecuador; *Passiflora ligularis;* H. Sydow, No. 688; Jan. 4, 1938.

DISTRIBUTION: Ecuador, Colombia, Venezuela.

NOTE: The almost sessile, comparatively short, hyaline to colored conidia separate this species from the others on Passiflora. See key, page 432.

**Cercospora fusco-virens** Saccardo

Michelia **2:** 149. 1880

Leaf spots none or indistinct; fruiting in effuse, dark olivaceous to almost black patches on lower leaf surface; stromata lacking; borne singly or loosely fasciculate; conidiophores pale to medium dark olivaceous brown, branched, plainly multiseptate, slightly sinuous or mildly geniculate, rounded tip with small spore scar, 3-4.5 x 20-300$\mu$; conidia cylindric to obclavato-cylindric, subhyaline to pale olivaceous, straight to strongly curved, 1-7, mostly 1-3, septate, blunt to sharply obconic base, obtuse tip, 4-6 x 20-60$\mu$.

HOSTS: *Passiflora foetida* L., *P. lutea* L.

TYPE: South Carolina; *Passiflora lutea;* H. W. Ravenel, No. 2212.

DISTRIBUTION: Common in southern states. A specimen sent from Trinidad by R. E. D. Baker.

NOTE: The short cylindric conidia and the medium dark colored nonfasciculate conidiophores separate this species from the others on Passiflora. It has been reported in many states and countries, but in at least several instances it has been *C. biformis* on *P. incarnata* L. and *C. passiflorae* on species in South America. The fungus could be classed also as an Helminthosporium. See key, page 432.

**Cercospora granadillae** sp. nov.

Maculae irregulariter sparsae, 1-30 mm. diam., brunneae vel griseo-brunneae; caespituli amphigeni; stromata atro-fuscae; 30-80$\mu$ diam.; conidiophora densissime fasciculata, flavo-olivacea vel olivaceo-brunnea, sursum pallidiora et attenuata, multiseptata, simplicia, 0-5 geniculata, recta vel flexuosa, ad apicem subtruncata, 4-5 x 50-350$\mu$; conidia hyalina, anguste obclavata, recta vel leniter curvata, ad basim truncata, ad apicem subacuta, 2.5-4 x 50-350$\mu$.

Leaf spots subcircular to irregular, 1-30 mm. in diameter, brown to dark grayish brown, bordered by a slightly darker line; fruiting amphigenous; stromata dark brown to almost black, irregular in shape, 30-80$\mu$ in length; fascicles dense to very dense, spreading; conidiophores pale to medium yellowish olivaceous or olivaceous brown, slightly paler and more narrow toward the tip, multiseptate, not branched, 0-5 geniculate, straight to somewhat curved or sinuous, medium spore scar at the subtruncate tip, 4-5 x 50-250$\mu$ (Hansford says 4-4.5 x 150-350$\mu$); conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2.5-4 x 50-200$\mu$ (Hansford says 3.5-4 x 100-350$\mu$).

HOST: Passiflora sp.
TYPE: Kampala, Uganda; Passiflora sp.; C. G. Hansford, No. 1273; June, 1930.
DISTRIBUTION: Known only from the type locality.
NOTE: See the key, page 432, for differences among the species on Passiflora. The species name refers to the fruit of the host.

**Cercospora passiflorae** Muller & Chupp
Arch. Inst. Biol. Veg. Rio de Janeiro. 3: 95. 1936

Leaf spots indistinct, angular, 2-4 mm. in diameter, brown, at margin fading into healthy tissue; fruiting chiefly epiphyllous; small brown globular stromata, 20-50$\mu$ in diameter; fascicles dense to very dense, compact; conidiophores very pale olivaceous brown, rarely septate, not geniculate, straight to undulate, somewhat irregular in width, slightly branched, rounded tip, spore scars indistinct, 2-4 x 10-55$\mu$; conidia cylindro-obclavate, subhyaline to pale olivaceous, straight to mildly curved, septa 1-9, indistinct, base long obconically truncate, tip suddenly attenuated and almost acute, 2-4 x 30-120$\mu$.

HOSTS: *Passiflora sexflora* Juss., Passiflora sp.
TYPE: Vicosa-Escola, Minas Geraes, Brazil; Passiflora sp.; A. S. Muller, No. 668; Dec. 23, 1933.
DISTRIBUTION: San Domingo, Puerto Rico, and Brazil.
NOTE: See the key, page 432 for differences among the species on Passiflora.

**Cercospora passifloricola** sp. nov.

Maculae sordide brunneae, numerosae, minutae, subinde confluendo irregulares et usque magnam folii partem occupantes; caespituli plerumque hypophylli; stromata minutissima; conidiophora laxe fasciculata, aequabiliter brunnea, multiseptata, vix ramosa, haud geniculata, recta vel leniter curvata, ad apicem subtruncata, 4-5 x 100-400$\mu$; conidia hyalina, anguste obclavata, spurie multiseptata, recta vel leniter curvata, ad basim truncata, ad apicem subacuta, 2.5-4 x 50-250$\mu$.

Leaf spots numerous, dull brown, without a distinct border, angular to irregular, small at first, then coalescing until the entire leaflet dies; fruiting chiefly hypophyllous, when abundant almost effuse; stromata lacking or a few dark brown cells; fascicles 2-10 spreading stalks; conidiophores pale to medium olivaceous

brown, fairly uniform in color and width, multiseptate, rarely branched, not geniculate, straight or only slightly curved, large spore scar at the subtruncate base, 4-5 x 100-400$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to mildly curved, base truncate, tip subacute, 2.5-4 x 50-250$\mu$.

HOST: Passiflora sp.
TYPE: San Jose, Edo. Miranda, Venezuela; Passiflora sp.; A. S. Muller, No. 2022; Nov. 2, 1937.
DISTRIBUTION: Known only from the type locality.
NOTE: See the key, page 432 for differences among the species on Passiflora.

**Cercospora regalis** Tharp
Mycologia 9: 114. 1917

Leaf spots large yellowish to brown blotches, sometimes covering half the leaf surface, and within which are small islands of pale green to grayish areas, 0.5-1.5$\mu$ in extent; fruiting in these areas, chiefly epiphyllous; stromata slight to as wide as 60$\mu$, irregular in shape, pale to dark brown; fascicles 5-20 rather compact stalks; conidiophores pale olivaceous brown, strongly attenuated and somewhat paler toward the tip, sparingly septate, not branched, not geniculate, almost straight, narrowly subtruncate tip, 4-6.5 x 10-75$\mu$, the base may be swollen to 8$\mu$ in width (Tharp says maximum is 5 x 460$\mu$); conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2.5-4 x 40-120$\mu$ (Tharp says up to 4 x 280$\mu$).

HOST: Passiflora sp.
TYPE: Mission, Texas; Passiflora sp.; B. C. Tharp; Nov. 5, 1915.
DISTRIBUTION: Known only from the type locality.
NOTE: See key, page 432 for differences among the species on Passiflora.

**Cercospora truncatella** Atkinson
Jour. Elisha Mitchell Scien. Soc. 8: 44. 1892

Leaf spots subcircular, 2-4 mm. in diameter, white center, pale brown border; fruiting plainly amphigenous; stromata a few cells to 30$\mu$ in diameter, irregular in shape, dark brown; fascicles 2-12 wide spreading stalks; conidiophores medium dark brown, paler and more narrow toward the tip, distinctly multiseptate, branched occasionally, 0-3 abruptly geniculate, curved to tortuous, small spore scar at the narrowly subtruncate tip, 3.5-5 x 50-250$\mu$; conidia hyaline to subhyaline, in mass showing some color, cylindro-obclavate to almost acicular, very short ones may be cylindric, straight to mildly curved, indistinctly multiseptate, base subtruncate to long obconically truncate, tip subobtuse, 2.5-4 x 30-100$\mu$, or even longer.

HOST: *Passiflora incarnata* L.
TYPE: Auburn, Lee Co., Ala.; *Passiflora incarnata;* Geo. F. Atkinson, No. 2025; Aug. 26, 1891.
DISTRIBUTION: Known only from the type locality.
NOTE: See key, page 432 for differences among the species on Passiflora.

**Cercospora decolor** Passerini
Anal. Soc. Cien. Argent. 9: 191. 1880

*Cercospora decolor* var. *macrospora* Elisei, Atti Ist. Bot. Giov. Briosi e Lab. Critt. Ital. R. Univ. Pavia IV. 10: 225. 1938

Leaf spots circular, 1-8 mm. in diameter, rusty brown with a minute to medium white center, occasionally zonate or bulged upward; fruiting amphigenous; stromata subglobular, dark brown, a few cells to 30$\mu$ in diameter; fascicles partly dense, rarely nonfasciculate; conidiophores pale to medium olivaceous brown, paler and more narrow toward the tip, sparingly septate, not branched excepting when borne singly from procumbent threads, 0-1 geniculate, tip subtruncate, 3.5-6 x 10-75$\mu$; conidia hyaline, acicular to cylindric, straight or nearly so, indistinctly multiseptate, base truncate, tip subobtuse, 2-5 x 30-150$\mu$. Immature specimens may have almost hyaline conidiophores and only short cylindric conidia.

HOSTS: *Martynia lutea* Lindl., *M. proboscidia* Glox. (*M. louisiana* Mill.)

TYPES: Parma, Italy, in R. Horto Botanico; *Martynia lutea;* G. Passerini; Sept. 1875; (var. *macrospora*) same place and host; F. G. Elisei.

DISTRIBUTION: Italy, Argentine, Kansas, Virginia.

NOTE: Elam Bartholomew distributed a specimen (No. 3251) which he named *C. decolor* on *Martynia proboscidia* Glox. It seems identical with the European collection. *Cercospora beticola* apparently wrongly has been reported on *M. louisiana* (Phytopath. 8: 117. 1918).

**Cercospora sesami** Zimmermann

Ber. Land.-Forst. Deut.-Ostafr. 2: 28. 1904

Leaf spots circular to subcircular, 0.5-3 mm. in diameter, rarely up to 6 mm., gray center, dull brown to almost black margin, largest spots may be slightly zonate; fruiting amphigenous; stromata slight or none; conidiophores in fascicles of 2-9 stalks or borne singly, medium dark olivaceous or olivaceous brown, slightly paler and more narrow toward the tip, multiseptate, rarely branched, sinuous to 1-4 mildly or sometimes 1-2 abruptly geniculate, medium spore scar at rounded to subtruncate tip, 4-5.5 x 20-110$\mu$; conidia acicular, hyaline, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-4.5 x 30-150$\mu$.

HOSTS: *Ceratotheca triloba* E.M., *Pretrea zanguebarica* J. Gay, *Sesamum orientale* L. (*S. indicum* L.)

TYPE: Experimental Gardens, German East Africa; *Sesamum indicum.*

DISTRIBUTION: Apparently a serious disease wherever Sesamum is grown extensively. Specimens have been received from every part of the tropical world. A number of collections were sent from Puerto Rico. Among the countries and states from which it has been reported are Maryland, Florida, Georgia, South Carolina, Alabama, Texas, Puerto Rico, Transvaal, Italian Somaliland, Sierre Leone, Uganda, San Domingo, Brazil, Trinidad, Venezuela, China, Philippines, Japan.

NOTE: Curzi (Bol. Staz. Pat. Veg. n.s. 12: 161. 1932) described the variety *somalensis.* The size of the conidiophores is given as 3-7 x 27-40$\mu$. In other respects the description fits the Zimmermann species. A specimen from the Research Station, Nelspruit, Transvaal, on *Pretrea zanguebarica,* collected by L. Liebenberg (D28) No. 26048, April 1931, seems to be identical. Another collection (No. 26179) on *Ceratotheca triloba* from Schagen of the same district, also resembles the species very closely. See Chowdhury (Jour. Indian Hort. Soc. 23: 91. 1944) for effects of media, temperature, humidity, and light on variations of the fungus.

**Cercospora flagellaris** Ellis & Martin
Amer. Nat. **16**: 1003. 1882

Leaf spots circular to subcircular, 3-10 mm. in diameter, pale tan to dingy gray, narrow raised brown line border; fruiting chiefly epiphyllous; stromata slight, dark; fascicles usually 2-10 stalks; conidiophores pale olivaceous brown, fairly uniform in color and width, multiseptate, rarely branched, 0-3 mildly or abruptly geniculate, large spore scar at subtruncate tip, 3-6 x 30-300$\mu$, some collections show them no longer than 65$\mu$; conidia acicular, hyaline, straight to bent, truncate base, acute tip, septa indistinct, 2-4 x 30-120$\mu$, rarely as long as 280$\mu$.

HOSTS: *Phytolacca decandra* L., *P. decumbens* (?), *P. icosandra* L., *P. abyssinica* Hoffm. (*P. dodecandra* L'Hérit.).

TYPE: West Chester, Pa.; *Phytolacca decandra;* Dr. Martin, No. 1342b; Nov. 1881.

DISTRIBUTION: From Pennsylvania and New Jersey to Florida and west to Kansas and Texas; also in Puerto Rico, and Abyssinia.

NOTE: This species has been reported also on Rivina (Mycologia **23**: 400. 1931) and Petiveria, but a critical study of the specimens leads me to consider them as distinct from the one on Phytolacca. The Ellis herbarium contains a specimen labeled *C. flagellaris* var. *diantherae* E. & M. on *Dianthera americana.* It is *Cercospora diantherae.* See also *C. pircuniae.* Hansford (Jour. East African Agric. **2**: 422. 1937) named a species *Cercospora phytolaccae,* but did not describe it. In Volume 8, page 50, 1943 of the same Journal he withdrew the name, saying it was *C. flagellaris.*

**Cercospora guaranitica** Spegazzini
Anales de la Soc. Scien. Argentine **16**: 170. 1883

Leaf spots subcircular, 0.5-3 mm. in diameter, when young uniformly reddish brown, when mature with gray center; fruiting chiefly hypophyllous; stromata dark brown, subglobular, small to 100$\mu$ in diameter; fascicles dense, divergent; conidiophores pale olivaceous brown, uniform in color and width, sparingly septate, not branched, not geniculate, curved to undulate, conic tip, 2.5-5 x 10-100$\mu$, mostly 10-60$\mu$; conidia very pale olivaceous, cylindric or slightly attenuated, straight to mildly curved, indistinctly multiseptate, sometimes catenulate, ends rounded bluntly or obconically truncate, 2.5-5 x 20-80$\mu$.

HOST: *Seguiera guaranitica* Speg.

TYPE: Caá-guazú, Paraguay; *Seguiera guaranitica;* B. Balansa, No. 3442 (Speg. No. 923); Jan. 1882.

DISTRIBUTION: Known only from the type locality.

**Cercospora petiveriae** sp. nov.

Maculae orbiculares vel angulatae, 0.5-3 mm. diam., rubro-brunneae, centro tandem expallentes; caespituli amphigeni; stromata atro-fuscae, 10-40$\mu$ diam.; conidiophora laxe vel dense fasciculata, brunneae, sursum pallidiora et attenuata, multiseptata, simplicia, recta vel sinuosa, ad apicem anguste subtruncata, 3-5 x 20-125$\mu$; conidia hyalina, anguste obclavata, curvata, multiseptata, ad basim truncata, ad apicem acuta, 2-4 x 30-140$\mu$.

Leaf spots circular to angular, 0.5-3 mm. in diameter, minute gray center, fairly wide reddish brown margin, often with a yellowish halo; fruiting amphigenous; stromata a few cells to 40$\mu$ in diameter, dark brown to black; fascicles

3-20 divergent stalks; conidiophores pale to medium brown, paler and more narrow toward the tip, multiseptate, not branched, straight or upper third undulate to geniculate, narrow subtruncate tip, 3-5 x 20-125$\mu$; conidia hyaline, acicular, curved, multiseptate, base truncate, tip acute, 2-4 x 30-140$\mu$.

HOST: *Petiveria alliacea* L.

TYPE: Base of Cliff at Sardinera, Mona Island; *Petiveria alliacea;* C. E. Chardon and J. I. Otera, No. 152; July 21, 1944.

DISTRIBUTION: Mona Island, and apparently in northern South America.

**Cercospora pircuniae** Spegazzini

Anales del Museo Nac. de B. Aires **20:** 441. 1910

Leaf spots at first small, circular, 0.5-2 mm. in diameter, pale brown, dark line border, later with a wide irregular yellowish brown border; fruiting chiefly hypophyllous, occasionally plainly effuse; stromata flattened, dark brown, filling stomatal openings or enlarging to 50$\mu$ in length; fascicles mostly dense, compact to somewhat divergent; conidiophores pale to medium brown, uniform in color and width, rarely septate, not branched, not geniculate, usually straight, tip blunt, 4-5.5 x 10-45$\mu$; conidia pale olivaceous, cylindric, straight to mildly curved, 1-5 septate, frequently catenulate, ends rounded bluntly or obconically truncate, 4-5.5 x 30-60$\mu$.

HOST: *Phytolacca dioica* L. (*Pircunia dioica* Moq.)

TYPE: Pereira, circa de La Plata, Buenos Aires; *Pircunia dioica;* C. Spegazzini, No. 946; May 5, 1906.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. flagellaris* for differences between the species on Phytolacca.

**Cercospora rivinae** Chupp & Stevenson, sp. nov.

Maculae suborbiculares, 0.5-3 mm. diam., griseae vel pallidissime brunneae; caespituli plerumque hypophylli; stromata atro-fusca, globosa, 15-40$\mu$ diam.; conidiophora laxe fasciculata, aequabiliter brunnea, multiseptata, torta, 1-3 subito geniculata, ad apicem subtruncata, 3.5-6 x 40-140$\mu$; conidia hyalina, anguste obclavata vel cylindrata, recta vel leniter curvata, spurie septata, ad basim subtruncata, ad apicem obtusa, 3-5 x 30-110$\mu$.

Leaf spots circular to subcircular, 0.5-3 mm. in diameter, gray to tan with a pale yellowish brown line margin; fruiting amphigenous, but more abundant on lower surface; stromata globular, dark brown, 15-40$\mu$ in diameter; fascicles 2-15 stalks; conidiophores medium dark brown, uniform in color and width, multiseptate, tortuous, undulate, or 1-3 abruptly geniculate, small to medium spore scar at rounded to subtruncate tip, 3.5-6 x 40-140$\mu$; conidia hyaline, bluntly acicular to cylindric, straight to mildly curved, septa indistinct, base truncate to subtruncate, tip obtuse to subobtuse, 3-5 x 30-110$\mu$.

HOST: *Rivina humilis* L.

TYPE: Lake Okechobee, Florida; *Rivina humilis;* C. V. Piper (J. A. Stevenson Herb. No. 1158); Dec. 19, 1919.

DISTRIBUTION: Florida, Colombia.

**Cercospora trichostigmae** Stevens

Ill. Acad. Sci. Trans. **10:** 211. 1917

Leaf spots circular to angular, 3-10 mm. in diameter, brown to yellowish

brown, sometimes with a pale brown line border; fruiting hypophyllous; stromata dark brown, subglobular, 30-60$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, attenuated, straight to curved, septation, geniculation, branching, and spore scars absent or indistinct, tip narrowly rounded, 2-4 x 5-35$\mu$; conidia obclavate, shortest ones may be cylindric, subhyaline to pale olivaceous, straight to mildly curved, septa indistinct, base obconic, tip subobtuse to subacute, 2-4 x 20-80$\mu$.

HOSTS: *Villamilla octandra* Hook (*Rivina octandra* L.) (*Trichostigma octandrum* H. Walter), *Gallesia scorododendrum* Casar.
TYPE: Barcelonta, Puerto Rico; *Trichostigma octandrum;* F. L. Stevens, No. 9254.
DISTRIBUTION: Puerto Rico, San Domingo, Sao Páulo.
NOTE: See also *C. rivinae.*

**Cercospora cryptomeriae** Shirai

Botanical Magazine of Tokyo **30** (360): 413. 1916

Especially prevalent on the older leaves of seedlings, starting at the base of the leaf as a necrotic reddish brown area and moving upward until it kills the leaf, and in most severe attacks may kill the entire plant; stromata present; fascicles dense; conidiophores dark brown, paler and more narrow toward the tip, sparingly septate or geniculate, not branched, straight to curved or tortuous, tip rounded bluntly or conic, 5-8 x 20-60$\mu$; conidia olivaceous, obclavate, straight to curved, 3-6 septate, base rounded to obconically truncate, tip subobtuse, 5-9 x 40-70$\mu$.

HOST: *Cryptomeria japanica* (L.) Don.
TYPE: No definite type is given with the description.
DISTRIBUTION: Apparently common in some areas of Japan and Formosa.
NOTE: I have not seen this specimen. The width of the conidiophores and conidia might indicate that it were some other genus.

**Cercospora exosporioides** Bubák

Ann. Mycol. **13**: 33. 1915

Affected parts of needle turn reddish brown, more often near or at the tip, but the discoloration may occur also in the middle or near the base of the needle, in severe cases the entire needle dies and falls to the ground; fruiting amphigenous; stromata extremely large, 75-300$\mu$ in length, dark reddish brown, covered with densely compact fascicles; conidiophores very pale olivaceous brown, paler and more narrow toward the tip, undulate, septation, geniculation, and branching absent or indistinct, rounded tip, 2-4 x 5-20$\mu$; conidia cylindric or slightly attenuated, straight or mildly curved, 1-5, mostly 3-septate, subhyaline to pale olivaceous, base obconically truncate, tip blunt, 2-3.5 x 15-50$\mu$.

HOST: *Larix europaea* DC.
TYPE: Mähr Weisskirchen, Ludinaback, Moravia; *Larix europaea;* Dr. F. Petrak; Oct. 8, 1914.
DISTRIBUTION: Known only from the type locality.
NOTE: The very large stromata are characteristic of Exosporium, but the very delicate, pale colored conidiophores and conidia are more like those of other Cercospora species.

**Cercospora juniperina** Georgescu & Badea

Anal. Inst. Cercet. Exp. For. Bucuresti I. **2**: 37. 1937

*Cercospora sequoiae* var. *Juniperi* Ellis & Everh., Jour. Mycol. **3**: 14. 1887

*Camarosporium juniperinum* Georg. & Bad., Rev. Padurilor, Bucuresti **3**: 1. 1935

HOST: *Juniperus communis* L., *J. virginiana* L., Juniperus sp.

TYPES: Roumania; Juniperus sp.; Georgescu and Badea; (var. *Juniperi*) Powers Lake, Wisc.; *Juniperus virginiana;* J. J. Davis, No. 8; Aug. 3, 1886.

NOTE: This fungus has short, 1-3 septate, cylindric, echinulate conidia, which would place it in Heterosporium rather than in Cercospora. It is closely related to the one described by Plakidas (Phytopath. **35**: 181. 1945) as *C. thujina.* Plakidas believes that the variety *Juniperi,* the conidiophores of which arise in a compact mass from a cushion-like structure—a sporodochium—is an Exosporium. In some herbaria are packets labeled *Cercospora spiculifera* Ellis on Gymnosporangium galls of Juniperinum. There, however, is not enough fruiting to be sure that it is a Cercospora. Greene also considers the variety, *juniperi,* as an Exosporium. See his discussion in the American Midland Naturalist **48**: 43. 1952.

**Cercospora pini-densiflorae** Hori & Nambu

Tokyo Jour. of Plant Protection **4**: 353. 1917

See also Mycologia **10**: 89. 1918

Yellowish brown to gray lesions appear mostly on the upper half of the needle, as the disease progresses especially on 2-year-old trees, the needles die to such an extent that it is known as "leaf-blight"; dark brown stromata fill the stomatal openings or as large as 60$\mu$ in diameter; fascicles dense to very dense; conidiophores dark brown, rarely septate, not branched, sparingly geniculate, 2.5-5 x 10-45$\mu$; conidia pale yellowish olivaceous, obclavate to obclavato-cylindric, straight to curved, 3-7 septate, rounded to obconically truncate base, obtuse tip, 3-6 x 20-60$\mu$.

HOSTS: *Pinus densiflora* Sieb. & Zucc., *P. massoniana* Lamb.

TYPE: Nursery of Makago, Kagoshima-ken, Major Forest Office, Japan; *Pinus densiflora;* Sept. 20, 1915.

DISTRIBUTION: Apparently common on red pine in Japanese nurseries. Also present in Formosa.

NOTE: I have seen only the Formosa collection.

**Cercospora sequoiae** Ellis & Everhart

Jour. Mycol. **3**: 13. 1887

HOST: *Sequoia gigantea* Lindl. & Gord.

TYPE: Germantown Nurseries, Penn.; *Sequoia gigantea;* Thos. Meehan; Oct. 1886.

NOTE: This has echinulate conidia, 3-5 septate, and should be considered an Heterosporium rather than a Cercospora.

**Cercospora thujina** Plakidas

Phytopath. **35**: 181. 1945

HOST: *Thuja orientalis* L.

TYPE: Baton Rouge, La.; *Thuja orientalis;* A. G. Plakidas.

NOTE: As described by Plakidas, this fungus has echinulate conidia. It is closely

related to the fungi named *C. juniperina* and *C. sequoiae.* Heterosporium, as described by Jacques (Contr. de l'Inst. Bot. de Univ. de Montreal 39: 1-46. 1941) could well include these fungi on the Pinaceae. They certainly are not Cercosporae.

## CERCOSPORAE ON PIPERACEAE

(All conidia colored)

A. Leaf spots distinct; fruiting not effuse; fascicles usually dense, sometimes compact; conidiophores 4-5 x 20-60$\mu$; conidia obclavate, 2-3.5 x 40-120$\mu$.
P. CRASSINERVIUM, PIPER sp. *C. artanthes*

AA. Leaf spots indistinct; fruiting effuse; fascicles not dense, nor compact.
B. Conidiophores subhyaline to very pale, not branched, 2-4 x 10-50$\mu$; conidia 2-3.5 x 15-75$\mu$, 1-5 septate.
P. LONGUM *C. piperata*
BB. Conidiophores pale to medium dark, branched, 3-6 x 20-80$\mu$; conidia 3-5 x 25-130$\mu$, multiseptate.
PIPER spp. *C. piperis*

**Cercospora artanthes** P. Hennings
Hedwigia 48: 18. 1909

Leaf spots irregular in shape, 2-5 mm. in diameter, dark reddish brown to almost black; fruiting hypophyllous; stromata small, dark brown; fascicles sometimes dense, spreading to compact; conidiophores pale olivaceous brown, uniform in color, irregular in width, sparingly septate, not branched, not geniculate, curved to sinuous, conic tip, 4-5 x 20-60$\mu$; conidia very pale olivaceous, narrowly obclavate, mildly curved, indistinctly multiseptate, base sharply obconic, tip subacute, 2-3.5 x 40-120$\mu$.

HOSTS: Piper sp. (Artanthe sp.), *P. crassinervium* H.B. & K.

TYPE: Serra da Cantareira, Sao Paulo, Brazil; Artanthe sp.; A. Puttemans, No. 678; Mar., 1903.

DISTRIBUTION: Several collections from Sao Paulo, Brazil and one from Venezuela.

NOTE: See key above for differences among the species on Piper.

**Cercospora piperata** Asthana & Mahmud
Mag. Agric. Coll. Nagpur, 21: 58. 1947

Leaf spots indistinct to definite, subcircular to irregular in form, 4-10 mm. in diameter, reddish brown on upper surface, sometimes with wide pale green to yellowish border, on lower surface grayish olivaceous; fruiting hypophyllous, subeffuse; conidiophores solitary or in small fascicles from slight stromata, subhyaline to very pale yellowish brown, mostly non-septate, rarely 1-3, 0-1 geniculate, 2-4 x 10-50$\mu$; conidia subhyaline to very pale olivaceous, narrowly obclavate, or with almost no attenuation, 1-5 septate, straight to mildly curved, base obconically truncate, tip blunt to conic, 2-3.5 x 15-75$\mu$.

HOST: *Piper longum* L. The authors were unable to infect *P. betle* with this species.

TYPE: Nagpur, India; *Piper longum;* K. A. Mahmud; Oct. 1945. The exact type is not given, but Dr. Asthana kindly sent me a specimen collected Oct. 28, 1947, apparently from the type locality.

DISTRIBUTION: Known only from the Nagpur area.

NOTE: See key above for differences among the species on Piper.

**Cercospora piperis** Patouillard

Bul. Soc. Mycol. France **11**: 233. 1895

*Cercospora piperis* Ellis & Ev., Mo. Bot. Gard. Ann. Rept. **9**: 119. 1898
*Cercospora portoricensis* Earle, Muhlenbergia **1**: 15. 1901
*Cercospora pipericola* Sacc. & Sydow, Syll. Fung. **16**: 1073. 1902

Leaf spots indefinite or none, sometimes a slight darkening or browning on upper surface; fruiting in dark olivaceous to slate colored effuse patches on lower surface; stromata lacking or only a few cells; nonfasciculate or 3-12 in fascicle; conidiophores pale or rarely medium dark olivaceous brown, uniform in color, irregular in width, plainly multiseptate, often constricted at septa, branched, plainly sinuous, rarely geniculate, small spore scar at rounded to conic tip, 3-6 x 20-80$\mu$ or longer when nonfasciculate; conidia obclavato-cylindric, pale olivaceous, straight or nearly so, plainly multiseptate, base sharply obconic, tip conic to bluntly rounded, 3-5 x 25-130$\mu$.

HOSTS: Piper sp., *P. aduncum* L., *P. hispidum* H.B. & K., *P. peltatum* L. (*Pothomorphe peltata* Miq.), *P. tuberculatum* Kunth., *P. umbellatum* L. (*Pothomorphe umbellatum* Miq.).

TYPES: Pululahua, Ecuador; Piper sp.; De Lagerheim; (*C. Piperis* E. + E.) Port Morant, Jamaica; *Piper hispidum;* A. S. Hitchcock; Dec. 20, 1890; (*C. portoricensis*) Mayaguez, Puerto Rico; *Piper aduncum;* F. S. Earle, No. 4359; Jan.

DISTRIBUTION: Many collections were received from Puerto Rico, Jamaica, San Domingo, Grenada, Cuba, Trinidad, Barbadoes, Mexico, Venezuela, Colombia, and Brazil. I did not see any specimens that were collected in the United States.

NOTE: Saccardo and Sydow changed *C. piperis* E. & E. to *C. pipericola.* See key, page 441 for differences among the species on Piper.

**Cercospora pittospori** Plakidas

Mycologia **32**: 601. 1940

Leaf spots on upper surface, angular, 1-5 mm. in diameter, yellow to dull brown, immarginate; fruiting in fawn-colored effuse patches on corresponding lower surface; stromata mostly in stomatal openings; fascicles usually not dense, or stalks nonfasciculate; conidiophores pale olivaceous or olivaceous brown, plainly septate, sometimes branched, irregular in width or slightly attenuated, straight to tortuous, rarely geniculate, spore scars indistinct, 3-4 x 25-100$\mu$; conidia pale olivaceous, linear or mildly attenuated, often much curved, septa indistinct, base obconic or obconically truncate, tip blunt to conic, 2-3.5 x 35-100$\mu$.

HOST: *Pittosporum tobira* Ait.

TYPE: Baton Rouge, La.; *Pittosporum tobira;* A. G. Plakidas.

DISTRIBUTION: Mississippi, Florida, Louisiana, and Texas. S. Katsuki sent a specimen from Japan.

**Cercospora pantoleuca** Saccardo

Michelia **1**: 268. 1879

HOST: *Plantago lanceolata* L.

TYPE: A Selva, Italy; *Plantago lanceolata;* P. Saccardo; Sept. 1876.

NOTE: Saccardo later (Fung. Italici No. 679, 1881) refers this to *Cercosporella pantoleuca* The fungus plainly is hyaline.

**Cercospora plantaginis** Saccardo
Michelia **1**: 267. 1879

*Cercospora plantaginella* Tehon, Mycologia **16**: 139. 1924

Leaf spots circular to angular, 1-6 mm. in diameter, pale brown to gray, indistinct brown margin, sometimes with raised line border; fruiting amphigenous but chiefly on upper leaf surface; stromata lacking to small, globular, black, 40$\mu$ in diameter; fascicles rarely dense, usually 1-8 stalks; conidiophores pale to medium dark fuligenous brown, tip may be pale, longer ones uniform in width, short ones attenuated, plainly multiseptate, slightly branched, straight to curved, 0-4 mildly or occasionally once abruptly geniculate, medium spore scar at rounded to subtruncate tip, 3.5-5.5 x 20-300$\mu$, some collections showing none over 50$\mu$ in length (as illustrated by Saccardo, Fung. Ital. No. 666, 1881), while others show few less than 150$\mu$ in length; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-4 x 40-200$\mu$.

HOSTS: *Plantago lanceolata* L., *P. lusitanica* L., *P. major* L., *P. media* L., *P. rugelii* Dcne., Plantago sp.

TYPES: A Selva, Italy; *Plantago lanceolata;* P. A. Saccardo; Sept. 1873; (*C. plantaginella*) Boaz, Ill.; *Plantago rugelii;* P. A. Young, No. 1140; Aug. 8, 1922.

DISTRIBUTION: From Alabama and Missouri to Wisconsin and eastward. Also in Bermuda, Italy, Portugal, Germany, Minas Geraes, Cyprus, Hawaii, and Central Russia.

**Cercospora platanicola** Ellis & Everhart,
Jour. Mycol. **3**: 17. 1887

Leaf spots irregular, 1-5 mm. in diameter, dull brown, slightly darker brown below, immarginate, whole leaf may finally turn brown; fruiting amphigenous; stromata small, usually filling stomatal openings; fascicles dense; conidiophores pale olivaceous brown, tip may be subhyaline, not or rarely septate, not branched, 1-3 mild geniculations near tip, minute spore scar at rounded tip, 2-3.5 x 5-20$\mu$; conidia narrowly obclavate or almost linear, subhyaline to pale olivaceous, distinctly curved, mostly 3-5 septate, base rounded to obconically truncate, tip subobtuse, 3-6 x 30-100$\mu$.

HOST: *Platanus occidentalis* L., *P. acerifolia* Willd., *P. orientalis.*

TYPE: Pointe a la Hache, La.; *Platanus occidentalis;* A. B. Langlois, No. 557; Oct. 2, 1886.

DISTRIBUTION: From California to the East Coast and as far north as West Virginia.

NOTE: The type of this has very delicate conidiophores and conidia, both of which are almost hyaline. The conidiophores measure 2-3 x 5-20$\mu$ and the conidia 1.5-3 x 20-60$\mu$, but in a later note (Jour. Mycol. **9**: 168. 1903) Ellis states they received a specimen with larger pale colored conidia, 4-5 x 30-55$\mu$. Therefore the type is immature or a different species from that illustrated by Wolf (Mycologia **30**: 62. 1938) when he described the perfect form as *Mycosphaerella platanifolia* Cke. *C. platanicola* often is mixed with Stigmina and Alternaria so that it may be difficult to study. Following the nomenclature of the perfect stage, some authors now prefer the name, *Cercospora platanifolia.* (Bull. For. Exp. Sta. Tokyo 46: 17-32. 1950). See also Mycologia **30**: 243. 1938.

**Cercospora insulana** Saccardo

Nuov. Giorn. Bot. Ital. n.s. **22**: 74. 1915

*Cercosporina insulana* Sacc., Nuov. Giorn. Bot. Ital. n.s. **22**: 74. 1915
*Cercospora staticis* Lobik, Bolezni Rast. **17**: 195. 1928
*Cercospora insulana* (Sacc.) Chupp, Bothalia **4** (4): 886. 1948
*Cercospora insulana* (Sacc.) Muller and Chupp, Ceiba **1**: 174. 1950

Leaf spots circular to subcircular, 2-6 mm. in diameter, tan to gray, with darker margin and bordered by a purplish line or zone; fruiting amphigenous but often chiefly epiphyllous; stromata mostly filling stomatal opening, dark brown (Saccardo says as large as 100$\mu$ in diameter); fascicles dense, compact; conidiophores pale brown, slightly paler and more narrow toward the tip, sparingly septate, not branched, longest ones may be sinuous or rarely once geniculate, small to medium spore scar at rounded to subtruncate tip, 4-5 x 20-60$\mu$; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to rounded, tip subacute, 2.5-4 x 55-135$\mu$ (Lobik and Saccardo say 4-6$\mu$ wide).

HOSTS: *Armeria maritima* Willd., *Limonium gmelinii* Kuntze (*Statice gmelinii* Willd.), *L. sinuatum* Mill. (*Statice sinuata* L.), *Limonium* (Statice) sp., *Statice armeria* L.

TYPES: Cimitero Ta Braxia et Addolorata, Insula Melita; *Statice sinuata;* (*C. staticis*) Bejirk v. Kisljar, Steppe in d. Ungeb. v. Kosakendorf Borosdinskaja, Russia; *Statice gmelinii;* A. J. Lobik; Oct. 5, 1922.

DISTRIBUTION: Reported from Russia, Transvaal, Manitoba, Guatemala, Malta, Florida, and Texas.

NOTE: I was unable to procure any type material, but the collections from Florida, Texas, and Guatemala fit both the Saccardo and Lobik descriptions very closely with the exceptions noted above.

**Cercospora plumbaginea** P. A. & D. Saccardo

Atti R. Ist. Ven. Sci. lett. ed arti **61**: 723. 1902

Leaf spots circular to oval, 2-4 mm. in diameter, indistinctly concentric zones, brown, sometimes bordered by a narrow raised dark brown line; fruiting amphigenous; stromata small, brown; fascicles 2-10 spreading stalks; conidiophores pale brown, slightly paler and more narrow toward the tip, sparingly septate, not branched, plainly geniculate, medium spore scar at the subtruncate tip, 4-6.5 x 25-100$\mu$; conidia hyaline, acicular to obclavate, mildly curved, indistinctly multiseptate, base truncate to obconically truncate, tip subobtuse, 2.5-4 x 35-100$\mu$.

HOST: *Plumbago europaea* L.

TYPE: Bisceglie (Bari), southern Italy; *Plumbago europaea;* Adr. Fiori; July 1898.

DISTRIBUTION: Several collections from Italy. Also reported from Palestine.

**Cercospora omphacodes** Ellis & Holway

Jour. Mycol. **1**: 5. 1885

*Cercospora phlogina* Peck, N. Y. State Mus. Bul. 150: 24. 1911

Leaf spots mostly large, 3-12 mm. in diameter, circular to irregular, at first dark brown, then center becomes pale brown, tan, or dingy gray with pale to medium brown margin; fruiting amphigenous, with larger stromata and shorter conidiophores on upper surface, rarely dark effuse on lower surface; stromata globular, dark to black, 25-60$\mu$ in diameter, on upper surface sometimes as large

as 100$\mu$; fascicles dense, rarely being coremoid in density; conidiophores very pale olivaceous brown, uniform in color, medium dark in mass, sparingly septate, not branched, mostly non-geniculate, sometimes once mildly geniculate near tip or rarely 2-3 times abruptly geniculate, small spore scar at conic tip, 3-4.5 x 10-100$\mu$ (some collections have only short ones); conidia cylindro-obclavate, subhyaline to pale olivaceous, straight to mildly curved, indistinctly septate, base short to medium obconic, tip obtuse, 2.5-4 x 15-90$\mu$, mostly about 3 x 15-50$\mu$.

HOSTS: *Phlox amoena* Sims, *P. caroliniana* Hill, *P. drummondi* Hk., *P. divaricata* L., *P. floridana* Benth., *P. maculata* L., *P. paniculata* L., *P. pilosa* L., Phlox sp.

TYPES: Decorah, Iowa; *Phlox divaricata* L. var. *Laphamii;* E. W. D. Holway; Aug. 10, 1884; (*C. phlogina*) Floral Park, L. I.; cultivated phlox; F. C. Stewart; June 28, 1900.

DISTRIBUTION: Minnesota and Ontario to Louisiana and eastward. Puerto Rico, South Africa, Japan.

NOTE: In the New York Botanic Garden Herbarium is a specimen collected Febr. 15, 1891 at Passaic, N. J. and labeled *Cercospora caroliniana* Ellis & Hals. on *Phlox caroliniana.* It is identical with *C. omphacodes.* In 1934 Dr. M. F. Barrus collected a Cercospora on *Gilia coronopifolia* Pers. (*Ipomoea rubra* Murr.) which apparently is identical with the one on Phlox.

**Cercospora polemonii** Overholts

Mycologia **32**: 253. 1940

Leaf spots indistinct on the brown dried leaf, faintly brownish, irregular in outline, bounded by the larger veins, often occupying a large part of the leaf surface; fruiting hypophyllous; stromata prominent, globular, olivaceous brown, 20-70$\mu$ in diameter, rather resembling a pycnidium; fascicles sometimes dense; conidiophores pale or very pale olivaceous brown, more narrow and almost hyaline near the tip, 0-2 septate, not branched, rarely geniculate, minute spore scar at the rounded tip, 3-5 x 5-30$\mu$; conidia hyaline to subhyaline, cylindric, 1-4 septate, mostly straight, rounded ends or base almost obconic, 2.5-5 x 15-60$\mu$.

HOST: *Polemonium reptans* L.

TYPE: State College, Pa.; *Polemonium reptans;* J. B. Demaree; Sept. 19, 1912.

DISTRIBUTION: Known only from the type locality.

**Cercospora grisea** Cooke & Ellis

Grevillea **5**: 49. 1876

*Cercospora polygalae* P. Henn., Hedwigia **43**: 95. 1904

Leaflets turn pale brown or almost gray and then on both surfaces (chiefly below) the area is darkened by minute closely aggregated black pustules or dark effuse fruiting; small black globular stromata may be present; fascicles dense, rarely nonfasciculate; conidiophores pale olivaceous brown, uniform in color, slightly attenuated, fairly closely septate, sometimes constricted at the septa, not branched excepting when nonfasciculate, not geniculate, often curved or undulate, minute spore scar at conic tip, 3-4.5 x 30-75$\mu$ or when nonfasciculate may be as large as 5 x 150$\mu$; conidia linear to narrowly obclavate, subhyaline to very pale olivaceous, long obconic base, tip subacute, straight to curved, septa indistinct, 2-3.5 x 20-100$\mu$.

HOSTS: *Polygala cruciata* L., *P. lutea* L., *P. nana* DC., *P. paniculata* L., *P. polygama* Walt., *P. sanguinea* L.

TYPES: Newfield, N. Jersey; *Polygala lutea;* J. B. Ellis, No. 1348 (Cooke, No. 2365); Sept. 1876; (*C. Polygalae*) Gavea, Estado de Rio de Janeiro, Brazil; *Polygala paniculata;* E. Ule, No. 2585; Jan. 1900.
DISTRIBUTION: Sparingly from Wisconsin to Mississippi and eastward. Brazil.
NOTE: Saccardo (Syll. Fung. 4: 434. 1886) states that Cooke and Ellis in Grevillea 5: 49. 1876, describe *Cercospora minuta* on *Polygala cruciata* and *P. lutea.* This is the citation and description for *C. grisea.* Therefore it seems that Saccardo made a mistake in the species name. In some herbaria is a packet labeled *C. grisea* var. *sabbatiae.* It, however, is *C. sabbatiae* and is not related to *C. grisea.*

**Cercospora monninae** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 51. 1942

Leaf spots subcircular to irregular, 2-10 mm. in diameter, tan to almost gray, papery in appearance; fruiting hypophyllous; stromata subglobular, dark brown, filling stomatal openings to 70$\mu$ in length; fascicles dense, strongly divergent; conidiophores pale to medium dark brown, slightly paler and more narrow toward the tip, multiseptate, not branched, curved to tortuous or upper third closely geniculate, tip rounded to narrowly subtruncate, 4-5.5 x 30-125$\mu$; conidia subhyaline to pale olivaceous, cylindric to cylindro-obclavate, straight to mildly curved, 3-5 septate, base rounded to short obconically truncate, tip obtuse, 3-5.5 x 20-60$\mu$.
HOST: Monnina sp.
TYPE: Caracas a Colonia Tovar, Venezuela; Monnina sp.; H. H. Whetzel and A. S. Muller, No. 3019; Mar. 17, 1939.
DISTRIBUTION: Known only from the type locality.

**Cercospora securidacae** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 55. 1942

Leaf spots circular to angular, 0.5-2 mm. in diameter, dark reddish brown, occasionally with a raised line border; fruiting amphigenous but more abundant on the lower surface; stromata globular, dark brown, 25-70$\mu$ in diameter; fascicles 3-25 spreading to compact stalks; conidiophores pale brown, uniform in color, irregular in width, multiseptate, rarely branched, straight to curved, 0-2 geniculate, conic tip, 3-5.5 x 20-130$\mu$; conidia hyaline to subhyaline, in mass very pale olivaceous, obclavate, straight to mildly curved, indistinctly 1-5 septate, base long obconically truncate, tip subobtuse, 3-6 x 20-55$\mu$.
HOST: Securidaca sp.
TYPE: Urama Edo. Carsbobo, Venezuela; Securidaca sp.; M. F. Barrus, No. 3678; Dec. 2, 1939.
DISTRIBUTION: Known only from the type locality.

**Cercospora acetosella** Ellis
Bul. Torrey Bot. Club 8: 65. 1881

Spots circular, tan with reddish border or whole leaflets may die and turn reddish brown or brick colored, then the fruiting occurs as leaden to sooty irregular patches on both leaf surfaces; stromata dark brown to almost black, mostly not globular, slight to 60$\mu$ in diameter; fascicles dense; conidiophores delicate, wavy, rarely branched, septa rare or indefinite, spore scars mostly lacking, not genicu-

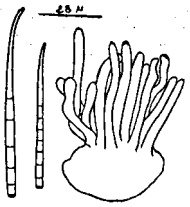


Fig. 150
*C. acetosellae* var. *maculosa*

late, pale brown at base and gradually paler toward almost hyaline tip, 2.5-4 x 10-40$\mu$; conidia linear to narrowly obclavate, subhyaline to pale olivaceous, indistinctly multiseptate, obconic to subtruncate base, tip subacute, 2-4 x 30-80$\mu$.

HOST: *Rumex acetosella* L.

TYPE: Newfield, New Jersey; *Rumex acetosella;* J. B. Ellis, No. 1332; Sept. 30, 1880.

DISTRIBUTION: New Jersey, Missouri.

NOTE: Peck (N. Y. State Mus. of Nat. Hist. Ann. Rept. **40**: 64. 1887) describes *C. acetosellae* var. *maculosa.* It has been changed to *C. peckiana.*

## CERCOSPORAE ON POLYGONUM

A. Conidia hyaline or rarely subhyaline.
  B. Conidia acicular, 2-4.5 x 50-110$\mu$; fruiting chiefly epiphyllous, not effuse; fascicles dense; conidiophores sometimes multigeniculate, 4-5.5 x 40-170$\mu$.
  POLYGONUM spp. *C. polygonacea*
  BB. Conidia narrowly obclavate or almost cylindric, 2-3.5 x 30-150$\mu$; fruiting chiefly hypophyllous, effuse; loosely fasciculate; conidiophores not geniculate, 2-3.5 x 5-25$\mu$.
  POLYGONUM sp. *C. paludicola*

AA. Conidia colored, mostly pale olivaceous; fruiting effuse.
  B. Conidiophores medium to dark in color, sometimes fasciculate, 4-6 x 30-100$\mu$; conidia more nearly cylindric than obclavate, 5-10 x 15-80$\mu$.
  POLYGONUM spp. *C. polygonorum*
  BB. Conidiophores pale in color; conidia more nearly obclavate than cylindric, 3-5 x 20-100$\mu$.
    C. Stromata small; fascicles usually dense; fruiting amphigenous; conidiophores 3-4 x 10-65$\mu$.
    POLYGONUM spp. *C. avicularis*
    CC. Stromata none; mostly nonfasciculate; fruiting hypophyllous; conidiophores 3.5-5 x 30-150$\mu$.
    POLYGONUM spp. *C. persicariae*

**Cercospora avicularis** Winter
Jour. Mycol. 1: 125. 1885
also Hedwigia **24**: 202. 1885

Leaf spots circular to irregular, brown, almost the reddish brown color of the dried leaf, occasionally marked by a grayish to olivaceous effuse fruiting layer on both leaf surfaces, 1-4 mm. in diameter, sometimes with purplish border; stromata small, globular, dark brown; fascicles often dense; conidiophores subhyaline

to pale olivaceous brown, rounded to conic tip, mostly 0-1 septate, straight to tortuous, rarely geniculate, sparingly branched, spore scars indistinct, 3-4 x 10-65$\mu$; conidia pale olivaceous, obclavate to obclavato-cylindric, obconically truncate base, subobtuse tip, straight to curved, 3-5 x 30-75$\mu$.

HOSTS: *Polygonum acre* H.B.K. (*P. punctata* Ell.), *P. aviculare* L. (*P. erectum* L.), *P. dumetorum* L. (*P. scandens* L.), *P. Pennsylvanicum* L., *P. sagittatum* L., Polygonum sp.

TYPE: Perryville, Missouri; *Polygonum aviculare;* Rev. C. H. Demetrio; July, 1883.

DISTRIBUTION: Widely distributed in the United States and as far north as Manitoba. A specimen was sent from Venezuela. It has been reported also in various parts of Europe.

NOTE: The specimen marked *C. polygonacea* of Fungi Columbiani No. 1813 apparently is *C. avicularis.* Atkinson (Jour. Elisha Mitchell Sci. Soc. **8**: 48. 1892) described *C. avicularis* var. *sagittati* on *Polygonum sagittatum.* This appears identical with *C. polygonacea.* In some herbaria are packets labeled *Cercospora arkansana* Bartholomew, Batesville, Ark., on *Polygonum Pennsylvanicum,* Oct. 9, 1908. It is identical with *C. avicularis.* The same is true of the packets marked *Cercospora clavata polygoni* Dearness & Bartholomew, Ste. Genevieve, Mo., Oct. 9, 1923. A. Commons reports *C. polygonacea* var. *avicularis* on *P. aviculare* from Faulkland, Delaware, Aug. 25, 1885 (Mycologia **41**: 17. 1949). This seems to be *C. avicularis.* See key above.

**Cercospora bicolor** Winter

Hedwigia **23**: 190. 1884

Leaf spots circular, brown to grayish brown, slightly darker margin, indistinctly zonate; fruiting amphigenous; stromata present; fascicles very dense, compact; conidiophores pale olivaceous, paler and more narrow toward the tip, sparingly septate, not geniculate, not branched, straight to undulate, 2-3.5 x 10-35$\mu$; conidia pale olivaceous, linear or slightly attenuated, indistinctly septate, straight to mildly curved, obconic base, rounded to conic tip, 2-3.5 x 20-80$\mu$.

HOSTS: *Muehlenbeckia sagittifolia* Meissn. (*Coccoloba sagittifolia* Ortega), *C. uvifera* L.

TYPE: Coimbra, Mot. Gast. (Portugal); *Coccoloba sagittifolia;* Moller; May 1884.

DISTRIBUTION: Portugal, Bermuda.

NOTE: The cotype material at Berlin showed no fruiting, even though a number of mounts were made. The leaves and the spots resembled Polygonum with *C. polygonacea.* See also *C. platensis.*

**Cercospora eriogoni** Ellis & Everhart

Erythea **5**: 6. 1897

HOST: *Eriogonum molle* Greene.

TYPE: Cedros Island off the coast of Lower California; *Eriogonum molle;* A. W. Anthony, No. 121; July-Oct., 1896.

NOTE: The dark colored, thick-walled, closely septate conidia are not those of a Cercospora. The conidiophores being nonfasciculate intertwining threads, the fungus might be considered a Cercodeuterospora Curzi (Boll. del R. Staz. di Pat. Veg. n.s. **12**: 149. 1932) instead of Passalora which has 1-septate conidia. See also *C. rubella* on Eriogonum.

**Cercospora fagopyri** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 44. 1942

Leaf spots circular, 1-10 mm. in diameter, grayish green to various shades of brown, slightly zonate; fruiting amphigenous, when luxuriant appearing as a dark effuse layer; stromata lacking or only a few dark brown cells; conidiophores borne singly or in spreading fascicles of 2-12, pale to medium dark brown, paler and more narrow toward the tip, multiseptate, not branched, 0-5 geniculate, straight to curved, subtruncate tip, 4-6 x 40-150$\mu$ or rarely 300$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2-4 x 50-150$\mu$ or even as large as 5 x 350$\mu$.

HOST: *Fagopyrum esculentum* Moench.

TYPE: El Valle, Caracas, Venezuela; *Fagopyrum esculentum;* M. F. Barrus and A. S. Muller, No. 3758; Jan. 7, 1940.

DISTRIBUTION: Uganda, Venezuela, Japan, China.

NOTE: Shigetaka Katsuki (Bul. Agr. Impr. Sect. Econ. Dept. Fukuoka Pref. Japan **1**: 14. 1949.) lists *C. fagopyri* Nakata. I do not know if this precedes the Chupp and Muller name.

**Cercospora paludicola** Spegazzini

Anal. Soc. Cient. Argentina **13**: 29. 1882

Leaf spots indistinct angular brownish areas on the upper surface, 2-3 mm. in diameter; fruiting on the corresponding lower surface, effuse, ochraceous; either fascicles arising from small dark globular stromata or stalks arising singly as branches from procumbent threads; conidiophores very pale olivaceous brown, uniform in color, irregular in width or attenuated, seldom septate, not geniculate, tip rounded to conic, 2-3.5 x 5-25$\mu$; conidia very narrowly obclavate or almost cylindric, hyaline to subhyaline, straight to mildly curved, indistinctly septate, base subtruncate to obconic, tip blunt to conic, 2-3.5 x 30-150$\mu$.

HOST: Polygonum sp.

TYPE: Ensenada prov. Buenos Aires, Argentine; Polygonum sp.; C. Spegazzini, No. 916; Febr. 13, 1881.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 447 for differences among the species on Polygonum.

**Cercospora peckiana** n. comb.

*Cercospora acetosellae* var. *maculosa* Peck, N. Y. State Mus. Nat. Hist. Rept. **40**: 64. 1887

Leaf spots circular, 2-4 mm. in diameter, dingy gray with wide raised pale brown line border; fruiting amphigenous, forming a sooty layer on the gray area; stromata pale brown, 50-75$\mu$ in diameter; fascicles dense to very dense; conidiophores pale to medium brown near base (dark in mass) and subhyaline to hyaline near the tip, slightly attenuated, septa indistinct, not branched, 0-2 mildly to abruptly geniculate, medium spore scar at rounded to subtruncate tip, 3-4.5 x 20-50$\mu$; conidia hyaline, acicular (shortest ones may be cylindric), straight to mildly curved, indistinctly multiseptate, base truncate, tip of longest ones acute, 2.5-4 x 40-80$\mu$.

HOST: *Rumex crispus* L.

TYPE: Elizabethtown, Essex Co., N. Y.; *Rumex crispus;* C. H. Peck; Sept. 1886.

DISTRIBUTION: Known only from the type locality.

NOTE: Dense fascicles, conidiophores 3-4.5 x 20-50$\mu$, and hyaline conidia separate this species from others on Rumex.

**Cercospora persicariae** Yamamoto

Jour. Soc. Trop. Agr. Formosa **6**: 605. 1934

Leaf spots none or indistinct brownish areas on the upper surface; fruiting on the corresponding lower surface, dark olivaceous to sooty in color, effuse; stromata lacking; nonfasciculate or 2-8 spreading stalks in a fascicle; conidiophores pale to medium brown, uniform in color, irregular in width, multiseptate, branched occasionally, slightly geniculate, variously curved or tortuous, conic tip, 3.5-5 x 30-150$\mu$; conidia pale olivaceous, cylindro-obclavate, the shortest ones may be cylindric, straight to mildly curved, 1-9 septate, base obconic, tip blunt to conic, 3.5-5 x 20-100$\mu$.

HOSTS: *Polygonum acre* H.B.K. (*P. punctatum* Ell.) (*Persicaria punctata* Small), *Polygonum chinense* L. (*Persicaria chinensis* [L.] Nakai)

TYPE: Taihoku, Formosa; *Persicaria chinensis;* W. Yamamoto; Dec. 24, 1933.

DISTRIBUTION: Several collections from Formosa.

NOTE: A specimen was sent from Transvaal on *Polygonum tomentosum* L. and which resembled the Formosa material somewhat. It had more narrow conidia and differed in other ways so that it finally may prove to be a new species. K. Sawada, Formosa Agr. Res. Inst. Rept. **85**: 119. 1943, meagerly described *Cercospora polygoni* Sawada on *Polygonum hydropiper* L. This was collected by R. Suzuki, Oct. 9, 1909 at Sinchu, Taiwan (Formosa). The specimen available to me was too scanty for me to make a certain identification. The conidia are shaped much like those of *C. persicariae,* but are more narrow. Possibly the two are the same. See key, page 447.

**Cercospora platensis** Spegazzini

Anal. Soc. Cien. Argentina **10**: 38. 1880

Leaf spots indistinct yellowish areas on the upper leaf surface; fruiting on the corresponding lower surface, effuse, dark olivaceous; stromata dark brown, subglobular to flattened, 15-50$\mu$ in diameter; fascicles dense, compact; conidiophores in mass medium dark, singly pale olivaceous brown, paler and more narrow toward the tip, longest ones sparingly septate, not branched, not geniculate, slightly undulate, 2.5-4 x 5-25$\mu$; conidia obclavato-cylindric, subhyaline to pale olivaceous, 3-6 septate, straight to mildly curved, base rounded to obconically truncate, tip obtuse, 3-4.5 x 30-50$\mu$.

HOST: *Muehlenbeckia sagittata* (?)

TYPE: Recoleta, Buenos Aires, Argentina; *Muehlenbeckia sagittata;* C. Spegazzini, No. 910; April, 1880.

DISTRIBUTION: Known only from the type locality.

NOTE: Some of the stromata are perched on top of tall coremium-like structures unlike anything found among other Cercosporae. It may finally prove to be some other genus. See also *C. bicolor.*

**Cercospora polygonacea** Ellis

Jour. Mycol. **1**: 24. 1885

*Cercospora avicularis* var. *sagittati* Atk., Jour. Elisha Mitchell Sci. Soc. **8**: 48. 1892

Leaf spots circular, 2-5 mm. in diameter, ferruginous, faintly zonate, sometimes with a narrow pale colored margin; fruiting chiefly epiphyllous; stromata slight, dark brown; fascicles usually dense; conidiophores pale olivaceous brown, uniform in color and width, multiseptate, rarely branched, straight to undulate or 1 to repeatedly geniculate, large spore scar at subtruncate tip, 4-5.5 x 40-170$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4.5 x 50-110$\mu$, rarely as long as 300$\mu$.

HOSTS: *Polygonum convolvulus* L. (*Tiniaria convolvulus* Webb. + Moq.), *P. dumetorum* L. (*P. scandens* L.), *P. lapathifolium* L., *P. pennsylvanicum* L., *P. ramosissimum* Michx., *P. sagittatum* L., *P. thunbergii* Sieb. & Zucc., *P. tenue* Michx.

TYPES: Newfield, N. J.; *Polygonum convolvulus;* J. B. Ellis; Aug. 1882; (var *sagittati*) Auburn, Ala.; *Polygonum sagittatum;* B. M. Duggar, No. 2201; Oct. 1, 1891.

DISTRIBUTION: Texas to Wisconsin and eastward. Japan.

NOTE: Fungi Columbiani 1813 apparently is *C. avicularis.* The long conidiophores and hyaline, acicular conidia separate this species from the others on Polygonum. Hansford (Proc. Linn. Soc. London **1942-3**: 34-67. 1943) records this on *Fagopyrum esculentum.* I believe this species differs from the one on buckwheat in having denser fascicles and paler conidiophores that are slightly branched. See key, page 447.

**Cercospora polygoni-caespitosi** Sawada

Taiwan (Formosa) Agr. Rev. **38** (9): 700. 1942

Leaf spots brown, circular, 2-3.5 mm. in diameter, at first greenish-gray, finally reddish gray center, with purple border; fruiting epiphyllous; conidiophores in fascicles of 7-10, brown, 2-3 septate, 4.7-5 x 34-104$\mu$; conidia hyaline, acicular, 4-7 septate, 2-4 x 50-112$\mu$.

HOST: *Polygonum caespitosum* Bl.

TYPE: None given definitely. Formosa; K. Sawada.

DISTRIBUTION: Formosa, Japan.

NOTE: Sawada included the description also in Formosa Agr. Exp. Sta. Bul. 33: 700. 1942; and Dept. Agr. Govt. Inst. Formosan **85**: 120. 1943. The description is too meager to make certain that it is a distinct species. Dr. Katsuki sent me a specimen on *Polygonum blumei* Meisn. (*Persicaria blumei* H. Gross.) from Yaku-Island, and collected August 10, 1951. He thought his specimen was identical with the Sawada species. If this is true, *C. polygoni-caespitosi* is a synonym of *Cercospora polygonacea.* See key, page 447.

**Cercospora polygonorum** Cooke

Hedwigia **17**: 39. 1878

*Helminthosporium hydropiperis* de Thuemen, Rev. Mycol. **1**: 60. 1879

*Cercospora hydropiperis* (de Thuemen) Speg., Bol. Acad. Cien. Cordoba **9**: 191. 1880

Leaf spots none or indefinite; fruiting irregular, effuse, dark olivaceous to black patches on lower leaf surface, from very small areas to large part of leaflet; stromata mostly lacking; nonfasciculate to densely fasciculate (mostly less than 10 stalks); conidiophores medium to dark olivaceous brown, uniform in color or slightly paler toward the tip, somewhat clavate, plainly multiseptate, straight,

curved, or tortuous, sparingly geniculate and branched, small to medium spore scar at subconic tip, 4-6 x 30-100$\mu$; conidia cylindric to cylindro-obclavate or irregular in shape, subhyaline to pale olivaceous or fuligenous, straight to slightly curved, plainly 1-6, mostly 3 septate, base long, sharply obconic, tip obtuse, 5-10 x 15-80$\mu$.

HOSTS: Polygonum sp., *P. acre* H.B.K. (*P. punctata* Ell.), *P. hydropiper* L., *P. hydropiperoides* Michx., *P. muhlenbergii* (Meisn.) Waston, *P. pennsylvanicum* L. A. Commons (See Mycologia **41**: 17. 1949) has reported *C. polygonorum* on *P. sagittatum, P. aviculare,* and *P. persicaria* L. It is doubtful that this identification is correct in every instance.

TYPE: Aiken, S. Car.; *Polygonum acre;* H. W. Ravenel, No. 120; cotype of *H. hydropiperis* distributed as de Thuem. Mycoth. Univ. 1087.

DISTRIBUTION: From Alabama to Missouri and Wisconsin and eastward. Also in Puerto Rico, San Domingo, Minas Geraes, Venezuela, and China.

NOTE: Cooke described this species in 1878, after which de Thuemen (1879) from the same type described *H. hydropiperis.* Then Spegazzini (1880) changed the de Thuemen name to *Cercospora hydropiperis.* Since then various authors have suggested that the Cooke species is a synonym of *C. hydropiperis* (Jour. Mycol. **8**: 58. 1902). See also Jour. Mycol. **1**: 52. 1885. The effuse fruiting and the colored cylindric conidia separate this species from the others on Polygonum. This should really be considered an Helminthosporium. See key, page 447.

**Cercospora rhapontici** Tehon & Daniels

Mycologia **17**: 248. 1925

Leaf spots circular, 1-4 mm. in diameter, dingy tan center, yellowish brown margin; fruiting amphigenous; stromata none to small, brown; fascicles sometimes dense; conidiophores pale brown, uniform in color and width, multiseptate, rarely branched, straight or once abruptly geniculate near mid-region, large spore scar at subtruncate tip, 4-5.5 x 40-125$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to mildly curved or undulate, base truncate, tip acute to subacute, 2.5-4 x 40-200$\mu$.

HOST: *Rheum rhaponticum* L.

TYPE: Coxeyville, Monroe Co., Ill.; *Rheum rhaponticum;* P. A. Young, No. 5111; Aug. 24, 1922.

DISTRIBUTION: Known only from the type locality.

NOTE: *C. rhei* on *Rheum officinale* Baill., the other species reported on this host genus, seems to have hyaline fruiting and therefore is not a Cercospora. It was distributed as Roum. Fungi Gallici Exc. 2775 and Sydow Mycot. M. 1767, but to my knowledge has never been described.

**Cercospora rubella** Cooke

Grevillea **7**: 34. 1878

Leaf spots circular, pale tan to red, 0.5-2.5 mm. in diameter or large irregular dark red blotches; fruiting epiphyllous; stromata black, globular, 15-50$\mu$ in diameter; most fascicles dense; conidiophores medium dark brown or fuligenous, uniform in color, irregular in width, rarely septate, sinuous, not geniculate, not branched, small spore scar at bluntly rounded tip, 3.5-5 x 10-35$\mu$; conidia cylindric to cylindro-obclavate, pale olivaceous to medium brown, straight to mildly curved, 1-5 septate, base rounded to obconic, tip obtuse, 3-5 x 20-50$\mu$.

HOST: *Eriogonum tomentosum* Michx.
TYPE: Aiken, S. Carolina; *Eriogonum tomentosum;* H. W. Ravenel, No. 289 (Cooke, No. 2586).
DISTRIBUTION: See also *C. eriogoni* for differences between the two species on this host genus. C. rubella could almost be classed as an Helminthosporium.

**Cercospora rumicis** Ellis & Langlois in litt.

Leaf spots circular, 3-7 mm. in diameter, dark olivaceous to brown, darkened somewhat by the fruiting which is amphigenous, occasionally slightly zonate; stromata lacking or only a few cells; fascicles 1-10 stalks; conidiophores medium brown, uniform in color and width, multiseptate, not branched, straight to 1-2 mildly or abruptly geniculate, medium spore scar at subtruncate tip, 4-5.5 x 20-100$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4 x 25-150$\mu$.

HOST: *Rumex obtusifolius* L.
TYPE: St. Martinsville, Louisiana; *Rumex obtusifolius;* A. B. Langlois; March 15, 1889.
DISTRIBUTION: Known only from the type locality.
NOTE: I found no published description of this species. It was distributed as N. Am. Fungi 2nd Ser. No. 2481, and has been listed in two publications (see Seymour, Host Index, p. 288. 1929).

**Cercospora tripolitana** Saccardo & Trotter
Ann. Mycol. **11**: 419. 1913

*Cercospora barrasii* Fragoso, Trab. Mus. Nac. Cien. Nat. Madrid Ser. Bot. 9: 68. 1916
*Cercospora emicis* Patouillard, *In* Pitard, J. C. Contribution a l'étude de la flore du Maroc. p. 73. 1931

Leaf spots circular, 2-4 mm. in diameter, pale tan to brown, usually with a raised line border, the leaves and spots both reminding one of beet leaves with *C. beticola;* fruiting amphigenous, slightly darkening the center of the spot; stromata dark brown, small; fascicles 5-12 rather compact stalks; conidiophores pale olivaceous brown, uniform in color, attenuated toward the tip, septation, branching and geniculation not evident, medium spore scar at the subtruncate tip, 4-6 x 10-30$\mu$ (Fragoso says 25-50$\mu$); conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 40-150$\mu$.

HOST: *Emex spinosa* (L.) Campd.
TYPES: Bir Sbea, Tripoli; *Emex spinosa;* Fr. Cavara; Febr. 1913; (*C. barrasii*) Prope Hispalis, circam fl. Guadalquiver, Spain; *Emex spinosa;* Prof. De Las Barras; Febr. 7, 1915. (*C. emicis*) Souani, near Tanger, Morocco; *Emex spinosa;* Pitard.
DISTRIBUTION: Tripoli, Morocco, Spain (several collections), Palestine.
NOTE: I found a specimen in the Paris herbarium dated April 17, 1916 from Seville and determined by Fragoso. On the label is written, "same as *C. barrasii* Frag. (1916)." Apparently the latter recognized his species as being a synonym.

**Cercospora adianti** Sydow
Ann. Mycol. **28**: 206. 1930

Leaf spots none or indistinct brown areas on the upper surface; fruiting hy-

pophyllous, effuse, often covering the entire surface of the leaflet, dark olivaceous to almost black; stromata lacking or small, dark, irregular; nonfasciculate to dense fascicles; conidiophores pale to medium olivaceous brown, uniform in color, irregular in width, multiseptate, usually constricted at the septa, branched, not to multigeniculate, variously curved to strongly tortuous, tip rounded to conic, 4-6 x 30-150$\mu$; conidia pale olivaceous, cylindric or mildly attenuated, straight to much curved, multiseptate, ends rounded or base obconically truncate, 4-5.5 x 50-120$\mu$.

HOST: *Adiantum tetraphyllum* Willd., var. *acuminata* Kuhn.

TYPE: El Limon pr. Puerto La Cruz, Venezuela; *Adiantum tetraphyllum* var. *acuminata;* H. Sydow, No. 242; Jan. 15, 1928.

DISTRIBUTION: Known only from the type locality.

**Cercospora asplenii** Jaap

Ann. Mycol. **14**: 43. 1916

Leaf spots minute to large, sometimes covering entire leaflet, varying shades of brown from golden to almost black, center brown to dull gray; fruiting amphigenous; stromata dark brown to almost black, a few brown cells to 75$\mu$ in diameter, almost globular; conidiophores borne singly or in fascicles of 2-20, divergent, medium olivaceous brown, uniform in color and width, multiseptate, rarely branched, straight to undulate or curved, 0-5 geniculate, subtruncate tip, 4-5.5 x 30-150$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4 x 20-120$\mu$. Some collections show only short, immature conidia like those Jaap described as being 1-2 celled and as large as 3.5 x 20$\mu$. He mentions also their being colored. Some collections do seem to have at least subhyaline conidia. The type and co-type material had only enough fragments of conidia present to show that they were much longer than Jaap's measurements, and probably were hyaline.

HOSTS: *Asplenium irichomanes* L., *A. nidus* L., Asplenium sp.

TYPE: Auf Lapad bei Ragusa, Dalmatia; *Asplenium irichomanes;* Otto Jaap; March 18, 1914.

DISTRIBUTION: Dalmatia, India, Canada, and possibly Florida.

NOTE: It is possible that *C. athyrii* is the same as *C. asplenii,* but I have had no opportunity to study Mendoza's species. Jaap spells the species name, *aspleni.*

**Cercospora athyrii** Mendoza

Philipp. Jour. Sci. **75**: 165. 1941

Leaf spots subcircular, 1-8 mm. in diameter, brown, slightly sunken on the upper surface; stromata filling the stomatal openings, brown; fascicles dense; conidiophores medium dark olivaceous brown, paler and more narrow toward the tip, multiseptate, not branched, 0-2 geniculate, medium spore scar at the subtruncate tip, 3.5-5 x 30-105$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 3-5 x 20-90$\mu$.

HOST: *Athyrium esculentum* Copel.

TYPE: Manila, Luzon, Philippines; *Athyrium esculentum;* Mendoza, No. 55483.

DISTRIBUTION: Known only from the type locality.

NOTE: Material of this species has not been available for study. The type specimen with others of this collection are deposited in the Philippine National Herbarium of the Natural History Museum, Manila.

**Cercospora camptosori** Davis

Wisc. Acad. Trans. 18: 267. 1915

Leaf spots circular to irregular brown blotches, sometimes including whole width of the leaflet, no definite border; fruiting on both leaf surfaces; dark brown stromata, 20-50$\mu$ in diameter; fascicles mostly dense; conidiophores pale olivaceous brown, paler toward the tip, indistinctly septate, mildly geniculate near tip, not branched, slightly attenuated, minute spore scars present, 4-5 x 20-60$\mu$; conidia acicular to narrowly obclavate, hyaline, truncate base, acute to subacute tip, straight to mildly curved, septa not evident, 1.5-3 x 30-125$\mu$.

HOST: *Camptosorus rhizophyllus* (L.) Lk.

TYPE: Marquette State Park, Grant Co., Wisc.; *Camptosorus rhizophyllus;* J. J. Davis; Aug. 1, 1914.

DISTRIBUTION: Known only from the type locality.

NOTE: Davis states that this species differs from *C. phyllitidis* in having shorter conidiophores. This might indicate it were a synonym. But it differs also in having acicular, hyaline conidia and in other characters.

**Cercospora filicum** P. Hennings

Hedwigia 41: 310. 1902

HOSTS: Aspidium (Nephrodium) sp., *Cyathea arborea* (L.) Sm. (*Polypodium arborea* L.)

TYPE: Botanical Garden, Sao Paulo, Brazil; Nephrodium sp.; Ars. Puttemans, No. 258.

NOTE: The wide, brown, cylindric, closely septate, thick-walled conidia represent Helminthosporium and not Cercospora.

**Cercospora lonchitidis** sp. nov.

Maculae irregulares, 3-6 mm. diam., sordide rubrae; caespituli epiphylli; stromata globosa, atro-fusca, 30-60$\mu$ diam.; conidiophora dense fasciculata, subhyalina vel pallidissime olivacea, vix septata, simplicia, haud geniculata, fere recta, ad apicem subacuta, 3-4.5 x 10-60$\mu$; conidia subhyalina vel pallide olivacea, anguste cylindrata, recta vel curvata, spurie multiseptata, ad basim subtruncata, ad apicem subobtusa vel subacuta, 3-5 x 30-110$\mu$.

Leaf spots irregular in shape, 3-6 mm. in diameter, dull red or on the under surface merely with a narrow red line surrounding a green area; fruiting epiphyllous; stromata globular, dark brown, 30-60$\mu$ in diameter; fascicles dense, spreading to compact; conidiophores subhyaline to very pale olivaceous brown, uniform in color, slightly irregular in width, sparingly and indistinctly septate, not branched, not geniculate, nearly straight, conic to rounded tip, 3-4.5 x 10-60$\mu$, or when conidia are persistent, appearing much longer; conidia subhyaline to pale olivaceous, linear or mildly attenuated toward the tip, straight to curved, indistinctly multiseptate, base obconically truncate or rarely subtruncate, tip obtuse to conic, 3-5 x 30-110$\mu$.

HOST: *Lonchitis hirsuti* L. (*Anisosorus hirsutus* [L.] Underw. & Maxon).

TYPE: Road Maracaya Choroni, Aragua, Venezuela; *Lonchitis hirsuti* (*Anisosorus hirsutus*); H. H. Whetzel and A. S. Muller, No. 3385; April 9, 1939.

DISTRIBUTION: Known only from the type locality.

**Cercospora lygodii** Sawada

Formosa Agr. Res. Inst. Rept. **87**: 83. 1944

Leaf spots 2-30 mm. in diameter; conidiophores amphigenous, brown, 2-7 septate, 3.5-4 x 23-90$\mu$; conidia hyaline, 1-3 septate, 2.5-4 x 13-32$\mu$.

HOST: *Lygodium macrostachyum* Desv.

NOTE: The description indicates that the fungus is not a Cercospora. It may be a Didymaria or a Piricularia.

**Cercospora phyllitidis** Hume

Bul. Torrey Bot. Club **27**: 577. 1900

Leaf spots mostly irregular, 2-4 mm. in diameter, brown, usually without a distinct border; fruiting hypophyllous; stromata at first fill stomatal opening, later may enlarge to 75$\mu$ in diameter, brown, globular; fascicles dense; conidiophores subhyaline to pale olivaceous brown, uniform in color, attenuated, rarely septate, not geniculate, not branched, straight to slightly sinuous, minute spore scar at rounded tip, 3-5 x 10-75$\mu$; conidia subhyaline to pale olivaceous, obclavate, straight to mildly curved, 3-5 septate, obconic base, subacute tip, 2-3.5 x 20-80$\mu$.

HOSTS: *Polypodium phyllitidis* L., Nephrolepis sp.

TYPE: Hobe Sound, east coast of Florida; *Polypodium phyllitidis;* H. H. Hume; Mar. 14, 1900.

DISTRIBUTION: Material studied from Kew Gardens, England; Ottawa, Canada; Florida; and Puerto Rico. Possibly present also in Indiana.

**Cercospora plagiogyriae** Sawada

Formosa Agr. Res. Inst. Rept. **85**: 119. 1943

Leaf spots brown, 7-10 mm.; conidiophores 3-6 septate, brown, 4-5 x 65-183$\mu$; conidia pale olive, 5-7 septate, 4.7-5 x 55-82$\mu$.

HOST: *Plagiogyria euphlebia* Merr.

NOTE: It is described too briefly to be classified.

**Cercospora platycerii** sp. nov.

Maculae suborbiculares, 10-30 mm. diam., atro-brunneae; caespituli hypophylli; stromata minutissima; conidiophora laxe fasciculata, olivaceo-brunnea, sursum pallidiora et attenuata, multiseptata, simplicia, 0-3 geniculata, recta vel fortiter flexuosa, ad apicem subtruncata, 3.5-5 x 30-200$\mu$; conidia hyalina, anguste obclavata, recta vel leniter curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2.5-5 x 40-150$\mu$.

Leaf spots subcircular, 10-30 mm. in diameter, dark brown to almost black, indistinctly zonate, margin bulging and center depressed or the reverse; fruiting hypophyllous; stromata a few dark brown cells; fascicles 1-9 spreading stalks; conidiophores pale to medium olivaceous brown, paler and more narrow toward the tip, multiseptate, not branched, 0-3 geniculate, straight to curved or rarely tortuous, tip subtruncate, 3.5-5 x 30-200$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2.5-5 x 40-150$\mu$.

HOST: Platycerium sp.

TYPE: East Orange, New Jersey; Platycerium sp.; D. L. Gill; Sept. 21, 1933.

DISTRIBUTION: Known only from the type locality.

**Cercospora pteridis** Siemaszko

Arch. Nauk. Biol. Towarz. Nauk. Warszaw. 1 (14): 57. 1923

*Cercospora pteridicola* Fragosa, Mem. R. Acad. Cien. Exact. Fisicas y Nat. Madrid II. 6: 227. 1927

Leaf spots subcircular, 3-6 mm. in diameter, yellowish brown to gray, with a wide dark red border; fruiting hypophyllous; stromata dark brown, filling the stomatal openings; fascicles dense, spreading; conidiophores medium dark brown near the base, pale brown above, uniform in diameter, plainly 3-7 septate, not branched, rarely geniculate, straight to mildly undulate, conic to conically truncate tip, 3-5 x 30-80$\mu$; conidia subhyaline to very pale olivaceous, obclavate, at times the tip being long drawn out, indistinctly multiseptate, curved, base obconically truncate, tip subacute, 2-4 x 40-210$\mu$, almost never 5$\mu$ in width.

HOSTS: *Pteridium aquilinum* (L.) Kuhn (*Pteris aqualina* L.), Pteris sp.

TYPES: Pskhu, Caucasus Mts., Russia; *Pteris aquilina;* W. Siemaszko; 1917; (*C. pteridicola*) Gerona, Spain; *Pteris aquilina;* Fragosa.

DISTRIBUTION: Caucasus Mts., Colombia, Spain.

NOTE: I have not seen either the Siemaszko or the Fragosa collection, so am not sure that they are synonymous or are identical with the specimen from Colombia. Siemaszko says the conidiophores measure 6-7 x 30-100$\mu$ and the conidia 5.5-6 x 40-140$\mu$; Fragosa's measurements are 9 x 70$\mu$ and 5-8 x 30-75$\mu$ respectively. Otherwise the descriptions are much alike for the three specimens.

**Cercospora trismeriae** Petrak

Sydowia 2: 379. 1948

Leaf spots narrowly elongate between the secondary veins and often extending from the midrib to the leaf edge, during severe infection nearly every interveinal portion may be affected, dull yellow to grayish brown on both surfaces; fruiting chiefly hvpophyllous; stromata small, usually below the stomatal openings, globose, dark olivaceous; fascicles dense, divergent; conidiophores pale olivaceous, straight to undulate or curved, sparingly septate, 5-7 x 40-150$\mu$; conidia obclavate, subhyaline to pale olivaceous brown, straight to curved, rarely S-shaped, 2-9 septate, base subtruncate, tip subobtuse to thinly attenuated, 5-7.5 x 25-200$\mu$.

HOST: Trismeria sp.

TYPE: Mindo, Pichinicha Prov., Ecuador; Trismeria sp.; H. Sydow, No. 1937; Nov. 5, 1937.

DISTRIBUTION: Ecuador.

NOTE: When I visited H. Sydow in 1938 he was in the process of sorting the genera of his recent South American collections. He promised to send me all the Cercosporae, but the war intervened, so that I was unable to study any of the collections from his 1937 trip.

**Cercospora piaropi** Tharp

Mycologia 9: 113. 1917

Leaf spots circular to ovate, 0.5-5 mm. in length, smaller ones uniformly ferrugineous, larger ones with dingy gray center and red margin; fruiting amphigenous; stromata lacking or a few brown cells; conidiophores borne singly or in fascicles of 2-9, medium dark brown, plainly multiseptate, not branched, 1-4 mildly to abruptly geniculate, variously curved, medium spore scar at rounded to subtruncate tip, uniform in color or sometimes slightly paler and more narrow

near the top, 4-5 x 100-200$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 25-140$\mu$.

HOST: *Eichhornia speciosa* Kunth (*Piaropus crassipes* Rafin.) (*Eichhornia crassipes* Solms).

TYPE: Palestine, Texas; *Piaropus crassipes;* Lewis and Tharp, No. 183; Oct. 30, 1914.

DISTRIBUTION: Known only from the type locality.

**Cercospora pontederiae** Ellis & Dearness
Can. Rec. Sci. 5: 270. 1893

HOST: *Pontederia cordata* L.

TYPE: Niagara-on-the-Lake, Ontario; *Pontederia cordata;* J. Dearness, No. 1800; Aug. 1891.

DISTRIBUTION: Ontario, Texas, Wisconsin.

NOTE: Saccardo (Syll. Fung. **11**: 629. 1895) and Davis (Wisc. Acad. Trans. **22**: 182. 1926) suggest that this is a Cercosporella. The type confirms their statements.

**Cercospora montiae** Rostrup
Fungi from the Faeröes, Part 1, Det Nordiske Forlag,
Copenhagen, p. 315. 1901

HOST: *Montia fontana* L. (*M. minor* C. C. Gmel.).

TYPE: Syderö: Trangisvaag; Videro; *Montia minor;* C. O.

NOTE: This is a Pseudocercospora or possibly an Alternaria. The wide, thick walled conidia are not characteristic of Cercospora.

**Cercospora talini** H. & P. Sydow
Mém. l'Herb. Boissier 8 (4): 2. 1900

Leaf spots circular to irregular, 2-5 mm. in diameter, dark brown, sometimes with a narrow pale margin; fruiting chiefly epiphyllous; stromata small, dark brown; fascicles 1-10 stalks or rarely dense; conidiophores pale to medium brown, paler and more narrow toward the tip, multiseptate, not branched, 0-5 geniculate, straight to bent, medium spore scar at the subtruncate tip, 4-5.5 x 40-300$\mu$ (type shows only 15-80$\mu$ in length); conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-4 x 30-125$\mu$.

HOST: *Talinum patens* Willd.

TYPE: Cordoba, Argentine; *Talinum patens;* T. Stuckert; April, 1899.

DISTRIBUTION: Argentine, Venezuela.

**Cercospora lysimachiae** Ellis & Halsted
Jour. Mycol. **6**: 34. 1890

Leaf spots indistinct or none; fruiting in scantily effuse ferruginous patches on both leaf surfaces; stromata when present dark reddish to almost black, up to 150$\mu$ in diameter; nonfasciculate to very dense fascicles; conidiophores pale to dark ferruginous or olivaceous brown, plainly multiseptate, branched, tortuous to 1-3 mildly or abruptly geniculate, rounded tip, spore scars indistinct, 4-5.5 x 30-200$\mu$, when in dense fascicles usually short; conidia narrowly obclavate, very pale ferruginous or olivaceous brown, straight to much curved, septa indistinct, base subtruncate to long obconically truncate, tip subacute, 2-4.5 x 50-200$\mu$.

HOST: *Lysimachia stricta* Ait. (L. *terrestris* Britton).
TYPE: Jonesburg, New Jersey; *Lysimachia stricta;* B. D. Halsted, No. 7; July 6, 1889.
DISTRIBUTION: Studied material from New Jersey, Massachusetts, and Ontario, Canada.
NOTE: The conidiophores and conidia of the Canadian collection were shorter than those occurring farther south.

**Cercospora primulae** Fautrey
Rev. Mycol. **13**: 13. 1891

HOST: *Primula elatior* Hill.
TYPE: Bois des Roches a Noidan (Cote-d'Or); *Primula elatior;* F. Fautrey; June 1, 1890.
NOTE: The cotype as well as a collection made in 1892 showed only hyaline fruiting. It apparently is the same fungus that de Thuemen described as *Ramularia Primulae* (Oest. Bot. Zeitschr. **28**: 147. 1878). On some packets of Roumeguere, Fungi Sel. No. 5587, the name is misspelled *C. drimulae.*

**Cercospora faureae** Chupp & Doidge
Bothalia **4**: 885. 1948

Leaf spots subcircular, 2-8 mm. in diameter, dingy gray, occasionally zonate, with a narrow purple or brown border; fruiting epiphyllous, appearing as minute black pustules easily seen with the unaided eye; stromata prominent, globular, black, 50-200$\mu$ in diameter; fascicles dense to very dense; conidiophores medium to dark olivaceous brown, uniform in color, irregular in width, sparingly septate, not branched, not geniculate, straight to variously curved or bent, bluntly rounded tip, 3.5-5 x 10-45$\mu$; conidia very pale olivaceous, cylindric, straight or nearly so, 3-5 septate, base obconically truncate, tip obtuse, 3-5 x 20-50$\mu$.
HOST: *Faurea speciosa* Welw.
TYPE: Concession, Southern Rhodesia; *Faurea speciosa;* J. C. Hopkins, No. 1620; June 12, 1931.
DISTRIBUTION: Known only from the type locality.

**Cercospora protearum** Cooke
Grevillea **12**: 39. 1883

*Cercospora protearum* var. *leucodendri* Cooke, Grevillea **12**: 39. 1883
*Cercospora protearum* var. *leucospermi* Cooke, Grevillea **12**: 39. 1883
*Cercospora erumpens* Winter, In Berlin and Stockholm herbaria

Leaf spots circular to irregular, 7-40 mm. in length, reddish tan to dingy gray, rarely with an old rose colored border; fruiting plainly amphigenous; stromata globular to elongate, almost black, very large, some as long as 500$\mu$; fascicles exceedingly dense; conidiophores pale to medium olivaceous brown, uniform in color, irregular in width, rarely septate, not branched, not geniculate, tip rounded bluntly to subtruncate, 5-8 x 10-35$\mu$; conidia pale to medium olivaceous, cylindric to obclavato-cylindric, seldom constricted near the center, straight or nearly so, 1-7 septate, mostly 3-4, base obconically truncate, tip obtuse, 6-8 x 30-65$\mu$.
HOSTS: *Leucodendron argenteum* R. Br. (*Protea argentea* L.), *Leucospermum conocarpum* R. Br.
TYPES: Cape Colony, Africa; *Leucodendron argenteum, Leucospermum cono-*

*carpum;* P. MacOwan, Nos. 1456 (var. *Leucospermi*) and 1457 (var. *Leucodendri*); March 1883.

DISTRIBUTION: Several collections from the Cape Province.

NOTE: Cooke thought there was a difference in the size of the spores (var. *leucodendri* = 7 x 35$\mu$ and var. *leucospermi* = 8 x 50-60$\mu$) so divided the species. MacOwan sent his collection No. 1456 to Winter who deposited it in the herbaria as *C. erumpens* but apparently never published this name. The dark colored, thick walled, wide conidia are like those of Helminthosporium, but the very large stromata and extremely dense fascicles resemble Exosporium.

**Cercospora punicae** P. Hennings

Bot. Jahrb. von Engler **37:** 165. 1906

Leaf spots circular, 0.5-3 mm. in diameter, dark reddish brown to almost black or sometimes grayish brown, rarely with a slightly darker line border; fruiting epiphyllous, visible under hand lens as minute black pustules; stromata pale to dark brown, globular, 10-60$\mu$ in diameter; fascicles dense; conidiophores subhyaline to very pale fuligenous or olivaceous brown, sparingly septate, not geniculate, rarely branched, sometimes attenuated, small spore scar at rounded tip, 2-3.5 x 10-55$\mu$; conidia subhyaline to pale olivaceous, straight to variously curved, cylindric to cylindro-obclavate, 2-8 septate, base obconic to obconically truncate, tip obtuse, rarely catenulate, 2.5-5 x 25-85$\mu$.

HOST: *Punica granatum* L.

TYPE: Tokyo, Komaba, Japan; *Punica granatum;* J. Miyake, No. 40; Oct. 1904.

DISTRIBUTION: Material studied from Florida, Texas, Brazil, Puerto Rico, Bermuda, India, and Japan. Also reported from San Domingo, China, and Formosa.

NOTE: This has wrongly been considered identical with *C. lythracearum.* It differs in having conidia more nearly cylindric than obclavate, the base of the conidium not being long obconic, conidia sometimes catenulate; conidiophores rarely branched, as long as 55$\mu$, and other minor differences. Wolf (Jour. Agr. Research **35:** 465. 1927) named the perfect stage of the species on Punica, *Mycosphaerella lythracearum.*

**Cercospora aconiti** Petrak

Ann. Mycol. **23:** 75. 1925

Leaf spots circular to angular, 1.5-5 mm. in diameter, olivaceous to reddish brown or almost gray; fruiting hypophyllous; stromata small, mostly a few pale brown cells; conidiophores near the base very pale olivaceous brown, upper half hyaline, uniform in width, indistinctly septate, not branched, not geniculate, longest ones curved or bent, tip bluntly rounded, 3-5 x 20-130$\mu$; conidia obclavato-cylindric, hyaline to subhyaline, straight to mildly curved, occasionally catenulate, 1-5 septate, base obconically truncate, tip obtuse, 4-7 x 15-75$\mu$.

HOST: *Aconitum napellus* L.

TYPE: Hohe Tatra: Kleines Kohlbachtal, Hungary; *Aconitum napellus;* Dr. J. Hruby; July 1924.

DISTRIBUTION: Several collections from Hungary.

NOTE: Penzes (Zeitsch. z. Erforsch. Kryptfl. 1 (5): 288. 1927) changes the name to Ramularia because he says the conidia are only 2-septate. This alone is hardly a legitimate basis for such a change. The almost colorless fruiting

might be a better basis for such an assertion. It is a borderline species between Cercospora and Ramularia.

**Cercospora adonidis** Fragoso

Broteria, Ser. Bot. **22**: 106. 1926

Leaf spots indistinct or none; fruiting effuse, amphigenous; stromata globular, dark; fascicles dense; conidiophores pale olivaceous brown, 0-1 septate, not branched, slightly irregular in width, not geniculate, almost straight, obtuse to conic tip, 3-4.5 x 10-40$\mu$; conidia hyaline to subhyaline, cylindro-obclavate, 1-5 septate, straight to mildly curved, ends conic, 3-4.5 x 15-65$\mu$.

HOST: *Adonis autumnalis* L. (*A. baetica* Coss).

TYPE: Near Bu-al-Hal (Marruecos), Spain; *Adonis baetica;* Vidal and Lopez; March 1925.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen this species.

**Cercospora aquilegiae** Kellerman & Swingle

Jour. Mycol. **5**: 74. 1889

Leaf spots circular to elliptic, reddish brown to almost black, 2-10 mm. in length; fruiting amphigenous; stromata small or absent; fascicles not dense,

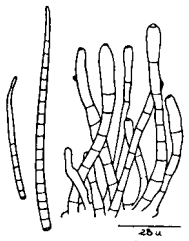


Fig. 151
*C. aquilegiae*

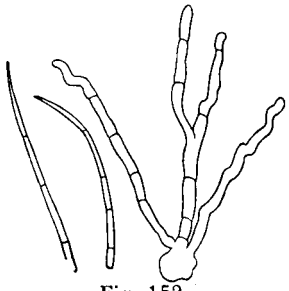


Fig. 152
*C. paeoniae*

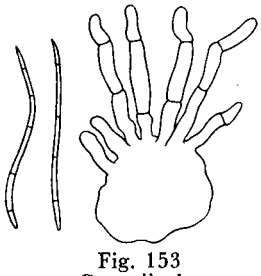


Fig. 153
*C. variicolor*

mostly 2-10; conidiophores straight or nearly so, pale to medium dark olivaceous brown or fuligenous brown, plainly multiseptate, attenuated, rarely geniculate, not branched, large spore scar at tip, 4-6.5 x 40-250$\mu$; conidia acicular, straight to curved, hyaline, truncate base, tip acute to subacute, fairly closely septate, 3-5 x 60-215$\mu$.

HOST: *Aquilegia canadensis* L.

TYPE: Manhattan, Kansas; *Aquilegia canadensis;* Kellerman & Swingle, No. 1495; June 21, 1889.

DISTRIBUTION: Studied material from Kansas, Wisconsin, Austria, and Minas Geraes. Also reported from Oregon.

**Cercospora calthae** Cooke

Grevillea **11**: 72. 1882; **17**: 65. 1888

HOST: Caltha sp.

TYPE: Forres, North Britain; Caltha sp.

NOTE: von Höhnel (Ann. Mycol. **22**: 194. 1924) states that *C. calthae* Cooke, *C.*

*calthae* Eriksson (Sjostugan, Experimental-fältet, Stockholm, Sweden; *Caltha palustris* L.; Jakob Eriksson, No. 299; July 18, 1883), and *Ramularia calthae* Lindroth 1902, apparently are the same as *Cylindrosporium niveum* Berk. & Broome (Ann. Mag. Nat. Hist. IV. 15: 34. 1875), and *Didymaria didyma* (Unger). He believes the correct name should be *Ramularia calthae* (Cooke) von Höhnel. Cooke's type shows the fungus as having hyaline conidiophores borne in an acervulus and having narrowly linear conidia. These characters are the ones usually associated with the cast-off genus, *Cylindrosporium*.

**Cercospora delphinii** de Thuemen

Hedwigia **21**: 157. 1882

Leaf spots circular to elongate, dark brown or pale brown, sometimes with grayish centers, 2-10 mm. in length; most of the fruiting on upper surface; stromata globular, 30-100$\mu$ in diameter, youngest ones hyaline, older ones pale brown; fascicles dense; conidiophores straight, hyaline, septa not visible, not branched, not geniculate, medium sized spore scar at rounded to subtruncate tip, 2.5-3.5 x 10-40$\mu$; conidia hyaline, cylindric or rarely slightly clavate, straight, bluntly rounded ends, 0-2 septate, 2.5-5 x 8-30$\mu$.

HOST: *Delphinium cultorum* Voss. (*D. elatum* L.), *R. robustum*.

TYPE: Minussinsk, Asiatic Siberia; *Delphinium elatum;* Martianoff.

DISTRIBUTION: Apparently rare, but found in various temperate zone countries. Colorado and Missouri.

NOTE: The fact that the conidiophores are hyaline, and the hyaline cylindric conidia 1-3 celled, places this species in Ramularia rather than in Cercospora.

**Cercospora filiformis** (Davis)

*Cercosporella filiformis* Davis, Wisc. Acad. Trans. **18**: 266. 1915

Leaf spots indistinct, angular, brownish, no definite margin; fruiting amphigenous; stromata globular to irregular, dark brown, 40-125$\mu$ in length; fascicles very dense; conidiophores very pale olivaceous brown, tip apparently hyaline, septation, geniculation, branching and spore scars not evident, 2-3.5 x 5-30$\mu$; conidia narrowly obclavate or almost linear, hyaline, straight to much curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse, 2-3.5 x 30-80$\mu$.

HOSTS: *Anemone patens* L. (*Pulsatilla hirsutissima* Britton), *A. patens* L. var. *wolf-gangiana* (Bers.) Koch.

TYPE: Altoona, Wisc.; *Anemone patens* var. *wolf-gangiana;* J. J. Davis.

DISTRIBUTION: Colorado and Wisconsin. A collection made at Long's Peak Inn, Colorado, on *Pulsatilla hirsutissima* Aug. 5, 1907, by F. E. and E. S. Clements, and distributed under the name of *Cercospora pulsatillae* Clements, as Cryptogamae Formationum Coloradensium No. 514 is the same fungus. Apparently no description was ever published.

NOTE: *Cercospora caulophylli* (Plant Disease Rept. **32**: 531. 1948) has been reported from Missouri on *Anemonella thalictroides* (L.) Spach (*Anemone thalictroides* L.). Could it have been the Davis species?

**Cercospora fingens** Davis

Wisc. Acad. Trans. **18**: 92. 1915

Large dark brown or almost black blotches on both leaf surfaces, often including almost whole leaflet; fruiting amphigenous, on upper surface appearing as minute black pustules, on lower surface grayish to olivaceous effuse growth; small

black stromata present on upper surface, mostly nonfasciculate on lower surface; conidiophores pale to medium dark olivaceous brown, fairly uniform in color and width, not branched, multiseptate, 1-7 mildly to abruptly geniculate, large spore scar at subtruncate tip, 4-6.5$\mu$ wide, on upper surface 20-60$\mu$ long, on lower leaf surface 70-300$\mu$; conidia acicular to obclavate, hyaline, truncate base, shorter ones with subobtuse tip, very longest ones with acute tip, straight or slightly curved, indistinctly multiseptate, 3-5.5 x 75-300$\mu$.

HOSTS: *Thalictrum dasycarpum* Fisch. Mey. & Avé-Lall., *T. dioicum* L.

TYPE: Lynxville, Wisc.; *Thalictrum dasycarpum;* J. J. Davis; Sept. 11, 1915.

DISTRIBUTION: Illinois; several collections from Wisconsin.

NOTE: The narrow, hyaline, acicular conidia separate this species from the others on Thalictrum.

**Cercospora isopyri** von Höhnel

Sitz.-K. Akad. Wissensch. Math.-Natur. Classe I. **111**: 1051. 1902

HOST: *Isopyrum thalictroides* L.

TYPE: Pfaffenwald near Purkersdorf, Wienerwald, southern Austria; *Isopyrum thalictroides;* F. von Höhnel, No. 1193; May, 1901.

NOTE: The very large thick-walled conidia and the wide, rigid conidiophores are not characteristic of Cercospora. It is possible that they should be classed under Helminthosporium.

**Cercospora merrowii** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **46**: 380. 1894

Leaf spots at first none or indistinct, later parts of leaf becoming dark or sometimes bluish, on corresponding lower surface is an inconspicuous olivaceous effuse fruiting layer; stromata lacking; mostly nonfasciculate; conidiophores pale olivaceous brown, uniform in color, wider near the tip, rarely or sparingly septate, not branched, often 1-4 abruptly geniculate, large spore scar at subtruncate tip, 4-7 x 20-60$\mu$; conidia cylindro-obclavate to cylindric, subhyaline to pale olivaceous brown, plainly 1-6 septate, straight to mildly curved, occasionally catenulate, subtruncate base, obtuse tip, 4-7 x 20-60$\mu$.

HOST: *Isopyrum biternatum* (Raf.) Torr. and Gray.

TYPE: Ann Arbor, Mich.; *Isopyrum biternatum;* Harriet L. Merrow; Oct. 30, 1893.

DISTRIBUTION: See type and N. Amer. Fungi No. 3195 which Miss Merrow collected the following spring. Also reported from Wisconsin.

NOTE: *C. isopyri,* the other species on this host genus, has conidia which resemble Alternaria in form. N. American Fungi No. 3195 gives the misspelled name, "*C. merzowi.*" Ellis uses the spelling, "*C. merrowi.*"

**Cercospora nigellae** Hollós

Ann. Hist.-Nat. Mus. Nat. Hung. **8**: 8. 1910

Leaf spots present; fruiting amphigenous; stromata punctiform, black; conidiophores fasciculate, pale brown, paler toward the tip, slightly nodular, 4 x 20-40$\mu$; conidia hyaline, cylindro-obclavate, only mildly attenuated, straight to curved, 1-5 septate, ends obtuse, 4-5 x 25-65$\mu$.

HOST: *Nigella arvensis* L.

TYPE: Near Kecskemét, Hungary; *Nigella arvensis;* L. Hollós.

DISTRIBUTION: Known only from the type locality.
NOTE: I have not had an opportunity to study this species.

**Cercospora paeoniae** Tehon & Daniels
Mycologia **17**: 247. 1925

Leaf spots circular to subcircular, 2-10 or even 25 mm. in diameter, brown to tan in color, may be closely zonate, immarginate; fruiting amphigenous; stromata none to large, globular, brown, 20-75$\mu$ in diameter; fascicles mostly not dense, 2-15 stalks, at times very dense, especially on upper leaf surface; conidiophores pale to medium brown, uniform in color and width, multiseptate, undulate or curved, 0-3 geniculate, plainly branched, medium spore scar at rounded tip, 3-4.5 x 30-130$\mu$; conidia hyaline, acicular to obclavate or almost cylindric, straight to curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse, 2-3.5 x 45-75$\mu$ or longer. (Often associated with an Alternaria).

HOST: *Paeonia officinalis* L.
TYPE: Prairie du Rocher, Randolph County, Ill.; *Paeonia officinalis;* No. 5645; Aug. 24, 1922.
DISTRIBUTION: Studied material from Illinois, Nebraska, and Missouri. Reported also from Indiana, Kentucky, Iowa, Wisconsin, and China.
NOTE: Rarely the same leaf may show also *C. variicolor,* which see for differences between the two species on Paeonia. Fungi Columbiani No. 2709 labeled *Cercospora variicolor* has hyaline acicular conidia and is *C. paeoniae.*

**Cercospora ranunculi** Ellis & Holway
Jour. Mycol. **1**: 5. 1885

Leaf spots indistinct, slight discoloration on upper surface; very scantily effuse olivaceous fruiting on corresponding lower surface, difficult to find on dried leaf; stromata lacking or only a few brown cells; most fascicles dense, divergent; conidiophores pale olivaceous brown, uniform in color, multiseptate, sometimes constricted at septa, sinuous to tortuous, occasionally 1-2 abruptly geniculate, branched, small spore scar at conic tip, wider near tip, 4-6 x 50-100$\mu$; conidia hyaline, obclavate, straight to mildly curved, indistinctly multiseptate, base subtruncate to obconically truncate, tip subobtuse to subacute, 2.5-5 x 35-85$\mu$.

HOSTS: *Ranunculus repens* L., *R. septentrionalis* DeBray.
TYPE: Decorah, Iowa; *Ranunculus repens;* E. W. D. Holway; July 22, 1884.
DISTRIBUTION: Studied collections from Iowa and Wisconsin.

**Cercospora squalidula** Peck
N. Y. State Mus. Nat. Hist. Ann. Rept. **33**: 29. 1880

Leaf spots circular to subcircular, 0.5-4 mm. in diameter, center pale tan to dingy gray, brown to purplish border; fruiting amphigenous; stromata dark brown, globular, 15-40$\mu$ in diameter; fascicles dense; conidiophores pale to medium dark brown, uniform in color and width, sparingly septate, not branched, undulate to 1-2 abruptly geniculate, small spore scar at conic tip, 3-5 x 15-65$\mu$; conidia subhyaline to pale olivaceous, obclavato-cylindric, straight to mildly curved, septa indistinct, base medium to long obconic, tip obtuse, 4-5 x 15-120$\mu$.

HOST: *Clematis virginiana* L., *C. simensis* Fres.
TYPE: Jamesville, N. Y.; *Clematis virginiana;* C. H. Peck; Aug. 1879.

DISTRIBUTION: From Maine to Oregon and as far south as Virginia, Nebraska, and California. Also reported from Manitoba, Russia, and Ethiopia.

NOTE: For some reason the species on Spiraea and Clematis have sometimes been confused. The two are distinct. *C. rubigo,* in some herbaria, is listed on Clematis. *C. olivascens* also has wrongly been reported on Clematis because the type is on *Aristolochia clematis.*

**Cercospora thalictri** de Thuemen

Jor. Sci. Math. Phys. e Nat. Acad. R. Sci. Lisboa I. 6: 232. 1886

*Cercospora thalictri* var. *thalictri flavi* de Thuemen, Mycoth. Univ. No. 1470

Leaf spots elongate to irregular, brown, occasionally with black to purplish border; fruiting hypophyllous, when abundant olivaceous, effuse; stromata pale brown, ranging in size from a few cells to 50$\mu$ in length; fascicles 5-25 divergent stalks; conidiophores pale to medium brown, uniform in color, attenuated toward the tip or irregular in width, almost straight, rarely septate, not branched, longest ones may be multigeniculate, tip bluntly rounded, 4.5-7 x 15-55$\mu$ or a few as long as 95$\mu$; conidia pale brown, cylindric and resembling detached conidiophores or attenuated into a beak (Alternaria-like), 1-5 septate, base rounded to subtruncate, tip obtuse to acute, 6-10 x 25-90$\mu$.

HOSTS: *Thalictrum flavum* L., *Th. glaucum* Desf., *Th. minus* L. (*Th. Jacquinianum* Koch).

TYPES: Coimbra, Portugal; *Thalictrum flavum;* Mesnier, No. 173; Aug. 1878; (var. *Thalictri flavi*) Coimbra, Portugal; *Thalictrum flavum;* Fr. Moller; Aug. 1878.

DISTRIBUTION: Portugal, Jugoslavia, Germany.

NOTE: Most of the herbarium material found both in Europe and America is in poor condition, so that a detailed study is difficult. See also *C. thalictrina* for differences between the two species on this host genus.

**Cercospora thalictrina** Karakulin

Materiali po Mikol. Obsl. Rossii 2: 85. 1915

Leaf spots circular to elongate or irregular, yellowish white, border dark brown; fruiting hypophyllous, sparse; stromata present; fasciculate; conidiophores brown, attenuated toward the tip, not septate, straight to curved, the longest ones sparingly septate and rather freely geniculate, rarely with incipient branches, 3-3.5 x 20-65$\mu$; conidia very pale olivaceous, cylindric or slightly wider near the base, mostly straight, 1-3 septate, rounded ends, 3-4 x 15-45$\mu$.

HOSTS: *Thalictrum minus* L. (*Th. majus* Jacq.), *Th. simplex* L.

TYPE: Ufimskoi Gubernii, Russia; *Thalictrum simplex;* A. Lobik.

DISTRIBUTION: Aside from the type, Siemaszko collected it in the Caucasus Mts.

NOTE: No material of this species was available for comparison with *C. Thalictri,* the other Cercospora on this host genus. It may prove to be a Didymaria or a Piricularia.

**Cercospora variicolor** Winter

Hedwigia 24: 205. 1885

also Jour. Mycol. 1: 124. 1885

Leaf spots subcircular, 3-20 mm. in diameter, dark brown to almost black, oc-

casionally with gray center or wide pale brown margin, older spots may be distinctly zonate; fruiting epiphyllous; stromata globular, dark brown to black, 20-60$\mu$ in diameter; fascicles dense to very dense, compact; conidiophores pale to very pale olivaceous brown, almost hyaline attenuated tip, rarely septate or geniculate, not branched, wavy, small spore scar at the conic tip, 2-4 x 10-35$\mu$; conidia narrowly linear (cylindric), hyaline to very pale olivaceous, curved, indistinctly multiseptate, base long obconically truncate, tip acute, 2-3.5 x 40-120$\mu$.

HOST: *Paeonia officinalis* L., *P. albiflora* Pall.

TYPE: Perryville, Missouri; *Paeonia officinalis;* C. H. Demetrio, No. 399; Sept. 1883.

DISTRIBUTION: Missouri, North Carolina, Pennsylvania. It has been reported also from Wisconsin, Illinois, Indiana, Kentucky, Nebraska, Iowa, and Japan, but in at least some instances the specimen was *C. paeoniae* rather than *C. variicolor.*

NOTE: See *C. paeoniae* for differences between the two species on Paeonia. Niederhauser (Plant Disease Reporter 28 (31): 946. 1944) describes these differences well.

**Cercospora resedae** Fuckel

Hedwigia 5: 30. 1866

*Virgasporium maculatum* Cooke, Grevillea 3: 182. 1874

*Cercospora resedae* var. *luteae* Lobik, Bolezni Rast. 17: 195. 1928

*Cercospora resedae* var. *mahonensis* Fragoso in Litt.

Leaf spots circular, 1-4 mm. in diameter, pale tan to yellowish brown, the center of the spot on both leaf surfaces darkened by the sooty effuse fruiting; stromata few brown cells to 50$\mu$ in diameter; fascicles usually dense; conidiophores pale olivaceous brown, medium dark brown in mass, longer ones plainly attenuated, sparingly septate, rarely branched, mostly not geniculate, but 1-2 abrupt geniculations may appear near the tip, medium-sized spore scar at subtruncate tip, 3.5-5 x 10-75$\mu$, mostly 10-40$\mu$; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate, tip of longest ones acute, short ones may be almost cylindric, 2-4.5 x 20-180$\mu$.

HOSTS: *Reseda alba* L., *R. lutea* L., *R. luteola* L., *R. odorata* L., Reseda sp.

TYPES: In Fuckel's Garden; *Reseda odorata;* 1866; cotype distributed as Fungi Rhenani, No. 1632; (*Virgasporium maculatum*) Jersey; Reseda sp.; (var. *luteae*) Bezirk v. Piatigorsk, on the west shore of the Lissogorski salt sea, Russia; *Reseda lutea;* A. I. Lobik; Aug. 14, 1925; (var. *mahonensis*) Baleares; *Reseda alba;* E. Rioja; May, 1918.

DISTRIBUTION: Material studied from New York, Pennsylvania, New Jersey, Mississippi, France and Spain. Reported from nearly every country in Europe, in South Africa, and in the U. S. widespread east of the Great Plains.

## CERCOSPORAE ON RHAMNUS

A. Conidia narrow, 1.5-4 x 15-75$\mu$, hyaline to subhyaline or rarely colored, linear to narrowly obclavate; stromata 60-180$\mu$ in length; fascicles very dense; conidiophores very pale, 2-4 x 20-40$\mu$; fruiting amphigenous.
RHAMNUS spp. *C. bacilligera*

AA. Conidia 4-7$\mu$ in width, pale to medium dark in color; stromata usually not over 60$\mu$ in diameter; nonfasciculate to dense; fruiting hypophyllous.

B. Leaf spots indistinct; fruiting effuse, olivaceous; conidiophores 4-6 x 40-200$\mu$; conidia more nearly cylindric than obclavate, 4-6.5 x 20-85$\mu$.
RHAMNUS sp. *C. frangulina*

BB. Leaf spots distinct; fruiting not effuse; conidia more nearly obclavate than cylindric.

C. Conidiophores 4-7 x 10-55$\mu$; conidia 3-9 septate, 4-7 x 40-165$\mu$.
RHAMNUS spp. *C. rhamni*

CC. Conidiophores 3-5 x 40-250$\mu$; conidia closely and plainly septate, 4-6.5 x 60-160$\mu$.
R. DISCOLOR *C. poasensis*

**Cercospora bacilligera** (Berk. & Br.) Fresenius
Beitr. Zur. Mycol. Drittes Heft. p. 91. 1863

*Fusisporium bacilligerum* Ber. + Br., Ann. and Mag. Nat. Hist. II. **7**: 176. 1851
*Fusarium bacilligerum* (B. + B.) Sacc., Syll. Fung. **4**: 711. 1886
*Cercospora aeruginosa* Cooke, Hedwigia **17**: 39. 1878

Leaf spots circular, black center, reddish brown margin, 1-5 mm. in diameter; fruiting amphigenous; stromata brown, sometimes elongated, 60-180$\mu$ in length; fascicles very dense; conidiophores delicate, wavy, subhyaline to very pale brown, tip hyaline, sometimes plainly 1-3 septate, geniculation and branching not evident, 2-4 x 20-40$\mu$; conidia hyaline to subhyaline or even slightly colored, linear to narrowly obclavate, rarely acicular, indistinctly multiseptate, base obconic to truncate, tip acute to subacute, straight to mildly curved, 1.5-4 x 15-75$\mu$.

HOSTS: *Rhamnus alaternus* L., *Rh. crocea* Nutt., *Rh. frangula* L., *Rh. lanceolata* Pursh, Rhamnus sp.

TYPES: Spye Park, Wiltshire, England; *Rhamnus alaternus;* C. E. Broome; 1860; cotype distributed as Rabenhorst Fungi Europaei No. 177; (*C. aeruginosa*) Aiken, S. Car.; Rhamnus sp.; H. W. Ravenel, No. 68.

DISTRIBUTION: Apparently widespread in North America and Europe; also reported from Formosa.

NOTE: It may still be possible that *C. bacilligera* and *C. aeruginosa* are not identical. Wollenweber (Ann. Mycol. **15**: 28. 1917) also changes the *Fusarium bacilligerum* to Cercospora. von Höhnel (Centralbl. f. Bakt. etc. Abt. 2. **60**: 1-26. 1924) verifies the Fresenius statement that this fungus is a Cercospora. Fungi Columbiani No. 2504 is labeled *C. aeruginosa* on *Rh. lanceolata* but has dark colored, thick walled conidia and other characters which resemble those of an Helminthosporium. See key above.

**Cercospora ceanothi** Kellerman & Swingle
Jour. Mycol. **4**: 94. 1888

Leaf spots dark or reddish brown, circular, 1-4 mm. in diameter, sometimes slightly darker margin; fruiting amphigenous, but chiefly on upper surface; small dark olivaceous stromata; fascicles mostly dense; conidiophores subhyaline to pale fuligenous or olivaceous brown, sparingly septate, not geniculate, slightly wavy, branched, rounded tip, small spore scars may be present, 2-4 x 5-50$\mu$, sometimes attenuated; conidia obclavate or shorter ones cylindric, obconic base, subobtuse tip, curved, septa indistinct, subhyaline to pale olivaceous or olivaceous brown, 2-3.5 x 20-100$\mu$, some collections show only short conidia.

HOSTS: *Ceanothus americanus* L., *C. ovatus* Desf., *Colubrina ferruginosa* Brongn. (*Colubrina colubrina* [L.] Millsp.)

TYPE: Manhattan, Kansas; *Ceanothus ovatus;* W. A. Kellerman and W. T. Swingle, No. 2292; Aug. 20, 1887.
DISTRIBUTION: Collected in Kansas and Wisconsin, and on Mona Island.
NOTE: J. J. Davis in his notes on Parasitic Fungi (Wisc. Acad. Trans. 18: 86. 1915) mixes this with *C. macClatchieana* (*C. fuliginosa* E. + E.) which also occurs on Ceanothus. It has plainly colored, wide conidia, and the fruiting is mostly effuse.

**Cercospora colubrinae** Chupp & Viégas
Bol. da Soc. Brasil. de Agron. 8: 20. 1945

Leaf spots irregular, 2-6 mm. in length, dark reddish brown or when old center grayish brown; fruiting hypophyllous, effuse, indistinct, ferrugineous; stromata lacking to large, globular, ferrugineous, up to 100$\mu$ in diameter; nonfasciculate to very dense fascicles; conidiophores pale to medium ferrugineous, uniform in color, irregular in width, occasionally clavate, 1-7 septate, often constricted at the septa, plainly branched, rarely geniculate, curved to tortuous, rounded to conic tip, 5-7 x 15-75$\mu$; conidia pale to medium olivaceous brown, cylindro-obclavate, straight to mildly curved, ends rounded bluntly or base obconically truncate, 1-5 septate, 4-5.5 x 20-65$\mu$.

HOST: *Colubrina rufa* Reiss.
TYPE: Escola Agricola, "Luiz de Queiroz," Piracicaba, Sao Paulo, Brazil; *Colubrina rufa;* A. S. Costa, No. 267; Sept. 7, 1933.
DISTRIBUTION: Known only from the type locality.

**Cercospora frangulina** P. Hennings
Hedwigia 48: 18. 1909

Leaf spots none or slight discoloration on upper leaf surface; fruiting scantily effuse, hypophyllous, olivaceous to brown; stromata lacking or large, dark brown to black, globular; nonfasciculate to dense, divergent fascicles; conidiophores medium to dark brown, uniform in color and width, curved to tortuous, plainly and closely multiseptate, branched profusely, rarely geniculate, rounded to conic tip, 4-6 x 40-200$\mu$; conidia pale to medium olivaceous, obclavato-cylindric, straight to mildly curved, 3-7 septate, ends rounded bluntly or base short obconically truncate, 4-6.5 x 20-85$\mu$.

HOST: Rhamnus sp. (Frangula sp.)
TYPE: Iponema, Pedra, Santa, Sao Paulo, Brazil; Frangula sp.; A. Puttemans, No. 721; April, 1903.
DISTRIBUTION: Known only from the type locality.
NOTE: See key, page 467.

**Cercospora hoveniae** Viégas & Chupp
Bol. da Soc. Brasil. de Agron. 8: 32. 1945

Leaf spots subcircular to irregular, 1-6 mm. in length or coalescing into fairly large blotches, dark brown; fruiting epiphyllous; stromata lacking or a few large brown cells; fascicles 1-11 stalks; conidiophores pale to medium olivaceous brown, only slightly paler and more narrow toward the tip, sparingly septate, not branched, almost straight, usually once geniculate, large spore scar at the subtruncate tip, 4.5-7 x 50-175$\mu$; conidia hyaline, acicular, mildly curved, indistinctly multiseptate, base truncate, tip acute to subacute, 4-5 x 50-270$\mu$.

HOST: *Hovenia dulcis* Thunb.
TYPE: Inst. Agronomico, Campinas, Sao Paulo, Brazil; *Hovenia dulcis;* O. Zagatto, No. 594; April 12, 1935.
DISTRIBUTION: Known only from the type locality.

**Cercospora jujubae** Chowdhury
Indian Jour. Agric. Sci. **16**: 525. 1946

Fruiting hypophyllous; mycelium internal and external; conidiophores fasciculate, emerging through stomata or rupturing the epidermis, fuscous, 1-4 septate, constricted at the septa, sometimes swollen at the base, with distinct geniculations and conidial scars, not branched, 4-7 x 48-152$\mu$; conidia obclavate, straight to mildly curved, 1-5 septate, ends rounded bluntly, pale olivaceous gray, 8-10 x 25-45$\mu$.

HOST: *Zizyphus jujuba* Lam.
TYPE: Maulvibazar, Assam, India; *Zizyphus jujuba;* S. Chowdhury, No. 102; Febr. 8, 1944.
DISTRIBUTION: India.
NOTE: See also *C. zizyphi.*

**Cercospora macClatchieana** Saccardo & Sydow
Syll. Fungorum **14**: 1106. 1899

*Cercospora fuliginosa* Ellis & Ev., Erythea **2**: 26. 1894

Leaf spots when present subcircular, 3-7 mm. in diameter, dull brown above, almost black below; fruiting amphigenous, sooty in appearance; stromata lacking; nonfasciculate; conidiophores pale olivaceous brown, plainly multiseptate, often constricted at septa, branched, short branches sometimes giving the appearance of geniculation, spore scars indistinct, tip blunt, 4-6.5 x 10-75$\mu$; conidia obclavato-cylindric to obclavate, straight or nearly so, medium olivaceous, plainly multiseptate, often constricted at septa, base medium to long obconically truncate, tip obtuse to subobtuse, 5-7.5 x 40-130$\mu$.

HOSTS: *Ceanothus americanus* L., *C. arboreus* Greene, *C. ovatus Desf.*
TYPE: Catalina Island, California; *Ceanothus arboreus;* A. J. MacClatchie, No. 438; Sept. 1893.
DISTRIBUTION: California, Wisconsin.
NOTE: *C. fuligniosa* E. & K., was described in 1887. Saccardo and Sydow, feeling that it was merely a typographical error in the spelling of *C. fuliginosa,* gave the name, *C. macClatchieana,* to the Ellis and Everhart collection on Ceanothus. In some herbaria the cotype is filed under *C. catalinae* E. & E. The wide, dark-colored, thick-walled, cylindric conidia place this species in Helminthosporium rather than in Cercospora.

**Cercospora poasensis** Sydow
Ann. Mycol. **23**: 426. 1925

Leaf spots at first small, circular, 0.5-2 mm. in diameter, later enlarging to large blotches or long distances along leaf edge, dark brown to almost black; fruiting hypophyllous; stromata lacking or black, globular, 20-40$\mu$ in diameter; nonfasciculate to very dense fascicles; conidiophores dark reddish brown or very dark fuligenous, slightly paler tip, often slightly wider near the tip, plainly multiseptate, sometimes constricted at septa, branched, upper third of longer ones sinuous,

tortuous or multigeniculate, tip conic with small spore scar, 3-5 x 40-250$\mu$; conidia pale to medium dark olivaceous brown, cylindro-obclavate, straight to curved, closely and plainly septate, usually constricted at septa, base rounded to long obconically truncate, tip subacute to subobtuse, 4-6.5 x 60-160$\mu$.

HOST: *Rhamnus discolor* Rose.

TYPE: In monte Poas pr. Grecia, Costa Rica; *Rhamnus discolor;* H. Sydow, No. 21; Jan. 15, 1925.

DISTRIBUTION: Known only from the type locality.

NOTE: The dark colored, multiseptate conidia and the long, branched, clavate, often nonfasciculate conidiophores separate this species from the others on Rhamnus. The dark, multiseptate conidia and clavate conidiophores separate this species from *C. frangulina* which it resembles in other characters. See key, page 467.

**Cercospora rhamni** Fuckel

Hedwigia **5**: 24. 1866

Leaf spots circular or elongated along margin of the leaf, 2-10 mm. in length, brown, no distinct border; fruiting hypophyllous; stromata none to dark brown, globular, 20-50$\mu$ in diameter; nonfasciculate to dense fascicles; conidiophores medium dark brown, uniform in color, irregular in width, tortuous, septate, 0-1 geniculate, rarely branched, small spore scar at rounded tip, 4-7 x 10-55$\mu$, sometimes as large as 8 x 100$\mu$; conidia obclavate, subhyaline to medium olivaceous, straight to mildly curved, 3-9 septate, base obconically truncate to subtruncate, tip obtuse, 4-7 x 40-165$\mu$.

HOSTS: *Rhamnus alnifolia* L'Hérit., *Rh. cathartica* L., *Rh. tinctoria* Waldst. & Kit.

TYPE: Darmstadt, Germany; *Rhamnus cathartica;* L. Fuckel; autumn. Cotype distributed as Fuckel's Fungi Rhenani, No. 1520.

DISTRIBUTION: Material studied from New Jersey, Ontario, Wisconsin, Illinois, and Germany. Reported in many countries of Europe.

NOTE: Fasciculate conidiophores, not longer than 100$\mu$, and colored conidia measuring 4-7 x 40-165$\mu$ separate this species from the others on Rhamnus. See key, page 467.

**Cercospora zizyphi** Petch

Ann. Roy. Bot. Gard. Peradeniya, Part 5. **4**: 306. 1909

*Cercospora paliuri* Sawada, Jour. Taihoku Soc. Agr. & Forestry **7**: 119. 1942

Leaf spots circular or elongated along edge of the leaf, 2-6 mm. in length, pale brown to grayish brown or distinctly gray, dark brown margin, occasionally distinctly zonate; fruiting chiefly epiphyllous; stromata subglobular, brown, 20-50$\mu$ in diameter; fascicles dense, compact; conidiophores pale olivaceous brown, paler and more narrow toward the tip, straight to curved or undulate, rarely septate or geniculate, not branched, narrowly rounded tip, 2-4 x 5-35$\mu$; conidia subhyaline to pale olivaceous, obclavate, straight to mildly curved, 3-9 septate, base obconic to obconically truncate, tip subacute, 2-4.5 x 25-75$\mu$.

HOSTS: *Paliurus ramosissimus* Poir., *Zizyphus mucronata* Willd., *Z. oenoplia* Mill., *Z. sativa* Gaertn. (*Z. vulgaris* Lam.)

TYPE: Royal Botanic Gardens, Peradeniya, Ceylon; *Zizyphus oenoplia;* T. Petch, No. 2702; Dec. 6, 1906.

DISTRIBUTION: Studied material from Ceylon, India, Transvaal, and possibly Texas. Apparently also present in Formosa.

NOTE: The Texas collection shows mostly Alternaria, but some fascicles similar to those of *C. zizyphi* also were found. Sawada gave too few characters to be sure that his species is synonymous, but the measurements and color are the same. See also *C. jujubae.*

**Cercospora alchemillae** Sydow

Ann. Mycol. **37**: 427. 1939

Leaf spots irregular in shape, 2-5 mm. in diameter or coalescing into areas as large as 10-20 mm., vein limited, brownish gray or small gray center; fruiting epiphyllous; stromata dark, subglobular, 20-50$\mu$ in diameter, the upper cells slightly elongated and forming the conidiophores which are very pale colored, not

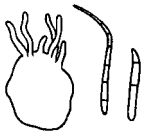


Fig. 154
*C. alchemillae*

branched, not septate, not geniculate, almost straight, 2-3.5 x 5-15$\mu$, rarely as long as 25$\mu$ and medium in color; conidia hyaline to subhyaline, filiform or very slightly attenuated, straight to mildly curved, indistinctly septate, base obconically truncate, tip conic, 2-4 x 35-100$\mu$.

HOSTS: *Alchemilla orbiculata* R. & P., *A. sibbaldiaefolia* HBK.

TYPE: Quito, Ecuador; *Alchemilla orbiculata;* H. Sydow, No. 131; Sept. 25, 1937.

DISTRIBUTION: Ecuador, Guatemala.

NOTE: I did not have an opportunity to see this type. The Guatemala collection fitted the original description excepting that some of the conidiophores were long.

**Cercospora ariae** Fuckel

Jahrb. Nassau. Ver. f. Naturk. **23-24**: 103. 1869

*Cercospora kriegeriana* Bresadola, Hedwigia **31**: 41. 1892

Leaf spots subcircular to irregular, minute to half of leaf area, on upper surface dark reddish brown, on lower surface indistinct to dingy brown; fruiting hypophyllous, when abundant effuse; stromata composed of a few, dark brown cells; fascicles 2-10 spreading stalks or nonfasciculate; conidiophores pale olivaceous brown, fairly uniform in color, irregular in width, sparingly septate, rarely geniculate or branched, straight to mildly tortuous, tip rounded to conic, 3-5.5 x 10-75$\mu$; conidia hyaline to subhyaline, cylindric, straight, 1-5, mostly 3-septate, ends rounded or base short obconic, 3-5.5 x 20-50$\mu$.

HOSTS: *Sorbus aria* Crantz, *S. aucuparia* L. (*Pyrus aria* Ehrh., *P. aucuparia* Ehrh.)

TYPES: Mt. Zange, near Halfgarten in the Rhine area; *Sorbus aria;* L. Fuckel; Autumn, 1866; cotype distributed as Fungi Rhenani, No. 2207; (*C. kriegeriana*) Koenigstein, Saxony; *Sorbus aucuparia;* W. Krieger; autumn.

DISTRIBUTION: In central western Europe.
NOTE: The specimen labeled *C. ariae* of Herbier Barbey-Boissier No. 2591 is not a *Cercospora* but a *Fusicladium*.

**Cercospora chrysobalani** Ellis & Everhart
Bul. Torrey Bot. Club 22: 438. 1895

Leaf spots circular to angular, reddish brown, sometimes lighter brown center, occasionally with raised line border, 1-6 mm. in diameter; fruiting amphigenous but chiefly on upper leaf surface; stromata slight, dark; most fascicles dense; conidiophores pale to medium olivaceous brown, 0-2 septate near base, not geniculate, not branched, attenuated toward tip which may have small spore scar, fairly uniform in color, 3-4.5 x 10-35$\mu$; conidia obclavate, subhyaline to very pale olivaceous, straight to mildly curved, base rounded or short obconic, tip subobtuse, septa mostly indistinct, 2.5-4.5 x 20-80$\mu$.

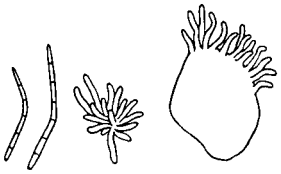


Fig. 155
*C. chrysobalani*

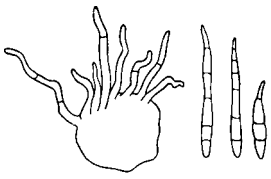


Fig. 156
*C. circumscissa*

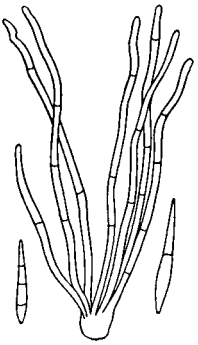


Fig. 157
*C. comari*

HOSTS: *Chrysobalanus oblongifolius* Michx., *Ch. icaco* L.
TYPE: Florida; *Chrysobalanus oblongifolius;* Geo. V. Nash, No. 1949; 1895.
DISTRIBUTION: Gulf States, San Domingo, and the Gold Coast.

CERCOSPORAE ON PRUNUS

(All conidia colored, at least subhyaline)

A. Conidiophores often in coremoid-like fascicles, sometimes slightly wider near the tip, 4-8 x 30-130$\mu$; conidia obclavate, 4.5-8 x 30-100$\mu$.
P. SEROTINA — *C. graphioides*

AA. Conidiophores not in coremoid-like fascicles, never clavate, rarely wider than 5$\mu$.

B. Stromata small or lacking; fascicles mostly not dense; conidia plainly obclavate, 2.5-5 x 30-115$\mu$; conidiophores sometimes with knob-like geniculations, 3-5 x 10-65$\mu$, rarely 100$\mu$.
PRUNUS spp. (Not *P. serotina*) — *C. circumscissa*

BB. Stromata 15-70$\mu$; fascicles dense or sometimes very dense; conidiophores rarely longer than 35$\mu$, not or rarely geniculate.

C. Conidia 1.5-3 x 15-65$\mu$, cylindric to cylindro-obclavate, straight to curved; conidiophores 3-4 x 5-15$\mu$, barely more than peripheral cells of the stromata; fruiting chiefly hypophyllous.
PRUNUS spp. — *C. prunicola*

CC. Conidia 2-5.5 x 20-55$\mu$, cylindro-obclavate, nearly straight; conidiophores 2-4.5 x 8-55$\mu$; fruiting chiefly epiphyllous.
P. PERSICA, P. AMYGDALUS — *C. rubro-tincta* (*C. guliana*)

**Cercospora circumscissa** Saccardo

Nuov. Giorn. Bot. Italy 8: 189. 1876

*Cercospora cerasella* Sacc., Michelia 1: 266. 1879
*Cercospora cerasella* var. *avium* Roum., Rev. Mycol. 18: 71. 1896
*Cercospora padi* var. *mahaleb.* Unam., Bol. Soc. Espan. Hist. Nat. Madrid 35: 435. 1935
*Cercospora padi* Búbak et Serebriankov. Hedwigia 52: 271. 1912

Leaf spots circular, distinct, rarely dehiscent, 0.5-5 mm. in diameter, from uniform bright reddish brown to dingy gray center and almost black margin; rarely on twigs and fruit; fruiting amphigenous but chiefly hypophyllous; stromata mostly filling stomatal openings; some fascicles dense; conidiophores pale to medium olivaceous brown, rarely or sparingly septate, 0-3 abruptly geniculate, geniculations sometimes appearing like knob-like branches, evident attenuation toward the tip which is subtruncate, 3-5 x 10-65$\mu$, rarely 100$\mu$; conidia olivaceous, obclavate, base long obconic or obconically truncate, tip subobtuse to subacute, straight to mildly curved, 1-7, mostly 3 septate, 2.5-5 x 30-115$\mu$.

HOSTS: *Prunus americana* Marsh, *P. avium* L., *P. cerasus* L., *P. divaricata* Ledb., *P. domestica* L. (*P. communis* Hud.), *P. mahaleb* L. *P. melanocarpa* Rydberg, *P. mume* Sieb. & Zucc., *P. Padus* L., *P. pennsylvanica* L., *P. spinosa* L., *P. virginiana* L. (*P. demissa* D. Dietr.), *P. yedoensis* Matsu., Prunus sp. Viégas in Brazil collected a specimen on *Eriobotrya japonica* Lindl. which also may be *C. circumscissa.* It has wrongly been reported on *P. serotina.*

TYPE: Selva, Italy; *Prunus domestica;* Treviso; Sept. 1875; cotype, Saccardo, Mycotheca Veneta No. 600; (*C. cerasella*) Selva, Italy; *Prunus cerasus;* Treviso; Aug. 1875; cotype Mycotheca Veneta, No. 1051; (var. avium) France; *Prunus avium;* F. Fautry; Aug. 1895; cotype C. Roumeguere Fungi Selecti Exsiccati No. 6907; (*C. padi*). In woods near Tambow, Russia; *Prunus padi;* Scherajewsky; June 7, 1910; (var. Mahaleb) Granja Horticola de Areitio (Abadiano); L. M. Unamuno; Sept. 19, 1934.

DISTRIBUTION: In all subtropical and temperate countries. In America as far north as North Dakota and New York.

NOTE: The Cercosporae on Prunus are extremely difficult to classify because even the type specimens may be overrun by Alternaria, Helminthosporium, Heterosporium, and other fungi, whose conidiophores may be confused with those of Cercospora. *C. circumscissa* can be distinguished from the other species by its non-clavate conidiophores, which are fairly long, and conidia 2.5-5$\mu$ in width. Unamuno's variety *Mahaleb* shows these characters quite distinctly. Aderhold (Ber. Deutsch. Bot. Ges. 18: 246. 1900) has described the perfect stage as *Mycosphaerella cerasella.* See also Jenkins (Phytopath. 20: 329. 1930). Saccardo (Ann. Myc. 13: 126. 1915) received a collection labeled *Prunus virginiana* from Dearness and named the fungus *C. circumscissa* var. *virginiana.* The type shows it to be *C. graphioides* on *P. serotina.* The same is true of a specimen in Peck's collections and labeled *C. circumscissa* var. *subangularis.* See key above for differences among the species on Prunus.

**Cercospora comari** Peck

N. Y. State Mus. Nat. Hist. Ann. Rept. **38**: 101. 1885

(Also Jour. Mycol. **1**: 63. 1885)

Leaf spots circular to irregular, 0.5-3 mm. in diameter, indistinct on lower surface, reddish brown above, sometimes with minute gray speck in the center; fruiting amphigenous; stromata slight or none; fascicles mostly 3-10 stalks; conidiophores medium olivaceous brown, fairly uniform in color and width, sparingly septate, not branched, 0-2 mildly or abruptly geniculate, conic tip with small spore scar, 4-5.5 x 40-225$\mu$; conidia obclavate, olivaceous, long obconic base, obtuse to subacute tip, straight, 2-5 septate, 5-6.5 x 35-60$\mu$.

HOST: *Potentilla palustris* (L.) Scop. (*Comarum palustre* L.)

TYPE: Karner, N. Y.; *Comarum palustre;* C. H. Peck; July.

DISTRIBUTION: Northern United States and southern Canada.

NOTE: The type of this was not found, but a specimen collected by Peck at Karner in July 1911 was studied. See also *C. potentillae* for differences between the species on this host genus. Davis (Wisc. Acad. Trans. **20**: 423. 1921) states that a collection he made was associated with *Mycosphaerella innumerella* (Karst.).

**Cercospora confluens** Lieneman

Ann. Missouri Bot. Gard. **16**: 33. 1929

*Cercospora crataegi* Heald & Wolf, Mycologia **3**: 16. 1911

TYPE: Gonzales, Texas; Crataegus sp.; Heald & Wolf, No. 2697; Sept. 10, 1909.

NOTE: This differs from *C. crataegi* Sacc. & Mass., (*C. apiifoliae* Tharp) which has narrow, subhyaline, sparingly septate conidia. The dark-colored thick-walled, distinctly obclavate conidia are those of Pseudocercospora rather than of Cercospora.

**Cercospora crataegi** Saccardo & C. Massalongo

Ann. Mycol. **3**: 515. 1905

*Cercospora apiifoliae* Tharp, Mycologia **9**: 107. 1917

Leaf spots circular to irregular, 0.5-2 mm. in diameter at first and yellowish, later enlarging to 2-7 mm. with dark brown or black center and yellow halo; fruiting chiefly epiphyllous; stromata small, brown; fascicles 5-20 stalks; conidiophores pale olivaceous brown, paler and more narrow tip, rarely septate, slightly undulate, not geniculate, not branched, minute spore scar at rounded to conic tip, 2-4 x 10-35$\mu$; conidia subhyaline to pale olivaceous, obclavato-cylindric, straight to mildly curved, 2-5 (mostly 3) septate, obconically truncate base, bluntly rounded tip, 2-4 x 20-65$\mu$.

HOSTS: *Crataegus oxyacanthi* L. (*C. marshallii* Eggleston), *C. apiifolia* Michx.

TYPE: Verona, Italy; *Crataegus oxyacanthi;* Sept. 1905; (*C. apiifoliae*) Texarkana, Texas; *Crataegus apiifolia;* B. C. Tharp and I. M. Lewis; Oct. 16, 1915.

DISTRIBUTION: Southern Europe and Texas.

NOTE: I did not have an opportunity to study Saccardo's type, but another collection on *Crataegus oxyacanthi* appears near enough like Tharp's collection to consider the two identical. This is quite distinct from *C. confluens* (Pseudocercospora).

**Cercospora cydoniae** Ellis & Everhart
Jour. Mycol. 8: 72. 1902

*Cercospora cydoniae* Rangel, Bol. Agr. Sao Paulo. Ser. 16A. 4. 322. 1915

Leaf spots subcircular to angular, 1-3 mm. in diameter, uniformly dark brown, tending to coalesce; fruiting chiefly epiphyllous; stromata globular, almost black, 20-60$\mu$ in diameter; fascicles dense; conidiophores very pale olivaceous brown,

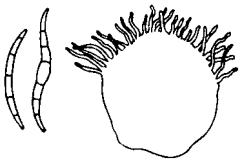


Fig. 158
*C. cydoniae*

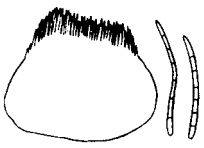


Fig. 159
*C. eriobotryae*

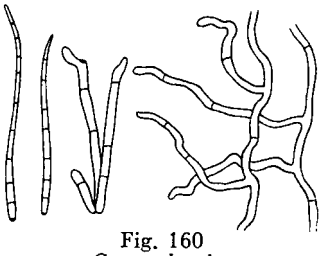


Fig. 160
*C. exochordae*

not septate, not branched, not geniculate, slightly sinuous; spore scars not evident on rounded tip, 2-3.5 x 5-35$\mu$; conidia linear (cylindric) to obclavato-cylindric, subhyaline to pale olivaceous, straight to mildly curved, base long obconic or obconically truncate, tip bluntly rounded, indistinctly multiseptate, 2-3.5 x 25-75$\mu$.

HOSTS: *Cydonia japonica* Pers., *C. lagenaria* Loisel., *C. oblonga* Mill. (*C. vulgaris* Pers.), *Chaenomeles japonica* Lindl.

TYPE: Tuskegee, Ala.; *Cydonia Japonica;* Geo. W. Carver; Sept. 10, 1901; (*C. cydoniae* Rangel) Sao Paulo, Brazil; *Cydonia vulgaris;* E. Rangel, No. 198; Dec. 1910.

DISTRIBUTION: Reported from southern United States and in South America as far south as Sao Paulo. Japan.

NOTE: The other species on *Cydonia, Cercospora tomenticola* has effuse fruiting and short elliptic conidia. *C. cydoniae* at first glance might seem identical with *C. mali, C. minima* and possibly other species on the Rosales, but a critical study of the types indicates, if it does not definitely prove, that each species is distinct. Here again may be a case where cross-inoculation studies are required to show whether detailed morphologic characters can be depended upon for separating species of Cercospora.

**Cercospora eriobotryae** (Enjoji) Sawada
Descr. Catalogue of Formosan Fungi. Part VI.
Rept. 61: 94. 1933

*Cercosporina eriobotryae* Enjoji, 1931 (Citation not found)

Leaf spots circular to irregular, dark reddish or purplish brown, sometimes with black line border and with gray center, 2-20 mm. in length; fruiting mostly epiphyllous, visible as black pustules; stromata dark brown to black, globular to elongate, 40-100$\mu$ in length, or smaller if on the lower leaf surface; fascicles very dense; conidiophores in mass dark, singly pale to very pale olivaceous brown, paler and more narrow toward the tip, septation, branching, and geniculation not present, tip conic to rounded, 2-3.5 x 5-30$\mu$; conidia narrowly obclavate to almost linear, subhyaline to very pale olivaceous, straight to mildly curved, indis-

tinctly multiseptate, base rounded to subtruncate, tip subacute to subobtuse, 2-3.5 x 20-80$\mu$.

HOSTS: *Eriobotrya japonica* Lindl.; *Photinia glabra* Decne.

TYPE: Formosa; *Eriobotrya japonica;* Enjoji. The Sawada collection came from Shimo-Meguro, Tokyo and was found by K. Goto, March 20, 1926, and Taipeh, Taiwan; K. Sawada; Aug. 4, 1909.

DISTRIBUTION: Formosa, Japan.

**Cercospora exochordae** Chupp & Stevenson, sp. nov.

Maculae orbiculares vel irregulares, 2-6 mm. diam., griseo-brunneae vel sordide griseae; caespituli plerumque hypophylli; stromata atra, globosa, 15-35$\mu$ diam.; conidiophora unica vel laxe fasciculata, olivaceo-brunnea, evidenter multiseptata, simplicia, 0-4 geniculata, sursum attenuata, ad apicem subtruncata, 3-5 x 30-200$\mu$; conidia hyalina, anguste obclavata, recta vel curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2-4 x 30-150$\mu$.

Leaf spots 2-6 mm. in diameter, circular to irregular, mostly along margin of leaf, grayish brown to dingy gray, on upper surface sometimes a brown margin, and on the lower surface a purplish one; fruiting amphigenous but more abundant below; stromata black, globular, 15-35$\mu$ in diameter; conidiophores borne singly and then without a stroma or in fascicles of 2-30, medium dark olivaceous brown, plainly multiseptate, not branched, 0-4 mildly to abruptly geniculate, large spore scar at subtruncate tip, very slightly attenuated from base upward, mostly somewhat curved or bent, 3-5 x 30-200$\mu$; conidia acicular, hyaline to sometimes subhyaline, straight to variously curved, base truncate, tip acute to subacute, indistinctly multiseptate, 2-4 x 30-150$\mu$.

TYPE: Tuskegee, Macon. Co., Alabama; *Exochorda grandiflora* Lindl; Geo. W. Carver; Sept. 1, 1935.

DISTRIBUTION: Known only from the type locality.

NOTE: This material was sent me by John A. Stevenson from the U.S.D.A. Herbarium.

**Cercospora fragariae** Lobik

Bolezni Rast. 17: 195. 1928

Leaf spots circular, 0.5-3 mm. in diameter, white center, dark purple border,

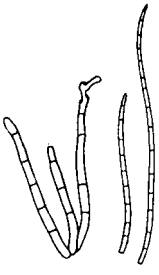


Fig. 161
*C. fragariae*

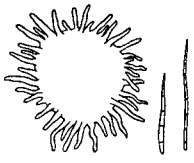


Fig. 162
*C. gei*

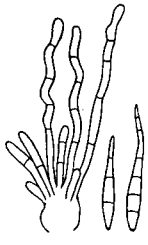


Fig. 163
*C. graphioides*

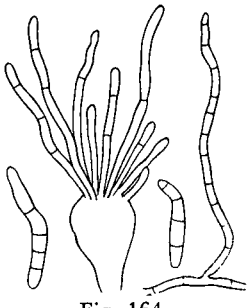


Fig. 164
*C. heteromalla*

sometimes indistinct on lower surface; fruiting amphigenous; stromata a few dark cells to 50$\mu$ in diameter, dark brown to almost black; fascicles 2-20 stalks;

conidiophores pale olivaceous brown, almost hyaline tips, uniform in diameter, multiseptate, not branched, curved, undulate or 1-6 abruptly geniculate, large spore scar at subtruncate tip, 3.5-5 x 25-150$\mu$, on lower leaf surface sometimes as long as 250$\mu$; conidia hyaline to subhyaline, acicular to obclavate, shorter ones may be cylindric, straight to mildly curved, indistinctly multiseptate, base truncate to long obconically truncate, tip subacute to subobtuse, 2.5-6 x 20-125$\mu$.

HOSTS: *Fragaria elatior* Ehrh., Fragaria sp. (Klondike var.), hybrid of Klondike x *F. grayana* Vilm.

TYPE: In the vicinity of Piatigorsk, Kolon, Russia; *Fragaria elatior;* A. I. Lobik; June 8, 1923.

DISTRIBUTION: Russia, Louisiana.

NOTE: See also *C. vexans* for differences between the two species on Fragaria. I have been unable to procure the Lobik type to compare with the Plakidas collection, but Lobik's description fits very closely the Louisiana fungus.

**Cercospora gei** Fuckel

Fungi Rhenani, No. 2229

*Acrotheca gei* Fuckel, Enumeratio Fungorum. Nassoviae Ser. 1. page 43. Jahr. d. Ver. f. Naturkunde in Herzogthume Nassau **15**: 43. 1860

*Depazea geicola* Fuckel, Symbolae Mycologicae p. 380. 1869

*Ovularia gei* Eliass., Bihang till K. Sv. Vet.-Akad. III. **22**: 19. 1897

*Ramularia gei* Lindr., Act. Soc. Faun. Flor. Fenn. **23**: 26. 1902

*Cercospora gei* Bubák, Sitzungsber. K. Böhm. Gesell. Wissensch. Math.-Naturw. Classe **1903** (XII): 21. 1903

*Ramularia submodesta* v. Höhnel, Sitzber. d. K. Akad. d. Wissensch. Vien. **111**: 1040. 1902

*Ramularia gei* (Eliasson) v. Höhnel, Ann. Mycol. **2**: 57. 1904

Leaf spots circular to elongate, 2-7 mm. in length, dark reddish brown to almost purple, rarely with gray center; fruiting chiefly epiphyllous; stromata small, globular, brown; some fascicles dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not geniculate, not branched, straight to slightly curved, tip narrowly rounded to conic, 2-3 x 5-25$\mu$; conidia hyaline to subhyaline, cylindric or longest ones almost acicular, straight, indistinctly 1-5 septate, occasionally catenulate, base rounded to subtruncate, tip obtuse to conic, 2-4 x 10-55$\mu$.

HOSTS: *Geum rivale* L., *G. triflorum* Pursh., *G. urbanum* L.

TYPES: Fungi Rhenani, No. 2229; *Geum urbanum;* (*Cercospora gei* Bubák) Jezero, Montenegro; *Geum rivale;* Bubák; (*Ovularia gei, Ramularia gei, R. submodesta*) Kungshamn, Sweden; *Geum urbanum;* Eliasson; 1897.

DISTRIBUTION: Sweden, Austria, Denmark, Montenegro, France, Wisconsin.

NOTE: On the label of Fungi Rhenani No. 2229, Fuckel uses the name, *Cercospora gei,* and lists as synonyms, *Depazea geicola* Fr. and *Acrotheca gei* Fckl. This fact is not mentioned in any of the volumes of Saccardo's Sylloge Fungorum. Fuckel's name, therefore, antedates Bubák's combination by many years.

CERCOSPORAE ON SPIRAEA

A. Conidia hyaline, acicular, 2-3.5 x 25-180$\mu$; fascicles 2-12 stalks; conidiophores 3-5 x 30-150$\mu$.

P. BRACTEATUS, SPIRAEA JAPONICA — *C. physocarpi*

AA. Conidia subhyaline to colored, not acicular,

B. Conidia more nearly cylindric than obclavate, 4-6 x 50-85$\mu$; conidiophores in dense fascicles, 4-6 x 80-170$\mu$.
S. SORBIFOLIA *C. gotoana*

BB. Conidia and conidiophores 2-4$\mu$ in width; conidia more nearly obclavate than cylindric.

C. Leaf spots indistinct at first; fruiting effuse, hypophyllous; conidia 2-4 x 30-120$\mu$; stromata none; nonfasciculate; conidiophores 2-4 x 15-100$\mu$.
S. SALICIFOLIA *C. laxipes*

CC. Leaf spots distinct; fruiting not effuse, mostly epiphyllous; conidia 2-3.5 x 15-55$\mu$; stromata 20-50$\mu$; fascicles compact; conidiophores 2-3.5 x 5-35$\mu$.
S. PRUNIFOLIA *C. spiraeicola*

**Cercospora gotoana** Togashi

Japanese Jour. Bot. **2**: 75-111. 1924

Leaf spots irregular, small, reddish brown; fruiting hypophyllous; stromata present; fascicles dense; conidiophores pale to medium olivaceous brown, 1-3 septate, not branched, flexuous, 4-6 x 80-170$\mu$; conidia pale olivaceous, cylindro-obclavate, curved, 1-5 septate, 4-6 x 50-85$\mu$.

HOST: *Spiraea sorbifolia* L. (*Sorbaria sorbifolia* A. Br.)

TYPE: Mt. Rishiri, Rishiri Island; *Sorbaria sorbifolia* var. *glabra* Max.; Kogo Togashi and Takeo Goto; Aug. 5, 1922.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen this fungus. See key above for differences among the species on Spiraea.

**Cercospora graphioides** Ellis, in litt.

*Cercospora circumscissa* var. *virginiana* Sacc., Ann. Mycol. **13**: 126. 1915

Leaf spots circular to subcircular, 0.5-10 mm. in diameter, uniformly dark reddish brown, or with a paler brown center; fruiting amphigenous; stromata dark reddish brown to almost black, globular, 20-70$\mu$ in diameter; fascicles mostly dense, often coremoid or Graphium-like; conidiophores pale olivaceous brown, slightly paler and often distinctly wider near the tip, not branched, indistinctly multiseptate, slightly undulate or 2-3 mildly geniculate, rounded tip with small spore scar, 4-6 x 30-130$\mu$ (widest point sometimes 8$\mu$); conidia obclavate, pale olivaceous brown, base long obconic or obconically truncate, tip subacute, straight to curved, septa fairly evident, 4.5-8 x 30-100$\mu$.

HOST: *Prunus serotina* Ehrh.

TYPE: Newfield, N. Jersey; *Prunus serotina;* J. B. Ellis, No. 1335; Sept., 1880.

DISTRIBUTION: Ontario to New Jersey and westward to Wisconsin.

NOTE: This is such an easily recognized species because of the coremoid fascicles, conidiophores wide near the tip and wide conidia that it is possible to identify the host species even though in many collections it is labeled wrongly, *P. virginiana*. So far as I am aware, no other Cercospora occurs on *P. serotina*, nor does this species affect any other host. In Peck's collection is a packet labeled *Cercospora cerasina* Peck. There is not enough fruiting to be sure of the determination, but it probably is identical with *C. graphioides*. See key, page 472.

## CERCOSPORAE ON RUBUS

A. Spots indistinct or ferrugineous; fruiting effuse, dark olivaceous, hypophyllous; conidia subhyaline to pale in color, 5-8 x 30-85$\mu$; stromata none; nonfasciculate; conidiophores 4-6 x 50-300$\mu$.
R. ROSAEFOLIUS, RUBUS sp. *C. heteromalla*

AA. Spots distinct; fruiting not effuse, chiefly epiphyllous; stromata 15-40$\mu$ or rarely 60$\mu$; fascicles mostly dense; conidiophores 2.5-4 x 10-40$\mu$.

B. Conidia subhyaline to pale, mostly obclavate, indistinctly septate, 2-4 x 25-125$\mu$.
RUBUS spp. *C. rubi*

BB. Conidia medium dark, cylindric, closely and plainly septate, 3-6 x 35-65$\mu$.
R. FRUTICOSUS *C. rubicola*

### **Cercospora heteromalla** Sydow

Ann. Mycol. 22: 433. 1924

Leaf spots none or irregular ferruginous areas on the upper surface; fruiting effuse on the corresponding lower surface, dark olivaceous to almost black; stromata lacking; nonfasciculate; conidiophores intertwining, procumbent, bright ferruginous to medium brown, uniform in color, irregular in width, plainly multiseptate, often constricted at septa, not geniculate, copiously branched, tortuous, blunt tip, 4-6 x 50-300$\mu$; conidia subhyaline to pale olivaceous or ferruginous, cylindric, 3-7 septate, straight to strongly curved, ends rounded or base short obconic, 5-8 x 30-85$\mu$.

HOST: *Rubus rosaefolius* Sm., Rubus sp.

TYPE: Houtbos, Transvaal; *Rubus rosaefolius;* Woodbusch; July, 1924.

DISTRIBUTION: Transvaal, Ethiopia, Uganda.

NOTE: Some of the conidia are thick walled so that the fungus could be classed also as an Helminthosporium. See key above for differences among the species on this host genus.

### **Cercospora heteromeles** Harkness

Cal. Acad. Sci. Bul. 1: 38. 1884

Leaf spots circular to oval, 3-7 mm. in diameter, dark reddish brown to grayish brown or even dingy gray, usually with a black line margin, the gray seems to be

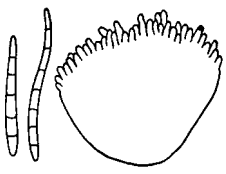


Fig. 165
*C. heteromeles*

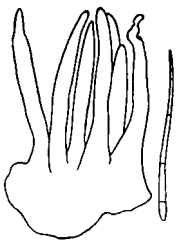


Fig. 166
*C. hyalina*

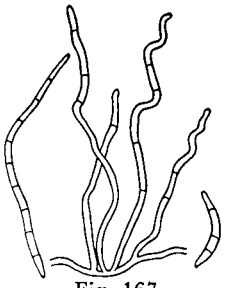


Fig. 167
*C. laxipes*

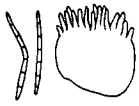


Fig. 168
*C. mali*

caused by the lifting of the epidermis; fruiting hypophyllous; stromata dark to black, globular, 30-80$\mu$ in diameter; fascicles extremely dense; conidiophores pale

to medium olivaceous brown, in mass almost black, straight, septation and spore scars indistinct or lacking, not branched, not geniculate, mostly uniform in color and width, bluntly rounded tip, 4-5.5 x 8-30$\mu$, sometimes when conidia are attached conidiophores appear very long; conidia cylindric, dark olivaceous, straight or nearly so, plainly multiseptate, base long obconically truncate to subtruncate, tip rounded bluntly, 5-7.5 x 60-150$\mu$ (Harkness says 16 x 130$\mu$).

HOST: *Photinia arbutifolia* Lindl. (*Heteromeles arbutifolia* Roem.)
TYPE: Oakland (Berkeley), Calif.; *Heteromeles arbutifolia;* Dr. Harkness, No. 3424; Sept., 1883.
DISTRIBUTION: Dr. Plunkett sent me two collections from southern California. I was fortunate in receiving also the Harkness types for study.
NOTE: This species is another one which could fit also into Helminthosporium.

## CERCOSPORAE ON ROSA

A. Conidia hyaline or rarely subhyaline.
  B. Conidia hyaline, obclavate to acicular, 2-3.5 x 40-150$\mu$; fruiting chiefly epiphyllous; fascicles 2-15 spreading stalks; conidiophores 3-5 x 20-100$\mu$; leaf spots minute, white centers.
  Rosa sp. *C. hyalina*
  BB. Conidia hyaline to subhyaline, mostly cylindric, 2-4 x 15-50$\mu$; fruiting hypophyllous; fascicles dense, usually compact; conidiophores 2-4 x 5-40$\mu$; leaf spots dull brown blotches.
  Rosa spp. *C. rosae*
AA. Conidia subhyaline to colored, obclavate; fruiting chiefly epiphyllous.
  B. Conidia subhyaline to very pale in color, 2-3.5 x 20-75$\mu$; stromata 15-45$\mu$; fascicles dense, compact; conidiophores pale in color, 2.5-4 x 10-30$\mu$ (young conidia may be hyaline).
  Rosa sp. *C. puderi*
  BB. Conidia pale to medium in color, 3-5 x 20-60$\mu$; stromata none to slight; fascicles 2-20 loose stalks; conidiophores medium dark, 3-4.5 x 20-110$\mu$, often only 20-50$\mu$.
  Rosa spp. *C. rosicola*

### **Cercospora hyalina** Muller & Chupp

Arquiv. Inst. Biol. Veg. R. de Janeiro **1**: 217. 1935

Leaf spots minute white to gray dots bordered by a wide purple or red line, 0.5-3 mm. in diameter; fruiting chiefly epiphyllous; stromata small, dark brown, subglobular; fascicles usually 2-15 spreading stalks, but occasionally dense and compact; conidiophores pale to medium olivaceous brown, paler and more narrow toward the tip, sparingly septate, not branched, 0-2 geniculate, curved to tortuous, tip conically truncate, 3-5 x 20-100$\mu$, some collections having none longer than 40$\mu$; conidia hyaline, obclavate to acicular, the shortest ones may be cylindric, straight to mildly curved, indistinctly multiseptate, base truncate to obconically truncate, tip subacute, 2-3.5 x 40-150$\mu$.

HOST: Rosa sp. (Cultivated Rose).
TYPE: Vicosa-Escola, Minas Geraes, Brazil; Rosa sp. (Cultivated Rose); A. S. Muller, No. 91; Nov. 28, 1929.
DISTRIBUTION: Minas Geraes, Venezuela, Colombia, India, Oklahoma.
NOTE: See key above for differences among the species on this host genus.

**Cercospora kerriae** Togashi

Trans. Sapporo Nat. Hist. Soc. **17**: 99. 1942

Leaf spots circular to oblong, 1-8 mm. in diameter, on upper surface brown, red below, with a dark line border; fruiting hypophyllous, not visible to the unaided eye; conidiophores pale olivaceous, paler and more narrow toward the tip, 2-4 septate, not branched, straight to flexuous, conic tip, 4-8 x 30-45$\mu$; conidia hyaline, cylindro-obclavate, straight to curved, 2-8 septate, ends obtuse, 4-6 x 25-85$\mu$.

HOST: *Kerria japonica* DC. var. *typica* Makino.

TYPE: Morioka, Pref. Iwate, Japan; *Kerria japonica* var. *typica;* K. Togashi; Sept. 2, 1934.

DISTRIBUTION: Known only from Japan.

NOTE: Dr. Togashi sent for examination a number of specimens and included a few descriptions without specimens. So far as I am aware, none of these has been published. He did not send me material of *C. kerriae,* but in 1941 sent me the description he later published.

**Cercospora laxipes** J. J. Davis

Trans. Wisc. Acad. Sci. **30**: 11. 1937

Leaf spots at first none, then gradually becoming ferrugineous, irregular to subcircular, 0.5 mm. to width of the leaflet; fruiting hypophyllous, scanty, effuse, olivaceous, usually present before definite leaf spots occur; stromata lacking; nonfasciculate; conidiophores branches from procumbent threads, pale olivaceous to olivaceous brown, uniform in color, irregular in width, tortuous, multiseptate, often multigeniculate, conic tip, 2-4 x 15-100$\mu$; conidia pale to very pale olivaceous, cylindric or slightly attenuated, straight to mildly curved, 1-7 septate, base rounded to obconically truncate, tip obtuse, 2-4 x 30-125$\mu$.

HOST: *Spiraea salicifolia* L.

TYPE: Nekoosa, Wisc.; *Spiraea salicifolia;* J. J. Davis; July 25, 1919.

DISTRIBUTION: Several collections from Wisconsin.

NOTE: See key, page 478 for differences among the species on Spiraea.

CERCOSPORAE ON PYRUS

A. Conidia hyaline, obclavate, 4-6 x 20-75$\mu$; fruiting effuse; stromata 20-70$\mu$; conidiophores 4-7.5 x 5-50$\mu$.
P. ARBUTIFOLIA — *C. pyri*

AA. Conidia subhyaline to very pale in color, obclavate to cylindric, rarely wider than 3.5$\mu$.

B. Leaf spots distinct; fruiting not effuse, chiefly epiphyllous; conidia 1.5-3 x 20-80$\mu$; conidiophores in dense fascicles, 2-4.5 x 8-40$\mu$.
P. MALUS, P. COMMUNIS — *C. mali*

BB. Leaf spots indistinct; fruiting effuse, hypophyllous; conidia 2-3.5 x 15-75$\mu$; conidiophores nonfasciculate or in loose fascicles, 2-3.5 x 10-60$\mu$.
P. COMMUNIS, P. SINENSIS — *C. piricola*

**Cercospora mali** Ellis & Everhart

Jour. Mycol. **4**: 116. 1888

*Cercospora minima* Tracy & Earle, Bul. Torrey Bot. Club **23**: 206. 1896

Leaf spots subcircular to irregular, 2-6 mm. in diameter, uniformly dull brown

or with a dingy gray center; fruiting chiefly epiphyllous, although rarely a collection will show much fruiting also on lower surface; stromata dark brown to almost black, globular, 20-50$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, slightly darker near base or in mass, sometimes distinctly septate, rarely slightly branched, not geniculate, spore scars indistinct, shorter ones attenuated, tip rounded, some collections show conidiophores only as slightly elongated cells on the periphery of the stroma, 2.5-4.5 x 8-40$\mu$; conidia narrowly obclavate to distinctly cylindric, subhyaline to very pale olivaceous brown, straight to mildly curved, septa indistinct, base subtruncate to obconically truncate, tip subacute to subobtuse, 1.5-3 x 20-80$\mu$.

HOSTS: *Pyrus malus* L. (*Malus pumila* Mill.) (*M. malus* [L.] Britt.), *Pyrus communis* L.

TYPES: St. Martinsville, La.; apple tree; A. B. Langlois; July 12, 1888; cotype distributed as Flora Ludoviciana No. 1373; (*C. minima*) Biloxi, Miss.; *Pyrus communis;* Sept. 1, 1895.

DISTRIBUTION: Studied material from India, Colombia, Brazil, Louisiana, Texas, Mississippi, and Alabama.

NOTE: See key above for differences among the species on Pyrus. *C. porrigo* has been described on pear but the type shows only Fusicladium. *C. pirina,* distributed as North American Fungi Second Series No. 2588, was later described as a Cercosporella.

**Cercospora persica** Saccardo

Hedwigia **15**: 119. 1876

HOST: *Prunus persica* (L.) Batsch. (*Persica vulgaris* Mill.)

TYPE: Selva, Italy; *Persica vulgaris;* Treviso; Sept. 1875; cotype distributed as Mycotheca Veneta No. 598.

NOTE: Rabenhorst in describing this species says it is hyaline and should belong to Ramularia but to him the conidia appeared too long for that genus. Saccardo said it was *Cercosporella persica* (Syll. Fung. **4**: 218. 1886). Atkinson (Jour. Elisha Mitchell Sci. Soc. **8**: 41. 1892) states that it should be *Fusarium persicum* (Sacc.). The fungus is not a Cercospora, but probably a Cercosporella.

**Cercospora physocarpi** Ray

Mycologia **34**: 560. 1942

Leaf spots subcircular to angular, 0.5-4 mm. in diameter, reddish brown, oldest spots may have small gray centers; fruiting chiefly hypophyllous; stromata slight;

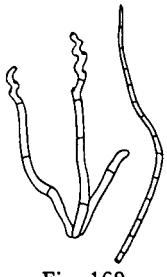


Fig. 169
*C. physocarpi*

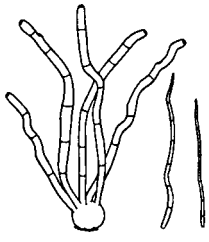


Fig. 170
*C. potentillae*

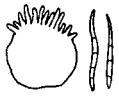


Fig. 171
*C. prunicola*

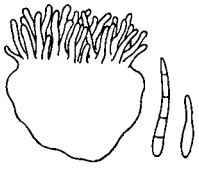


Fig. 172
*C. puderi*

fascicles 2-12 stalks; conidiophores pale to medium dark brown near the base, paler and more narrow toward the tip, sparingly septate, slightly geniculate, not branched, almost straight, medium spore scar at the subtruncate tip, 3-5 x 30-150$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 25-180$\mu$.

HOSTS: *Physocarpus bracteatus* (Rydb.) Rehder, *Spiraea japonica* L.

TYPE: College Nursery, Stillwater, Oklahoma; *Physocarpus bracteatus;* W. W. Ray; Aug. 26, 1941, and Sept. 17, 1940.

DISTRIBUTION: Oklahoma.

NOTE: This seems plainly distinct from any of the other species with acicular conidia on the Rosaceae. Physocarpus is sometimes listed as a Spiraea. *C. spiraeae* is a Cercosporella and *C. rubigo,* a Cylindrosporium (Cercosporella). See key, page 477.

**Cercospora piricola** Sawada

Formosan Jour. Nat. Hist. Soc. No. 17, p. 3. 1914

Leaf spots indistinct or none; fruiting effuse, grayish, hypophyllous patches varying from 0.5 mm. in diameter to large area of the leaf surface; stromata none or loosely woven masses of olivaceous brown mycelium, as large as 60$\mu$ in diameter; conidiophores borne singly from procumbent threads or arising from the stromata in divergent fascicles that resemble free ends of many threads, subhyaline to very pale olivaceous brown, sparingly septate, sometimes branched, not geniculate, variously curved or intertwined, blunt to conic tip, 2-3.5 x 10-60$\mu$; conidia concolorous, very narrowly obclavate to cylindric, straight to strongly curved, indistinctly multiseptate, ends bluntly rounded to conic, 2-3.5 x 15-75$\mu$.

HOSTS: *Pyrus communis* L., *P. sinensis* Lindl.

TYPE: Taihokucho Chonaihosho, Formosa; *Pyrus sinensis;* Y. Fujikuro; Jan. 15, 1910. This is the earliest of a number of collections.

DISTRIBUTION: A number of collections from Formosa.

NOTE: See key, page 481. Dr. Lee Ling kindly sent me an authentic specimen. collected October 12, 1912, and determined by K. Sawada.

**Cercospora porrigo** Spegazzini

Anal. Mus. Nac. B. Aires. II. 3: 341. 1899.

HOST: *Pyrus malus* L.

TYPE: La Plata, prov. Buenos Aires, Argentine; *Pyrus malus;* C. Spegazzini, No. 934; Nov. 1894.

NOTE: Spegazzini in his publication questioned the genus. The type shows the fungus to be the Fusicladium stage of *Venturia pyrina.*

**Cercospora potentillae** Chupp & Greene

Trans. Wisc. Acad. Sci., Arts, Letters 36: 263. 1946

Leaf spots subcircular, 0.5-3 mm. in diameter, brown to gray center, wide dark red border; fruiting chiefly epiphyllous; fascicles 2-20 diverging stalks; conidiophores pale brown, fairly uniform in color, somewhat irregular in width, multiseptate, not branched, 0-1 geniculate, slightly curved or bent, subtruncate tip, 4-5.5 x 40-170$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-4 x 40-160$\mu$.

HOSTS: *Potentilla gracilis* Dougl. (*P. recta* Nutt.), *P. norvegica* L. var. *hirsuta.*

TYPE: Madison, Wisc.; *Potentilla gracilis;* H. C. Greene; July 7, 1943.
DISTRIBUTION: Several collections from Wisconsin.
NOTE: See also *C. comari* for differences between the two species on Potentilla.

**Cercospora prunicola** Ellis & Everhart
Jour. Mycol. 3: 17. 1887

*Cercospora pruni-yedoensis* Sawada, Formosa Agr. Res. Inst. Rept. 85: 120. 1943

Leaf spots circular to irregular, 1-4 mm. in diameter, dark red to reddish brown, usually without a definite margin; fruiting chiefly hypophyllous; stromata dark brown, globular, 15-50$\mu$, rarely 75$\mu$ in diameter; fascicles dense to very dense; conidiophores very pale olivaceous brown, slightly attenuated, not or rarely septate, not geniculate, not branched, spore scars indistinct, 3-4 x 5-15$\mu$; conidia linear or cylindric to cylindro-obclavate, straight to curved, indistinctly septate, subhyaline to pale olivaceous brown or fuligenous, base subtruncate or occasionally obconic, tip subobtuse, 1.5-3 x 15-65$\mu$.

HOSTS: *Prunus americana* Marsh, *P. domestica* L., *P. Puddum* Roxb. (*P. cerasoides* D. Don), *P. yedoensis* Matsum.
TYPE: Point a la Hache, La.; *Prunus americanus;* A. B. Langlois, No. 542.
DISTRIBUTION: Material studied came from Alabama and Louisiana. Also reported from Japan, Formosa, and Middle Asia.
NOTE: I did not see the Sawada collection, but his meager description tends to fit this Cercospora species. See key, page 472.

**Cercospora puderi** Ben Davis
Mycologia 30: 291. 1938

Leaf spots circular, 0.5-5 mm. in diameter, center dingy gray to grayish brown, margin brown to reddish brown; fruiting amphigenous but chiefly epiphyllous; dark brown stromata 15-45$\mu$ in diameter; fascicles dense, compact; conidiophores pale olivaceous with brownish base, occasionally septate, not branched, rarely once geniculate, slightly attenuated, minute spore scar at the very narrow tip, 2.5-4 x 10-30$\mu$; conidia subhyaline to very pale olivaceous, obclavate, straight to curved, indistinctly 1-7 septate, base obconic, tip subacute, 2-3.5 x 20-75$\mu$. On immature collections the conidia may be hyaline and then resembling somewhat those of *C. hyalina.*

HOST: Rosa sp.
TYPE: Savannah, Georgia; Dorothy Perkins rose; Comm. J. Conrad Puder; June 15, 1915.
DISTRIBUTION: Georgia, Texas, Mexico, Venezuela.
NOTE: Dense fascicles, short conidiophores and narrow, colored conidia separate this species from the others on Rosa. See key, page 480.

**Cercospora pyracanthae** Katsuki
Bul. Agr. Impr. Sect. Econ. Dept. Fukuoka Pref. Japan 1: 19. 1949

Leaf spots angular to subcircular, irregular, occasionally confluent, on the upper surface brown, on the lower grayish brown; fruiting epiphyllous; stromata olivaceous brown, subglobular, 20-70$\mu$ in diameter; fascicles dense, compact; conidiophores straight, not branched, not geniculate, rarely septate, cylindric, pale olivaceous brown, paler near rounded tip, 2.5-3 x 15-40$\mu$; conidia subhyaline to faintly olivaceous, 2-5 septate, cylindro-obclavate, straight to mildly curved, base rounded to short obconically truncate, tip subobtuse, 2.5-4 x 25-65$\mu$.

HOST: *Pyracantha angustifolia* Schneid.
TYPE: Pref. Kurume, Fukuoka, Japan; *Pyracantha angustifolia;* S. Katsuki; Nov. 6, 1947.
DISTRIBUTION: Japan.
NOTE: Katsuki spells the host and species name "Pyrecantha(e)."

**Cercospora pyri** Farlow
Appalachia 3: 250. 1884

Leaf spots indefinite and indistinct brownish areas on upper surface; olivaceous to dark effuse fruiting on corresponding lower surface, sometimes manifested only by a slight darkening of the leaf pubescence; stromata pale brown, globular, 20-70$\mu$ in diameter; some fascicles dense; conidiophores hyaline, or the base pale

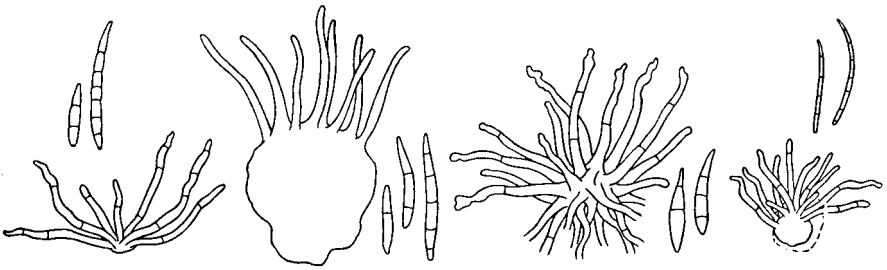


Fig. 173 *C. pyri* | Fig. 174 *C. rosae* | Fig. 175 *C. rosicola* | Fig. 176 *C. rubi*

brown, rarely septate, not branched, longest ones may be 1-2 geniculate, 2-7 small spore scars at and near long conic tip, 4-7.5 x 5-50$\mu$; conidia hyaline, obclavate, rounded to obconic base, rarely long obconically truncate, tip obtuse, straight or mildly curved, indistinctly 5-10 septate, 4-6 x 20-75$\mu$.

HOSTS: *Aronia arbutifolia* (L.) Elliott (*Pyrus arbutifolia* L.) (*Aronia melanocarpa* [Michx.] Elliott).
TYPE: Shelburne, New Hampshire; *Pyrus arbutifolia;* W. G. Farlow; Sept. 1883.
DISTRIBUTION: Material examined from New Hampshire and Wisconsin. Also reported from Iowa and Michigan.
NOTE: This could just as well be considered a Cercosporella. In some mounts of this species, one finds only hyaline fruiting. It has been spelled also *C. piri.* See key, page 481.

**Cercospora rosae** (Fuckel) v. Höhnel
Ann. Mycol. 1: 412. 1903

*Exosporium rosae* Fuckel, Symbolae Mycologicae p. 373. 1869
*Cercospora hypophylla* Cavara, Rev. Mycol. 21: 103. 1899
*Cercospora rosae-alpinae* Massalongo, Atti R. Ist. Veneto di Sci., Lett. Arti. VIII. 2: 684. 1900

Leaf spots large dull brown blotches, often along the leaf margin, when fully developed may reach to the midrib; fruiting plainly hypophyllous, appearing as numerous minute black pustules; stromata subglobular, pale to very pale brown, a few cells to 70$\mu$ in diameter; fascicles dense to very dense, mostly compact; conidiophores pale to very pale olivaceous brown, tip almost hyaline and narrow,

rarely septate, not branched, not geniculate, straight to mildly curved, tip conic to narrowly rounded, 2-4 x 5-40$\mu$ or appearing longer when conidia remain attached; conidia hyaline to subhyaline, cylindric or longest ones slightly attenuated, straight or nearly so, 0-5 but usually 1-septate, ends rounded or base subtruncate, 2-4 x 15-50$\mu$.

HOSTS: *Rosa agrestis* Savi, *Rosa alpina* L. (*R. pendulina* Ait.), *Rosa arvensis* Huds. (*R. scandens* Moench.), *Rosa canina* L., *Rosa cinnamomea* L., *Rosa gallica* L., *Rosa pimpinellifolia* L., *Rosa villosa* L., Rosa sp.

TYPES: Jura mountains; *Rosa alpina;* Morthier; summer. Cotype distributed as Fungi Rhenani No. 1658; (*C. rosae-alpinae*) Vajo del L'Anguilla near St. Anne d'Alfaedo; *Rosa alpina;* C. Massalongo; July 1894; (*C. hypophylla*) In arboreto Berengerii, Vallisumbrosae; *Rosa gallica;* F. Cavara.

DISTRIBUTION: In Europe from Italy to Germany and from France to the Ural mountains. Also present in Cyprus. It has been reported in the western hemisphere, but all the collections examined were some other species.

NOTE: See key, page 480 for differences among the species on Rosa. The large brown blotches, all fruiting hypophyllous, and the subhyaline, cylindric, one-septate conidia separate this species readily from the three others. The Allescher and Schnabl Fungi bavarici No. 498 labeled *Cercospora rosicola* Pass. is an excellent illustration of *C. Rosae.* This is not to be confused with *C. rosae* van Hook which is a synonym of *C. rosicola.* Some collections of *C. rosae* are so nearly colorless that they well could be considered a Ramularia.

**Cercospora rosicola** Passerini
Just's Bot. Jahresber. **3**: 276. 1877

*Cercospora rosigena* Tharp, Mycologia **9**: 114. 1917
*Cercospora rosaecola* var. *undosa* Davis, Wisc. Acad. Trans. **20**: 405. 1921
*Cercospora rosae* van Hook, Ind. Acad. Sci. Proc. **38**: 131. 1929
*Cercospora rosae-indiananensis* van Hook, Ind. Acad. Sci. Proc. **39**: 82. 1930

Leaf spots circular or when coalescing irregular, singly 1-4 mm. in diameter, uniformly purplish or reddish brown, or the center pale brown, tan or even gray, indistinct on lower leaf surface; fruiting amphigenous, chiefly on upper leaf surface; stromata lacking or only a few brown cells; fascicles 2-20 stalks; conidiophores medium dark olivaceous brown near base, more narrow and paler toward the tip, multiseptate, straight, sinuous or with one to many abrupt geniculations, rarely with incipient branches, medium spore scar at rounded to subconic tip, 3-4.5 x 20-110$\mu$, often short, 20-50$\mu$; conidia pale to medium olivaceous, obclavate, straight to mildly curved, mostly 1-4 septate, base obconic to rather long obconically truncate, tip subobtuse, 3-5 x 20-60$\mu$.

HOSTS: *Rosa arkansana* Porter & Coulter, *Rosa arvensis* Huds. (*R. scandens* Moench.), *Rosa blanda* Ait., *Rosa californica* Schlecht., *Rosa carolina* L., *Rosa centifolia* L., *Rosa cinnamomea* L., *Rosa humilis* Marsh, *Rosa semperflorens* Curt., *Rosa setigera* Michx., *Rosa spinosissima* L., Rosa sp.

TYPES: Parma, Italy; cultivated rose; G. Passerini; summer, 1874; cotype distributed as de Thuemen, Herb. Mycol. Oeconomicum No. 333 (see note below); (*C. rosigena*) Gonzales, Texas; bush rose; B. C. Tharp; Sept. 29, 1915; (*C. rosae*) Bloomington, Ind.; *Rosa setigera;* Culp; Aug. 11, 1909; (var. *undosa*) London, Canada; *Rosa blanda;* John Dearness, (Fungi Columbiani 3412).

DISTRIBUTION: Almost or quite co-extensive with rose culture.

NOTE: This species in literature also is spelled *C. rosaecola.* The cotype is distributed as von Thümen Herb. Mycol. Oeconomicum No. 333 and Mycotheca Universalis No. 1086. The cotype has wrongly been listed as Myco. Univ. No. 333. Since *C. Rosae* (Fuckel) von Höhnel was described previously to van Hook's species, he changed it to *C. rosae-indiananensis.* He felt that his species had larger conidiophores and conidia than did *C. rosicola. C. rosae* (Fuckel) von Höhnel has not been found in the Americas. B. H. Davis (Mycologia **30**: 282. 1938) describes the perfect stage as *Mycosphaerella rosicola.* See also the Davis article for distinctions between the species on Rosa. *C. rosicola* has wrongly been reported on *Rubus flagellaris* Lefev. & Muell. See key, page 480.

**Cercospora rubi** Saccardo

Nuov. Giorn. Bot. Ital. **8**: 188. 1876

*Cercospora septorioides* Ellis & Ev., Field Columb. Mus. Bot. ser. **1**: 94. 1896
*Cercospora garbiniana* Massalongo, Atti Mem. Acad. Agr. Sci. Lett. Verona ser. 4. **3**: 147. 1902

Leaf spots mostly numerous, inclined to coalesce, circular to angular, 3-15 mm. in diameter, uniformly dull brown on lower leaf surface, reddish brown to grayish or almost gray on upper surface, frequently with a brown or purple border, rarely with a yellow halo; fruiting chiefly epiphyllous; stromata globular, dark brown, 20-40$\mu$ or occasionally 60$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous or fuligenous, uniform in color, rather irregular in width, curved, bent or sinuous, rarely septate or geniculate, sometimes branched, minute spore scar at subconic tip, 2.5-4 x 10-40$\mu$ or rarely conidia almost sessile; conidia subhyaline to pale olivaceous, obclavate to obclavato-cylindric, straight to curved, base obconic to subtruncate, tip subacute, septa indistinct, rarely guttulate, 2-4 x 25-75$\mu$, or even 125$\mu$ long.

HOSTS: *Rubus allegheniensis* Porter, *Rubus canadensis* L., *Rubus cuneifolius* E. Merc., *Rubus fruticosus* L., *Rubus glandulosus* Bell., *Rubus hirtus* Waldst. & Kit. (*R. amoenus* Koehl.), *Rubus idaeus* L., *Rubus imperialis* Cham. & Schlecht., *Rubus loganobaccus* Bailey, *Rubus corchorifolius* L.F., *Rubus palmata* Thunb., *Rubus trivialis* Michx., *Rubus villosus* Ait., *Rubus vulgaris* Weihe & Nees., Rubus sp.

TYPES: Selva, Italy; *Rubus fruticosus;* Treviso; Sept. 1875; cotype distributed as Saccardo, Mycotheca Veneta 595; (*C. septorioides*) Fayette Co., W. Virginia; *Rubus canadensis;* L. W. Nuttall, No. 610; Oct. 15, 1894; (*C. garbiniana*) Verona, Italy; *Rubus fruticosus;* C. Massalongo; Oct. 18, 1900.

DISTRIBUTION: Widely distributed in North America and Europe. Also reported from Bermuda, India, and South America. Dr. Togashi sent a specimen from Japan.

NOTE: Passerini (Atti Accad. Lincei (4) **3**: 4. 1887) suggested for the perfect stage of this fungus, *Gnomoniella cercosporae.* Wolf (Mycologia **27**: 347. 1935; **28**: 85. 1936) named the ascus stage, *Mycosphaerella confusa.* An occasional collection may show medium dark olivaceous brown conidiophores, plainly septate and as large as 5 x 55$\mu$. See also *C. rubicola* and *C. heteromalla* for differences among the species on this host genus. See key, page 479.

**Cercospora rubicola** de Thuemen

Hedwigia **21**: 14. 1882

*Cercospora bliti* Tharp, Mycologia **9**: 108. 1917

Leaf spots irregular, reddish brown blotches without border, 3-15 mm. in extent; fruiting chiefly epiphyllous; stromata globular, dark brown, 15-40$\mu$ in diameter; some fascicles dense; conidiophores pale olivaceous brown, uniform in color

Fig. 177
*C. rubicola*

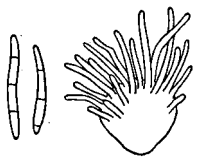


Fig. 178
*C. guliana*

Fig. 179
*C. vexans*

and width, longest ones undulate, sparingly septate, not geniculate, not branched, spore scars indistinct, tip rounded, 2.5-4 x 10-35$\mu$ or rarely as long as 75$\mu$; conidia cylindric to obclavato-cylindric, medium dark olivaceous, straight to much curved, ends rounded or attenuated, rather closely and plainly septate, 3-6 x 35-65$\mu$, (reported as long as 110$\mu$).

HOSTS: *Rubus fruticosus* L., Rubus sp.

TYPES: Cellas near Coimbra, Portugal; *Rubus fruticosus;* F. Moller; (*C. bliti*) Brazoria, Texas; Rubus sp. (wild blackberry); B. C. Tharp; Sept. 3, 1915.

DISTRIBUTION: Texas. Reported rather frequently in lower half of Europe.

NOTE: This resembles *C. rubi,* excepting that the conidia are more nearly cylindric, wider and with deeper color. I have not seen the type of *C. rubicola* but other collections seem identical with *C. bliti.* See key, page 479 for differences among the species on this host genus.

**Cercospora rubigo** Cooke & Harkness
Grevillea **13**: 17. 1884

HOSTS: *Spiraea aruncus* L., Spiraea sp.

TYPE: Redwood City, California; Spiraea sp.; W. H. Harkness, No. 2527; May, 1881.

NOTE: The type and cotype material show only hyaline fruiting in an acervulus. It seems identical with the genus, Cylindrosporium. In three of the Wisconsin Academy Reports (**15**: 779. 1907; **17**: 982. 1914; **20**: 428. 1921) J. J. Davis infers that the species is a doubtful one. The fungus has been listed in herbaria as also appearing on Clematis. Microscopic mounts show this to be incorrect. Davis in the first two reports listed above mentions a *Cercospora rubigo* on each of *S. aruncus* L. and *S. salicifolia* L. The latter finally was referred to *C. laxipes* which Davis described.

**Cercospora rubro-tincta** Ellis & Everhart
Jour. Mycol. **3**: 20. 1887

*Cercospora consobrina* Ellis & Ev., Jour. Mycol. **3**: 19. 1887
*Cercospora guliana* Saccardo, Ann. Mycol. **11**: 565. 1913
*Cercospora amygdali* Riza, Bul. Soc. Mycol. France **36**: 191. 1920

Leaf spots circular, 0.5-3 mm. in diameter, brown to reddish brown, sometimes with tan to gray center and purple border or with a narrow dark brown line; fruiting amphigenous but more abundant on upper surface; stromata dark

olivaceous brown, 15-25$\mu$ in diameter or rarely as long as 70$\mu$; fascicles dense to very dense; conidiophores pale fuligenous or olivaceous brown, tip almost hyaline, rarely septate, 0-1 geniculate, not branched, 2-4.5 x 8-55$\mu$; conidia cylindro-obclavate, longest ones attenuated, straight to mildly curved, subhyaline or oldest ones may show very pale color, base truncate to obconically truncate, tip subobtuse, 1-5 indistinct septa, 2-5.5 x 20-55$\mu$.

HOSTS: *Prunus amygdalus* Batsch. (*Amygdalus communis* L.), *P. persica* (L.) Batsch. (*Persica vulgaris* Mill.).

TYPES: Porte a la Hache, La.; living leaves of peach tree; A. B. Langlois, No. 824; Nov. 6, 1886; (*C. consobrina*) Louisiana; peach leaves; A. B. Langlois, No. 685; June, 1886; (*C. guliana*) Malta; *Amygdalus communis;* Caruana-Gatto and Borg; Mar.-June, 1913; (*C. amygdali*) Halkali, Bysantium; *Amygdalus communis.*

DISTRIBUTION: Louisiana, Delaware, Transvaal, Malta, Turkey.

NOTE: Although *C. consobrina* occurs on page 19 and *C. rubrotincta* on page 20 of the same article, Ellis (Jour. Mycol. 3: 34. 1887) has made the former one the synonym. See key, page 472.

**Cercospora spiraeae** de Thuemen,
Oesterr. Bot. Zeitschr. 28: 146. 1878.

HOSTS: *Physocarpus opulifolius* (L.) Maxim. (*Neillia opulifolia* Benth. & Hook) (*Spiraea opulifolia* L.) *Spiraea chamaedryfolia* L.

TYPE: Klosterneuburg, Austria; *Spiraea opulifolia;* F. de Thuemen; Aug. 1877.

NOTE: All of the collections of this fungus, including the cotype, show only hyaline fascicles. Apparently it is a Cercosporella. Refer to key, page 478.

**Cercospora spiraeicola** Muller and Chupp
Ceiba 1: 177. 1950

Leaf spots subcircular to irregular, 3-6 mm. in diameter, center pale brown or rarely almost gray, wide dark reddish brown margin; fruiting chiefly epiphyllous; stromata dark brown, globular, 20-50$\mu$ in diameter; fascicles dense, compact; conidiophores delicate, subhyaline to pale olivaceous brown, uniform in width, almost hyaline tip, seldom septate, not branched, not geniculate, variously curved or bent, tip conic to rounded, 2-3.5 x 5-35$\mu$; conidia subhyaline to very pale olivaceous, cylindric, straight to curved, 1-5 septate, ends rounded bluntly or base obconically truncate, 2-3.5 x 15-55$\mu$.

HOST: *Spiraea prunifolia.*

TYPE: Chimaltenango, Guatemala; *Spiraea prunifolia;* Albert S. Muller, No. 397; Jan. 16, 1943.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 478 for differences among the species on Spiraea.

**Cercospora tomenticola** (de Thuemen) Saccardo
Syll. Fungorum 4: 461. 1886

*Helminthosporium tomenticolum* de Thümen, Boll. Soc. Adr. Sci. Nat. Trieste 3: 434. 1877

HOST: *Cydonia vulgaris* Pers.

TYPE: Common along the coast of the Adriatic near Gorizia; *Cydonia vulgaris;* G. Bolle, No. 335; autumn.

NOTE: I have not seen this fungus. The description might indicate that it is a Cladosporium. The tomentose fruiting, the nonfasciculate conidiophores and the short orculiform conidia 0-3 septate at least are suggestive of that genus.

**Cercospora vexans** C. Massalongo
Ann. Mycol. **4**: 494. 1906

Leaf spots circular to angular, 0.5-15 mm. in diameter, uniformly brown or brown with a white speck in the center, may have red margin; fruiting amphigenous; stromata slight to very prominent, almost black, sometimes resembling closely an enclosed fruit body; fascicles 3-20 stalks; conidiophores medium dark brown, much paler and markedly attenuated toward the tip, plainly multiseptate, not branched, straight or rarely slightly geniculate, small spore scar at narrowly rounded to conic tip, 3.5-5 x 25-130$\mu$; conidia hyaline to subhyaline, cylindric to cylindro-obclavate, straight to mildly curved, 1-5 septate, base rounded, tip blunt, 1.5-3 x 15-40$\mu$. Some collections have only 1-septate conidia.

HOSTS: *Fragaria vesca* L., *F. virginiana* Duchesne, Fragaria sp. (Marshall var.)

TYPE: Tregnago, Italy; *Fragaria vesca;* C. Massalongo; Oct. 1906; D. Saccardo, Mycotheca Italica 1741 is not cotype.

DISTRIBUTION: Fairly common under moist conditions in New York and Wisconsin. A specimen was received from California. Material was studied also from Poland, Hungary, and Italy.

NOTE: Lobik (Bolezni Rast. **17**: 195. 1928) described *C. fragariae,* which differs from the above species in having much wider conidiophores and conidia. I was unable to obtain material of this for comparison. Plakidas (Phytopath. **29**: 19, 20, 1939) found a Cercospora on strawberry in Louisiana and which he thought was too large for *C. vexans.* It resembles very closely the description of *C. fragariae.*

**Cercospora violamaculans** Fukui
Bul. Mie Agric. College **3**: 15. 1933

Spots irregular, small to almost whole leaf surface, violaceous in color when young, changing to brown on old or dead leaf; fruiting amphigenous; sometimes fasciculate, but conidiophores mostly short branches from procumbent threads, pale olivaceous, rarely geniculate, 0-2 septate, 3-4.5 x 10-35$\mu$; conidia hyaline or possibly subhyaline, very narrowly obclavate or with almost no attenuation, strongly curved or bent, indistinctly multiseptate, base subtruncate, tip acute, 2-3.5 x 20-65$\mu$.

HOST: *Rhaphiolepis umbellata* Makino, var. *mertensii* Makino.

TYPE: Kurima-mura, Mie Pref., Japan; *Rhaphiolepis umbellata;* T. Fukui; June 2, 1932.

DISTRIBUTION: Japan.

NOTE: Dr. Togashi sent me a specimen collected by S. Katsuki, Oct. 14, 1949, in the Kagoshima Prefecture.

**Cercospora adinae** T. S. & K. Ramakrishnan
Proc. Indian Acad. Sci. **26** (Sect. B): 9. 1947

On upper leaf surface spots indistinct or lacking; fruiting effuse on lower surface, forming irregular, often confluent, ochraceous-orange patches involving much of the leaf surface; fascicles dense, usually emerging through stomata; co-

nidiophores deep orange in color, septate, repeatedly geniculate near the rounded to conic tip, sometimes branched, occasionally clavate in form, 4-7 x 15-50$\mu$; conidia hyaline to orange, obclavate, 3-7 septate, straight to curved, base obconic, tip subobtuse, 4-7 x 50-85$\mu$.

HOST: *Adina cordifolia* Hook.

TYPE: Walayar, Malabar District, India; *Adina cordifolia;* T. S. and K. Ramakrishnan; Dec. 31, 1946 (the authors give also 1936).

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen this species.

**Cercospora balladynae** Hansford

Proc. Linn. Soc. London **158**: 50. 1947

No leaf spots are described as the species is supposed to be parasitic on a fungus, Balladyna, one of the Dothidiales. The conidiophores are scattered, erect, olivaceous, cylindric, 3-5 septate, not branched, 5-7 x 100$\mu$; conidia single, terminal, elongato-obclavate, pale olivaceous, base truncate, attenuated toward the rounded apex, 3-7 septate, 5-7 x 50-80$\mu$.

HOST: Pavetta sp.

TYPE: Entebbe Road, Uganda; parasitic on Balladyna sp. on foliage of Pavetta sp.; C. G. Hansford, No. 2609.

DISTRIBUTION: Uganda.

NOTE: It is possible that Mr. Hansford is correct in stating that this species is parasitic on another fungus, but at present I doubt the statement. No Mycosphaerella has ever been proved pathogenic on any host excepting those with chlorophyll.

CERCOSPORAE ON BORRERIA, SPERMACOCE, AND HEMIDIODIA

A. Conidia hyaline, acicular, 2.5-4 x 20-350$\mu$; conidiophores in fascicles of 2-7, medium dark, 4.5-6 x 40-250$\mu$.
*C. diodiae-virginianae*

AA. Conidia colored, not acicular.

B. Conidia subhyaline to very pale in color, narrowly obclavate, curved, 2-4 x 40-130$\mu$; conidiophores very pale in color, almost straight, fascicles dense, often compact, 3-5 x 20-125$\mu$, not branched.
*C. hemidiodiae*

BB. Conidia pale olivaceous, almost straight, 3.5-6 x 30-110$\mu$, mostly shorter; conidiophores not in compact fascicles, tortuous, branched, 3-5.5 x 35-220$\mu$.

C. Conidia cylindro-obclavate, showing distinct attenuation, base not rounded.
*C. borreriae*

CC. Conidia cylindric, not attenuated, both ends usually rounded.
*C. ubatubensis*

**Cercospora borreriae** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **46**: 379. 1894

Leaf spots indistinct, may later show as brown irregular blotches which include part or all of the upper surface of the leaflet; fruiting on the corresponding lower surface scantily effuse, olivaceous to sooty; stromata a few cells or filling the stomatal openings; fascicles 2-20 divergent stalks; conidiophores sometimes single,

medium dark reddish brown, uniform in color, irregular in width, plainly multiseptate, branched, slightly geniculate, curved to tortuous, small spore scar at the

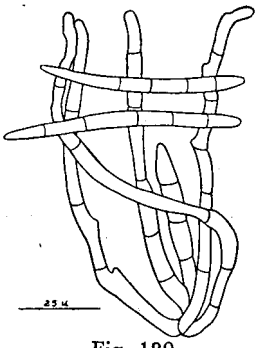


Fig. 180
*C. borreriae*

bluntly rounded tip, 3-5.5 x 35-220$\mu$; conidia subhyaline to pale or medium olivaceous, narrowly obclavate to almost cylindric, straight to mildly curved, 3-9 septate, base obconic to obconically truncate, tip subobtuse, 2.5-5 x 30-90$\mu$ or slightly longer.

HOSTS: *Spermacoce ocymoides* Burm. (*Borreria micrantha* Torr. & Gray), *Mitracarpum villosum* Cham. & Schlecht. (*M. hirtum DC.*), Mitracarpum sp., *Spermacoce laevis* Lam. (*Borreria laevis* [Lam.] Griseb.), Borreria sp., *Borreria latifolia* (Aubl.) Schum.

TYPE: Biloxi, Miss.; *Borreria micrantha;* S. M. Tracy; July, 1893.

DISTRIBUTION: Gulf States, Trinidad, Puerto Rico, Guatemala, Honduras, Costa Rica, Uganda.

NOTE: See key above for differences among the species on these host genera. Although the conidia of this species are narrow and resemble those of *C. hemidiodiae,* the conidiophores in comparison are coarse and dark.

**Cercospora carveriana** P. Saccardo & D. Saccardo
Syll. Fung. **18**: 607. 1906

*Cercospora richardsoniae* Ellis & Ev., Jour. Mycol. **8**: 72. 1902

Leaf spots indistinct; very scantily effuse olivaceous fruiting on both leaf surfaces, difficult to see on dried specimens; stromata slight; fascicles mostly dense; conidiophores uniformly pale to medium brown, plainly multiseptate, sometimes constricted at the septa, branched, rarely geniculate, spore scars small or lacking, rounded tip, 3-5.5 x 20-80$\mu$; conidia cylindro-obclavate, pale olivaceous, straight to mildly curved, tip subobtuse to subacute, long obconic base, 2-4.5 x 30-110$\mu$.

HOST: *Richardsonia pilosa* H.B.K. (*R. glabra* A.St.Hib.)

TYPE: Tuskegee, Ala.; *Richardsonia glabra;* Geo. W. Carver, No. 47; Aug. 31, 1900.

DISTRIBUTION: Reported from the Gulf States.

NOTE: It is probable that *C. richardsoniae* E.+E. was published a month or two earlier than was *C. richardsoniae* P. Henn. Inasmuch as Saccardo has made the former a synonym, it is being left as such to avoid further confusion. *C. richardsoniae* P. Henn. differs from this species in having black globular stro-

mata, fascicles sometimes coremium-like, conidiophores not branched, occasionally wider near the tip, as long as 160$\mu$, and conidia cylindric, with short obconic base.

**Cercospora cephalanthi** Ellis & Kellerman
Bul. Torrey Bot. Club 11: 121. 1884

*Cercospora perniciosa* Heald & Wolf, Mycologia 3: 19. 1911

Leaf spots circular to irregular, reddish brown, sometimes with slightly darker margin, 3-30 mm. in diameter; fruiting chiefly epiphyllous, appearing as very minute black pustules; stromata none to 25$\mu$ in diameter, dark brown; fascicles 1-9 conidiophores or sometimes dense, compact; conidiophores in mass fairly dark, singly pale olivaceous or olivaceous brown, uniform in color, attenuated toward the tip, plainly multiseptate, sometimes branched, mildly geniculate or with one abrupt geniculation, longest ones may be wavy, small spore scar at rounded tip, 3-4.5 x 20-70$\mu$; conidia cylindric to cylindro-obclavate, hyaline to very pale olivaceous, almost straight, occasionally catenulate, obconic base, bluntly rounded tip, 1-4 septate, 2-4.5 x 10-100$\mu$.

HOST: *Cephalanthus occidentalis* L.

TYPES: Manhattan, Kansas; *Cephalanthus occidentalis;* W. A. Kellerman; July, 1884; cotype distributed as N. Amer. Fungi 2nd Ser. 1510; (*C. perniciosa*) Victoria, Texas; *Cephalanthus occidentalis;* Heald & Wolf, No. 2539; Sept. 2, 1909.

DISTRIBUTION: Reported from Delaware, Alabama, Texas, Oklahoma, Kansas, Wisconsin, and New York. Sawada (Trans. Nat. Hist. Soc. Formosa 21: 330. 1931) reported it also from Formosa.

NOTE: Ellis (Jour Mycol. 4: 5. 1888) says that in a mature specimen the conidia are darker, larger and more septate, the conidiophores quite dark, and the fascicles dense. I examined material from four states but did not find this pronounced variation. Some of the Sawada material is deposited in the U.S.D.A. Mycological Herbarium under the name, *C. cephalanthi* Sawada, but I am not sure whether he described it under this name. Heald (U. S. Bur. Plant Ind. Bul. 226: 61. 1912) states that *C. cephalanthi* E. & K. is a Ramularia. He bases his statement mostly on catenulate conidia.

**Cercospora cinchonae** Ellis & Everhart,
Jour. Mycol. 3: 17. 1887

Leaf spots circular, very dark reddish brown, 2-4 mm. in diameter, sometimes with slightly raised margin; fruiting epiphyllous; small, globular, dark brown stromata; fascicles dense; conidiophores slightly elongated cells on the surface of the stroma, pale colored; conidia narrowly linear or cylindric, slightly undulate, ends bluntly rounded or base subtruncate, septa not distinct, pale olivaceous, 2-3 x 25-80$\mu$.

HOSTS: *Cinchona ledgeriana* Moens, Cinchona sp.

TYPE: Lafayette, La.; Cinchona sp.; A. B. Langlois, No. 720; Sept. 21, 1886.

DISTRIBUTION: Louisiana, Uganda, Belgian Congo.

**Cercospora coffeicola** Berkeley & Cooke
Grevillea 9: 99. 1881

*Cercospora coffeae* Zimm., Ber. Land-u. Forstw. Deut. Ostafr. 2: 35. 1904
*Cercospora herrerana* Farn., Atti Inst. Bot. R. Univ. Pavia, ser. 2. 9: 37. 1911

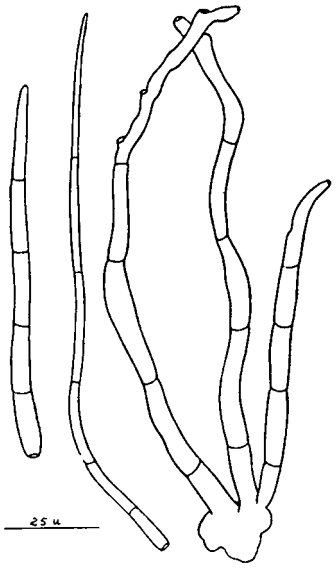



Fig. 181
*C. coffeicola*

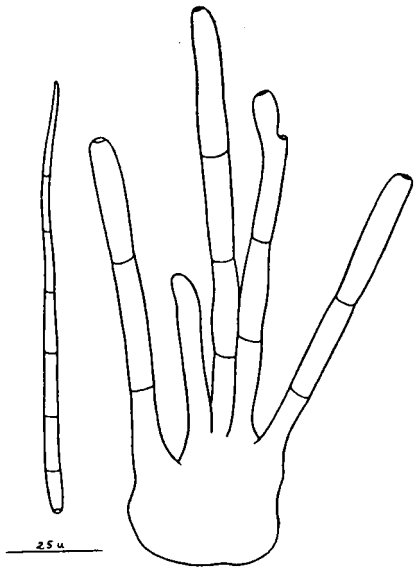



Fig. 182
*C. diodiae-virginianae*

Leaf spots circular, 3-10 mm. in diameter, tan, gray, or white center and reddish brown to almost black margin, sometimes marked slightly with concentric rings; fruiting amphigenous but chiefly on upper surface, may occur also on the cotyledons and fruit; stromata slight to 50$\mu$ in diameter, globular, dark brown; fascicles 3-30 stalks; conidiophores pale to medium brown, slightly paler near the tip, sometimes branched, multiseptate, 1-7 mildly to abruptly geniculate, slightly attenuated, medium sized spore scar at subtruncate tip, 4-6 x 20-275$\mu$ (some specimens show only short conidiophores); conidia hyaline, acicular to obclavate, nearly straight, truncate to subtruncate base, acute tip, indistinctly multiseptate, 2-4 x 40-150$\mu$ (Welles says 5-7$\mu$ wide).

HOSTS: *Coffea arabica* L., *C. excelsa* Cheval., *C. laurina* Smeathm., *C. robusta* Linden, *C. stenophylla* G. Don, Coffea sp.

TYPES: Jamaica; Coffee; Mr. Morris; Jan. 1881; (*C. coffeae*) German East Africa; *Coffea stenophylla;* A. Zimmerman; (*C. herrerana*) Cuicatlan (Oaxaca), Mexico; *Coffea arabica.*

DISTRIBUTION: Probably wherever coffee is grown intensively. Seems common in Puerto Rico, South America, and Trinidad. Has been reported also from Guatemala, San Domingo, Peru, Philippines, Colombia, Uganda, Sierra Leone, Japan, China, Caledonia, Minas Geraes, Sao Paulo, Java, Venezuela, and South Africa.

**Cercospora diodiae** Cooke,
Grevillea 7: 34. 1878

Leaf spots circular, brown, 0.5-2 mm. in diameter, difficult to distinguish on dried brown specimens; fruiting amphigenous, showing as minute black, closely aggregated pustules; stromata dark, mostly small, but may be up to 60$\mu$ in diam-

eter; fascicles rarely dense; conidiophores dark brown or olivaceous brown, straight to slightly sinuous, not branched, not geniculate, septa 0-4, sometimes minute spore scar at rounded tip, 3-5 x 10-60$\mu$, mostly 10-30$\mu$ long; conidia pale olivaceous, very narrowly obclavate, base rounded to obconic, straight to mildly curved, indistinctly multiseptate, tip acute to subacute, 1.5-3 x 40-125$\mu$.

HOSTS: *Diodia teres* Walt., Diodia sp.

TYPE: Aiken, S. Carolina; *Diodia teres;* H. W. Ravenel, No. 2284 (585).

DISTRIBUTION: Wisconsin to Texas and eastward; India, Brazil.

NOTE: Saccardo (F. Ital. No. 684. 1881) shows long wavy conidiophores, and (Michelia **2**: 148. 1880) says they range from 60-80$\mu$ in length. I found none like these, but often colored threads spread in all directions from the stroma and which might be mistaken for conidiophores. This differs from *C. diodiae-virginianae* in not having acicular hyaline conidia, and in its short conidiophores. See key, page 491.

**Cercospora diodiae-virginianae** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 58. 1892

Leaf spots subcircular to elongate, 3-8 mm. in length, brown to dingy gray with an ill-defined purple border; fruiting amphigenous; stromata slight, globular, dark, rarely more than 20$\mu$ in diameter; fascicles 2-7 stalks; conidiophores medium dark brown, plainly multiseptate, not branched, mostly not geniculate, sometimes 1-5 mildly or 1-2 abruptly geniculate, often with peculiar protruberances with small conidial scar along side of conidiophores, color and width fairly uniform, sometimes attenuation near subtruncate tip, which has a fairly large spore scar, 4.5-6 x 40-250$\mu$; conidia acicular, hyaline, straight to mildly curved, indistinctly multiseptate, truncate base, subacute tip, 2.5-3.5 x 20-110$\mu$, rarely as large as 4 x 350$\mu$.

HOST: *Diodia virginiana* L.

TYPE: Auburn, Ala.; *Diodia virginiana;* B. M. Duggar; Sept. 26, 1891.

DISTRIBUTION: Known only from the type locality.

NOTE: See *C. diodiae* for differences between the two species. Atkinson has written this as *C. D.-virginianae,* so that the term, *C. virginianae,* has crept into the literature several times. E. B. Martyn sent leaves of *Borreria laevis* Griseb. from Jamaica and which had a Cercospora appearing so nearly like the above species that at present it is considered the same. See key, page 491.

**Cercospora emmeorrhizae** Sydow

Ann. Mycol. **28**: 210. 1930

Leaf spots at first subcircular, later elongating between the parallel veins or along the leaf edge, dark brown, no distinctive border; fruiting chiefly epiphyllous; stromata black, globular, 30-75$\mu$ in diameter; nonfasciculate from procumbent threads or dense fascicles on stromata; conidiophores pale olivaceous brown, slightly paler toward the tip, sparingly septate, irregular in width, not branched, rarely geniculate, almost straight, tip subtruncate to rounded, 3-4.5 x 20-80$\mu$; conidia subhyaline to pale olivaceous, cylindro-obclavate, straight to mildly curved, 3-7 septate, base obconically truncate, tip obtuse, 2.5-4 x 25-80$\mu$.

HOST: *Emmeorrhiza umbellata* (Spreng.) K. Schum.

TYPE: El Limón, Valle de Puerto L. Cruz, D. F., Venezuela; *Emmeorrhiza umbellata;* H. Sydow, No. 296a; Jan. 18, 1928.

DISTRIBUTION: Known only from the type locality.

**Cercospora galii** Ellis & Holway
Jour. Mycol. **1**: 5. 1885

*Cercospora concinna* Sydow (Mycoth. Germ. No. 2596)

Leaf spots grayish brown to tan, mostly without any definite margin, finally may turn entire leaflet brown; fruiting hypophyllous, sometimes almost effuse; stromata globular, dark brown, 20-60$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, undulate, or variously bent and curved, septa rare or indistinct, sparingly branched, rarely once abruptly geniculate, slightly attenuated, fairly uniform in color, minute spore scar at rounded tip, 3-4 x 25-60$\mu$; conidia cylindric, straight to curved, pale olivaceous, indistinctly 1-5 septate, base long obconically truncate, tip rounded or sometimes conic, 3-4.5 x 30-50$\mu$.

HOSTS: *Galium aparine* L., *G. asprellum* Michx., *G. mollugo* L., *G. pilosum* Ait., *G. triflorum* Michx.

TYPES: Decorah, Iowa; *Galium aparine;* E. W. D. Holway; July 13, 1884; (*C. concinna*) Langenaubach, Dillkreis, Prov. Hessen-Nassau; *Galium mollugo;* A. Ludwig; July 12, 1931.

DISTRIBUTION: From Alabama to Wisconsin and eastward; Oregon, Alaska. Also reported from Germany, Poland, and Latvia. It has been confused with *C. tenuis,* therefore the exact range cannot be given.

NOTE: The other species, *C. tenuis* (*C. punctoidea*) on Galium is differentiated by more nearly black stromata, fruiting amphigenous, conidiophores shorter, more nearly straight, and darker, and conidia slightly different in shape. The Latvian collection has wider conidia and longer conidiophores than does the type of *C. galii.* Wehmeyer (Mycologia **38**: 308. 1946) reports *C. galii* on *Galium triflorum* Michx. from Western Wyoming. His "stromatic acervuli," very short conidiophores and unicellular conidia do not resemble a description of *C. galii.*

**Cercospora genipae** Rangel
Arch. Jardin Bot. R. Janeiro. **2**: 71. 1916

Leaf spots subcircular to irregular, 4-10 mm. in diameter, tan to pale brown, uniform in color or with a pale to dark line border; fruiting amphigenous; stromata subglobular, dark brown to black, 30-75$\mu$ in diameter; fascicles dense to very dense; conidiophores in mass medium dark, singly pale olivaceous brown, paler and more narrow toward the tip, seldom septate, not branched, not geniculate, straight to undulate or curved, tip rounded to conic, 3-4 x 5-25$\mu$; conidia pale olivaceous, cylindro-obclavate, rather closely septate, straight to mildly curved, base long obconically truncate, tip obtuse, 5-7 x 20-100$\mu$.

HOST: Genipa sp.

TYPE: Rio de Janeiro, Brazil; Genipa sp. (an American); Maublanc and Rangel, No. 579; Aug. 9, 1912.

DISTRIBUTION: Known only from the type locality.

**Cercospora guettardae** sp. nov.

Maculae magnae, plerumque venulis limitatae, pallide brunneae, in epiphyllo linea atro-fusca cinctae; caespituli epiphylli; hypostromate innato-erumpente, 30-75$\mu$ diam. metiente; conidiophora densissime fasciculata, pallide olivaceo-brunnea, sursum pallidiora et attenuata, simplicia, saepe continua, vix 1-2 geniculata,

2-3.5 x 10-35$\mu$; conidia subhyalina vel pallide olivacea, cylindro-obclavata, recta vel curvata, spurie 1-5 septata, utrimque subobtusa, 2-3.5 x 20-55$\mu$.

Leaf spots large, often following between larger veins from leaf margin to midrib, pale brown, usually with a dark brown margin; fruiting epiphyllous, visible as numerous black pustules; stromata black, globular, 30-75$\mu$ in diameter; fascicles dense to very dense, compact; conidiophores pale olivaceous brown, paler and more narrow near tip, which may have a minute spore scar, variously curved or bent, not branched, septa not visible, rarely 1-2 abruptly geniculate, 2-3.5 x 10-35$\mu$; conidia cylindro-obclavate, subhyaline to pale olivaceous, straight to curved, indistinctly 1-5 septate, base long obconic, tip subobtuse, 2-3.5 x 20-55$\mu$.

HOST: *Guettarda scabra* Lam.

TYPE: Twenty miles south of Miami, Florida; *Guettarda scabra;* L. W. Nuttall; Dec. 8, 1924.

DISTRIBUTION: Known only from the type locality.

NOTE: This specimen was found in the Bartholomew herbarium, Hays, Kansas, and listed as *C. guettardae* Dearness and Bartholomew.

**Cercospora hameliae** sp. nov.

Maculae orbiculares, 1-4 mm. diam., pallide brunneae; caespituli epiphylli; stromata atro-fusca, subglobosa, 10-70$\mu$ diam.; conidiophora fere dense fasciculata, olivaceo-brunnea, sursum attenuata et pallidiora, leniter geniculata, vix ramosa, ad apicem acuta, 2.5-5 x 25-100$\mu$; conidia obclavato-cylindrata, pallide olivacea, fere recta, spurie septata, utrimque obtusa, 2-3.5 x 20-75$\mu$.

Leaf spots 1-4 mm. in diameter, circular, brown to tan, margin narrow dark brown line; fruiting chiefly epiphyllous; stromata dark brown, subspherical, a few cells to 70$\mu$ in diameter; some fascicles dense; conidiophores pale singly, in mass medium dark olivaceous brown, paler and more narrow near tip, plainly multiseptate, slightly geniculate, rarely slightly branched, small spore scar at rounded to conic tip, 2.5-5 x 25-100$\mu$; conidia obclavato-cylindric, pale olivaceous, nearly straight, septa indistinct, base obconic to long obconically truncate, tip blunt, 2-3.5 x 20-75$\mu$.

HOST: *Hamelia patens* Jacq.

TYPE: Cordoba, Mexico; *Hamelia patens;* O. A. Plunkett, No. 209; July 30, 1932; and Jalapa, Mexico; No. 92; July 18, 1932.

DISTRIBUTION: Known only from the type localities.

**Cercospora hemidiodiae** Toro

Jour. Dept. Agr. Puerto Rico 14: 288. 1930

Leaf spots indistinct, at least at first, later irregular reddish blotches may appear; fruiting on the corresponding lower surface effuse, brown to dark olivaceous or almost black, rarely almost purplish in color; stromata lacking or filling stomatal openings; nonfasciculate or 2-20 divergent stalks in the fascicle; conidiophores subhyaline to pale olivaceous, fairly uniform in color, irregular in width, plainly multiseptate, branched, sinuous or crooked, sometimes once geniculate, conic tip with minute spore scar, rarely biconic and with two conidia attached that resemble narrow branches, 3-5 x 20-125$\mu$; conidia narrowly obclavate, straight to curved, subhyaline to pale olivaceous, indistinctly multiseptate, medium to long obconically truncate base, subacute conic tip, 2-4 x 40-130$\mu$.

HOSTS: *Spermacoce ocimifolia* Willd. (*Hemidiodia ocimifolia* [Willd.] Schum.), *Spermacoce laevis* Lam. (*Borreria laevis* [Lam.] Griseb.)

TYPE: Mayaguez, Puerto Rico; *Hemidiodia ocimifolia;* Whetzel and Olive; March 6, 1916.

DISTRIBUTION: Bermuda, Trinidad, Puerto Rico, Cuba, Central America, and northern South America.

NOTE: See key, page 491. *C. borreriae* differs in having dark, relatively coarse conidiophores; *C. ubatubensis,* in producing definite leaf spots and having wide conidia.

**Cercospora houstoniae** Ellis & Everhart

Proc. Nat. Sci. Phila. I. **43**: 89. 1891

Leaf spots indistinct, especially on dried brown foliage; fruiting in slightly darkened effuse areas on upper leaf surface; stromata globular, dark reddish brown, 30-75$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, slightly paler and more narrow toward the tip, rarely once septate near base, not geniculate, not branched, sometimes slightly undulate, small spore scar at rounded tip, 3-4 x 10-40$\mu$; conidia pale olivaceous, obclavate, short obconic to subtruncate base, subacute tip, indistinctly multiseptate, straight to mildly curved, 2-3.5 x 20-60$\mu$.

HOST: *Houstonia caerulea* L.

TYPE: Wilmington, Del.; *Houstonia caerulea;* A. Commons, No. 1371; April 28, 1890.

DISTRIBUTION: Known only from the type locality.

**Cercospora ixorae** Solheim ap. Stevens & Peirce

Indian Jour. Agr. Science **3** (5): 15. 1933

*Cercospora ixorae* Yamamoto, Jour. Soc. Trop. Agr. **6**: 602. 1934. (Reprint = Phytopath. Lab. Taihoku Imp. Univ. Contrib. **28**: 602. 1934).

Leaf spots subcircular, 4-20 mm. in diameter, tan to pale brown, indistinctly zonate, often with a dark line margin; fruiting amphigenous but more abundant on the lower leaf surface, rarely in frosty effuse patches; stromata subglobular, dark brown, 20-50$\mu$ in diameter; fascicles dense; conidiophores subhyaline to very pale olivaceous brown, indistinctly multiseptate, irregular in width, plainly branched, rarely geniculate, variously bent or curved, interlacing, 2-4 x 15-45$\mu$; conidia subhyaline to very pale olivaceous, cylindric or only faintly attenuated, straight to mildly curved, indistinctly septate, base subtruncate to long obconically truncate, tip rounded to conic, 2-4 x 25-75$\mu$.

HOSTS: *Ixora chinensis* Lam., *I. coccinea* L., *I. parviflora* Vahl.

TYPES: Bombay, Poona, India; *Ixora coccinea;* B. N. Uppal; 1932? (*C. ixorae* Yamamoto) Taihoku, Formosa; *Ixora chinensis;* W. Yamamoto, No. 17; Jan. 20, 1934.

DISTRIBUTION: India, Formosa.

NOTE: I did not see the Solheim type, but his description fits other specimens from India and Formosa.

**Cercospora mitracarpi** Speggazzini

Bol. Acad. Nac. Cien. de Cordoba. **11**: 614. 1889

HOST: Mitracarpum sp.

TYPE: Apiahy, Sao Paulo, Brazil; Mitracarpum sp.; J. Puiggari, No. 2607 (Speg. 939); 1888.

NOTE: The type shows only an Alternaria. Many of the younger conidia are not muriform.

**Cercospora morindae** Sydow

Ann. Mycol. **12**: 490. 1914

Leaf spots circular to irregular, 2-10 mm. in diameter, reddish brown, sometimes with pale tan to grayish center; fruiting hypophyllous; stromata black, globular, 15-40$\mu$ in diameter; fascicles dense; conidiophores very pale brown or fuligenous, attenuated toward the tip, sometimes curved or bent or irregular in width, not septate, not branched, not geniculate, rarely minute spore scar at narrowly rounded tip, 2-3.5 x 5-25$\mu$; conidia subhyaline to pale olivaceous, narrowly obclavate, only mildly attenuated, nearly straight, indistinctly multiseptate, base medium to long obconic, tip subacute to subobtuse, 2-3.5 x 25-80$\mu$.

HOST: *Morinda tinctoria* Roxb.

TYPE: Government Farm, Coimbatore, Madras Presidency, India; *Morinda tinctoria;* W. McRae, No. 80; Febr. 17, 1914.

DISTRIBUTION: India.

NOTE: See also *C. morindicola* for differences between the two species on this host genus.

**Cercospora morindicola** Jenkins & Chupp

Mycologia **35**: 480. 1943

Leaf spots subcircular to irregular, various shades of brown to gray; fruiting amphigenous, chiefly epiphyllous, arranged more or less concentrically; stromata subglobular, medium dark in color, 30-80$\mu$ in diameter; fascicles dense; conidiophores pale to medium dark, paler and more narrow toward the tip, septate, tortuous, sometimes branched, 2.5-5 x 10-60$\mu$; conidia subhyaline to pale olivaceous, obclavato-cylindric, straight to mildly curved, 1-5 septate, base obconically truncate, tip obtuse to conic, 2.5-4 x 20-55$\mu$.

HOST: *Morinda umbellata* L. (*M. roioc* L.).

TYPE: U. S. Plant Introduction Grounds, Coconut Grove, Florida; *Morinda roioc;* J. E. Fennell, No. 1345; Febr. 13, 1941.

DISTRIBUTION: Several collections from Florida and one from Haiti.

NOTE: See also *C. morindae* for differences between the species on this host genus. *C. morindicola* has noticeably longer conidiophores, larger brighter colored stromata, and more stubby appearing conidia.

**Cercospora oldenlandiae** Hansford

Proc. Linnean Soc. London **1942-43**: 58. 1943

Leaf spots indeterminate, olivaceous; fruiting amphigenous, chiefly hypophyllous; stromata 25-40$\mu$; conidiophores dark olivaceous, usually in dense fascicles, flexuose, upper part geniculate and pale, 0-3 septate, not branched, 4-5 x 30-100$\mu$; conidia hyaline to pale olivaceous, obclavate, almost straight, 1-4 septate, base subtruncate, 3-4.5 x 40-80$\mu$.

HOSTS: *Borreria senensis* Hiern., Oldenlandia sp.

TYPE: Serere, Uganda; Oldenlandia sp.; Hansford, 1577; cotype, Ankole, Uganda; *Borreria senensis;* Purseglove, 564.

DISTRIBUTION: Uganda.

NOTE: I have not seen this species, so am not sure whether it is identical with one of the species described previously on Borreria, (see key, page 491) or whether the one on Oldenlandia is identical with the one on Borreria, since the two genera occur in distinct groups of the Rubiaceae.

**Cercospora paederiae** Tai

Bul. Chinese Bot. Soc. **2**: 56. 1936

(Sci. Rept. Nat. Tsing Hua Univ. Ser. B. **2**: 433. 1937)

*Cercospora paederiae* Sawada, Formosa Agr. Res. Inst. Rept. 87: 84. 1944

Leaf spots circular, 1-6 mm. in diameter, tan to pale brown center, dark brown margin, largest spots slightly zonate; stromata subglobular, dark brown to almost black, 30-50$\mu$ in diameter; conidiophores borne singly without stroma or in dense fascicles from stroma, pale to medium olivaceous brown, uniform in color and width, sparingly septate, not branched, not geniculate, straight or nearly so, bluntly rounded tip, 2-4 x 20-120$\mu$, mostly short; conidia subhyaline to pale olivaceous brown, cylindro-obclavate, straight to mildly curved, 3-7 septate, base obconic, tip subobtuse, 4-5.5 x 30-80$\mu$.

HOSTS: *Paederia chinensis* Hance, *P. foetida* L., *P. tomentosa* Blume.

TYPE: Nanking, China; *Paederia foetida;* C. T. Wei, No. 177; Sept. 26, 1930.

DISTRIBUTION: China, Japan, Formosa.

NOTE: The Sawada description was too poor to be certain of the synonymy.

**Cercospora palicoureina** Petrak & Ciferri

Ann. Mycol. **30**: 325. 1932

Leaf spots subcircular to irregular, 5-20 mm. in diameter, yellowish brown to grayish brown, rarely indistinctly zonate, mostly immarginate; fruiting amphigenous, on upper surface larger stromata, denser fascicles and shorter conidiophores; stromata none to black, globular, 15-30$\mu$ in diameter; fascicles mostly 2-12 stalks, on upper leaf surface may be dense, medium to dark brown, multiseptate, not branched, longer ones tortuous or 1-3 mildly geniculate, small spore scar at rounded tip, 3-4.5 x 15-150$\mu$, those on upper surface being mostly 15-45$\mu$; conidia cylindro-obclavate, subhyaline to pale olivaceous, straight to mildly curved, 1-5 septate, base rounded to obconic, tip subobtuse, 2.5-4 x 10-55$\mu$.

HOSTS: *Palicourea domingensis* (Jacq.) DC., *P. galeottiana* Martens.

TYPE: Las Lagunas above Pozo Hediondo, San Domingo; *Palicourea domingensis;* E. L. Ekman, No. 3910; Dec. 3, 1930.

DISTRIBUTION: San Domingo and Mexico.

NOTE: Dr. O. A. Plunkett sent me a collection on *Palicourea galeottiana* from Jalapa, Mexico (No. 144A), July 20, 1932.

**Cercospora psychotriae** Chupp & Viégas

Bol. da Soc. Brasil. de Agron. **8**: 45. 1945

Leaf spots pale to medium brown, bordered by a narrow black line, circular to angular, 2-10 mm. in length; fruiting hypophyllous, slightly effuse when abundant; stromata lacking; nonfasciculate; conidiophores arising as single branches, pale to very pale olivaceous, uniform in color, irregular in width, sparingly septate, straight to undulate or multigeniculate, conic tip, 2.5-5 x 10-60$\mu$; conidia concolorous, cylindric to cylindro-obclavate, straight to mildly curved, indistinctly multiseptate, base short obconically truncate, tip conic, frequently anastomosing with adjoining ones, 2-4 x 25-125$\mu$.

HOSTS: *Psychotria ligustrifolia* (Northrup) Millsp. (*Myrstiphyllum ligustrifolium* Northrup), Psychotria sp.

TYPE: Bosque dos Jequitibás, Campinas, Sao Paulo; Psychotria sp.; A. P. Viégas, No. 2644; Nov. 23, 1941.

DISTRIBUTION: Sao Paulo, Brazil, Bermuda.

NOTE: See also the following species for differences between the two species on Psychotria. Sawada (Formosa Agr. Res. Inst. Rept. **87**: 86, 87) in 1944 used the same name for a Cercospora species on *Psychotria reevesii* Wall., collected in Formosa, but his description is too meager to be sure of its identity.

**Cercospora psychotriaecola** Chupp & Doidge

Bothalia **4**: 891. 1948

Leaf spots subcircular to irregular, 3-8 mm. in diameter, dark reddish brown, sometimes bounded by a wide pale green margin; fruiting hypophyllous, visible under the hand lens as a gray to olivaceous effuse layer; stromata brown, filling stomatal openings; fascicles usually dense, divergent; conidiophores pale olivaceous brown, paler toward the tip, somewhat irregular in width, sparingly septate, not geniculate, not branched, straight to curved, tip rounded bluntly, 2-4 x 5-45$\mu$, sometimes when conidia are persistent appearing much longer; conidia subhyaline to pale olivaceous, narrowly obclavate, with only slight attenuation, indistinctly multiseptate, straight to curved, base obconically truncate, tip subacute, 2-4 x 40-120$\mu$.

HOST: *Psychotria capensis* Vatke.

TYPE: Mambatini Forest, Nelspruit, Transvaal; *Psychotria capensis;* A. O. D. Mogg, No. 32773; March 31, 1938.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. psychotriae* for differences between the species on this host genus.

**Cercospora richardsoniae** P. Hennings

Hedwigia **41**: 117. 1902

Leaf spots circular to irregular, large, grayish brown to brown, sometimes bordered by a slightly raised dark line, or the edges may be scalloped; fruiting amphigenous, chiefly hypophyllous, when abundant appearing as a black mass of pustules; stromata dark brown, globular, 40-100$\mu$ in diameter; fascicles dense to very dense or even coremoid; conidiophores dark colored in mass, singly pale olivaceous brown near the base, tip almost hyaline, uniform in width or somewhat clavate, multiseptate, not geniculate, rarely branched, almost straight, bluntly rounded tip, 3-5 x 40-140$\mu$; conidia pale olivaceous, obclavato-cylindric, straight to mildly curved, 4-11 septate, base obconically truncate, tip obtuse, 3.5-6 x 30-150$\mu$.

HOST: Richardsonia sp.

TYPE: Botanical Garden, Sao Paulo, Brazil; Richardsonia sp.; Ars. Puttemans, No. 166; Febr. 4, 1901.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. carveriana* for differences between the species on this host genus.

**Cercospora tenuis** Peck

N. Y. State Mus. Ann. Rept. 47: 149. 1894

*Cercospora punctoidea* Ellis & Holway in litt. See Wisc. Acad. Trans. 9: 167. 1893

Leaf spots, when present, circular to subcircular, 2-4 mm. in diameter, pale brown, slightly darker line border, often whole leaflet turns brown and dies; fruiting amphigenous, appearing as minute black closely aggregated pustules; stromata globular to flattened, dark brown to black, 15-40$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, straight to mildly curved, septation, geniculation, branching and spore scars not present or indistinct, narrowly rounded tip, 3-4.5 x 5-35$\mu$; conidia subhyaline to very pale olivaceous, obclavate, straight to curved, indistinctly multiseptate, base obconic, tip subacute to subobtuse, 2-3.5 x 40-90$\mu$.

HOSTS: *Galium asprellum* Michx., *G. pilosum* Ait., *G. trifidum* L.

TYPES: Riverhead, Suffolk Co., N. Y.; *Galium pilosum;* C. H. Peck; July, 1893; (*C. punctoidea*) Racine, Wisc.; *Galium trifidum;* J. J. Davis; July 17, 1886.

DISTRIBUTION: Northern tier of states as far westward as Wisconsin and as far south as Long Island.

NOTE: See also *C. galii* for differences. The two species rarely are found in the same mount. Davis (Wisc. Acad. Trans. 16: 746. 1910) states that *C. punctoidea* is a synonym of *C. galii*. This seems incorrect.

**Cercospora ubatubensis** Chupp & Viégas

Bol. da Soc. Brasil. de Agron. 8: 55. 1945

Leaf spots subcircular, small to almost the entire leaflet, pale tan to brown, resembling sunscald in appearance; fruiting hypophyllous; stromata subglobular, dark brown, a dozen cells to 50$\mu$ in diameter; fascicles a few stalks to very dense, compact; conidiophores in mass dark colored, singly pale olivaceous, uniform in color and width, indistinctly multiseptate, rarely branched or geniculate, straight to curved or undulate, conic tip, 3-5 x 40-220$\mu$; conidia pale to medium olivaceous, cylindric, straight to mildly curved, indistinctly multiseptate, base rounded to long obconically truncate, tip obtuse to conic, 3.5-6 x 40-110$\mu$.

HOST: *Spermacoce alata* Aubl. (*Borreria alata* [Aubl.] DC.)

TYPE: Est. Exp. de Ubatuba, Sao Paulo, Brazil; *Borreria alata;* A. P. Viégas, No. 3310; March 10, 1940.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 491 for differences among the species on this host genus. *C. ubatubensis* has distinctly cylindric conidia which are wider and longer than those of *C. borreriae,* both of which have darker, more nearly cylindric conidia than does *C. hemidiodiae.*

**Cercospora chloroxyli** Ramakrishnan & Reddy

Proc. Indian Acad. Sci. Sect. B. 35: 121. 1952

Leaf spots amphigenous, irregular in outline, straw-colored to pale brown, marked by minute black fruiting clusters often arranged in concentric rings; fruiting hypophyllous; stromata subepidermal, dark brown; densely fasciculate; conidiophores olivaceous brown, cylindric, usually not septate, not branched, 5-7 x 10-35$\mu$; conidia hyaline to pale brown, cylindric, 1-4 septate, rounded at the apex, 3-7 x 30-65$\mu$.

HOST: *Chloroxylon swietenia* DC. (*Swietenia chloroxylon* Roxb.).
TYPE: Kallar, Madras, India; *Chloroxylon swietenia;* G. S. Reddy; Jan. 1, 1951.
DISTRIBUTION: India.
NOTE: The drawings and most of the description seem to fit *C. subsessilis* closely. The only marked difference is the width of the conidiophores and conidia. I have not been able to study the species.

**Cercospora clausenae** Thirumalachar & Chupp
Mycologia **40:** 354. 1948

Leaf spots irregular to angular, 0.5-4 mm. or coalescing into large areas, at first uniformly dark reddish brown, later the center becomes pale brown to dingy gray; fruiting chiefly epiphyllous; stromata subglobular, brown, 20-50$\mu$ in diameter; fascicles dense, divergent; conidiophores pale to very pale olivaceous brown, uniform in color, irregular in width, 1-5 septate, rarely geniculate, not branched, blunt apex, 4-5.5 x 10-65$\mu$; conidia hyaline to faintly olivaceous, cylindro-obclavate, occasionally distinctly cylindric, straight to mildly curved, multiseptate, base long obconically truncate, tip subobtuse, 3-5.5 x 30-155$\mu$.
HOST: *Clausena wildenowii* Wight and Arn.
TYPE: Mysore, India; *Clausena wildenowii;* M. J. Thirumalachar; Dec. 18, 1945.
DISTRIBUTION: Known only from the type locality.

**Cercospora coleroides** Saccardo
Jour. Mycol. **12:** 52. 1906

Leaf spots indistinct, irregular to angular yellowish areas on the upper leaf surface, often vein-limited; fruiting on the corresponding lower surface, dark olivaceous to black, effuse; stromata none to large, black, subglobular; nonfasciculate to very dense fascicles; conidiophores pale to dark olivaceous brown, sparingly septate, not branched, rarely geniculate, straight, curved or undulate, rounded to conic tip, 3-6 x 5-50$\mu$; conidia medium to dark olivaceous, cylindric or longest ones distinctly obclavate, straight to mildly curved, 3-12 septate, base obconically truncate or rounded, tip obtuse, 4-6 x 40-150$\mu$.
HOSTS: *Casimiroa edulis* La Llave, *C. sapota* Oerst.
TYPE: Tenancingo, Mexico; *Casimiroa edulis;* Dr. Silvius Bonansea Italus; Nov. 1905.
DISTRIBUTION: Mexico, Guatemala.
NOTE: This is another intermediate form between Cercospora and Helminthosporium.

**Cercospora evodiae** H. & P. Sydow
Ann. Mycol. **12:** 112. 1914

Leaf spots none; fruiting effuse, olivaceous, hypophyllous, 0.5-3 mm. in extent; stromata lacking or only a few cells; fascicles dense to very dense, divergent; conidiophores pale to medium dark olivaceous brown, paler near the base, strongly clavate, 0-3 septate, curved to undulate, not branched, not geniculate, tip subtruncate to rounded bluntly, 5-10 x 30-80$\mu$, mostly 30-50$\mu$; conidia subhyaline to pale olivaceous brown, obclavate, straight to moderately curved, usually 3-septate, base long obconically truncate, tip subacute to obtuse, 6-9 x 30-70$\mu$.
HOST: *Evodia meliaefolia* Benth.
TYPE: Giran, Formosa; *Evodia meliaefolia;* K. Sawada; May 21, 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: This is not a Cercospora. The wide, strongly clavate conidiophores in dense fascicles and the large conidia with thick walls are characteristic of Pseudocercospora (*P. evodiae* [Sydow]).

**Cercospora fagarae** Yamamoto

Trans. Sapporo Nat. Hist. Soc. **13**: 140. 1934

(Taihoku Imp. Univ. Contrib. **26**: 140. 1934)

Leaf spots irregular, 0.5-8 mm. in diameter, dark reddish brown; fruiting chiefly hypophyllous; stromata none to 100$\mu$ in diameter, dark brown; fascicles mostly dense, divergent; conidiophores in mass dark brown, singly pale olivaceous brown, paler and slightly more narrow toward the tip, sparingly septate, not geniculate, not branched, straight to curved outward, tip obtuse, 3-5 x 15-40$\mu$, a few as long as 75$\mu$; conidia pale olivaceous, cylindro-obclavate, 3-11 septate, often strongly curved, base long obconically truncate, tip blunt, 3-5.5 x 20-105$\mu$.

HOST: *Zanthoxylum ailanthoides* Sieb. & Zucc. (*Fagara ailanthoides* Engl.)

TYPE: Tansui, Formosa; *Fagara ailanthoides;* W. Yamamoto; Nov. 26, 1933.

DISTRIBUTION: Several collections from Formosa.

NOTE: Spegazzini (Bol. Acad. Nac. Cien. Argent. **29**: 180. 1924) reports *C. xanthoxyli* on *Fagara coco* Engl. (= *Zanthoxylum coco* Gill.). It may have been *C. fagarae*. See also *C. xanthoxyli*.

**Cercospora fagarina** (Hansford) n. comb.

*Cercospora fagarae* Hansford, Proc. Linn. Soc. London **158**: 50. 1947

Leaf spots none; fruiting hypophyllous, effuse; stromata indistinct; conidiophores sometimes in divergent fascicles, olivaceous, simple to branched, erect, irregularly geniculate near tip, 5 x 100-250$\mu$; conidia olivaceous, obclavate, 3-9 septate, very slightly constricted at septa, rarely branched, curved toward the obtuse tip, base subtruncate, 6-8 x 40-100$\mu$.

HOST: Fagara sp.

TYPE: Entebbe Road, Uganda; Fagara sp.; C. G. Hansford, 3569.

DISTRIBUTION: Uganda.

NOTE: I have not seen this species but the description indicates that it is distinct from the two other species on Fagara, *C. fagarae* and *C. xanthoxyli*.

**Cercospora paramignyae** Thirumalachar & Chupp

Mycologia **40**: 358. 1948

Leaf spots circular, 4-12 mm. in diameter, center gray or almost black with the closely stipple-like fruiting bodies, wide blanched or tan margin; fruiting chiefly epiphyllous; stromata almost black, subcircular, 30-100$\mu$ in diameter; fascicles very dense, compact; conidiophores often merely peripheral cells on the stroma or occasionally elongated to 2-4 x 10-25$\mu$, not septate, not geniculate, not branched, tip almost hyaline; conidia narrowly cylindric, subhyaline, in mass olivaceous, indistinctly multiseptate, straight to strongly curved, long obconically truncate base, subacute tip, 1.5-3 x 25-100$\mu$.

HOST: Paramignya sp.

TYPE: Balchonnur, Mysore, India; Paramignya sp.; M. J. Thirumalachar; April 23, 1945.

DISTRIBUTION: Known only from the type locality.

**Cercospora penzigii** Saccardo
Syll. Fungorum **15**: 84. 1901

*Cercospora fumosa* Penzig, Michelia **2**: 476. 1882 (Hedwigia **22**: 76. 1883)
*Cercospora aurantia* Heald & Wolf, Mycologia **3**: 15. 1911

Leaf spots circular to irregular, 2-20 mm. in diameter, grayish brown to dingy gray, often with a yellow halo, sometimes with a dark center; fruiting amphigenous but more abundant on the lower surface, stromata being larger, fascicles more dense, and conidiophores shorter on the upper surface; stromata dark brown, subglobular, small; fascicles dense to very dense on upper surface, sometimes dense on the lower surface; conidiophores pale to medium dark brown, uniform in color, occasionally irregular in width, multiseptate, not branched, 0-3 geniculate, straight to curved or undulate, tip subtruncate, 4-6.5 x 20-50$\mu$ or when hypophyllous, 40-225$\mu$; conidia hyaline, acicular to obclavate, shortest ones cylindric, straight to curved, indistinctly multiseptate, base subtruncate to truncate, tip acute to subobtuse, 3-5 x 25-135$\mu$.

HOSTS: *Citrus sinensis* Osbeck (*Citrus aurantium* var. *sinensis* L.), *C. limonia* Osbeck (*C. limonium* Risso)., *C. aurantifolia* Swingle.

TYPES: R. Horto Agrario, Patavino, Italia; *Citrus limonium;* O. Penzig; (*C. aurantia*) Falfurrias, Texas; *Citrus aurantium sinensis;* Heald and Wolf, No. 2446; Sept. 14, 1909.

DISTRIBUTION: Apparently almost co-extensive with the hosts. Material was studied from Texas, Brazil, and Italy.

NOTE: Heald and Wolf describe the conidia as colored. The type shows only hyaline ones. Their type has paler colored conidiophores than have other collections, but in all other ways the different collections seem the same. At one time I thought the two species were distinct.

**Cercospora pteleae** Winter
Hedwigia **24**: 205. 1885
(same in Jour. Mycol. **1**: 125. 1885)

*Cercospora afflata* Wint., Hedwigia **24**: 201. 1885 (same in Jour. Mycol. **1**: 125. 1885)

Leaf spots when present circular to angular, 2-4 mm. in diameter, yellowish to yellowish brown, sometimes with dingy gray center around which the fruiting occurs on both leaf surfaces; fruiting rarely effuse and without distinct leaf spots; stromata dark brown, 20-60$\mu$ in diameter; fascicles very dense; conidiophores pale olivaceous brown, uniform in color and width, multiseptate, not branched, straight to tortuous or 1-2 geniculate, small spore scar at rounded to subtruncate tip, 3-4.5 x 40-160$\mu$; conidia pale olivaceous brown, cylindric to obclavato-cylindric, 3-5 septate, sometimes constricted at septa, rarely catenulate, straight to slightly curved, base short obconic, tip obtuse, 3.5-5 x 40-110$\mu$.

HOST: *Ptelea trifoliata* L.

TYPES: Perryville, Mo.; *Ptelea trifoliata;* C. H. Demetrio; June, 1885; cotype distributed as Rabenhorst-Winter-Pazachke Fungi Europaei 4096; (*C. afflata*) Perryville, Mo.; *Ptelea trifoliata;* C. H. Demetrio; June, 1885.

DISTRIBUTION: Material studied came from Missouri and Indiana. Also reported from Iowa.

NOTE: Winter states that the two species are quite distinct and easily distinguishable from each other, since one causes gray leaf spots and the other

causes no spots. I found no difference in the fungi. In the Journal of Mycology, *C. afflata* follows immediately after *C. pteleae*, therefore is considered the synonym.

**Cercospora schiffnerulae** Hansford

Mycol. Papers. Imper. Mycol. Inst. **15**: 216. 1946

Forming a thin pale olive mold over colonies of the fungus *Schiffnerula toddaliae,* mycelium pale olive, septate, 2-4$\mu$ wide, ramifying over and between those of the above fungus; conidiophores olivaceous brown, scattered loosely and singly over the procumbent threads, erect, rarely septate, not branched, straight to bent, slightly attenuated toward the apiculate tip, up to 5-6 x 40$\mu$ in size; conidia pale olivaceous, long cylindric to filiform, usually mildly attenuated toward the rounded apex, 3-7 septate, not constricted at the septa, basal scar flat, up to 4-6 x 150$\mu$ in size.

HOST: *Toddalia aculeata* Lam.; Hansford believes the species is parasitic on *Schiffnerula toddaliae.* I believe this is incorrect, for we have never before found a Cercospora pathogenic on any plant not having chlorophyll.

TYPE: Entebbe Road, Uganda; affecting *Schiffnerula toddaliae* on the foliage of *Toddalia aculeata;* C. G. Hansford, No. 3120.

DISTRIBUTION: Uganda.

NOTE: I have not seen this species.

**Cercospora subtorulosa** H. & P. Sydow

Ann. Mycol. **11**: 270. 1913

Leaf spots subcircular, 3-10 mm. in diameter, uniformly pale tan, no distinctive border; fruiting hypophyllous; stromata subglobular, dark brown to almost black, 20-50$\mu$ in diameter; fascicles dense; conidiophores pale to medium dark olivaceous brown, tip pale, irregular in width, rarely septate, not geniculate, branched occasionally, curved to tortuous, bluntly rounded tip, 3-5 x 10-35$\mu$, when conidia remain attached appearing much longer; conidia obclavate, pale olivaceous brown, 3-7 septate, straight to mildly curved, base long obconically truncate, tip subobtuse, 4-5 x 20-65$\mu$.

HOST: *Melicope triphylla* Merrill.

TYPE: Los Banos, Philippines; *Melicope triphylla;* C. T. Baker, No. 904; April 7, 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: In the original description the host was given as Allophylus sp. but the correction was made in the Philippine Jour. Science (Botany) **8**: 508. 1913.

**Cercospora xanthoxyli** Cooke

Grevillea **12**: 30. 1883

*Cercospora fagaricola* Sawada, Formosa Agr. Res. Inst. Rept. **85**: 105. 1943

Leaf spots circular to irregular, 3-10 mm. in diameter, brown, sometimes with definite brown line margin; often blackened on both surfaces by effuse fruiting or marked on upper surface with numerous black pustules; stromata black, globular, 30-60$\mu$ in diameter; fascicles dense to very dense, compact; conidiophores pale olivaceous brown, uniform in color and width, septation, spore scars, branching and geniculation absent or indistinct, rounded to conic tip, 3-4 x 10-30$\mu$; conidia olivaceous, obclavate, shorter ones may be cylindric, mildly curved, septa indistinct, base obconically truncate, tip subacute to subobtuse, 2-4 x 20-75$\mu$.

HOSTS: *Zanthoxylum clava-herculis* L. (*Zanthoxylum carolinianum* Lam.) (Xanthoxylum), Z. *nitidum* DC. (*Fagara nitida* Roxb.).

TYPES: Darien, Georgia; *Xanthoxylum carolinianum;* W. H. Ravenel, No. 780 (Cooke 3362); (*C. fagaricola*) Taipeh, Taiwan (Formosa); *Fagara nitida;* K. Sawada; Febr. 3, 1910. (There may be an earlier collection than this).

DISTRIBUTION: Georgia, Florida, Formosa.

NOTE: Spegazzini (Bol. Acad. Nac. Cien. Argent. **29**: 180. 1926) reports it also on *Fagara coco*. See also *C. fagarae*. A Sawada collection is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora populicola** Tharp

Mycologia **9**: 113. 1917

Leaf spots circular, 3-10 mm. in diameter, dingy gray to grayish brown, sometimes zonate, darkened on both surfaces by fruiting of the fungus; stromata small, black, globular, 15-30$\mu$ in diameter; some fascicles dense; conidiophores medium dark brown, slightly paler near the tip, plainly multiseptate, rarely branched or geniculate, straight, uniform in width, medium spore scar at subtruncate tip, 4-5.5 x 60-200$\mu$; conidia hyaline, acicular, variously curved, indistinctly multiseptate, base truncate, tip acute, 2.5-4 x 60-150$\mu$.

HOSTS: *Populus balsamifera* L. (*P. deltoides* Marsh) (*P. angulata* Ait.), Populus sp.

TYPE: Rockdale, Texas; *Populus deltoides;* B. C. Tharp, No. 136; Oct. 31, 1914.

DISTRIBUTION: Studied material from Texas and Brazil.

NOTE: See also *C. populina* for differences between the two species on Populus. The two species may occur in the same mount.

**Cercospora populina** Ellis & Everhart

Jour. Mycol. **3**: 20. 1887

*Cercospora sessilis* Ellis & Ev., Jour Mycol. **8**: 71. 1902

*Cercospora reducta* H. + P. Sydow, Ann. Mycol. **1**: 178. 1903

Leaf spots subcircular to irregular, 3-7 mm. in diameter or coalescing into much larger areas, brown to grayish brown or rarely dingy gray; fruiting epiphyllous; small dark globular stromata 15-45$\mu$ in diameter; fascicles mostly dense; conidiophores pale olivaceous brown, tips almost hyaline, longest ones variously curved, not septate, not geniculate, not branched, spore scars indistinct at narrowly rounded tip, 2-3.5 x 5-30$\mu$, sometimes merely elongated cells on periphery of stroma; conidia pale olivaceous, obclavate to obclavato-cylindric, usually curved, septa indistinct, base sharply obconic or sometimes rounded, tip subacute, 2-3 x 15-60$\mu$.

HOSTS: *Populus alba* L., *P. balsamifera* L. (*P. deltoides* Marsh) (*P. angulata* Ait.) (*P. monilifera* Ait.), *P. nigra* L. var. *italica* DuRoi (*P. dilatata* Ait.)

TYPES: Porte a la Hache, La.; *Populus alba* and *Populus angulata;* A. B. Langlois; No. 818, Nov. 17, 1886 and No. 819, Nov. 3, 1886; (*C. sessilis*) Tuskegee, Ala.; *Populus monilifera;* Geo. W. Carver; Sept. 1901.

DISTRIBUTION: Material studied was collected in Alabama, Missouri, and Louisiana. Also reported from Japan.

NOTE: See also *C. populicola* for differences between the two species on this host genus. The Sydows changed *C. sessilis* E. +E. to *C. reducta* because the former name had already been used by Sorok.

**Cercospora salicina** Ellis & Everhart
Jour. Mycol. 3: 19. 1887

*Cercospora babylonicae* Sawada, Formosa Agr. Res. Inst. Rept. 87: 79. 1944
*Cercospora salicicola* Sawada, Formosa Agr. Res. Inst. Rept. 87: 87. 1944

Leaf spots usually numerous, 0.5-5 mm. in diameter, irregular in outline, dark reddish brown, sometimes surrounded by a reddish to purplish zone; fruiting amphigenous; stromata pale fuligenous to dark brown, globular, 15-30$\mu$ in diameter; fascicles dense; conidiophores subhyaline to pale fuligenous, undulate, septation, geniculation, branching and spore scars indistinct or lacking, 1.5-4 x 5-20$\mu$; conidia very pale olivaceous, obclavate to obclavato-cylindric, straight to mildly curved, septa indistinct, base rounded to obconic, tip subobtuse, 2-3 x 15-60$\mu$.

HOSTS: *Salix babylonica* L., *S. glandulosa* Seem., *S. longifolia* Muhl., *S. matsudana* Koidz., *S. nigra* Marsh, *S. viminalis* L.
TYPE: Plaq. Co., La.; *Salix nigra;* A. B. Langlois, No. 783; Oct. 1886.
DISTRIBUTION: Argentine to Manitoba, Canada. Also studied material from Formosa.
NOTE: At first this was considered a synonym of *C. populina.* But a critical study of the mounts indicates sufficient differences to consider them distinct until someone by cross inoculation proves otherwise. I have not seen the Sawada collection of *Cercospora salicicola,* but his meager description fits insofar as it goes. A portion of the *Cercospora babylonicae* type is deposited in the U.S.D.A. Mycological Herbarium.

**Cercospora salicis** Chupp & Greene
The Amer. Midland Naturalist 41: 757. 1949

Leaf spots numerous, minute, angular to irregular, dark reddish brown, 0.5-2 mm. in diameter or coalescing into areas 3-5 mm. in extent; fruiting epiphyllous, olivaceous, faintly effuse; stromata none to only a few cells; fascicles dense, compact to divergent; conidiophores pale olivaceous brown, uniform in color, irregular in width or slightly attenuated upward, straight to bent, sparingly septate, not branched or incipient branches near the blunt tip, 0-1 geniculate, 3.5-5 x 15-45$\mu$ or seeming much longer when conidia are persistent; conidia pale olivaceous, cylindric or longest ones cylindro-obclavate, straight to mildly curved, 1-7 septate, base subtruncate, tip obtuse, 2-4.5 x 20-70$\mu$.

HOST: *Salix alba* L.
TYPE: Madison, Dane Co., Wisconsin; *Salix alba;* H. C. Greene; Sept. 28, 1948.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. salicina.*

**Cercospora salvadorae** Maire
Le Botaniste 34: 308. 1949

Leaf spots immarginate, amphigenous, brown; stromata small; fascicles dense; conidiophores brown, 0-1 septate, 5-6 x 20-25$\mu$; conidia cylindric, fairly uniform in diameter, mildly curved, brown, 0-2 septate, ends obtuse, 3-4 x 28-65$\mu$.

HOST: *Salvadora persica* L.
TYPE: Sbar, Central part of the western Sahara; *Salvadora persica;* Murat. (date not given).
DISTRIBUTION: Western Sahara.

NOTE: I have not seen this species. The description is too meager to be sure that it is a Cercospora, especially since the conidia are not over 2-septate.

**Cercospora comandrae** Ellis & Dearness

Proc. Acad. Nat. Sci. Phila. Part 1 **43**: 90. 1891

Leaf spots minute, circular, uniformly brown or sometimes with paler brown center, 0.5-2 mm. in diameter; fruiting amphigenous; brown stromata filling stomatal openings; fascicles 5 stalks to very dense; conidiophores pale to medium olivaceous brown, slightly paler and more narrow tip, which is bluntly rounded and has minute spore scar, rarely septate, not or rarely once mildly geniculate, not branched, 3-5 x 10-35$\mu$; conidia obclavate (short ones may be cylindric), olivaceous, base subtruncate to obconically truncate, tip blunt, mildly curved, septa indistinct, 2-3.5 x 40-100$\mu$.

HOSTS: *Comandra richardsiana* Fernald, *C. umbellata* (L.) Nutt.

TYPE: London, Canada; *Comandra umbellata;* John Dearness, No. 294; Aug. 1890.

DISTRIBUTION: Northern tier of the United States and southern Canada.

**Cercospora capensis** var. **osyridis compressae** (de Thümen)

Saccardo, Syll. Fungorum **4**: 469. 1886

HOST: *Colpoon compressum* Berg. (*Osyris compressa* A. DC.)

TYPE: Grahamstown, Union of S. Africa; *Osyris compressa;* P. MacOwan, No. 1256; July 1876.

NOTE: F. de Thümen (Flora **59**: 570. 1876) described *Helminthosporium capense* and *H. capense* var. *osyridis compressae.* Saccardo thought that both were Cercosporae. Miss Doidge in a letter dated July 14, 1942, made the following statement. "With reference to *Helminthosporium capense* Thuem. (MacOwan 1262) and *H. capense* var. *osyridis* (MacOwan 1256), we have here only small portions of the type collections, which under the present circumstances I am reluctant to send away. It may serve your purpose, however, to know that these have been examined recently by Mr. Hansford of Uganda who is making a study of hyperparasites on other fungi. He finds that *Helminthosporium capense* Thuem. is the valid name for this fungus (including the var. *osyridis*)."

**Cercospora aesculina** Ellis & Kellerman

Jour. Mycol. **9**: 105. 1903

Leaf spots circular, dingy gray, often numerous, sometimes with purple border, 0.5-2 or rarely up to 4 mm. in diameter; fruiting chiefly epiphyllous; stromata globular, dark brown, 30-80$\mu$ in diameter; fascicles dense; conidiophores yellowish brown, not branched, slightly geniculate, longest ones 1-2 septate, 4-5.5 x 40-75$\mu$; conidia obclavate, subhyaline to pale olivaceous, straight, wide near base with sudden attenuation near middle and upper half narrow, base rounded, tip subobtuse, often with only one septum which occurs at the point of attenuation, rarely 3 or 4 septate, often with vacuoles in the wider part, 6-12.5 x 50-90$\mu$.

HOST: *Aesculus octandra* Marsh.

TYPE: Marlinton, West Virginia; *Aesculus octandra;* W. A. Kellerman; Aug. 1902.

DISTRIBUTION: West Virginia.

NOTE: The wide, thick-walled and distinctly obclavate conidia are characteristic of the genus, Pseudocercospora. The species is not a Cercospora.

**Cercospora allophyli** Sawada

Taiwan (Formosa) Agr. Res. Inst. Rept. **87**: 79. 1944

*Cercospora allophylli* Hansford, Proc. Linnean Soc. London **1944-45**: 40. 1945

On upper surface leaf spots indistinct or none; fruiting hypophyllous, in effuse, olivaceous to almost black patches, 0.5-6 mm. in extent, or even larger; stromata lacking; nonfasciculate; conidiophores short single branches from procumbent threads, pale to medium olivaceous brown, uniform in color and width, rarely septate, not geniculate, conic tip, 2-4.5 x 10-35$\mu$ (Hansford says as large as 4-5 x 180$\mu$); conidia pale olivaceous brown, obclavate, straight to mildly curved, 3-6 septate, base obconically truncate, tip subobtuse, 3-5 x 25-120$\mu$.

HOSTS: *Allophylus timorensis* Bl., Allophylus sp.

TYPES: Kaohsiung, Taiwan (Formosa); *Allophylus timorensis;* R. Suzuki; Oct. 19, 1908; (*C. allophylli* Hansford) Semuto Road, Uganda; Allophyllus sp.; Hansford, No. 3317.

DISTRIBUTION: Formosa, Uganda.

NOTE: A portion of the Sawada cotype is deposited in the U.S.D.A. Mycological Herbarium. I have not seen the Hansford collection, but his description aside from the size of the conidiophores seems identical.

**Cercospora cardiospermi** Petch

Ann. Roy. Bot. Gard. Peradeniya **6**: 250. 1917

Leaf spots circular, 0.5-1.5 mm. in diameter, center white, border reddish brown; fruiting amphigenous; stromata a few pale brown cells; fascicles 5-15 widely divergent stalks; conidiophores pale to very pale olivaceous brown, uniform in color, strongly attenuated from each geniculation, sparingly septate, knobs or incipient branches, 1-5 abruptly geniculate, curved to crooked, subtruncate tip, 4-6.5 x 10-75$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 25-160$\mu$.

HOST: *Cardiospermum helicacabum* L.

TYPE: Peradeniya, Ceylon; *Cardiospermum helicacabum;* T. Petch, No. 4454; Jan., 1915.

DISTRIBUTION: Known only from the type locality.

**Cercospora cupaniae** Sydow

Ann. Mycol. **23**: 424. 1925

Leaf spots subcircular to irregular, 4 mm. in diameter to almost whole length of leaf margin, pale brown, with a slightly darker wide margin; fruiting chiefly hypophyllous, some pycnidial form usually on the upper surface; stromata dark brown, 20-80$\mu$ in diameter; fascicles mostly dense; conidiophores pale olivaceous brown, rarely septate, crooked or curved and somewhat irregular in width, not attenuated, not geniculate, rarely branched, no visible spore scars on the bluntly rounded tip, 3-5 x 10-40$\mu$; conidia obclavate to cylindro-obclavate, medium dark olivaceous, 1-8 plainly septate, straight to mildly curved, obconic to rounded base, tip obtuse to subobtuse, 2-4 x 20-55$\mu$.

HOST: *Cupania guatemalensis* Radlk.

TYPE: Greica, Costa Rica; *Cupania guatemalensis;* H. Sydow, No. 351; Jan. 13, 1925.
DISTRIBUTION: Known only from the type locality.

**Cercospora mitteriana** Sydow
Ann. Mycol. **35**: 240. 1937

Leaf spots angular to irregular, often vein limited or along leaf margin, large, pale brown to tan, slightly darker border; fruiting hypophyllous; stromata medium to dark brown, globular, 20-50$\mu$; fascicles sometimes dense, fairly divergent; conidiophores very pale olivaceous brown, tip almost hyaline, strongly attenuated, not septate, not branched, not geniculate, narrowly rounded apex, 2-4 x 5-30$\mu$; conidia narrowly obclavate to almost linear, subhyaline to very pale olivaceous, straight to mildly curved, 1-7 septate, base subtruncate to long obconically truncate, tip subobtuse, 2.5-4 x 25-90$\mu$.

HOST: *Dodonaea viscosa* L.
TYPE: Jullundur, East India; *Dodonaea viscosa;* J. H. Mitter, No. 269; Sept. 25, 1933.
DISTRIBUTION: Known only from the type locality.

**Cercospora sapindi** Obregón-Brotero
Caldasia **3**: 50. 1941

Leaf spots subcircular to angular, 2-6 mm. in diameter, gray to grayish brown or tan, often with a reddish brown line margin; fruiting amphigenous but chiefly hypophyllous; stromata medium to dark brown, a few cells to 50$\mu$ in diameter; fascicles dense, compact; conidiophores in mass medium dark, singly very pale olivaceous brown, tip almost hyaline, attenuated, rarely septate, not branched, 0-1 geniculate, curved or bent, narrowly rounded apex, 2-3.5 x 5-35$\mu$; conidia subhyaline to very pale olivaceous, obclavato-cylindric, straight to mildly curved, 1-6 septate, base short obconic, tip obtuse, 2-4 x 15-80$\mu$.

HOST: *Sapindus saponaria* L.
TYPE: Guategue, Colombia; *Sapindus saponaria;* G. J. Quintana, No. 870; March 19, 1940.
DISTRIBUTION: Known only from the type locality.
NOTE: Lee Ling wrote April 29, 1938, that a Cercospora was present on Sapindus in China. This later was described by Tai as *C. sapindicola.*

**Cercospora sapindi-emarginati,** T. S. & K. Ramakrishnan
Proc. Indian Acad. Sci. Sect. B. **32**: 107. 1950

Leaf spots angular, 2-3 mm. in diameter, yellowish to brown, sometimes with white center; fruiting amphigenous; stromata small to medium in size, brown; fascicles dense to very dense, compact; conidiophores brown, straight to curved or undulate, not branched, not septate, not geniculate, 10-35$\mu$ in length; conidia obclavate, olivaceous brown, multiseptate, straight or mildly curved to undulate, base obconic, tip subacute, 4-7 x 20-105$\mu$.

HOST: *Sapindus trifoliatus* L. (*S. emarginatus* Vahl.)
TYPE: Anakapalle, Madras, India; *Sapindus emarginatus;* T. S. Ramakrishnan; Febr. 27, 1948.
DISTRIBUTION: India.
NOTE: I am not sure if this is distinct from one of the other two species described on Sapindus.

**Cercospora sapindicola** Tai

Lloydia **11**: 52. 1948

Leaf spots indefinite, confluent and large, yellow, usually irregular along leaf edge; fruiting hypophyllous; stromata present, 25-45$\mu$ in diameter; conidiophores moderately to densely fasciculate, straight or slightly curved, occasionally geniculate, undulating, scars prominent at the apex and along the sides, shouldered, 0-3 septate, olivaceous brown, 4-6 x 50-115$\mu$; conidia subhyaline, cylindro-clavate or clavate, with conico-truncate or truncate base, indistinctly 4-21 septate, 4-5 x 40-160$\mu$.

HOST: *Sapindus mukorossi* Gaertn.

TYPE: Chengtu, Szechwan, China; *Sapindus mukorossi;* Lee Ling, No. 207; Dec. 1, 1939.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen specimens of this species.

**Cercospora thouiniae** Stevens

Ill. Acad. Sci. Trans. **10**: 213. 1917

Leaf spots indistinct, angular, brown areas on both leaf surfaces; fruiting in faint ferrugineous effuse patches on lower leaf surface, difficult to find on the brown leaf; stromata lacking; nonfasciculate; conidiophores procumbent, branched, multiseptate, intertwined threads, pale to medium brown, not geniculate, spore scars not evident, 3.5-6 x 50-500$\mu$; conidia obclavate to obclavato-cylindric, medium dark olivaceous, straight to mildly curved, mostly 1-5 septate, base rounded, tip subobtuse, 5-8 x 30-75$\mu$.

HOST: *Thouinia striata* Radlk.

TYPE: Maricao, Puerto Rico; *Thouinia striata;* F. L. Stevens, No. 751; April 13, 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: The wide, thick-walled conidia are characteristic of Helminthosporium unless the distinctly obclavate forms are classed in another genus. It would then be Pseudocercospora.

**Cercospora butyrospermi** Hansford

Proc. Linnean Soc. London **1942-3**: 55. 1943

Leaf spot at first showing only on the lower leaf surface as minute rust-colored stipples. This is followed by browning or reddening of irregular areas from 1-2 mm. in extent to elongations from the mid-rib to the margin of the leaf. On the corresponding upper surface pale grayish brown areas or blotches finally develop. Stromata usually slight or consisting only of the united bases of the stalks. The fascicles are extremely dense. The conidiophores are medium dark in mass but pale colored singly, septate, not geniculate, rarely branched, bluntly rounded tip, spore scars slight or none, 5-6 x 10-25$\mu$. The conidia are cylindric, 3-8 septate, dark olivaceous, straight to mildly curved, base subtruncate to rounded, tip obtuse, 4.5-9 x 20-70$\mu$.

HOST: *Butyrospermum parkii* (G. Don) Kotschy.

TYPE: Serere, Uganda; *Butyrospermum parkii;* Hansford, 1611; Dec. 1931.

DISTRIBUTION: Uganda.

NOTE: The thick-walled conidia are distinctly those of an Helminthosporium. I studied the type at Kew in 1938.

**Cercospora lanuginosa** Heald & Wolf

Mycologia **3**: 17. 1911

Leaf spots irregular, 0.5-2 mm. in diameter, at first dark reddish brown to purple, later becoming gray and almost transparent; on upper surface of this gray area are very large black globular pycnidia and smaller paler brown stromata, 20-50$\mu$ in diameter (apparently the Cercospora follows the pycnidial form); fascicles mostly not dense; conidiophores sparingly septate, medium brown, not branched, undulate, rarely geniculate, rounded tip, spore scars not evident, 3-4 x 10-60$\mu$; conidia cylindric, pale olivaceous brown, 1-5 septate, rounded ends, 3-5 x 20-55$\mu$.

HOST: *Bumelia lanuginosa* (Michx.) Pers.

TYPE: Luling, Texas; *Bumelia lanuginosa;* Heald and Wolf, No. 2222; Aug. 26, 1909.

DISTRIBUTION: Texas and Missouri.

NOTE: Neither the type nor a collection made Sept. 11, 1909, showed sufficient fruiting of Cercospora to be sure of this species. The original description also is meager.

**Cercospora anemopsidis** sp. nov.

Maculae orbiculares vel irregulares, 2-6 mm. diam., atro-brunneae vel griseo-brunneae; caespituli epiphylli; stromata atro-fuliginea, 20-50$\mu$ diam.; conidiophora dense fasciculata, olivaceo-brunnea vel fuliginea, subclavata, recta vel curvata, leniter geniculata, ad apicem angusta, 3-4.5 x 10-65$\mu$; conidia pallide olivacea, cylindro-obclavata, fere recta, 1-5 septata, utrimque obtusa, 4-5 x 20-70$\mu$.

Leaf spots circular to irregular, 2-6 mm. in diameter, dark brown or sometimes grayish brown, narrow raised line border; fruiting epiphyllous; stromata dark fuligenous, elongated vertically 20-50$\mu$ in height; fascicles dense; conidiophores pale to medium olivaceous brown or fuligenous, uniform in color, some of them wider near the tip, straight or curved, rarely once mildly geniculate, minute spore scar at rounded to conic tip, 3-4.5 x 10-65$\mu$; conidia pale olivaceous, cylindric to cylindro-obclavate, straight or nearly so, mostly bluntly rounded ends, 1-5 septate, 4-5 x 20-70$\mu$.

HOST: *Anemopsis californica* Hook.

TYPE: Los Angeles, California; *Anemopsis californica;* O. A. Plunkett; Oct. 1, 1926.

DISTRIBUTION: Known only from the type locality.

NOTE: The genus is related closely to Saururus, but the Cercospora is quite distinct from *C. saururi.*

**Cercospora houtthuyniae** Togashi and Katsuki

Bot. Magazine Tokyo **65**: 21. 1952

Leaf spots large, circular, or when coalescing, elongate, 8-25 mm. in length, dull olivaceous brown, sometimes with a reddish line margin, occasionally with a grayish center; fruiting hypophyllous; stromata filling stomatal openings, dark reddish brown; fascicles dense, divergent; conidiophores pale olivaceous brown, uniform in color and width or slightly attenuated toward the tip, rarely septate, not branched, mildly geniculate, straight to tortuous, 3-4.5 x 10-55$\mu$; conidia obclavate, pale olivaceous brown, straight to moderately curved, 3-9 septate, base obconically truncate, tip usually subacute, 3.5-5 x 30-85$\mu$.

HOST: *Houtthuynia cordata* Thunb.
TYPE: Gontazaka, Hodogaya, Yokohama, Japan; *Houtthuynia cordata;* K. Togashi; Sept. 18, 1950.
DISTRIBUTION: Japan.
NOTE: Dr. Togashi sent me some of the type material.

***Cercospora saururi*** Ellis & Everhart
Jour. Mycol. **3**: 14. 1887

*Cercospora saururicola* Sawada, Formosa Agr. Res. Inst. Rept. **87**: 88. 1944
Leaf spots circular, 1-8 mm. in diameter, dark reddish brown to almost black, sometimes with a slightly reddish tinged halo; fruiting hypophyllous; stromata slight, filling stomatal openings; fascicles 3-15 stalks; conidiophores pale olivaceous brown, attenuated, sparingly septate, not branched, rarely once geniculate, minute spore scar at conic tip, 3-5 x 5-60$\mu$, sometimes only 5-15$\mu$; conidia linear or slightly attenuated, hyaline to very pale olivaceous, straight to curved, indistinctly multiseptate, base subtruncate, tip subacute, 2.5-4 x 30-125$\mu$.
HOSTS: *Saururus cernuus* L., *S. chinensis* Ball., *S. loureiri* Decne.
TYPES: Louisiana; *Saururus cernuus;* A. B. Langlois, No. 599; July, 1886; (*C. saururicola*) Formosa; *Saururus chinensis;* K. Sawada; Aug. 22, 1908.
DISTRIBUTION: Studied material from Louisiana, Mississippi, Alabama, Tennessee, New York, and Formosa.
NOTE: Atkinson (Jour. Elisha Mitchell Sci. Soc. **8**: 54. 1892) says the conidia are hyaline, acicular (terete), and 3-4.5 x 30-140$\mu$ in size. A part of the Sawada type is deposited in the U. S. D. A. Mycological Herbarium. Because some of the conidia are catenulate, Tharp placed *C. saururi* in the genus, Ramularia (Mycologia **9**: 120. 1917).

**Cercospora angulata** Winter
Hedwigia **24**: 202. 1885
(same in Jour. Mycol. **1**: 124. 1885)
Leaf spots circular to angular, with a dingy gray center and dark purple,

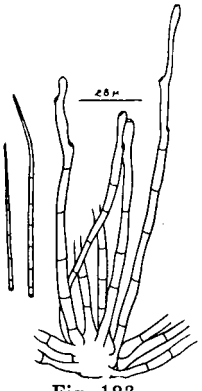


Fig. 183
*C. angulata*

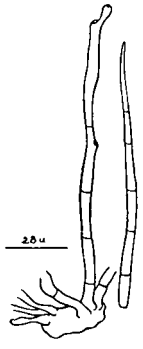


Fig. 184
*C. deutziae*

brown or almost black margin, 2-4 mm. in diameter; fruiting amphigenous but chiefly on lower leaf surface; stromata mostly small; fascicles often dense; conidi-

ophores pale olivaceous brown, plainly multiseptate, longest ones branched, rarely geniculate, no evident spore scars, some specimens showing conidiophores as short as 4-6 x 30-60$\mu$, while others show them as long as 50-200$\mu$; conidia hyaline, acicular, straight or nearly so, truncate base, tip acute or subacute, 3-4 x 70-250$\mu$.

HOST: *Philadelphus coronarius* L.

TYPE: Perryville, Mo.; *Philadelphus coronarius;* C. H. Demetrio; Aug. 1883; cotype distributed as Rabenhorst-Winter, Fungi europaei 3588.

DISTRIBUTION: Reported from Missouri, Kansas, Iowa, and China.

NOTE: This species has been reported also on Ribes (Iowa Sta. Bul. 13, Stevens' textbook, and N. Am. Fungi No. 1941). It is true this resembles somewhat *C. ribis,* but a critical study shows them to be distinct, especially since *C. angulata* has more nearly straight conidia, and acute conidial tip, denser fascicles, and some of the conidiophores plainly branched.

**Cercospora astilbes** Togashi

Trans. Sapporo Nat. Hist. Soc. **17**: 96. 1942

Leaf spots at first minute, sparse, indistinct, 0.5-1 mm. in diameter, pale straw colored, turning to brown or reddish brown, becoming confluent and irregular in shape along the leaf margin; fruiting hypophyllous, inconspicuously effuse; stromata lacking; nonfasciculate; conidiophores arising as single branches from procumbent threads, olivaceous brown, tip almost hyaline, slightly geniculate near tip, 3-5 x 15-40$\mu$; conidia obclavato-cylindric, curved, rarely straight, base long obconically truncate, tip conic, pluriguttulate, indistinctly 1-4 septate, hyaline, 2-4 x 17-42$\mu$.

HOST: *Astilbe congesta* Nakai.

TYPE: Oshida, Pref. Iwate, Japan; *A. congesta;* K. Togashi; Sept. 9, 1934.

DISTRIBUTION: Japan.

NOTE: In a letter dated September 25, 1941, Dr. Togashi sent me a Latin description of the species but did not enclose a specimen. He stated that this species as well as some others, of which he had sent me type material, would soon be placed in print. The short conidia may indicate a genus other than Cercospora.

**Cercospora coalescens** Davis

Wisc. Acad. Trans. **15**: 779. 1907

HOST: *Ribes bracteosum* Dougl.

TYPE: Portland, Ore.; *Ribes bracteosum;* J. J. Davis; July 12, 1905.

NOTE: Although there may sometimes be a slight amount of color in the stromata, the conidiophores always seem hyaline and the conidia often are not septate. For these reasons the fungus is considered a Ramularia.

**Cercospora decumariae** Tracy & Earle

Bul. Torrey Bot. Club **26**: 495. 1899

Leaf spots may be definite, dirty gray to slate color with lavender to purplish line border, or almost same color as dried leaf and indistinct, 10-20 mm. in extent; fruiting amphigenous; stromata slight to 50$\mu$ in diameter, black, globular; fascicles dense; conidiophores pale olivaceous brown, paler near tip, wide base, tip much attenuated, not septate, not branched, not geniculate, small spore scar sometimes present, 3.5-6 x 5-20$\mu$; conidia pale to medium dark olivaceous, ob-

clavate, base obconic to long obconically truncate, indistinctly multiseptate, straight to mildly curved, subobtuse tip, 3-5 x 45-80$\mu$.

HOST: *Decumaria barbara* L.

TYPE: Ocean Springs, Miss.; *Decumaria barbara;* S. M. Tracy, No. 5206; Nov. 1897.

DISTRIBUTION: Known only from the type locality.

NOTE: Although the published data give the type as being collected in 1897, all the packets bearing the number, 5206, are dated Nov. 7, 1898.

**Cercospora deutziae** Ellis & Everhart

Jour. Mycol. 4: 5. 1888

Leaf spots minute, circular, 0-5-1.5 mm. in diameter, white center, narrow pale brown raised line border; fruiting amphigenous; stromata none or a few brown cells; fascicles mostly 3-15 stalks; conidiophores pale to medium dark brown or golden brown, uniform in color, longest ones slightly attenuated, sparingly septate, not branched, not or rarely 1-2 mildly geniculate, medium sized spore scar at subtruncate base, 3.5-6 x 40-200$\mu$; conidia acicular, hyaline, truncate base, tip subobtuse, indistinctly multiseptate, straight to mildly curved, 2.5-4 x 50-125$\mu$, rarely as long as 300$\mu$.

HOST: *Deutzia gracilis* Sieb. + Zucc., *D. scabra* Thunb.

TYPE: Faulkland, Delaware; *Deutzia gracilis;* A. Commons, No. 199; Sept. 9, 1885.

DISTRIBUTION: Iowa, Delaware, New York, and Japan.

**Cercospora escalloniae** Marchionatto

Inst. Sanidad Veg. Argentina Series A. 2 (21): 4. 1946

Leaf spots numerous, suborbicular, 1.5-3.5 mm., grayish, purple border; fascicles superficial, compact, compressed near base, olivaceous; conidiophores olivaceous, straight, 0-2 septate, truncate tip, 4 x 35-45$\mu$; conidia olivaceous, cylindro-obclavate, straight to mildly curved, 1-3 septate, base subtruncate, tip subacute, 4.5 x 75-85$\mu$.

HOST: *Escallonia rubra* (R. & P.) Pers.

TYPE: Buenos Aires, Argentina; *Escallonia rubra;* Juan B. Marchionatto; Sept. 1942.

DISTRIBUTION: Argentina.

NOTE: I have not seen this species.

**Cercospora heucherae** Ellis & Martin

Amer. Naturalist 18: 189. 1884

Leaf spots circular, 4-6 mm. in diameter, brown, slightly zonate, bordered by a slightly darker line; fruiting amphigenous; small dark brown globular stromata, 20-40$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, sparingly septate, not geniculate, not branched, uniform in color but slightly irregular in width, straight, rounded tip, spore scar indistinct, 2-4 x 10-50$\mu$; conidia narrowly obclavate (shortest ones cylindric), subhyaline to pale olivaceous, straight or nearly so, base subtruncate, tip subobtuse, septa indistinct, 2-3.5 x 20-75$\mu$.

HOSTS: *Heuchera americana* L., *H. hispida* Pursh.

TYPE: Chester Co., Penn.; *Heuchera americana;* Geo. Martin; July, 1882; cotype distributed as Ellis, North Amer. Fungi 1258.

DISTRIBUTION: I studied material from New Jersey, Delaware, Pennsylvania and Indiana. Also reported from Manitoba, Wisconsin, Iowa, Missouri, Ohio, Virginia, West Virginia, and Illinois.

**Cercospora hydrangeae** Ellis & Everhart

Jour. Mycol. **8**: 71. 1902

*Cercosporina hydrangeicola* Speg., Anal. Mus. Nac. Buenos Aires **20**: 426. 1910
*Cercospora hydrangeana* Tharp, Mycologia **9**: 110. 1917
*Cercospora arborescentis* Tehon and Daniels, Mycologia **17**: 246. 1925

Leaf spots circular to angular, brown to dingy gray, usually with a dark reddish brown or almost black margin, often confluent and covering much of the leaf surface; fruiting chiefly epiphyllous; small dark brown stromata or sometimes only a few brown cells; most fascicles not dense, 2-12, rarely 20-30; conidiophores pale to medium brown, septate, not branched, longer ones may be 1-2 abruptly or 1-5 mildly geniculate, slightly attenuated, 4-6 x 10-80$\mu$, occasional collections may show them 300$\mu$ in length; conidia acicular, hyaline, straight to mildly curved, truncate base, longer ones with acute tip, indistinctly multiseptate, 2-3.5 x 40-100$\mu$, rarely as large as 4 x 165$\mu$.

HOSTS: *Hydrangea arborescens* L., *H. hortensia* Siebold, *H. macrophylla* Seringe, Hydrangea sp.

TYPES: Tuskegee, Ala.; cultivated Hydrangea; Geo. W. Carver, No. 696; (*Cercosporina hydrangeicola*) La Plata, Argentine; cultivated Hydrangea; C. Spegazzini; (*Cercospora hydrangeana*) Houston, Texas; Hydrangea sp.; B. C. Tharp; June 24, 1915; (*Cercospora arborescentis*) Alexander Co., Ill.; *Hydrangea arborescens;* P. A. Young, No. 599; Aug. 17, 1922.

DISTRIBUTION: As far north as Illinois and as far south as Argentine. Also reported in Formosa, and Japan.

NOTE: See also *C. obtegens* for differences between the two species on this host genus.

**Cercospora magellanica** Spegazzini

Bol. Acad. Nac. de Cien. de Cordoba **11**: 306. 1887

HOST: *Ribes magellanicum* Poir.

TYPE: Picton Island, Tierra del Fuego; *Ribes magellanicum;* C. Spegazzini, No. 960; May, 1882.

NOTE: The type plainly is not a Cercospora. A pycnidial stage is present as well as a hyphomycetous form that possibly could be classed as a Polythrincium (Annotated account of fungi received at the Imperial Mycological Institute **2** (2): 9. 1933).

CERCOSPORAE ON RIBES

A. Conidia pale olivaceous or olivaceous brown, cylindric, 3-6 x 20-125$\mu$; fruiting chiefly hypophyllous; stromata 20-40$\mu$; fascicles usually dense; conidiophores 2.5-4 x 10-80$\mu$.
   RIBES spp. *C. marginalis*

AA. Conidia hyaline (the oldest conidia of *C. ribicola* may be colored slightly).
   B. Conidia acicular, truncate base, acute tip, 3-4.5 x 40-200$\mu$; fascicles 3-20 spreading stalks; conidiophores 3.5-6 x 20-225$\mu$.
      RIBES spp. *C. ribis*
   BB. Conidia not acicular, base not truncate; fascicles dense to very dense; conidiophores 2-3.5 x 5-25$\mu$.

C. Conidia cylindro-obclavate (oldest ones slightly colored), 3-6 x 20-120$\mu$; stromata 20-75$\mu$; fruiting amphigenous.
RIBES spp. *C. ribicola*

CC. Conidia Septoria-like, not colored, 1.5-3 x 25-75$\mu$; stromata 40-125$\mu$; fruiting epiphyllous.
RIBES spp. *C. septoriopsis*

**Cercospora marginalis** de Thuemen
Bol. Soc. Adriat. Sci. Nat. Trieste 9: 68. 1885

*Cercospora ribis-rubri* Savulescu & Sandu-Ville, Hedwigia 75: 224. 1935

Leaf spots circular, 2-4 mm. in diameter, on green leaves pale brown with a dark margin, on brown leaves may be olivaceous; fruiting chiefly hypophyllous; stromata small, globular, pale to dark fuligenous, 20-40$\mu$ in diameter; fascicles mostly dense; conidiophores pale to medium olivaceous brown or fuligenous, multiseptate, not or rarely branched, not to plainly attenuated, uniform in color, occasionally 1-2 abruptly geniculate, medium spore scar at rounded to subtruncate tip, 2.5-4 x 10-80$\mu$, or when conidia are persistent appearing much longer; conidia cylindric, pale olivaceous or olivaceous brown, straight or mildly curved, sparingly septate, ends rounded to obconically truncate, 3-6 x 20-125$\mu$, often as short as 20-45$\mu$.

HOSTS: *Ribes aureum* Pursh. var. *gracillenum, R. grossularia* L., *R. menziesii* Pursh., *R. rubrum* L. (*R. sativum* Syme), Ribes sp.

TYPES: Gorizia, Austria; *Ribes grossularia;* G. Bolle, No. 1037; August; (*C. ribis-rubri*) Sona, Bez, Tarvava, Mare, Roumania; *Ribes rubrum;* Aug. 3, 1933.

DISTRIBUTION: Aside from cotypes, I received collections from near San Francisco and near Los Angeles, California.

NOTE: The cylindric, plainly colored conidia separate this species from the others on Ribes. See key above.

**Cercospora mitellae** Hicks, nom. nud.

HOST: *Mitella diphylla* L.

TYPE: Near Michigan Agr. College, East Lansing, Mich.; *Mitella diphylla;* G. H. Hicks, No. 329; April, 1892.

NOTE: The conidia are mostly 0-1 septate and are small, 1-2.5 x 5-20$\mu$; therefore, the fungus is not a Cercospora. Seymour, in his Host Index, p. 346. 1929 lists it, and for that reason it is recorded here. Possibly it could be classed as a Didymaria.

**Cercospora obtegens** H. & P. Sydow
Ann. Mycol. 7: 171. 1909

Leaf spots none or indistinct, later the entire leaf may wither and die; fruiting abundantly effuse, hypophyllous, dark olivaceous to sooty, finally covering the entire leaf surface; stromata lacking; nonfasciculate; conidiophores procumbent, intertwining, pale to medium olivaceous brown, uniform in color, irregular in width, plainly multiseptate, often constricted at septa, curved to tortuous, rarely geniculate, tip rounded to conic, 4-6.5 x 40-300$\mu$; conidia cylindro-obclavate, pale to medium olivaceous brown, straight to strongly curved or undulate, 5-11 septate, ends conic, 4-6.5 x 40-130$\mu$.

HOST: *Hydrangea hortensia* Siebold, var. *Azisai.*

TYPE: Tokyo, Japan; *Hydrangea hortensia* var. *Azisai;* Sugano; Aug. 27, 1905.

DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. hydrangeae* for differences between the species on this host genus.

**Cercospora ribicola** Ellis & Everhart

Proc. Acad. Nat. Sci. Phila. **46**: 379. 1894

Leaf spots subcircular to angular, 2-5 mm. in diameter, dark reddish brown; fruiting amphigenous but more abundant on upper surface; stromata dark reddish brown, globular, 20-75$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, dark in mass, uniform in color and width, longest ones slightly undulate, not septate, not branched, occasionally once mildly geniculate, minute spore scar at rounded to subtruncate tip, 2-3.5 x 5-25$\mu$; conidia cylindro-obclavate to cylindric, hyaline to subhyaline, oldest ones may be slightly colored, straight or nearly so, 1-8 septate, base rounded to long obconically truncate, tip rounded, rarely catenulate, 3-6 x 20-120$\mu$.

HOSTS: *Ribes aureum* Pursh (*R. tenuiflorum* Lindl.), *R. sanguineum* Pursh, *R. viscosissimum* Pursh.
TYPE: Seattle, Wash.; *Ribes sanguineum;* C. V. Piper; Aug., 1893.
DISTRIBUTION: Seems confined to the far northwest—Washington, Idaho, and Oregon. It has also been reported doubtfully on *R. rubrum* in the Caucasus Mts. region of Europe.
NOTE: The wide, hyaline, cylindric conidia and prominent stromata with dense fascicles separate this species from the others on Ribes. See key, page 518.

**Cercospora ribis** Earle

Bul. Torrey Bot. Club **25**: 366. 1898

*Cercosporina bubakii* Picbauer, Ann. Mycol. **35**: 147. 1937

Leaf spots circular to irregular, 0.5-4 mm. in diameter, dingy gray center, dark purplish to black margin; fruiting amphigenous but more abundant on lower surface; stromata mostly a few dark cells; fascicles 3-20 stalks; conidiophores near base medium dark olivaceous or fuligenous, attenuated and paler toward the tip, longer ones multiseptate, not branched, rarely undulate or once geniculate, large spore scar at subtruncate tip, 3.5-6 x 20-100$\mu$ or even 225$\mu$ long; conidia hyaline, acicular, variously curved, indistinctly multiseptate, base truncate, tip acute, 3-4.5 x 40-200$\mu$.

HOSTS: *Ribes americanum* Mill., *R. petraeum* Wulf., *R. rubrum* L. (*R. sativum* Syme), Ribes sp.
TYPES: Auburn, Lee Co., Ala.; cultivated gooseberry (Ribes sp.); F. S. Earle; July 18, 1896; (*Cercosporina bubakii*) Camkorije, Bulgaria; *Ribes petraeum;* F. Bubák; Aug. 31, 1907.
DISTRIBUTION: Studied material from Kansas, Alabama, Wisconsin, Indiana, Washington, D. C., and Missouri. Bulgaria.
NOTE: The fascicles of 3-20 stalks, long conidiophores, and hyaline acicular conidia separate this species from the others on Ribes. In some herbaria are packets marked *Cercospora ribis* Ellis & Galloway (on cultivated Ribes). This is identical with the Earle collection. Even though Picbauer gives the length of the *bubakii* conidiophores as only 35-40$\mu$ long, the species still fits *C. Ribis* for some specimens of the latter show only short fruiting. See key, page 517.

**Cercospora septoriopsis** comb. nov.

*Cylindrosporium ribis* Davis, Wisc. Acad. Trans. **16**: 759. 1910
*Cercoseptoria ribis* (Davis) Petrak, Ann. Mycol. **23**: 69. 1925

Leaf spots circular to irregular, 2-5 mm. in diameter, brown, sometimes with a yellowish margin; fruiting epiphyllous; stromata dark brown to black, 40-125$\mu$ in length; fascicles very dense; conidiophores delicate, wavy, pale olivaceous brown, in mass medium dark, tips almost hyaline, septation, branching, geniculation, and spore scars not visible, 2-3 x 5-25$\mu$; conidia narrowly linear (Septoria-like), curved or wavy, hyaline, septa indistinct, base subtruncate, rarely obconic, tip subobtuse, 1.5-3 x 25-75$\mu$.

HOSTS: *Ribes prostratum* L'Hérit., *R. triste* Pallas, *R. viscosissimum* Pursh.
TYPE: Racine, Wisc.; *Ribes triste* and *Ribes prostratum;* J. J. Davis.
DISTRIBUTION: Studied material from Wisconsin and British Columbia.
NOTE: Dearness, on the packet, named the British Columbia collection *Cercoseptoria ribis* (Davis) Petrak. I did not find a published description of this combination. See key, page 518.

**Cercospora yakushimensis** Togashi et Katsuki
Bot. Magazine, Tokyo. **65**: 25. 1952

Leaf spots subangular to irregular, usually vein-limited, 2-4 mm. in diameter, pale to dark brown, finally with a white center; fruiting amphigenous, mostly hypophyllous; minutely punctiform; stromata dark brown, 15-25$\mu$ in diameter; fascicles dense; conidiophores brown, straight to flexuous, not branched, not geniculate, 2-4 septate, 2.5-4 x 25-75$\mu$; conidia subhyaline, obclavate to obclavato-cylindric, straight to mildly curved, base obconically truncate, apex subacute, indistinctly 4-5 septate, 3-4 x 50-65$\mu$.

HOST: *Hydrangea kawagoena* Koiz.
TYPE: Pref. Kagoshima, Yaku Island, Japan; *Hydrangea kawagoena;* S. Katsuki; Oct. 19, 1949.
DISTRIBUTION: Yaku Island.
NOTE: See also *C. hydrangeae* and *C. obtegens* for differences among the species on Hydrangea.

**Cercospora alectrae** Hansford
Proc. Linnean Soc. London **1942-3**: 55. 1943

Leaf spots indistinct; fruiting hypophyllous, olivaceous, effuse; conidiophores in fascicles of 3 to 6, olivaceous brown, sometimes irregularly branched, multiseptate, toward the tip nodular or geniculate, 4-6 x 150-300$\mu$; conidia subhyaline, cylindro-fusoid, straight or nearly so, 0-3 septate, ends rounded bluntly, 4-5 x 20-30$\mu$.

HOST: Alectra sp.
TYPE: Kampala, Uganda; Alectra sp.; Hansford, 1307.
DISTRIBUTION: Uganda.
NOTE: This is not a Cercospora. Not having seen the specimen I am not sure whether it should be classed as a Cladosporium, a Piricularia, or some other genus having very short, mostly 1-septate conidia.

**Cercospora alonsoae** Sydow
Ann. Mycol. **37**: 427. 1939

Leaf spots subcircular to irregular, 3-5 mm. in diameter, grayish brown, on the

upper surface bounded by a narrow darker line and a purplish yellow halo; fruiting amphigenous; stromata dark olivaceous brown, 30-70$\mu$; fascicles dense to very dense, compact; conidiophores pale olivaceous brown, paler and more narrow toward the tip, 0-3 septate, septa near base, not branched, curved to torulose, 4-5.5 x 30-70$\mu$; conidia subhyaline to very pale olivaceous, narrowly cylindric to cylindro-obclavate, ends rounded bluntly, straight to mildly curved, 3-6 septate, 3-4.5 x 35-90$\mu$.

HOST: *Alonsoa caulialata* Ruiz. & Pav. (*A. meridionalis* Druce) (*Scrophularia meridionalis* L.)

TYPE: Hacienda San Antonia, Banos, Prov. Tungurahua, Ecuador; *Alonsoa meridionalis;* H. Sydow, No. 680; Jan. 6, 1938.

DISTRIBUTION: Known only from the type locality.

NOTE: I have not seen this species. The war intervened before Dr. Sydow could send me specimens of his Ecuador trip. Fortunately he gives excellent descriptions. See also *C. scrophulariae.*

**Cercospora antirrhini** Muller & Chupp
Ceiba **1**: 171. 1950

Leaf spots circular, 0.5-5 mm. in diameter, dingy gray to white, narrow raised brown line border; fruiting amphigenous, easily visible as black pustules; stromata lacking to large, brown, globose, 60$\mu$ in diameter; conidiophores borne singly from procumbent threads or in fascicles of 2-12 from the stromata, pale olivaceous brown, fairly uniform in color and width, sparingly septate, not branched, straight to mildly curved or undulate, 0-2 geniculate, tip subtruncate or rounded bluntly, 3-6 x 20-80$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-4 x 35-125$\mu$ or longer.

HOST: *Antirrhinum majus* L.

TYPE: Chimaltenango, Guatemala; *Antirrhinum majus;* Albert S. Muller, No. 386; Jan. 10, 1943.

DISTRIBUTION: Known only from the type locality.

NOTE: Killian in one of his publications mentions a *Cercospora antirrhini,* but I believe he had in mind *Cercosporella antirrhini.*

**Cercospora gerardiae** Ellis & Dearness
Can. Rec. Sci. **5**: 271. 1893

Leaf spots indistinct to irregular and brown on upper surface; on corresponding lower surface a fuzzy black or dark effuse growth, indistinguishable on dried darkened foliage; stromata slight, dark brown, filling stomatal opening; most fascicles dense, somewhat congested near the base; conidiophores medium to dark brown near the base, pale to medium brown near the tip, plainly multiseptate, sometimes with incipient branching, upper half sinuous to geniculate (2-5 mildly or 1-3 abruptly), slightly attenuated, tip conic, with small spore scar, 3.5-5 x 20-100$\mu$, sometimes only short ones; conidia obclavate, olivaceous, multiseptate, straight to mildly curved, base long obconic to obconically truncate, tip subacute, 2.5-4 x 50-150$\mu$.

HOSTS: *Gerardia quercifolia* Pursh (*G. virginica* [L.] B.S.P.) (*Dasystoma virginica* [L.] Britton), *G. grandiflora* Benth.

TYPE: Walpole Island, St. Clair River, Canada; *Gerardia quercifolia;* J. Dearness, No. 1957; July 27, 1892.

DISTRIBUTION: From Ontario and Wisconsin to Mississippi and eastward.
NOTE: See also *C. madisonensis* for differences between the two species on this host genus. Ellis suggests that *C. clavata* is found on *Gerardia quercifolia* (Jour. Mycol. 1: 55. 1885) and distributed a collection from Newfield, New Jersey as N. Amer. Fungi, No. 823B. The fungus actually is *Cercospora gerardiae*. In the New York Botanical Garden Herbarium labelled *Cercospora lactea* Ellis & Everhart, on *Gerardia flava* L. and collected by J. B. Ellis at Newfield, New Jersey, Aug. 24, 1882. The conidia are short and mostly 1-septate, so that the fungus cannot be classed as a Cercospora.

**Cercospora gratiolae** Ellis & Everhart
Jour. Mycol. 8: 71. 1902

Leaf spots indistinct or lacking; fruiting in dark to black effuse layers on lower side of leaf; small globular dark reddish brown stromata sometimes present; nonfasciculate to dense fascicles; conidiophores pale to medium brown, uniform in color and width, multiseptate, branched, rarely 1-3 geniculate, intertwined or undulate, tip rounded with small spore scar, 3-5 x 25-100$\mu$; conidia pale yellowish olivaceous, narrowly obclavate to obclavato-cylindric, straight or nearly so, base medium to long obconic, tip conic to bluntly rounded, mostly 3-7 septate, 3-4 x 25-90$\mu$.

HOST: *Gratiola pilosa* Michx.
TYPE: Tuskegee, Ala.; *Gratiola pilosa;* Geo. W. Carver, No. 482.
DISTRIBUTION: Known only from the type locality.
NOTE: Hansford (Proc. Linn. Soc. London **1942-3**: 34. 1943) reports this species on *Sesamum angolense*. I believe this is incorrect.

**Cercospora halleriae** Chupp & Doidge
Bothalia 4: 886. 1948

Leaf spots angular, bounded by veins, 2-5 mm. in extent, uniformly reddish brown on the upper surface, indistinct to obscurely brown on the lower surface; fruiting hypophyllous; stromata few brown cells filling stomatal openings; fascicles 2-15 spreading stalks; conidiophores subhyaline to very pale olivaceous brown, tip almost hyaline and strongly attenuated, sparingly septate, not geniculate, rarely branched, straight to tortuous, conic tip, 2-4 x 10-35$\mu$; conidia hyaline to subhyaline, cylindro-obclavate, straight to curved, indistinctly 1-5 septate, base rounded to obconically truncate, tip conic, 1.5-3 x 15-70$\mu$.

HOST: *Halleria lucida* L.
TYPE: Barberton, Transvaal, Union of S. Africa; *Halleria lucida;* P. v. d. Byl, No. 7377; Oct. 16, 1913.
DISTRIBUTION: Known only from the type locality.

**Cercospora herpestica** Petrak & Ciferri
Ann. Mycol. 30: 317. 1932

Leaf spots indistinct or none; fruiting effuse, hypophyllous, 4-7 mm. in extent, sooty in appearance; stromata lacking; nonfasciculate; conidiophores intertwining procumbent branches, pale to medium olivaceous brown, uniform in color, irregular in width, multiseptate, often constricted at the septa, rarely geniculate, curved to tortuous, apex bluntly rounded to conic, 4-6.5 x 20-300$\mu$; conidia cylindro-obclavate and with bluntly rounded tips or the longest ones distinctly ob-

clavate with subacute tips, pale to medium olivaceous brown, 5-15 septate, straight to mildly curved, base long obconically truncate, 3.5-6 x 35-150$\mu$.

HOST: *Herpestis stricta* Schrad.

TYPE: La Cumbre, Cordillera Central, San Domingo; *Herpestis stricta;* E. L. Ekman, No. 376 (Ciferri, No. 3760); Mar. 3, 1930.

DISTRIBUTION: Known only from the type locality.

NOTE: The type and cotype are labeled *Cercospora herpesticola.*

**Cercospora leptandrae** J. J. Davis

Wisc. Acad. Trans. **22**: 162. 1926

Leaf spots indistinct; fruiting in olivaceous effuse patches on lower leaf surface, 1-5 mm. in extent; stromata lacking; nonfasciculate or 2-7 wide spreading stalks in a fascicle; conidiophores medium brown, plainly and closely septate, often constricted at septa, branched, tortuous or closely and abruptly geniculate, wider near the tip, usually two small spore scars at rounded tip, 4-6 x 50-200$\mu$; conidia obclavato-cylindric, 3-7 plainly septate, sometimes constricted at septa, pale to medium olivaceous brown, straight to mildly curved, long obconic base, tip obtuse, 5-8 x 20-75$\mu$.

HOST: *Veronica virginica* L. (*Leptandra virginica* Nutt.) (*Veronicastrum virginicum* [L.] Pennell).

TYPE: Blue River, Wisc.; *Leptandra virginica;* J. J. Davis; Sept. 14, 1923.

DISTRIBUTION: Studied material from Blue River and from Madison, Wisconsin.

NOTE: The wide long conidiophores and conidia measuring 5-8 x 20-75$\mu$ separate this species from the others on Veronica. This is a transition stage between Cercospora and Helminthosporium, since the oldest spores may have thick walls.

**Cercospora madisonensis** Chupp & Greene

Wisc. Acad. Sci., Arts, Letters **35**: 132. 1944

Leaf spots circular, 0.5-2 mm. in diameter, white center, reddish to purplish border; fruiting amphigenous; on upper surface fascicles dense, short, on lower surface often nonfasciculate, long; conidiophores pale to medium brown, paler and more narrow toward the tip, multiseptate, tip rounded to subtruncate, on lower leaf surface branched, tortuous or 1-3 geniculate, 4-6 x 20-200$\mu$; conidia hyaline, acicular to obclavate, indistinctly multiseptate, straight to mildly curved, base truncate to subtruncate, tip subacute, 2-3.5 x 20-70$\mu$ or longer.

HOST: *Gerardia grandiflora* Benth.

TYPE: Madison, Wisconsin; *Gerardia grandiflora;* H. C. Greene; Sept. 14, 1942.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. gerardiae.*

**Cercospora mimuli** Ellis & Everhart

Jour. Mycol. **3**: 18. 1887

Leaf spots circular, 1-2.5 mm. in diameter, pale tan to dirty gray center, brown margin; fruiting amphigenous but chiefly epiphyllous; small dark brown globular stromata, 20-40$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, attenuated, not septate, not branched, not geniculate, sometimes with minute spore scar at rounded tip, 3-5 x 5-25$\mu$; conidia obclavate, hyaline, straight

to mildly curved, rounded to subtruncate base, subobtuse tip, indistinctly 1-5 septate, 2-3.5 x 30-60$\mu$.

HOST: *Mimulus alatus* Ait.

TYPE: Missouri; *Mimulus alatus;* S. M. Tracy, No. 225; Oct. 1886.

DISTRIBUTION: Known only from the type locality.

**Cercospora paulowniae** Shotaro Hori

Jour. Plant Protection 2: 79. 1915

Leaf spots scattered, circular, 1-10 mm. in diameter, grayish or fuligenous in color, margin darker and slightly sunken; later the spots may dehisce giving the foliage a ragged appearance; fruiting epiphyllous; stromata slight; fascicles 3-8 spreading stalks; conidiophores medium to dark brown, straight to flexuous, 1-5 septate, linear, 3-5 x 30-90$\mu$ or even 120$\mu$; conidia obclavate, hyaline, 3-12 septate, curved, 3.5-6 x 50-120$\mu$.

HOST: *Paulownia imperialis* Sieb. & Zucc. (*P. tomentosa* Stendel).

TYPE: Tokyo, Japan; *Paulownia tomentosa;* N. Nambu; Nov. 10, 1914.

DISTRIBUTION: Apparently fairly common in Japan; China.

NOTE: Kanesuke Hara in his text on the Diseases of Arboreous Trees has described this species in the following editions: p. 252, 1923; p. 228, 1925; p. 116, 1927. Dr. Togashi, in a letter of May 1, 1941, kindly translated Hori's notes regarding the species. I have not been able to study the material, nor to read the original description.

**Cercospora pentstemonis** Ellis & Kellerman

Bul. Torrey Bot. Club 11: 121. 1884

Leaf spots circular, 1-5 mm. in diameter, pale brown to gray center, darker brown margin, slightly zonate; fruiting amphigenous but chiefly epiphyllous; stromata small, brown to almost black, 20-50$\mu$ in diameter; fascicles dense; conidiophores pale to medium dark brown or fuligenous, paler tip, plainly attenuated, not septate, not geniculate, not branched, minute spore scar at short conic tip, 3-5 x 5-35$\mu$; conidia obclavato-cylindric, very pale fuligenous or olivaceous, mildly curved, septa indistinct, base very short obconically truncate, tip blunt, 1.5-3 x 20-75$\mu$, mostly 20-45$\mu$.

HOSTS: *Pentstemon cobaea* Nutt., *P. glaber* Pursh, *P. grandiflorus* Nutt., *P. laevigatus* Ait., *P. palmeri* Gray, *P. pubescens* Ait. (*P. hirsutus* [L.] Willd.)

TYPE: Manhattan, Kansas; cultivated *Pentstemon grandiflorus;* W. A. Kellerman, No. 566; June, 1884.

DISTRIBUTION: Material studied was collected in South and North Dakotas, Wisconsin, Nebraska, Kansas, Oklahoma, and Alabama. Also reported from Texas, Montana, and Indiana.

NOTE: F. E. and E. S. Clements Crypt. Form. Color. No. 268 labeled *Cercosporium nivosum* E. + E. on *P. brandegei* Porter and C. V. Piper, Fungi of Idaho No. 297, labeled *Cercospora nivosa* E. + E. on *P. ovatus* Dougl. Both fungi are hyaline—or at most subhyaline—and may be considered as *Cercosporella nivosa* E. & E.

**Cercospora scopariae** Thirumalachar and Lacy,

Sydowia 5: 127. 1951

Leaf spots pale yellow, diffuse, up to 10 mm. in diameter, inclined to coalesce and causing defoliation; fruiting amphigenous; fascicles usually emerging through

the stomata, dense to divergent; conidiophores yellowish brown, flexuous, geniculate, sparingly septate, 2-3 x 6-15$\mu$; conidia narrowly obclavate, hyaline, straight to mildly curved, 3-14 septate, base obconic, tip acute, 2-3 x 15-90$\mu$.

HOST: *Scoparia dulcis* L.
TYPE: Patna, Bihar, India; *Scoparia dulcis;* R. C. Lacy; Aug. 20, 1950.
DISTRIBUTION: India.
NOTE: I have not seen this species.

**Cercospora scrophulariae** (Moesz) n. comb.

*Cercosporina scrophulariae* Moesz, Magyar Biol. Kut. Inst. Munk. 3: 115. 1930

Leaf spots suborbicular to irregular, 2-12 mm. in diameter, center pale brown to almost gray, margin dark reddish brown; fruiting hypophyllous; stromata pale to medium brown, subglobular, a few cells to 30$\mu$ in diameter; fascicles 2-12 spreading stalks; conidiophores very pale to medium brown, fairly uniform in color and width, sparingly septate, rarely branched, 0-3 geniculate, straight to tortuous, tip rounded to subtruncate, 4-6 x 30-175$\mu$ (Moesz says 310$\mu$); conidia hyaline, cylindro-obclavate, shortest ones distinctly cylindric, 3-11 septate, base subtruncate, tip subobtuse or obtuse, 4-5.5 x 30-140$\mu$.

HOST: *Scrophularia alata* Gray.
TYPE: Hévízfürdö, Hungary; *Scrophularia alata;* G. Moesz; Sept. 10, 1902 (?).
DISTRIBUTION: Known only from the type locality.
NOTE: Dr. A. S. Muller sent a specimen of some Scrophulariaceae showing a Cercospora similar to the Moesz species, excepting that the conidia were more narrow (3-4$\mu$) and more nearly acicular. It may be a new species. See also *C. alonsoae.*

**Cercospora stemodiae** Sydow

Ann. Mycol. 37: 433. 1939

Leaf spots irregular, especially when bordering the leaf margin, 5-10 mm. in length, on the upper surface dull yellowish brown, immarginate or with a raised line border, below grayish brown to yellowish; fruiting hypophyllous, faintly effuse; stromata dark olivaceous, 25-35$\mu$ in diameter; fascicles dense, compact; conidiophores pale olivaceous brown, paler and more narrow toward the tip, 0-4 septate, not branched, straight to slightly curved or undulate, 3-4.5 x 10-100$\mu$, mostly 10-35$\mu$; conidia subhyaline to pale olivaceous, cylindric, 2-7 septate, ends obtuse, 3-4.5 x 35-105$\mu$.

HOSTS: *Stemodia durantifolia* (L.) Sw., *S. suffruticosa* H.B.K.
TYPE: Hacienda San Antonia, Banos, Prov. Tungurahua, Ecuador; *Stemodia suffruticosa;* H. Sydow, No. 469; Dec. 7, 1937.
DISTRIBUTION: Ecuador, Trinidad.
NOTE: Sydow records long conidiophores, but those from Trinidad were short. Otherwise the latter specimen fitted closely the original description.

**Cercospora toreniae** P. Hennings

Hedwigia 43: 395. 1904

Leaf spots none or indistinct; fruiting effuse, hypophyllous, dark olivaceous to almost black; stromata slight, composed of a few dark brown cells; nonfasciculate to dense, diverging fascicles; conidiophores pale olivaceous brown, uniform in color, irregular in width, plainly multiseptate, sometimes constricted at the septa, branched, curved or undulate to tortuous, rarely geniculate, bluntly rounded tip,

4-6 x 50-140$\mu$; conidia cylindro-obclavate, very pale olivaceous brown, straight to mildly curved, 3-9 septate, base obconically truncate, tip obtuse, 3-5.5 x 40-130$\mu$.

HOST: Torenia sp.

TYPE: Juruá-Miry, Estado de Amazonas, Brazil; Torenia sp.; E. Ule, No. 2953; Sept., 1901.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. torenicola* for differences between the species on this host genus.

**Cercospora torenicola** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 57. 1942

Leaf spots circular, minute, 0.5-1.5 mm. in diameter, gray center, brown to purple border; fruiting amphigenous; stromata merely a few brown cells; fascicles 3-12 diverging stalks; conidiophores pale olivaceous brown, paler and more narrow toward the tip, plainly branched, wavy to mildly multigeniculate, sparingly septate, subtruncate tip, 3-4.5 x 15-100$\mu$, mostly 30-50$\mu$; conidia hyaline, acicular or rarely obclavate, nearly straight, indistinctly multiseptate, base truncate, tip acute, 1.5-3 x 60-200$\mu$.

HOST: *Torenia Fournieri* Linden.

TYPE: Plaza in front of Pantheon, Caracas, Venezuela; *Torenia Fournieri;* A. S. Muller, No. 2923; Mar. 10, 1939.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. toreniae* for differences between the species on this host genus.

**Cercospora tortipes** J. J. Davis

Wisc. Acad. Trans. **20**: 430. 1921

Leaf spots subcircular to irregular, dark olivaceous to indistinctly brown, soon entire leaflet dies, difficult to observe on dried specimens; fruiting chiefly hypophyllous; stromata globular, dark brown to black, mostly filling stomatal openings, sometimes as large as 50$\mu$ in diameter; fascicles dense; conidiophores pale fuligenous, uniform in color and width, plainly multiseptate, branched, tortuous or 1-2 abruptly geniculate, small spore scar at subconic tip, 3-5 x 20-75$\mu$; conidia narrowly obclavate, almost linear, subhyaline to pale olivaceous, straight to mildly curved, multiseptate, base medium to long obconically truncate, tip subacute to subobtuse, 2.5-4 x 30-130$\mu$.

HOST: *Veronica scutellata* L.

TYPE: Bruce, Wisc.; *Veronica scutellata;* J. J. Davis; Sept. 4, 1918.

DISTRIBUTION: Wisconsin and New York.

NOTE: *C. tortipes* is differentiated from the other species on Veronica by its narrow conidia. Duggar in 1896 collected an immature specimen near Ithaca, N. Y. It may be the same species.

**Cercospora verbascicola** Ellis & Everhart

Jour. Mycol. **4**: 3. 1888

Leaf spots circular to subcircular, 1-4 mm. in diameter, pale tan to dingy gray, occasionally with a purplish raised line border; fruiting chiefly epiphyllous, rarely wholly hypophyllous, darkening the gray area; stromata few dark brown cells to 50$\mu$ in diameter; fascicles mostly 2-12 diverging stalks; conidiophores medium

dark brown, paler and more narrow toward the tip, multiseptate, not branched, straight to slightly curved, rarely 1-3 geniculate, medium spore scar at narrowly rounded tip, 4-6 x 60-1000$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 3-4 x 60-400$\mu$.

HOSTS: *Verbascum thapsiforme* Schrad., *V. thapsus* L.

TYPE: Faulkland, Del.; *Verbascum thapsus;* A. Commons, No. 669; Aug. 26, 1887.

DISTRIBUTION: New York, Delaware, Maryland, Alabama, Texas, Kansas, Iowa, Wisconsin.

**Cercospora veronicae** Smith & Ramsbottom

Brit. Mycol. Soc. Trans. 5: 243. 1916

HOST: *Veronica chamaedrys* L.

TYPE: Buteshire, Island of Cumbrae; *Veronica chamaedrys;* D. A. Boyd; Aug. 1914.

NOTE: When I visited Dr. Ramsbottom's laboratory, we could not find type material of this species. If the printed description is correct that the conidia are 0-1 septate and 17-20$\mu$ in length, the fungus is not a Cercospora, but possibly a Didymaria. See also *C. leptandrae* and *C. tortipes.*

**Cercospora ailanthi** P. Sydow

Hedwigia 38: (Beiblatt) 140. 1899

Leaf spots subcircular, 0.5-6 mm. in diameter, grayish center, dark brown margin; fruiting epiphyllous; stromata none or only a few brown cells; nonfasciculate or 2-5 diverging stalks; conidiophores medium dark brown, uniform in color, irregular in width or constricted at septa, plainly multiseptate, branched, rarely geniculate, curved to tortuous, tip rounded to conic, 4-6.5 x 50-200$\mu$; conidia pale olivaceous brown, obclavato-cylindric, straight to mildly curved, 3-7 septate, base short obconic, tip obtuse, 4-6 x 15-60$\mu$. (Sydow says 8-12 x 100-200$\mu$).

HOST: *Ailanthus glandulosa* Desf.

TYPE: Rixdorf, near Berlin, Germany; *Ailanthus glandulosa;* P. Sydow; Sept. 2, 1896 (Cotype distributed as Mycotheca Marchica, No. 4890).

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. glandulosa* for differences between the two species on Ailanthus.

**Cercospora bruceae** Petch

Ann. Roy. Bot. Gard. Peradeniya V. 4: 306. 1909

Leaf spots indistinct to fairly evident, circular, 3-5 mm. in diameter, brown; fruiting on the corresponding lower surface, effuse, dark gray to black; stromata lacking; nonfasciculate to slightly fasciculate; conidiophores pale to medium olivaceous brown, uniform in color, irregular in width, not geniculate, straight to intertwined, tip bluntly rounded, sometimes branched, 4-5.5 x 10-30$\mu$; conidia pale olivaceous brown, obclavato-cylindric, nearly straight, 3-9 septate, base short obconic, tip obtuse, 4-5.5 x 20-80$\mu$.

HOST: *Brucea sumatrana* Roxb.

TYPE: Kandy, Ceylon; *Brucea sumatrana;* T. Petch, No. 2446; June 24, 1907.

DISTRIBUTION: Known only from the type locality.

**Cercospora glandulosa** Ellis & Kellerman
Jour. Mycol. **1**: 3. 1885

Leaf spots circular to irregular, 1-6 mm. in diameter, grayish brown to dingy gray or sometimes almost black, often dehiscent leaving the leaflet in a ragged condition; fruiting amphigenous, but more abundant on the upper surface, where stromata are larger, fascicles more dense, and conidiophores shorter than on the lower surface; stromata almost none to 50$\mu$ in diameter, dark brown; fascicles none to dense; conidiophores pale to medium brown, somewhat paler and more narrow tip, multiseptate, rarely geniculate or branched, subconic to rounded tip with small to medium spore scar, 4-5.5 x 20-125$\mu$; conidia hyaline, acicular, straight to mildly curved, septa indistinct, base truncate, tip acute to subacute, 2.5-4 x 45-125$\mu$.

HOST: *Ailanthus glandulosa* Desf.
TYPE: Manhattan, Kansas; *Ailanthus glandulosa;* W. A. Kellerman, No. 689; Oct. 1884.
DISTRIBUTION: China, South America, and various southern states as far north as Nebraska.
NOTE: *C. ailanthi,* the other species on this host genus, has colored, obclavato-cylindric conidia.

**Cercospora harrisoniae** Hansford
Proc. Linnean Soc. London **1942-3**: 57. 1943

Leaf spots numerous, subcircular to irregular, dark reddish brown to almost black, often with a reddish or wine colored margin, 0.5-4 mm. in diameter; fruiting hypophyllous; stromata small; fascicles sometimes dense, divergent; conidiophores medium dark brown, paler and more narrow toward the rounded tip, 0-3 septate, not geniculate, not branched, straight to slightly curved, 5-7 x 10-40$\mu$; conidia fairly dark olivaceous, obclavate, straight to curved, 3-9 septate, base obconically truncate, tip subobtuse, 4-8 x 20-90$\mu$.

HOST: *Harrisonia abyssinica* Oliver.
TYPE: Serere, Uganda; *Harrisonia abyssinica;* Hansford, 1604; Oct. 1932.
DISTRIBUTION: Uganda.
NOTE: I studied the type at Kew in 1938.

**Cercospora picrasmae** Togashi and Katsuki
Bot. Magazine, Tokyo **65**: 24. 1952

Leaf spots subcircular, 0.5-3 mm. in length, on upper surface brown with white center, on lower surface uniformly dull brown; fruiting hypophyllous; stromata globular, medium brown, 15-50$\mu$ in diameter; fascicles dense; conidiophores mostly so short that they appear only as peripheral cells of the stromata, sometimes as large as 5 x 15$\mu$, very pale olivaceous brown, not septate, not geniculate, not branched, bluntly rounded tip; conidia pale olivaceous, obclavate, 3-7 septate, straight to mildly curved, base long obconically truncate, tip subobtuse, 4-5.5 x 25-85$\mu$.

HOST: *Picrasma quassioides* Benn. (*P. ailanthoides* [Bunge] Planch.)
TYPE: Yabakei, Pref. Oita, Japan; *Picrasma ailanthoides;* S. Katsuki; Sept. 3, 1941.
DISTRIBUTION: Japan.

**Cercospora aratai** Spegazzini

Anal. Mus. Nac. B. Aires II. 3: 340. 1899

HOST: *Solanum glaucum* Dun.

TYPE: La Plata, Buenos Aires, Argentine; *Solanum glaucum;* C. Spegazzini, No. 933; Jan. 30, 1892.

Fig. 185
*C. aratai*

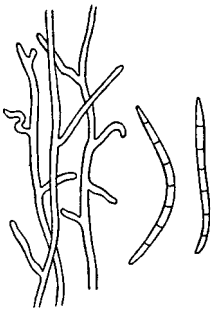


Fig. 186
*C. asperi*

NOTE: The fact that the conidia are short, wide, and mostly 1-septate places this species into Didymaria rather than into Cercospora.

## CERCOSPORAE ON SOLANUM

A. Conidia hyaline or sometimes subhyaline.
  B. Conidia not acicular, not with truncate base.
    C. Leaf spots indistinct, or sometimes distinct; fruiting effuse, slate colored; nonfasciculate to 2-12 stalks; conidiophores 4-6 x 10-60$\mu$; conidia obclavate, 3.5-7 x 15-75$\mu$; stromata none or slight; fruiting mostly hypophyllous.
      S. DULCAMARA — *C. dulcamarae*
    CC. Leaf spots distinct; fruiting not effuse; fascicles mostly dense; stromata 15-80$\mu$; fruiting chiefly epiphyllous; conidiophores 2-4.5 x 5-35$\mu$.
      D. Conidia 2-3.5 x 15-70$\mu$, obclavate; rarely nonfasciculate, dense fascicles, not compact.
        S. MICRANTHUM — *C. marcelliana*
      DD. Conidia 3-6 x 20-85$\mu$, longest ones obclavate to almost acicular; fascicles dense, compact.
        S. PANDURAEFORME — *C. egenula*
  BB. Conidia acicular, with truncate base.
    C. Leaf spots indistinct; fruiting effuse, hypophyllous, olivaceous; stromata none or slight; fascicles usually dense; conidia 3.5-6 x 40-125$\mu$; conidiophores 4-6 x 20-85$\mu$.
      S. NIGRUM — *C. solani*
    CC. Leaf spots distinct; fruiting not effuse; stromata slight to 75$\mu$ in length.
      D. Conidiophores in dense to very dense fascicles, 4-5.5 x 10-30$\mu$; conidia 2.5-4 x 30-130$\mu$; fruiting chiefly epiphyllous.
        S. CAROLINENSE — *C. carolinensis*
      DD. Conidiophores 3-12 in loose fascicles, long, paler toward the tip; fruiting chiefly hypophyllous.

E. Conidiophores medium dark in color, sometimes with incipient branches, 3-5 x 40-200$\mu$; conidia 3-5 x 75-300$\mu$; stromata small to medium in size.
S. TUBEROSUM *C. solanicola*

EE. Conidiophores pale to medium in color, without branches, 4-6.5 x 20-150$\mu$; conidia 2.5-5 x 40-120$\mu$; stromata usually only a few cells.
S. MELONGENA *C. melongenae*

AA. Conidia colored, not with truncate base.

B. Leaf spots distinct; fruiting not effuse; stromata usually present; mostly fasciculate (*C. puyana* without stromata or fascicles).

C. Conidia more nearly obclavate than cylindric.

D. Stromata none; nonfasciculate; conidia 2-3.5 x 40-115$\mu$; conidiophores amphigenous, branched, 2.5-4 x 10-85$\mu$.
S. TRACHYCYPHUM *C. puyana*

DD. Stromata present; fasciculate; fruiting chiefly epiphyllous; conidiophores not or rarely branched.

E. Conidia 4-6 x 30-80$\mu$, multiseptate; fascicles dense; conidiophores 3-6 x 15-75$\mu$, rarely branched.
S. STRAMONIFOLIUM *C. modesta*

EE. Conidia 2-3.5 x 30-50$\mu$, 1-5 septate; fascicles compact, 6-15 stalks; conidiophores 3-4 x 15-45$\mu$, not branched.
S. VIOLAEFOLIUM *C. sciadophila*

CC. Conidia more nearly cylindric than obclavate; fascicles dense or rarely very dense; stromata 20-60$\mu$; conidiophores not branched, paler and more narrow toward the tip.

D. Conidia 2-3.5 x 25-90$\mu$, mostly 30-50$\mu$; conidiophores 2-3.5 x 10-60$\mu$.
S. ARGENTEUM *C. venezuelae*

DD. Conidia and conidiophores 2.5-5.5$\mu$ in width.

E. Fruiting amphigenous; conidia 3-9 septate, 2.5-5 x 30-90$\mu$; conidiophores almost straight, 3-5 x 5-30$\mu$.
S. MELONGENA *C. solani-melongenae*

EE. Fruiting epiphyllous; conidia 3-5 septate, 4-5.5 x 20-60$\mu$; conidiophores undulate to variously curved, 3.5-5 x 20-55$\mu$.
S. VERBASCIFOLIUM *C. solanacea*

BB. Leaf spots none or indistinct; fruiting effuse; stromata absent; usually nonfasciculate; conidiophores arising as branches from procumbent threads.

C. Conidia more nearly obclavate than cylindric.

D. Conidia and conidiophores frequently wider than 5$\mu$.

E. Conidiophores very pale in color, 4-7 x 15-75$\mu$; conidia subhyaline to pale, not closely septate, 3.5-6 x 20-100$\mu$.
S. TUBEROSUM *C. concors*

EE. Conidiophores medium to dark in color, 4-7 x 10-30$\mu$; conidia pale to medium, closely septate, 5-7.5 x 25-85$\mu$.
S. LANUGIFLORUM *C. lanugiflori*

DD. Conidia and conidiophores usually not wider than 5$\mu$.

E. Conidiophores pale to medium brown, 3-5 x 20-150$\mu$; conidia 2-4.5 x 20-85$\mu$.
S. RUGOSUM *C. rugosi*

EE. Conidiophores pale to very pale in color, rarely or never longer than 85$\mu$.

F. Conidia with long obconically truncate base, 1-7, mostly 3-septate, 3.5-5 x 20-90$\mu$; conidiophores 3-5 x 15-60$\mu$.
S. TORVUM — *C. solani-torvi*

FF. Conidia with obconic base, 3-11 septate.

G. Conidia subhyaline, and only oldest ones colored, shorter ones fusiform, 2.5-5 x 25-90$\mu$; conidiophores 1-3 geniculate, sometimes clavate, 3-5 x 10-85$\mu$.
S. MELONGENA — *C. deightonii*

GG. Conidia very pale olivaceous, shorter ones not fusiform, 3-4 x 30-80$\mu$; conidiophores not geniculate, not clavate, 3-5 x 10-60$\mu$.
S. ASPERUM — *C. solani-asperi*

CC. Conidia more nearly cylindric than obclavate.

D. Conidia and conidiophores rarely as wide as 5$\mu$; conidiophores 3-5 x 10-100$\mu$, plainly branched.

E. Leaf spots sometimes present and then conidiophores in fascicles; conidiophores irregular in width; conidia 2.5-5 x 15-80$\mu$, sometimes with subtruncate base.
S. NIGRUM, S. GRACILE — *C. atro-marginalis*

EE. Leaf spots not present; conidiophores not in distinct fascicles, uniform in width; conidia 3-4.5 x 30-75$\mu$, sometimes with long obconically truncate base.
S. HIRTUM — *C. solani-hirti*

DD. Conidia and conidiophores often wider than 5$\mu$.

E. Conidiophores 3-5 x 10-40$\mu$.

F. Conidia almost straight, obclavato-cylindric, 4-7 x 20-100$\mu$; conidiophores sometimes on leaf hairs.
S. UMBELLATUM — *C. brachyclada*

FF. Conidia straight to strongly curved, cylindric, 3-6 x 25-110$\mu$; conidiophores not on leaf hairs.
S. JAMAICENSE — *C. pariensis*

EE. Conidiophores 15-120$\mu$ in length.

F. Effuse fruiting red to ferrugineous; conidiophores 5-8 x 20-100$\mu$, copiously branched; conidia 5-7.5 x 20-90$\mu$.
SOLANUM sp. — *C. incarnata*

FF. Effuse fruiting olivaceous or rarely almost black; conidiophores not strongly branched, not as wide us 8$\mu$.

G. Conidia with sharply obconic base, 1-11 septate, 4.5-7 x 20-110$\mu$, rarely longer than 60$\mu$; conidiophores subhyaline to pale in color, uniform in width, 3.5-6 x 20-120$\mu$.
S. VERBASCIFOLIUM — *C. costeroana*

GG. Conidia with obconically truncate base, 1-5 septate, 4-6.5 x 15-65$\mu$; conidiophores medium olivaceous brown, irregular in width, 5-7 x 15-100$\mu$.
SOLANUM sp. — *C. jaguarensis*

**Cercospora solani-asperi** Baker and Dale

Mycol. Papers, Commonwealth Mycol. Inst. 33: 105. 1951

Leaf spots none or indistinct, irregular yellowish areas on the upper leaf surface; fruiting hypophyllous, in scantily effuse olivaceous areas; stromata none, nonfasciculate; conidiophores short to long branches from procumbent threads, very pale olivaceous, uniform in color and width, branched, sparingly septate, not geniculate, bluntly rounded tips, 3-5 x 10-60$\mu$; conidia very pale olivaceous, obclavate, straight to curved, 3-11 indistinctly septate, base obconic, tip subacute, 3-4 x 30-80$\mu$.

HOST: *Solanum asperum* L. C. Rich.

TYPE: Arima Forest Reserve, Trinidad; *Solanum asperum;* W. T. Dale, No. 1729; Oct. 25, 1947.

DISTRIBUTION: Known only from the type locality.

NOTE: The nonfasciculate, pale conidiophores and the narrow, pale, obclavate conidia separate this species from the others on Solanum. See key, page 531.

**Cercospora atro-marginalis** Atkinson

Jour. Elisha Mitchell Sci. Soc. 8: 59. 1892

*Cercospora rigospora* Atk., Jour. Elisha Mitchell Sci. Soc. 8: 65. 1892

*Cercospora tosensis* Henn., Bot. Jahrb. v. Engl. 34: 605. 1905

*Cercospora nigri* Tharp, Mycologia 9: 112. 1917

*Cercospora solani-biflori* Sawada, Taiwan Agr. Res. Inst. Rept. 85: 123. 1943

Leaf spots mostly indistinct, when present circular to irregular, pale brown or tan to dingy gray center, dark to black border, 4-6 mm. in diameter; fruiting chiefly hypophyllous, mostly effuse, olivaceous, but sometimes when spots are present, not effuse; stromata lacking or a few brown cells in the stomatal openings; nonfasciculate to dense fascicles; conidiophores pale olivaceous or olivaceous brown, uniform in color, somewhat irregular in width, longer ones curved, sharply bent or undulate, sparingly septate, branched, rarely geniculate, minute spore scar at conic tip, 3-5 x 10-50$\mu$, or even 110$\mu$; conidia pale olivaceous, obclavate-cylindric to distinctly obclavate, multiseptate, straight to mildly curved, base subtruncate to sharply obconic, tip subobtuse, 2.5-5 x 15-80$\mu$.

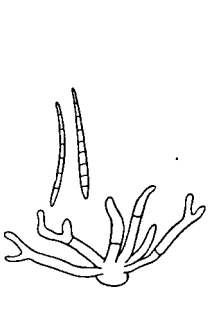


Fig. 187
*C. atro-marginalis*

Fig. 188
*C. brachyclada*

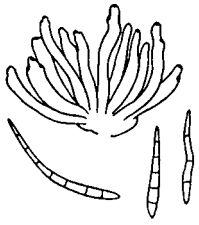


Fig. 189
*C. concors*

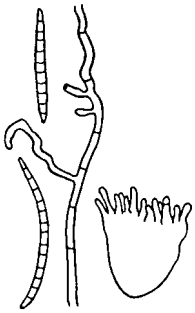


Fig. 190
*C. costeroana*

HOSTS: *Solanum nigrum* L. (*S. nodiflorum* Jacq.), *S. gracile* Otto, and possibly others of the nigra group. *S. biflorum* Lour.

TYPES: Auburn, Ala.; *Solanum nigrum* (?); Geo. F. Atkinson, No. 1359; 1890; (*C. rigospora*) Auburn, Ala.; *Solanum nigrum* (?); Geo. F. Atkinson, No. 1225; July 5, 1890; (*C. tosensis*) Akimachi, Prov. Tosa, Japan; *Solanum nigrum;* Yoshinaga, No. 43; Oct. 1903; (*C. nigri*) Palestine, Texas; *Solanum nigrum;* Lewis and Tharp, No. 192; Oct. 30, 1914.

DISTRIBUTION: Southern tier of states, Central America, Northern South America, West Indies, Bermuda, Uganda, China, Japan, and Formosa. Prof. Greene sent a specimen from Wisconsin.

NOTE: The only differences between Atkinson's two species are that the type of *C. atro-marginalis* has leaf spots and short conidiophores, while *C. rigospora* has plainly effuse fruiting and on the average slightly longer conidiophores. The conidia are identical, as are many of the fascicles. Therefore the two are considered as synonymous. I did not see K. Sawada's collection but Dr. Togashi of Japan sent me a specimen on *Solanum biflorum* and it fitted closely the description of *C. atro-marginalis*. See key, page 531.

**Cercospora atropae** Kvashnina

Bul. North Caucasian Plant Prot. Sta. **4**: 37. 1928

Leaf spots suborbicular, 0.5-5 mm. in diameter, center dull brown to gray, margin raised, darker brown; fruiting amphigenous; stromata small, filling stomatal openings, brown; fascicles 3-15 diverging stalks; conidiophores pale to medium brown, slightly paler and more narrow toward the tip, sparingly septate, not branched, 0-3 geniculate, straight to undulate, subtruncate tip, 4-6 x 15-100$\mu$, mostly 30-50$\mu$; conidia hyaline, acicular, curved, indistinctly multiseptate, base truncate, tip acute, 2-4 x 35-200$\mu$.

HOST: *Atropa belladonna* L.

TYPE: Kajala, Ciscaucasus; *Atropa belladonna;* E. S. Kvashnina; July, 1927. Another collection was made near Krasnodar, August, 1927.

DISTRIBUTION: Several collections in Northern Caucasia. S. B. Fenne found the same fungus in Virginia (Plant Dis. Reporter **26**: 280. 1942). It was collected there also by Dewey Stewart in 1934.

**Cercospora brachycarpa** Sydow

Ann. Mycol. **28**: 207. 1930

HOST: *Solanum obtusifrons* Bitter.

TYPE: Puerto La Cruz, D.F., Venezuela; *Solanum obtusifrons;* H. Sydow, No. 90; Dec. 24, 1927.

NOTE: The short, wide, 1-3 septate conidia with non-fasciculate conidiophores place this species in Cladosporium rather than in Cercospora.

**Cercospora brachyclada** Sydow

Ann. Mycol. **23**: 422. 1925

Leaf spots none or on upper leaf surface indistinct yellowish or brownish areas, on corresponding lower surface scantily effuse olivaceous patches, 2-10 mm. in extent; stromata none; fascicles none; conidiophores short branches, 4-5 x 10-25$\mu$, arising from procumbent branched threads, very pale olivaceous brown, sometimes on leaf hairs, sometimes arising from strands of intertwined threads, not geniculate; conidia pale olivaceous, obclavato-cylindric, straight to slightly curved, 1-10 septate, rarely constricted at septa, base mostly obconic, tip blunt, 4-7 x 20-100$\mu$.

HOST: *Solanum umbellatum* Mill.
TYPE: San José, Costa Rica; *Solanum umbellatum;* H. Sydow, No. 59; Dec. 24, 1924.
DISTRIBUTION: Southern North America to Northern South America.
NOTE: In some herbaria, this species is listed under the name, *C. solani,* but the latter has hyaline conidia with truncate base, and occurs on *Solanum nigrum.* See key, page 531.

**Cercospora browalliae** Chupp & Barrus, spec. nov.

Maculae orbiculares, albae, zonula lata purpurea cinctae, 0.5-2 mm. diam.; caespituli amphigeni, praecipue hypophylli, laxe sparse; stromata minuta, fusca; conidiophora pallide flavido-brunnea, septata, simplicia, vix geniculata, recta vel leniter curvata, 3.5-5 x 10-60$\mu$; conidia hyalina, anguste obclavata, ad basim truncata, ad apicem acuta, spurie multiseptata, recta vel leniter curvata, 2-4 x 20-120$\mu$.

Leaf spots circular, white centers and with a relatively wide purple margin, 0.5-2 mm. in diameter; fruiting chiefly epiphyllous; stromata composed of a few brown cells; fascicles 2-10 divergent stalks, or conidiophores sometimes borne singly, pale yellowish brown, uniform in color and width, sparingly septate, not branched, rarely geniculate, almost straight, tip rounded to subtruncate, 3.5-5 x 10-60$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2-4 x 20-120$\mu$.

HOST: *Browallia demissa* L. (*B. americana* L.)
TYPE: U.S.D.A. Rubber Station Farm, Turrialba, Costa Rica; *Browallia americana;* M. F. Barrus, No. 169; Mar. 25, 1946.
DISTRIBUTION: Costa Rica.
NOTE: This seems plainly distinct from any others of the acicular-spored species on the Solanaceae.

**Cercospora capsici** Heald & Wolf
Mycologia 3: 15. 1911

Leaf spots circular to subcircular, sometimes zonate, 3-10 mm. in diameter, brown to yellowish brown, finally with minute to fairly large gray center; fruiting amphigenous; stromata lacking or a few brown cells, rarely 15-30$\mu$ in diameter; fascicles 2-20 stalks, mostly 2-10, denser and with shorter conidiophores on upper leaf surface; conidiophores pale to medium dark olivaceous brown, paler and more narrow toward the tip, plainly multiseptate, almost never branched, straight, curved, or 1-3 abruptly geniculate, medium to large spore scar at truncate tip, 3.5-5 x 20-150$\mu$, base sometimes slightly wider; conidia hyaline, acicular, rarely obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse to subacute, 2.5-4 x 30-200$\mu$.

HOST: *Capsicum frutescens* L. (*C. annuum* L., *C. baccatum* L.)
TYPE: Cuero, Texas; *Capsicum annuum;* Heald & Wolf. No. 2592; Sept. 3, 1909.
DISTRIBUTION: In all the countries of the equatorial belt and as far north as the Gulf States and California.
NOTE: Kovachevski (Zeitschr. Pflanzenkr. 48: 321. 1938) after studying *C. capsici* Mar. & Stey. concluded that this Cercospora on Capsicum was really Cladosporium. It is true that the species which Marchal and Steyaert described as well as the one Unamuno (Bol. Soc. Espanola Hist. Nat. 32: 161. 1932) named *C. capsici* has effuse olivaceous growth like a Cladosporium; but the

conidiophores are in dense fascicles, and the conidia elongate, so that we do not agree with Kovachevski that the effuse type with colored conidia is a Cladosporium, but agree with Castellani (Riv. Agric. Subtrop. Trop. 42: 20. 1948) who says it is a true Cercospora, and gives the name *C. unamunoi.*

**Cercospora carolinensis** Tharp

Mycologia 9: 109. 1917

Leaf spots circular to angular, 2-5 mm. in diameter, brown, sometimes slightly zonate, no special margin; fruiting chiefly epiphyllous; stromata dark brown, slight to as large as 75$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown, rarely septate, not geniculate, not branched, straight or nearly so, not attenuated, rounded tip with small spore scar, sometimes small spore scars also on side near tip, 4-5.5 x 10-30$\mu$; conidia acicular to obclavate, hyaline to subhyaline, base truncate to subtruncate, tip subobtuse to subacute, straight to mildly curved, 2.5-4 x 30-130$\mu$.

HOST: *Solanum carolinense* L.

TYPE: Palestine, Texas; *Solanum carolinense;* Lewis & Tharp, No. 176; Oct. 30, 1914.

DISTRIBUTION: Since this has been confused with other species, the distribution is difficult to determine.

NOTE: See key, page 529 for separation from other species on Solanum.

**Cercospora cestri** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 40. 1942

Leaf spots none or indistinct yellowish areas on the upper surface; fruiting hypophyllous, scantily effuse, dark olivaceous to almost black; stromata lacking; nonfasciculate; conidiophores procumbent interlaced threads or short branches from such threads, medium brown, uniform in color and width, plainly multiseptate, rarely once geniculate, narrowly rounded tip, 2-3.5$\mu$ in width, of indeterminate length; conidia pale olivaceous to medium olivaceous brown, cylindro-obclavate, straight to mildly curved, base long obconically truncate, tip subobtuse, 2-10 septate, 2-4 x 20-85$\mu$.

HOST: *Cestrum latifolium* Lam.

TYPE: Upsata, in coffee farms, Est. Bolivar, Venezuela; *Cestrum latifolium;* H. Solters, No. 1532; Nov. 5, 1932.

DISTRIBUTION: Known only from the type locality.

**Cercospora chengtuensis** Tai

Lloydia 11: 40-41. 1948

Indefinite discolored spots on the upper surface; fruiting hypophyllous in an effuse sooty olivaceous layer forming roundish spots 1-1.5 mm. in diameter; stromata present, 20-25$\mu$ wide; conidiophores densely clustered, straight to slightly curved or ffexuous, rarely geniculate, scars not conspicuous, shouldered, dentate near the apex, branched near the base, sometimes nodulose, 1-5 septate, olivaceous or pale olivaceous brown, 3-4 x 30-80$\mu$; conidia olivaceous, subcylindric to clavato-cylindric, 3-14 indistinctly septate, base conico-truncate, 3.5-5.5 x 40-100$\mu$.

HOST: *Lycium chinense* Mill.

TYPE: Chengtu, Szechuan, China; *Lycium chinense;* Lee Ling, No. 126; 1943.
DISTRIBUTION: China, Japan.
NOTE: See also *C. lycii.* Dr. Togashi sent me a specimen from Japan.

**Cercospora concors** (Caspary) Saccardo
Syll. Fung. **4**: 449. 1886

*Fusisporium concors* Caspary, Monatsber K. Akad. Wiss. Berlin **1855**: 314
*Cercospora heterosperma* Bres., Ann. Mycol. **1**: 129. 1903

Leaf spots none to large dark brown irregular areas on upper surface; fruiting in effuse olivaceous layers on corresponding lower surface; nonfasciculate to dense fascicles, mostly the latter; stromata small or none; conidiophores very pale fuligenous or olivaceous brown, branched, septate, 0-2 mildly geniculate, often irregular in width and variously curved or bent, tip bluntly rounded, spore scars small, 4-7 x 15-75$\mu$; conidia cylindro-obclavate, subhyaline to very pale olivaceous or fuligenous, straight to mildly curved, rounded or short obconic base, tip subobtuse, 3.5-6 x 20-100$\mu$.

HOST: *Solanum tuberosum* L. (*S. utile-tuberosum* Klotzsch.)
TYPES: Schöneberg, near Berlin, Germany; *Solanum tuberosum* & *S. utile-tuberosum* R. Caspary; 1854; (*C. heterosperma*) Poland; *Solanum tuberosum;* B. Eichler; July 1900.
DISTRIBUTION: Wherever potatoes are grown in the north temperate zone, usually occurring sparingly when August rainfall and temperatures are high. It has been reported in most of the states east of the Mississippi River. Reports indicate it as general in Europe. Jones (Science n.s. **25**: 291. 1907) reported it first in America. Hansford (Proc. Linn. Soc. London **1942-3**: 34-67. 1943) reports it from Uganda. Tai (Lloydia **11**: 36. 1948) reports it from China.
NOTE: *C. concors* is differentiated from other species by its very pale conidiophores and almost hyaline conidia, and the serpentine conidiophores often in dense fascicles. See also *C. solanicola* for differences between the two species on *S. tuberosum.* Zweigbaumówna writes with pen in her publication saying that *C. heterosperma* is a synonym of *C. concors* (Acta. Soc. Bot. Polon. **2**: 26. 1925). Penzes (Magyarország Virág. Noveny. vonatk. Közlem. **1**: 301. 1927) makes the same suggestion. There was a collection of *C. heterosperma* in the Berlin herbarium marked co-type collected by A. Bondergew, Kursk, Russian Poland, Aug. 30, 1903. The writing was so indistinct that this spelling of names may not be correct. Stone (Mass. Agr. Exp. Sta. Ann. Rept. **20**: 128. 1908) mistook the fungus on potato for *Cladosporium fulvum* Cke, which he reported late in the season after heavy rains. See key, page 530.

**Cercospora costeroana** Petrak & Ciferri
Ann. Mycol. **30**: 311. 1932

Leaf spots large indistinct subcircular to irregular yellow to yellowish brown blotches 4-15 mm. in diameter; fruiting very scantily effuse on both surfaces, more abundant on lower surface; stromata lacking; mostly nonfasciculate, rarely 2-3 stalks from a common base; conidiophores branches from procumbent intertwining threads, usually somewhat wider than the basal threads, subhyaline to pale brown, sparingly septate, not geniculate, spore scars indistinct, tip bluntly rounded, fairly uniform in width, occasionally slightly constricted at the base, 3.5-6 x 20-120$\mu$; conidia subhyaline to pale olivaceous brown, cylindric to almost

obclavate, straight to mildly curved or undulate, 1-11 but generally three septate, base sharply obconic, tip obtuse, 4.5-7 x 20-110$\mu$, some specimens show none longer than 60$\mu$.

HOST: *Solanum verbascifolium* L. (*S. bicolor* Willd.)

TYPE: Llano Costero, San Domingo; *Solanum verbascifolium;* E. L. Ekman, No. 3649; Febr. 10, 1930.

DISTRIBUTION: Studied material from San Domingo, Jamaica, Colombia, and Sneed's Island, Florida.

NOTE: *C. solanacea,* the other species on *S. verbascifolium,* has definite fascicles, and differs in other respects. Muller sent a collection on *Solanum bicolor* Willd. from Venezuela and which resembles *C. costeroana* closely. It seems to have darker colored, sometimes geniculate conidiophores and darker colored, generally longer, more septate conidia. It probably is *C. costeroana.* The leaf hairs and the Cercospora species both show plainly that the host labelled *S. jamaicense* is a synonym of *S. verbascifolium.* See key, page 531.

**Cercospora crassa** Saccardo

Michelia **1**: 88. 1879

*Cercospora daturae* Peck, N. Y. State Mus. Ann. Rept. **35**: 140. 1884

HOSTS: *Datura stramonium* L., *D. metel* L.

TYPES: Italy; *Datura stramonium;* (*C. daturae*) Cold Spring, Putnam Co., N. Y.; *Datura stramonium.*

NOTE: The drawings of Saccardo (F. Italici No. 69) as well as the statements of Rands (Phytopath. **7**: 327. 1917) show that this is an Alternaria. Several varities of *C. crassa* have been described and apparently all are Alternaria.

*C. crassa* var. *eupatorii* Sacc., Michelia **2**: 557. 1882; on *Eupatorium cannabinum.*

*C. crassa* var. *solani nigri* Massal., Atti R. Ist. Veneto Sci. VIII **2**: 684. 1900; on *Solanum nigrum* and *S. tuberosum.*

*C. crassa* var. *sonchi* Woronichin, Monit. Jard. Bot. Tiflis **12**: 120. 1917; on Sonchus sp.

The species has been reported also on genera of the Cruciferae, such as *Lunaria annua* L. and *Iberis umbellata* L. In these instances it also seems to be an Alternaria.

**Cercospora daturicola** (Spegazzini) Ray

Mycologia **36**: 175. 1944

*Cercosporina daturicola* Spegazzini, Anal. Mus. Nac. B. Aires. **20**: 425. 1910

*Cercospora abchazica* Siemaszko, Bul. du Musée du Caucase **12**: 26. 1919

Leaf spots circular, 2-6 mm. in diameter, tan to medium brown or with center almost white; fruiting amphigenous; stromata none or a thin layer of very pale olivaceous cells; conidiophores borne singly or in groups of 2-15, divergent, very pale olivaceous, uniform in color, attenuated above each of the 1-5 abrupt geniculations, 0-3 indistinctly septate, not branched, straight to bent, subtruncate tip, 3-6 x 20-100$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to mildly curved, base truncate, tip subacute, 3-5 x 35-135$\mu$.

HOSTS: *Hyoscyamus niger* L., *Datura stramonium* L., *D. alba.*

TYPES: La Plata, Argentine; *Datura stramonium;* C. Spegazzini April, 1904; (*C. abchazica*) Ckhalta Abchaziae, Caucasia; *Hyoscyamus niger;* G. Woronov. et W. Siemaszko.

DISTRIBUTION: Argentine, Caucasia, Oklahoma, China.

NOTE: See also *C. jamaicensis.* I have not seen the type of *C. abchazica* but am considering it a synonym since Siemaszko says it occurs also on *Datura stramonium.* His description too fits *C. daturicola. C. abchazica* has been reported from Jamaica on *Datura suaveolens* (Jamaica Dept. Agr. Ann. Rept. Ending March 1944. 1945). It is possible that the fungus was *C. jamaicensis.*

CERCOSPORAE ON SOLANUM MELONGENA

A. Conidia hyaline, acicular, 2.5-5 x 40-120$\mu$; fascicles 3-15 stalks; conidiophores 4-6.5 x 20-150$\mu$. *C. melongenae*

AA. Conidia subhyaline to faintly colored, not acicular, 2.5-5 x 25-90$\mu$.

B. Conidiophores nonfasciculate, 3-5 x 10-85$\mu$; stromata lacking; fruiting hypophyllous, effuse; conidia mostly obclavate. *C. deightonii*

BB. Conidiophores in dense fascicles, 3-5 x 5-30$\mu$; stromata prominent; fruiting chiefly epiphyllous, not effuse; conidia mostly cylindric. *C. solani-melongenae*

**Cercospora deightonii** sp. nov.

Maculae distinctae, brunneae aut nullae, sed discolorationes epiphyllas indeterminatas flavidas efficiens; caespituli hypophylli, effusi, olivacei; stromata carentia; conidiophora nonfasciculata, pallidissime olivacea, ramosa, saepe clavata,

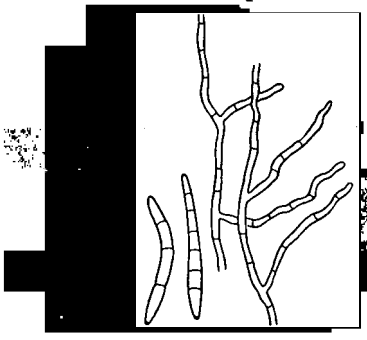


Fig. 191
*C. deightonii*

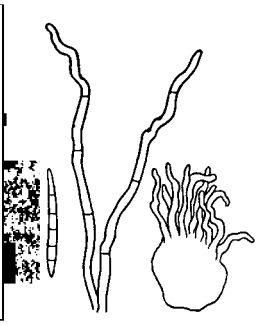


Fig. 192
*C. dulcamarae*

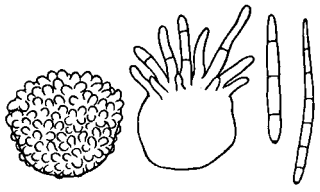


Fig. 193
*C. egenula*

vix septata, 0-3 geniculata, recta vel torta, ad apicem acuta, 3-5 x 10-85$\mu$; conidia subhyalina aut pallidissime olivacea, obclavata, recta vel leniter curvata, 3-9 septata, utrimque obtusa, 2.5-5 x 25-90$\mu$.

Leaf spots distinctly brown or indistinct yellowish areas on the upper surface; fruiting on the corresponding lower surface, effuse, olivaceous; stromata lacking; nonfasciculate; conidiophores single branches from procumbent threads, pale to very pale olivaceous or olivaceous brown, uniform in color, irregular in width or clavate, sparingly septate, rarely 1-3 geniculate, straight to tortuous, conic tip, 3-5 x 10-85$\mu$; conidia subhyaline or oldest ones very faintly colored, obclavate or shorter ones fusiform, straight to mildly curved, 3-9 septate, base long obconic, tip subacute to subobtuse, 2.5-5 x 25-90$\mu$.

HOST: *Solanum melongena* L.

TYPE: Sierra Leone; *Solanum melongena;* F. C. Deighton, No. 239; Dec. 17, 1928.

DISTRIBUTION: Sierra Leone, Japan.

NOTE: See key above for differences among the species on egg plant.

**Cercospora diffusa** Ellis & Everhart
Jour. Mycol. **4**: 3. 1888

On leaves and fruit pods, causing an olivaceous to almost black effuse fruiting layer over small to large areas, no definite leaf spots formed; fruiting amphigenous; stromata dark, filling stomatal openings; fascicles mostly dense, 10-30 stalks; conidiophores medium dark olivaceous brown, uniform in color, irregular in width, crooked, rarely 1-2 mildly geniculate, not branched, plainly 1-3 septate, tip rounded, conic or even subtruncate and with minute to medium sized spore scar, 4 6.5 x 10-40$\mu$, rarely 60$\mu$; conidia mostly cylindric, a few may be distinctly obclavate, subhyaline to pale yellowish olivaceous or olivaceous brown, straight to mildly curved, mostly 1-5 septate, base rounded or short to long obconic, tip bluntly rounded, 4-7.5 x 15-75$\mu$, rarely up to 110$\mu$ in length.

HOSTS: *Physalis heterophylla* Nees, *Ph. lanceolata* Michx.
TYPE: Manhattan, Kansas; *Physalis lanceolata;* W. T. Swingle; July, 1887.
DISTRIBUTION: Wisconsin, Kansas, New Jersey, Mexico, Costa Rica, Venezuela, and Ontario, Canada.
NOTE: This species has been reported also on Capsicum and Lycopersicum but the diffuse species on Lycopersicum may be *C. fuligena* Roldan and the one on Capsicum probably is *C. unamunoi.* It seems that each solanaceous genus has its own species of Cercospora. This species resembles *C. solanacea, C. rigospora,* and *C. modesta,* but can be distinguished from these by its wide, irregular conidiophores and more nearly cylindric conidia. See also *C. physalidicola* and *C. physalidis* for differences among the species on this host genus. Hansford (Proc. Linn. Soc. London **1942-3**: 34. 1943) reports *C. rigospora* on *Physalis peruviana* in Uganda. I believe this was *C. diffusa.*

**Cercospora dulcamarae** (Peck) Ellis
Jour. Mycol. **1**: 55. 1885

*Ramularia dulcamarae* Peck, N. Y. State Mus. Ann. Rept. **33**: 30. 1880
*Cercospora dulcamaraecola* Hollos, Ann. Mus. Nat. Hung. **4**: 370. 1906

Leaf spots indistinct slaty areas on upper leaf surface, or sometimes distinct and with gray centers, 0.5-3 mm. in diameter; on corresponding lower surface fruiting in effuse slate-colored to olivaceous patches; stromata none or filling stomatal openings; nonfasciculate to 2-12 stalks; conidiophores subhyaline to very pale olivaceous, straight or sometimes once abruptly geniculate, septa indistinct or none, not branched or when nonfasciculate short branches from procumbent threads, but conidia arising from geniculation may appear like a branch, small spore scar at rounded to subtruncate tip, 4-6 x 10-45$\mu$, rarely 60$\mu$ in length; conidia obclavate, hyaline, straight or nearly so, obconically truncate to long sharply obconic base, subobtuse tip, septa indistinct, 3.5-7 x 15-75$\mu$ (Hollos says 70-150$\mu$), mostly 3.5-5 wide.

HOST: *Solanum dulcamara* L.
TYPES: Verona, N. Y.; *Solanum dulcamara;* C. H. Peck; Aug.; (*C. dulcamaraecola*) Kecskemét, Hungary; *Solanum dulcamara;* L. Hollos.
DISTRIBUTION: New York, Wisconsin, and Hungary. Probably sparingly present wherever the host is plentiful.
NOTE: This differs from all the other species on this host genus by having hyaline obclavate conidia with obconic base. I have not seen the Hollos species but his description fits the Peck type. Besides he says *C. dulcamaraecola* is

distinct because *C. dulcamarae* has brown conidia. There are in European herbaria specimens marked *C. dulcamaraecola* on *Solanum tuberosum*. In each instance the fungus proved to be *C. concors*. See key, page 529.

**Cercospora egenula** (H. Sydow) Chupp & Doidge
Bothalia **4**: 885. 1948

*Cercoseptoria egenula* Sydow, Ann. Mycol. **33**: 235. 1935

Leaf spots subcircular to angular, 2-6 mm. in diameter, various shades of brown, often with a yellow margin; fruiting epiphyllous; stromata medium to dark brown, irregular, 20-80$\mu$ in diameter; fascicles dense, compact; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, not septate, not branched, not geniculate, undulate, conic to rounded apex, 2.5-4.5 x 5-35$\mu$; conidia hyaline to subhyaline, shorter ones distinctly cylindric, and the very long ones obclavate or almost acicular, straight or nearly so, indistinctly 1-5 septate, base subtruncate to rounded, tip obtuse, 3-6 x 20-85$\mu$.

HOST: *Solanum panduraeforme* Drege.

TYPE: Barberton, Transvaal, S. Afr.; *Solanum panduraeforme;* L. Liebenberg, No. 25999; May 1931.

DISTRIBUTION: Known only from the type locality.

NOTE: Cercoseptoria is based on dense fascicles of very short conidiophores. The length of the conidiophores is such a relative character that fully half of the proposed species might be doubtful. Consequently I am considering all Cercoseptoria species with colored conidiophores as Cercospora. The hyaline, wide, almost acicular conidia and very short epiphyllous conidiophores separate this species from others on Solanum. See key, page 529.

**Cercospora fuligena** Roldan
Philipp. Jour. Sci. **66**: 8. 1938

Leaf spots indistinct; fruiting effuse, hypophyllous, brown, in small angular colonies; stromata slight or none; fasciculate, 2-7 spreading stalks to dense; conidiophores pale to medium brown, septate, not branched, slightly geniculate, 3.5-5 x 25-70$\mu$; conidia obclavate to cylindro-obclavate, straight to mildly curved, subhyaline, indistinctly multiseptate, base rounded to long obconic, tip conic, 3.5-5 x 15-120$\mu$.

HOST: *Lycopersicum esculentum* Mill.

TYPE: College of Agr. Campus, Luzon, Laguna, Philippines; *Lycopersicum esculentum;* E. F. Roldan, No. 32; Mar. 5, 1934.

DISTRIBUTION: Philippines, Japan, China. Ramirez (Mex. Sec. Agr. y Fomento. Dir. Agr. Bol. 107: 62. 1922) reports *C. diffusa* on tomato. It may have been *C. fuligena*. The same disease is reported from Japan.

NOTE: *C. canescens, C. physalidis,* and *C. diffusa* have been reported on tomato, but it is probable that there was a mistake in species identity. I have not had an opportunity of studying the Roldan collection on Lycopersicum, but obtained a specimen from Dr. Togashi of Japan.

**Cercospora incarnata** P. Hennings
Hedwigia **48**: 17. 1909

Leaf spots at first none, later irregular yellowish areas on the upper surface; on the corresponding lower surface effuse fruiting, red to ferrugineous, 2-5 mm. in extent; stromata lacking; nonfasciculate; conidiophores branches from pro-

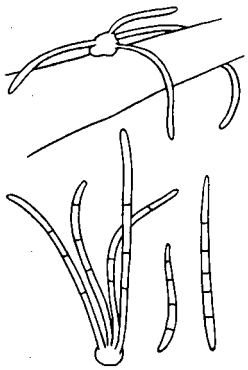


Fig. 194
*C. solani-hirti*

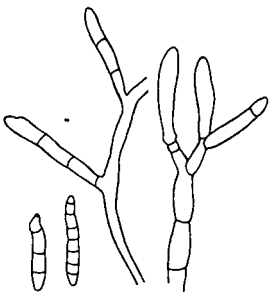


Fig. 195
*C. incarnata*

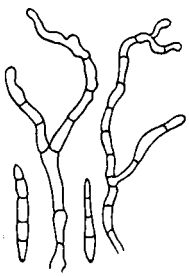


Fig. 196
*C. jaguarensis*

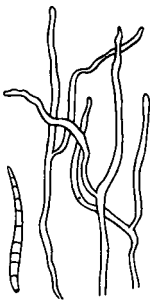


Fig. 197
*C. lanugiflori*

cumbent threads, in turn branched copiously, medium olivaceous brown to almost carmine, uniform in color, extremely irregular in width, plainly multiseptate, not geniculate, curved to tortuous, bluntly rounded tip, 5-8 x 20-100$\mu$; conidia pale to medium olivaceous, cylindric, straight or almost so, bluntly rounded ends, occasionally catenulate, 2-12, mostly 2-5 septate, 5-7.5 x 20-90$\mu$.

HOST: Solanum sp.

TYPE: Sao Paulo, Capital, Brazil; Solanum sp.; A. Puttemans, No. 632; Febr. 1903.

DISTRIBUTION: Known only from the type locality.

NOTE: The red color of the fruiting, the extremely irregular, copiously branched, nonfasciculate, wide conidiophores and wide conidia distinguish this species from others on Solanum. Ellis used the name *C. incarnata* in 1897 for a fungus on Asclepias, but as it is a synonym of *C. clavata*, the Hennings name is retained. See key, page 531.

**Cercospora jaguarensis** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. 8 (52): 48. 1942

Leaf spots none or indistinct brownish areas on the upper leaf surface; fruiting hypophyllous, sparingly effuse, olivaceous, 0.5-5 mm. in extent; stromata lacking; nonfasciculate; conidiophores branches from procumbent threads, medium olivaceous brown, uniform in color, irregular in width or constricted at the septa, plainly multiseptate, not geniculate, straight to tortuous, rounded to conic tip, 5-7 x 15-100$\mu$; conidia pale olivaceous brown, cylindric, straight or nearly so, 1-5 but mostly 1-3 septate, often constricted at the septa, base obconically truncate, tip obtuse, 4-6.5 x 15-65$\mu$.

HOST: Solanum sp.

TYPE: Jaguara, Caracas, Venezuela; Solanum sp.; Muller, Whetzel, and Tamayo, No. 2885; March 2, 1939.

DISTRIBUTION: Known only from the type locality.

NOTE: The only other species on Solanum and having 1-5 septate cylindric conidia borne on nonfasciculate conidiophores is *C. brachycarpa*. The latter grows mostly on the leaf hairs, has shorter conidia, and in other ways differs from the Jaguara collection.

**Cercospora jamaicensis** sp. nov.

Maculae suborbiculares vel angulatae, 1-5 mm. diam., pallide brunneae vel griseae; caespituli amphigeni; stromata subglobosa, fusca, 15-40$\mu$ diam.; conidiophora dense fasciculata, pallide olivaceo-brunnea, sursum attenuata et subhyalina, vix septata, haud geniculata, simplicia, recta vel sinuosa, 2-3.5 x 5-35$\mu$; conidia subhyalina, obclavato-cylindrata, recta vel leniter curvata, spurie 3-7 septata, ad basim subtruncata, ad apicem obtusa vel acuta, 2-3.5 x 20-75$\mu$.

Leaf spots subcircular to angular, 1-5 mm. in diameter, center greenish brown, tan or almost gray, margin slightly darker; fruiting plainly amphigenous; stromata 15-40$\mu$ in diameter, brown, subglobular; fascicles dense, compact; conidiophores pale olivaceous brown, narrow and almost hyaline, conic tip, not or rarely septate, not geniculate, not branched, straight to curved or undulate, 2-3.5 x 5-35$\mu$; conidia subhyaline, in mass plainly colored, obclavato-cylindric or rarely obclavate, straight to mildly curved, indistinctly 3-7 septate, base obconically truncate, tip blunt to conic, 2-3.5 x 20-75$\mu$.

HOST: *Datura suaveolens* Humb. + Bonpl. (*Brugmansia suaveolens* [H. + B.] Bercht. + Presl.), *D. arborea* L.

TYPE: Shaw Park Hotel above Ocho Rios, Jamaica; *Datura suaveolens* (*Brugmansia suaveolens*); C. E. Chardon, No. 39; April 8, 1945.

DISTRIBUTION: Jamaica, Costa Rica.

NOTE: See also *C. daturicola.*

**Cercospora jochromatis** Patouillard

Bul. Soc. Mycol. France. **11**: 233. 1895

Leaf spots circular, 3-10 mm. in diameter, olivaceous to lead colored or sometimes the upper center almost gray; fruiting hypophyllous; stromata filling stomatal openings, medium brown; fascicles dense to very dense, fairly compact; conidiophores in mass medium brown, singly pale olivaceous brown, uniform in color, irregular in width, sparingly septate, not branched, rarely geniculate, curved to tortuous, tip bluntly rounded to conic, 4-6 x 10-25$\mu$; conidia cylindric, pale olivaceous, straight to undulate, mostly 3-7 septate, base obconic to long obconically truncate, tip obtuse, 4.5-7 x 30-160$\mu$, usually 30-90$\mu$.

HOST: Jochroma sp.

TYPE: Entre Quito et Seminario major, Ecuador; Jochroma sp.; G. de Lagerheim; Febr., 1892.

DISTRIBUTION: Known only from the type locality.

**Cercospora lanugiflori** Chupp & Muller

Bol. Soc. Venez. Cien. Nat. 8 (52): 49. 1942

Leaf spots indistinct; fruiting effuse, dark to black, epiphyllous, covering minute areas, rarely hypophyllous; stromata lacking; nonfasciculate; conidiophores short branches from procumbent intertwined threads, medium to dark olivaceous brown, uniform in color, irregular in width, rarely with intercalary swellings, plainly multiseptate, not geniculate, undulate to tortuous, tip rounded bluntly, 4-7 x 10-30$\mu$; conidia pale to medium olivaceous brown, obclavate to cylindro-obclavate, straight to curved, closely and plainly septate, base long obconic, tip obtuse, 5-7.5 x 25-85$\mu$.

HOST: *Solanum lanugiflorum* (?)

TYPE: Los Teques, Edv. Miranda, Venezuela; *Solanum lanugiflorum* (?) A. S. Muller, No. 2114; Mar. 11, 1938.
DISTRIBUTION: Known only from the type locality.
NOTE: The nonfasciculate, wide, short conidiophores, with wide, obclavate conidia, and epiphyllous fruiting separate this species from the others on Solanum. Should the host be S. *lanuginosum* Humb. + Bonpl.? See key, page 530.

**Cercospora lycii** Ellis & Halsted
Jour. Mycol. 4: 7. 1888

Leaf spots circular to oval, 2-7 mm. in diameter, pale tan to dingy gray center, wide medium brown margin; fruiting chiefly hypophyllous; slight brown stromata; fascicles mostly 2-7 stalks; conidiophores pale to medium brown, slightly paler and more narrow toward the tip, multiseptate, not branched, 0-4 mildly to abruptly geniculate, medium sized spore scar at subtruncate tip, 4-6 x 45-200$\mu$; conidia acicular to obclavate, hyaline, straight to mildly curved, indistinctly multiseptate, truncate to subtruncate base, acute tip, 2-4 x 50-200$\mu$.
HOSTS: *Lycium pallidum* Miers., *L. vulgare* Dunal. (*L. halimifolium* Mill.)
TYPE: Ames, Iowa; *Lycium vulgare;* B. D. Halsted; Sept. 1887.
DISTRIBUTION: Studied specimens from Iowa, Wisconsin, West Virginia, Oklahoma, and Poland.
NOTE: See also *C. chengtuensis.*

**Cercospora marcelliana** sp. nov.

Maculae suborbiculares, 2-12 mm. diam., flavae vel brunneae, tandem leniter expallentes, in epiphyllo interdum zonula ferruginea cinctae; caespituli potissime epiphylli; stromata subglobosa, atro-fusca, 15-50$\mu$ diam.; conidiophora vix unica, fere dense fasciculata, pallidissime olivaceo-brunnea, sursum attenuata et

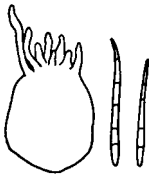


Fig. 198
*C. marcelliana*

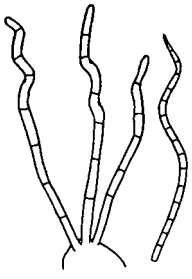


Fig. 199
*C. melongenae*

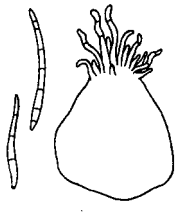


Fig. 200
*C. modesta*

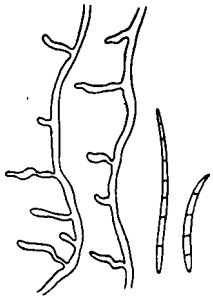


Fig. 201
*C. pariensis*

pallidora, continua, simplicia, haud geniculata, recta vel sinuosa, ad apicem acuta, 2-4 x 5-25$\mu$; conidia hyalina vel subhyalina, obclavata, fere recta, spurie 3-7 septata, ad basim subtruncata, ad apicem subacuta, 2-3.5 x 15-70$\mu$.

Leaf spots subcircular, 2-12 mm. in diameter, at first yellowish to brown, gradually turning to gray, occasionally with a ferrugineous margin; fruiting chiefly epiphyllous; stromata subglobular, dark brown, 15-50$\mu$ in diameter; fascicles dense or rarely nonfasciculate (branches from procumbent threads); conidiophores in mass medium brown, singly pale to very pale olivaceous brown, the more narrow tip almost hyaline, not septate, not branched, not geniculate, straight

to undulate, tip conic, 2-4 x 5-25$\mu$; conidia hyaline to subhyaline, obclavate or the shortest ones cylindric, straight or nearly so, indistinctly 3-7 septate, base subtruncate to obconically truncate, tip subacute, 2-3.5 x 15-70$\mu$.

HOST: *Solanum micranthum* Willd.

TYPE: Banks of Neveri, near Barcelona, Venezuela; *Solanum micranthum;* C. E. Chardon, No. 2670; May 26, 1938.

DISTRIBUTION: Known only from the type locality.

NOTE: The hyaline, narrow, obclavate conidia and short conidiophores in dense fascicles separate this species from all the others on Solanum. Named in honor of Miss Burns, an efficient secretary. See key, page 529.

**Cercospora melongenae** Welles

Phytopath. **12**: 63. 1922

Leaf spots circular to irregular, 4-10 mm. in diameter, brown to grayish brown on upper surface and dull brown below; fruiting amphigenous but more abundant on lower surface; stromata mostly only a few dark brown cells; fascicles 3-12 or rarely more stalks; conidiophores pale to medium dark brown, slightly paler and more narrow toward the tip, sparingly septate, not branched, geniculation variable, from none and perfectly straight stalk to closely undulate or geniculate from the base to the tip, the shorter ones on some collections have 0-2 abrupt geniculations, large spore scar at rounded to subtruncate tip, 4-6.5 x 20-150$\mu$, some collections show none longer than 60$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2.5-5 x 40-120$\mu$.

HOST: *Solanum melongena* L.

TYPE: Los Banos, Philippines; *Solanum melongena.*

DISTRIBUTION: Northern South America, Central America, Trinidad, Mexico, Mauritius, Central Africa, India, Japan, China, Formosa, and the Philippines. It is possible that it occurs in the southern United States, but that it has been overlooked inasmuch as the spots resemble the one caused by Alternaria.

NOTE: Welles did not expressly designate a type. I have considered Philippine Fungi No. 11664, collected by C. G. Welles in Los Banos, July 6, 1921, as the possible cotype. See also *C. solani-melongenae* and *C. deightonii* for differences among the species on eggplant. *C. melongenae* in many ways resembles other species on Solanum, especially *C. solanicola,* and later it may be found through cross inoculation that it is a synonym. At present there seem to be enough slight differences in width, shape, and tip of conidium; size and color of stromata; density of fascicles; length, color, septation, geniculation, width, attenuation, and tip of conidiophore to consider it distinct. Apparently each Solanum genus has its own Cercospora species. E. W. Mason (May 21, 1943) writes: "*Cercospora solani-melongenae* Hori is a *nomen nudum* which was withdrawn by Hori in favour of *C. melongenae* Welles. The particulars are given by Arata Ideta, Supplement to Hand-Book of the plant diseases of Japan II, pp. 996-7, 1926. The translation of the relevant part runs: 'Dr. Hori determined this fungus to be a new species, and named it *Cercospora solani-melongenae.* No characteristics of this fungus have yet been published. However, Dr. Hori says that this species is most probably the same as *Cercospora melongenae* which Welles discovered in the Philippine Islands in 1922.'—In Shirai & Hara, 'A List of Japanese fungi hitherto known,' 3rd ed. p. 70, 1927, the species is cited as: '*C. melongenae* Welles—(*C. solani-melongenae* Hori in Agr. World 12: 9).'" See key, page 538.

**Cercospora modesta** Sydow
Ann. Mycol. **25**: 141. 1927

Leaf spots angular, 2-5 mm. in diameter, on upper surface reddish brown, below dull brown or indistinct; fruiting chiefly epiphyllous; stromata dark brown, globular, 20-60$\mu$ in diameter; fascicles dense; conidiophores very pale fuligenous or olivaceous brown, irregular in width, septa indistinct, not geniculate, undulate, rarely branched, blunt tip, spore scars not evident, 3-6 x 15-75$\mu$; conidia cylindro-obclavate, very pale fuligenous, straight to mildly curved, septa indistinct, base short obconic to long obconically truncate, tip subacute to subobtuse, 4-6 x 30-80$\mu$.

HOSTS: *Solanum stramonifolium* Jacq., Solanum sp.
TYPE: San José, Costa Rica; Solanum sp. (novae?); H. Sydow, No. 50; Jan. 3, 1925.
DISTRIBUTION: Costa Rica, Venezuela.
NOTE: Definite leaf spots; stromata; dense fascicles, epiphyllous; and the lengths and widths of the conidia and conidiophores separate this from most of the other species on Solanum. See key, page 530.

**Cercospora nicandrae** sp. nov.

Maculae angulatae, plerumque venulis limitatae, atro-fuscae, 3-25 mm. diam.; caespituli epiphylli; stromata minutissima; conidiophora laxe fasciculata, pallidissime olivacea, sursum subhyalina et attenuata, vix geniculata, simplicia, recta vel fortiter flexuosa, 3.5-5 x 15-50$\mu$; conidia hyalina vel subhyalina, cylindrata, fere recta, ad basim truncata, ad apicem acuta vel obtusa, 1-7 septata, 3-5 × 20-80$\mu$.

Leaf spots dark brown to almost black, angular, bounded by leaf veins, 3-25 mm. in length; fruiting epiphyllous; stromata none or a few pale brown cells; fascicles 2-12 spreading stalks; conidiophores pale to very pale olivaceous, almost colorless subtruncate tip, not branched, straight to sharply bent or torulose, 0-2 geniculate, 3.5-5 x 15-50$\mu$; conidia hyaline to subhyaline, cylindric or longest ones mildly attenuated, straight or nearly so, base truncate, tip obtuse or conic, 1-7 septate, 3-5 x 20-80$\mu$, mostly 20-50$\mu$.

HOST: *Nicandra physaloides* Gaertn.
TYPE: Hacienda La Molina, Experiment Station, Lima, Peru; *Nicandra physaloides;* E. V. Abbott; Nov. 6, 1929.
DISTRIBUTION: Peru.

**Cercospora nicotianae** Ellis & Everhart
Proc. Acad. Sci. Phila. **45**: 170. 1893

*Cercospora raciborskii* Sacc. & Sydow, Syll. Fung. **16**: 1070. 1902

Leaf spots fairly large, circular, sometimes zonate, 2-15 mm. in diameter, brown, tan, or dingy gray, mostly with a darker border; fruiting amphigenous; stromata lacking or a few dark brown cells; conidiophores mostly in spreading fascicles of 2-7, but may be in dense fascicles, medium brown base, paler upward, shorter ones attenuated but longer ones usually uniform in width, multiseptate, not branched, slightly undulate or 1-5 mildly to abruptly geniculate, large spore scar at subtruncate to rounded tip, 4-5.5 x 20-600$\mu$, with individual collections showing lengths of 20-50$\mu$ or 50-150$\mu$; conidia hyaline, acicular, straight to variously curved, indistinctly multiseptate, base truncate, tip acute to subacute, 3-4 x 35-150$\mu$, occasionally 5 x 300$\mu$.

HOSTS: *Nicotiana repanda* Willd., *N. tabacum* L., Nicotiana sp.
TYPES: Raleigh, N. Car.; tobacco; Gerald McCarthy; Oct. 1891; (*C. raciborskii*) Java; *Nicotiana tabacum;* M. Raciborski.
DISTRIBUTION: Found in all tobacco growing sections, excepting the farthest northern and southern limits of the hosts. It seems especially prevalent between 35° north and 35° south latitude.
NOTE: See also Mycologia **23**: 368 and 386. 1931, and Bot. Inst. Buitenzorg. p. 40. 1900, for a further description. *C. solanicola* has been reported on tobacco, but the species probably was *C. nicotianae*. Matsumoto and Nagaoka in the Journal of Plant Protection have listed a *Cercospora raciborskii* Mat. & Nag., but I have been unable to determine whether their species also was on Nicotiana. Reitsma, Sloof, and Thung (Chron. Nat. **103**: 94-98. 1947) believe there are two kinds of Cercospora leaf spots on tobacco, one caused by *C. nicotianae* and the other by *C. raciborskii*. All of the specimens I saw and which were labelled as the latter species were the same as *C. nicotianae*.

**Cercospora pariensis** sp. nov.

Maculae nullae, sed decolorationes epiphyllas indeterminatas flavidas efficiens; caespituli effusi, olivacei, hypophylli; stromata carentia; conidiophora nonfasciculata, subhyalina vel pallide olivacea, ramosa, fere continua, vix geniculata, recta vel sinuosa, ad apicem acuta, 3-4.5 x 10-40$\mu$; conidia subhyalina vel pallide flavo-olivacea, recta vel fortiter curvata, 3-13 septata, utrimque acuta vel obtusa, 3-6 x 25-110$\mu$.

Leaf spots none or indistinct yellowish areas on the upper surface; fruiting effuse, olivaceous, on corresponding lower surface, 3-7 mm. in extent; stromata lacking; non-fasciculate; conidiophores short branches from procumbent threads, usually slightly wider than the mycelial strands, subhyaline to pale olivaceous, sparingly septate, mildly irregular in width, occasionally once geniculate, straight to curved or undulate, conic tip, 3-4.5 x 10-40$\mu$; conidia cylindric, subhyaline to pale yellowish olivaceous, straight to strongly curved, 3-13 septate, ends rounded or base almost sharply obconic, 3-6 x 25-110$\mu$.

HOSTS: *Solanum jamaicense* Mill., Solanum sp.
TYPE: Chacachacare Island, Gulf of Paria, Trinidad; Solanum sp.; C. E. Chardon, No. 33; Dec. 20, 1944.
DISTRIBUTION: Trinidad, Jamaica.
NOTE: The cylindric, sometimes strongly curved, pale colored conidia, 3-5$\mu$ in width, and the nonfasciculate, pale conidiophores separate this from other species on Solanum. See key, page 531.

**Cercospora petuniae** (Saito) Muller & Chupp
Arch. Inst. Biol. Veg. Rio de Janeiro **3**: 96. 1936

*Cercosporina petuniae* Saito, Trans. Tottori Soc. Agr. Sci. **3**: 271. 1931

Leaf spots circular, 1-5 mm. in diameter, dingy gray center, dark brown margins which sometimes are raised; fruiting amphigenous but at times chiefly epiphyllous; stromata lacking or merely a few dark cells; fasciculate, 1-8 spreading stalks; conidiophores pale to medium yellowish brown or olivaceous brown, slightly paler and more narrow toward the apex, plainly multiseptate, rarely branched, 0-2 geniculate, straight to moderately bent, subtruncate tip, 4-6.5 x 40-300$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate,

base truncate, tip subacute, 3-4.5 x 40-200$\mu$. Some collections show only relatively short conidiophores and conidia.

HOSTS: *Petunia hybrida* Vilm., *P. parviflora* Juss., *P. violacea* Lindl., Petunia sp.

TYPES: Vicosa Escola, Minas Geraes, Brazil; Petunia sp.; A. S. Muller, No. 659; Dec. 20, 1933; Tottori, Japan; *Petunia violacea;* H. Saito; Sept. 17, 1928; also Toyama, Japan; June 30, 1929.

DISTRIBUTION: Minas Geraes, Oklahoma, Wisconsin, Guatemala, Japan.

NOTE: This species has been mistaken for *C. canescens,* which it resembles in having long acicular conidia. Petunia being closely related to Nicotiana, and the Cercosporae on the two genera resembling each other closely, the question naturally arises whether the two species are not identical. No detailed cross inoculations were made, but some preliminary ones gave negative results. Furthermore, *C. nicotianae* has broader conidia and conidiophores, a slightly greater average number of stalks to the fascicle, and usually definitely more geniculations than does *C. petuniae.* They, therefore, are considered distinct.

**Cercospora physalidicola** Spegazzini

Anal. Mus. Nac. B. Aires. II. **3**: 342. 1899

Leaf spots indistinct; fruiting effuse, hypophyllous, 3-5 mm. in extent, yellowish olivaceous; stromata small, dark brown; fascicles mostly dense, divergent; conidiophores medium dark brown, uniform in color and width, plainly multiseptate, not branched, 0-3 geniculate, curved to mildly tortuous, subtruncate tip, 4-5.5 x 100-250$\mu$ or longer; conidia hyaline, acicular, curved, indistinctly multiseptate, base truncate, tip acute, 2.5-4 x 30-130$\mu$.

HOST: *Physalis viscosa* L.

TYPE: La Plata, Buenos Aires, Argentine; *Physalis viscosa;* C. Spegazzini, No. 936; March 26, 1889.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. diffusa* and *C. physalidis* for differences among the species on this host genus. *C. physalidis* differs from the Spegazzini collection in having definite leaf spots, wider, paler conidiophores, and wider conidia with slightly more blunt tips.

**Cercospora physalidis** Ellis

Amer. Nat. **16**: 810. 1882

*Cercospora physalicola* Ellis & Barth., Erythea **4**: 28. 1896

Leaf spots circular to subcircular, 3-10 mm. in diameter, brown to grayish brown, slightly zonate, sometimes bordered by a narrow raised line; fruiting amphigenous; stromata lacking or small, brown; conidiophores borne singly to dense fascicles, divergent, very pale olivaceous to pale olivaceous brown, uniform in color and width, meagerly septate, not branched, occasionally 1-2 geniculate, straight or only slightly curved, large spore scar at bluntly round or sometimes subtruncate tip, 4-6.5 x 20-250$\mu$, many collections showing them only 20-60$\mu$ in length; conidia hyaline, acicular, shortest ones may be cylindric, straight to variously curved, indistinctly multiseptate, base truncate, tip subobtuse, 3-5 x 25-220$\mu$.

HOSTS: *Physalis Alkekengi* L., *P. heterophylla* Nees, *P. lanceolata* Michx. (*P. longifolia Nutt.*), *P. lobata* Torr., *P. pubescens* L., *P. subglabrata* Mack. & Bush, *P. virginiana* Mill. (*P. virginica* A. Gray), *P. viscosa* L., Physalis sp.

TYPES: Lexington, Ky.; *Physalis lanceolata* var. *laevigata* Gray; W. A. Keller-

man; (*C. physalicola*) Rockport, Kansas; *Physalis virginica;* Elam Bartholomew; July 27, 1894.

DISTRIBUTION: Material was studied from Kansas, Kentucky, Indiana, Wisconsin, Colorado, Mexico, San Domingo, and Brazil. It also has been reported from Iowa, Missouri, Texas, Sierra Leone, India, Japan, and China.

NOTE: See also *C. physalidicola* and *C. diffusa* for differences among the species on this host genus. This species has wrongly been reported on tomato.

**Cercospora puyana** Sydow

Ann. Mycol. 37: 431. 1939

Leaf spots subcircular to irregular, 1-4 mm. in diameter or coalescing into large areas, pale to medium brown; fruiting amphigenous, on upper surface with dark brown stromata, 35-60$\mu$ in diameter and dense to very dense compact fascicles, on lower surface stromata lacking, nonfasciculate; conidiophores in mass

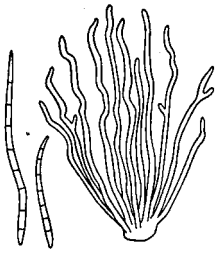


Fig. 202
*C. puyana*

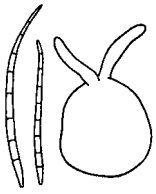


Fig. 203
*C. rugosi*

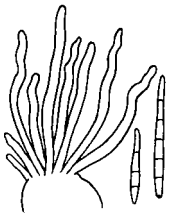


Fig. 204
*C. solanacea*

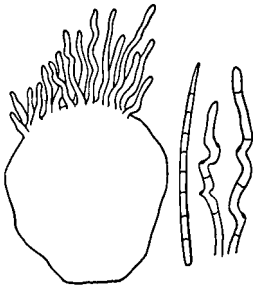


Fig. 205
*C. solani*

medium olivaceous brown, singly pale to very pale yellowish olivaceous, uniform in color and width, indistinctly septate, not geniculate, branched, variously curved, conic tip, 2.5-4 x 10-85$\mu$; conidia cylindro-obclavate, pale to very pale yellowish olivaceous, straight to mildly curved, indistinctly 3-7 septate, medium to long obconically truncate base, conic tip, 2-3.5 x 40-115$\mu$.

HOST: *Solanum trachycyphum* Bitter.

TYPE: Puyo, Prov. Napo Pastaza, Ecuador; *Solanum trachycyphum;* H. Sydow, No. 870; Febr. 17, 1938.

DISTRIBUTION: Known only from the type locality.

NOTE: The amphigenous fruiting, densely fasciculate above, nonfasciculate below, and the very narrow, very pale yellowish conidiophores and conidia separate this species from others on Solanum. See key, page 530.

**Cercospora rugosi** sp. nov.

Maculae typicae nullae, sed decolorationes epiphyllas indeterminatas flavidas efficiens; caespituli tenuiter effusi, olivacei, amphigeni; stromata carentia; conidiophora unica aut 2-7 diverse fasciculata, aequabiliter flavo-brunnea, evidenter multiseptata, vix ramosa et geniculata, recta vel fortiter flexuosa, 3-5 x 20-150$\mu$; conidia subhyalina vel pallidissime olivacea, obclavata, recta vel leniter curvata, spurie multiseptata, utrimque subobtusa, 2-4.5 x 20-85$\mu$.

Leaf spots indistinct or none; fruiting sparingly effuse, olivaceous, amphige-

nous, 1-4 mm. in extent; stromata lacking; fasciculate, 1-7 stalks, divergent; conidiophores pale to medium yellowish brown, uniform in color, slightly attenuated, plainly multiseptate, sparingly branched, rarely geniculate, straight to sinuate or tortuous, rounded to conic apex, 3-5 x 20-150$\mu$; conidia subhyaline to very pale olivaceous, obclavate, shortest ones may be cylindric, straight to mildly curved, indistinctly multiseptate, base obconic, tip subobtuse, 2-4.5 x 20-85$\mu$.

HOST: *Solanum rugosum* Dunal.

TYPE: La Vega, Trail from Jarabacoa to Constanra, San Domingo; *Solanum rugosum;* C. E. Chardon, No. 1156; Sept. 13, 1937.

DISTRIBUTION: Known only from the type locality.

NOTE: The fascicles of 2-7 stalks, the long conidiophores, and the very pale obclavate narrow conidia differentiate this species from others on Solanum. See key, page 530.

**Cercospora sarachae** (Sydow) n. comb.

*Cercosporina sarachae* Sydow, Ann. Mycol. **23**: 428. 1925

Leaf spots indistinct or none; fruiting in scantily effuse olivaceous to almost ferruginous patches on lower leaf surface, sometimes covering the leaf surface; stromata a few large brown cells; most fascicles not dense, or nonfasciculate; conidiophores subhyaline to pale olivaceous brown, often plainly attenuated, 0-2 geniculate, the geniculations being near the tip, which rarely is bifurcate, septa none or indistinct, 4-6 x 10-50$\mu$; conidia cylindric, subhyaline to very pale olivaceous, sometimes showing bifurcation and spore scars as do the conidiophores, almost straight, 1-5 septate, at times catenulate, base long obconic, tip rounded, 4.5-6 x 30-60$\mu$.

HOST: *Saracha jaltomata* Schl.

TYPE: Aserri, Costa Rica; *Saracha jaltomata;* H. Sydow, No. 358; Jan. 7, 1925.

DISTRIBUTION: Known only from the type locality.

**Cercospora sciadophila** (Speg.) n. comb.

*Cercosporina sciadophila* Spegazzini, Anal. Mus. Nac. Hist. Nat. B. Aires. **31**: 439. 1922

Leaf spots orbicular, distinct, 2-5 mm. in diameter, pale to white center and dark border; fruiting epiphyllous; stromata dark brown, subglobular, small; fascicles 6-15 stalks, fairly compact; conidiophores pale olivaceous, uniform in color, slightly irregular in width or constricted at the septa, 1-5 septate, not branched, occasionally once geniculate, tip rounded bluntly, 3-4 x 15-45$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate, straight to mildly curved, 1-5 septate, base obconic, tip conic to subobtuse, 2-3.5 x 30-50$\mu$.

HOST: *Solanum violaefolium* Schott.

TYPE: Asunción, Paraguay; *Solanum violaefolium;* C. Spegazzini; July, 1919.

DISTRIBUTION: Known only from the type locality.

NOTE: See note under *C. venezuelae.* I did not find opportunity to study this species. See key, page 530.

**Cercospora solanacea** Saccardo & Berlese

Atti del R. Ist. Ven. di Sci. Lett. ed Arti VI. **3**: 721. 1885

(also Rev. Mycol. **7**: 97. 1885)

Leaf spots angular, bounded by the veins, 1-6 mm. in diameter, dark reddish brown to almost black; fruiting epiphyllous; stromata subglobular, dark brown,

20-60$\mu$ in diameter; fascicles dense to very dense, compact; conidiophores in mass dark brown, singly pale to medium olivaceous brown, paler and more narrow toward the tip or irregular in width, sparingly septate, not branched, not geniculate, undulate to variously curved, rounded to conic tip, 3.5-5 x 20-55$\mu$ or rarely 75$\mu$; conidia subhyaline to pale olivaceous, cylindric, straight or nearly so, 3-5 septate, ends conic to obtuse, 4-5.5 x 20-60$\mu$.

HOST: *Solanum verbascifolium* L.

TYPE: Australia; *Solanum verbascifolium;* Logan, No. 34.

DISTRIBUTION: Australia, India, Formosa, Venezuela, China.

NOTE: See notes under *C. venezuelae* and *C. costeroana,* and key, page 530.

**Cercospora solani** de Thuemen

Hedwigia **19:** 135. 1880

*Cercospora solani* Feuilleaubois, Rev. Mycol. **6:** 231. 1884

*Cercospora nigrescens* Winter, Bol. Soc. Broter. Coimbra **3:** 60. 1885

*Cercospora feuilleauboisii* Saccardo, Syll. Fungorum **4:** 449. 1886

Leaf spots indistinct, irregular, brown areas on upper surface; very scanty olivaceous to dark effuse fruiting on corresponding lower surface; stromata lacking or small, brown; fascicles mostly dense; conidiophores subhyaline to pale olivaceous brown, paler and more narrow toward the tip, mostly 1-3 abruptly geniculate, septate, rarely branched, medium sized spore scar at subtruncate tip, 4-6 x 20-85$\mu$; conidia acicular, hyaline, straight to mildly curved, indistinctly multiseptate, base truncate, tip subobtuse to subacute, 3.5-6 x 40-125$\mu$.

HOST: *Solanum nigrum* L. (*S. nodiflorum* Jacq.)

TYPES: Near Coimbra, Portugal; *Solanum nigrum;* F. Moller; Jan. 1879; (*C. solani* Feuill.) Chailly, France; Feuilleaubois, No. 583; Oct. 1883.

DISTRIBUTION: This species has been reported a number of times in the United States, but all such specimens which I examined had been wrongly identified. Europe generally; Mauritius. Hansford reports it from Uganda.

NOTE: The Winter species was collected also by Moller in Portugal, June 1883. It no doubt is the same as *C. solani.* The term *Cercospora solani* var. *feuilleauboisii* Sacc. has wrongly been used. Saccardo changes the name *Cercospora solani* Feuill. to *Cercospora feuilleauboisii* Sacc., but lists it under the same number (88) as he did *Cercospora solani* de Thuemen thus suggesting that the two were identical. In Syll. Fungorum **15:** 85. 1901., he verifies this suggestion. See also *C. atro-marginalis* for differences between the two species on *S. nigrum.* See key, page 529.

**Cercospora solanicola** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8:** 53. 1892

Leaf spots circular to irregular, small to 10 mm. in diameter, tan to gray, brown border; fruiting chiefly hypophyllous, or rarely effuse on old stems; stromata small to medium in size, brown, rarely narrowly elongated; fascicles sometimes dense; conidiophores medium dark brown, uniform in color and width, multiseptate, sometimes incipient branches, straight to curved or near tip undulate to mildly geniculate, medium spore scar at subtruncate tip, 3-5 x 40-200$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 3-5 x 75-300$\mu$.

HOST: *Solanum tuberosum* L.

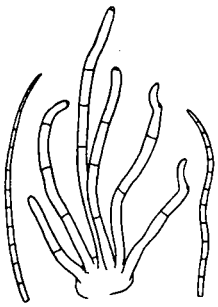


Fig. 206
*C. solanicola*

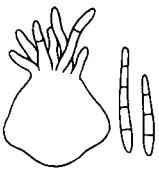


Fig. 207
*C. solani-melongenae*

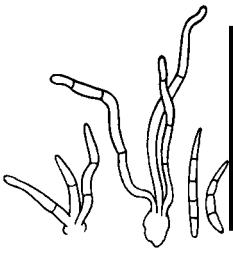


Fig. 208
*C. solani-torvi*

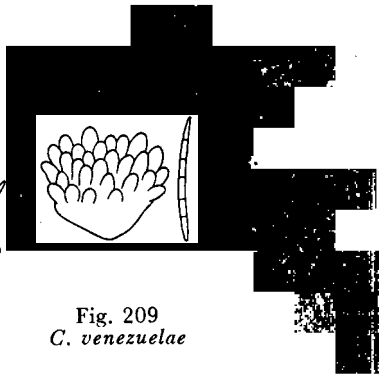


Fig. 209
*C. venezuelae*

TYPE: Auburn, Lee Co., Ala.; *Solanum tuberosum;* Geo. F. Atkinson; June 19, 1891.

DISTRIBUTION: Alabama, Minas Geraes, Southern Russia, and Lombardy.

NOTE: This has been reported on *S. dulcamara* and on tobacco. Specimens show that each of these reports is incorrect. See also *C. concors* for differences between the two species on *Solanum tuberosum.* Hill (Council Sci. Ind. Res. [Australia] Bul. 98:1. 1936) says it is a synonym of *C. nicotianae.* It has darker, more narrow, less geniculate conidiophores, and in other ways seems to differ from the species on tobacco. See key, page 530.

**Cercospora solani-hirti** Baker and Dale

Mycol. Papers, C.-wealth Mycol. Inst. 33: 105. 1951

Leaf spots indistinct, sometimes irregular to subcircular brownish areas on the upper surface, rarely with a darker line margin; the corresponding spots on the lower surface faintly darkened; fruiting hypophyllous; stromata lacking; mostly nonfasciculate or a few stalks in a pseudo-fascicle; conidiophores very pale olivaceous, uniform in color and width, sparingly septate, arising as branches from procumbent threads, may in turn be branched, not or seldom geniculate, short conic or rounded tip, 3-4.5 x 15-100$\mu$; conidia very pale olivaceous, cylindric to obclavato-cylindric, straight to curved, 3-7 septate, base long obconically truncate to sharply obconic, tip obtuse, 3-4.5 x 30-75$\mu$.

HOST: *Solanum hirtum* Vahl.

TYPE: Grand Riviere, Trinidad; *Solanum hirtum;* R. E. D. Baker, No. 1521; June 15, 1947.

DISTRIBUTION: Known only from the type locality.

NOTE: The conidia of this species are more narrow and more nearly cylindric than any of the other nonfasciculate forms on Solanum. See key, page 531.

**Cercospora solani-melongenae** Chupp

Bothalia 4: 892. 1948

Leaf spots subcircular, 2-5 mm. in diameter, dark reddish brown, occasionally bordered by an indistinct dark zone; fruiting amphigenous; stromata globular, dark brown, 20-60$\mu$ in diameter; fascicles dense; conidiophores in mass medium dark, singly pale olivaceous brown, paler toward the tip, uniform to irregular in width, not or sparingly septate, not branched, not geniculate, straight to slightly

curved, tip conic to rounded bluntly, 3-5 x 5-30$\mu$, often so short as to resemble mere peripheral cells; conidia subhyaline to pale olivaceous, obclavato-cylindric, straight to mildly curved, 3-7 septate, base obconically truncate, tip conic to obtuse, 3-5 x 30-80$\mu$, mostly 30-50$\mu$.

HOST: *Solanum melongena* L.

TYPE: Matsudo, Prov. Shimosa, Japan; *Solanum melongena;* Shotaro Hori; Oct. 5, 1916.

DISTRIBUTION: Japan, South Africa.

NOTE: See also *C. melongenae* and *C. deightonii* for differences among the species on egg plant. This description is taken from a specimen collected and determined by S. Hori in 1916. E. W. Mason (May 21, 1943) wrote me that *C. solani-melongenae* was a nomen nudum, which was withdrawn by Hori in favour of *C. melongenae* Welles. As can be seen from the description, it is distinct from the Welles species which has hyaline, acicular conidia. See key, page 538.

**Cercospora solani-torvi** Fragosa & Ciferri

Rep. Dom. Est. Agr. Moca Ser. B-Bot. Bul. **11**: 66. 1927

Leaf spots none or indistinct yellowish blotches on upper leaf surface; effuse olivaceous fruiting on lower leaf surface; stromata lacking; mostly nonfasciculate, rarely few stalks in fascicles; conidiophores subhyaline or pale olivaceous to medium olivaceous brown, short branches from procumbent threads, branches sparingly septate, straight to tortuous, irregular in width, sometimes once mildly geniculate, small spore scar at subtruncate to obconic tip, 3-5 x 15-60$\mu$; conidia very pale olivaceous, obclavate to cylindro-obclavate, straight to curved, 1-7, mostly 3 septate, base long obconically truncate, tip subobtuse, 3.5-5 x 20-90$\mu$.

HOST: *Solanum torvum* Sw.

TYPE: Prope Haina, Republica Dominicana; *Solanum torvum;* R. Ciferri; April 12, 1926.

DISTRIBUTION: Northern South America, Central America, and West Indies. Apparently common in Puerto Rico and Trinidad. Also present in Jamaica, Barbados, and reported from Formosa.

NOTE: This differs only slightly from *C. brachyclada,* but can be recognized by the conidia with long obconically truncate base, and other minor differences. Ciferri (Ann. Myc. **29**: 291. 1931) says this is a synonym of *C. trichophila.* But *C. trichophila* apparently first was described on *Helicteres jamaicensis,* since some of the Stevens collections of 1913 were placed in herbaria, and labeled *C. helicteris.* Furthermore, in his list of three hosts he gives Helicteres first. Taking the fungus on Helicteres as *C. trichophila,* it is not the same as *C. solani-torvi.* If, however, we take his second named host, and the first numbered collection under that host we have *C. solani-torvi* which Fragosa and Ciferri later described. Furthermore, if we take his third host, *S. verbascifolium,* we have the same fungus that Fragosa and Ciferri described as *C. costeroana.* See key, page 531.

**Cercospora unamunoi** Castellani

Riv. Agric. Subtrop. Trop. **42**: 20. 1948

*Cercospora capsici* Marchal & Steyaert, Bul. Soc. Roy. Bot. de Belg. **61**: 167. 1929
*Cercospora capsici* Unamuno, Bol. Soc. Espanola Hist. Nat. **32**: 161. 1932

*Cladosporium capsici* (March. & Stey.) Kovachevsky, Zeitschr. f. Pflanzenkr. **48**: 321. 1938

Leaf spots indistinct or none, sometimes irregular yellowing on the upper surface; fruiting effuse, hypophyllous, small areas to entire leaf surface, olivaceous to almost black; stromata merely a few dark cells; fascicles dense to very dense, divergent to compact; conidiophores pale to medium olivaceous brown, slightly paler tip, obclavate to clavate or irregular in width, plainly multiseptate, branched, curved to tortuous, rarely geniculate, rounded to conic tip, 4-6 x 10-60$\mu$; conidia subhyaline to very pale olivaceous brown, obclavato-cylindric, straight to mildly curved or undulate, occasionally catenulate, ends obconic or obtuse, 1-5 or more septate, 3-6.5 x 15-100$\mu$, mostly 15-50$\mu$ in length.

HOST: *Capsicum frutescens* L. (*C. baccatum* L., *C. annuum* L.)

TYPES: Prov. di l'Equateur, Congo Belge; *Capsicum frutescens;* J. Ghesquiere, No. 443; June, 1925; Spain; *Capsicum annuum;* L. M. Unamuno.

DISTRIBUTION: Apparently common in all tropical and subtropical countries where peppers are grown. Found as far north as California and the Gulf States.

NOTE: The fungus has been mistaken for *Cercospora diffusa, C. rigospora,* and other species on the Solanaceae. Kovachevsky considers it a true Cladosporium. I do not agree with him, because of the dense fascicles and the long conidia. See also *C. capsici* Heald and Wolf.

**Cercospora venezuelae** Chupp

Monog. Univ. P. Rico. Ser. B. **2**: 254. 1934

Leaf spots circular to irregular, 2-20 mm. in diameter, pale to medium brown, sometimes with yellowish halo; fruiting amphigenous but chiefly on the upper surface; stromata globular, medium reddish brown, 20-50$\mu$ in diameter; fascicles dense; conidiophores very pale olivaceous brown, paler and more narrow toward the tip, septation, geniculation and branching not evident, longest ones undulate, tip narrowly rounded to conic, slightly elongated cells on the stromatal periphery to evident conidiophores and then measuring 2-3.5 x 10-60$\mu$; conidia subhyaline to very pale olivaceous, obclavato-cylindric, straight to mildly curved, indistinctly septate, ends rounded bluntly or base obconically truncate, 2-3.5 x 25-90$\mu$, mostly 30-50$\mu$.

HOSTS: *Solanum argenteum* Dunal., Solanum sp.

TYPE: La Mulera, Est. Táchira, Venezuela; Solanum sp.; C. E. Chardon, No. 1238; Sept. 17, 1932.

DISTRIBUTION: Venezuela, Minas Geraes (Brazil).

NOTE: Among the other species on Solanum with somewhat similar descriptions are *C. egenula, C. solanacea, C. modesta, C. puyana,* and *C. sciadophila.* But each of these differs slightly in a number of ways, so that each is considered a distinct species. See key, page 530.

**Cercospora withaniae** H. & P. Sydow

Ann. Mycol. **10**: 444. 1912

Leaf spots indistinct or irregular yellowish to brown areas on the upper surface, 4-8 mm. in diameter; fruiting hypophyllous, sparsely effuse, dark olivaceous to almost black; stromata slight, dark brown; fascicles dense, fairly compact; conidiophores in mass medium dark, singly pale to very pale yellowish olivaceous or

olivaceous brown, uniform in color, irregular in width or constricted at septa, 0-5 septate, branched, not geniculate, curved to tortuous, tip conic to obtuse, 3-5.5 x 15-45$\mu$; conidia subhyaline to pale olivaceous brown, obclavato-cylindric, straight to mildly curved, base long obconically truncate, tip obtuse, 3-7 septate, 2.5-5 x 25-80$\mu$.

HOST: *Withania somnifera* Dun.

TYPE: Bluff, Durban, Natal, S. Africa; *Withania somnifera;* E. M. Doidge, No. 1672; July 7, 1911.

DISTRIBUTION: Natal, S. Africa; Cyprus; India.

**Cercospora staphyleae** Ray & McLaughlin

Mycologia **36**: 174. 1944

Leaf spots subcircular, 0.5-4 mm. in diameter, gray to white, wide dark reddish brown margin, less distinct on lower surface; fruiting amphigenous; stromata dark brown, globular, a few large cells to 25$\mu$ in diameter; fascicles 2-12 divergent stalks; conidiophores medium brown, slightly paler and more narrow toward the apex, multiseptate, not branched, straight to slightly curved, 0-2 geniculate, not branched, subtruncate tip, 4-6 x 30-150$\mu$; conidia hyaline, acicular or occasionally obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip acute, 2-4 x 30-150$\mu$.

HOST: *Staphylea trifolia* L.

TYPE: College nursery, Stillwater, Oklahoma; *Staphylea trifolia;* W. W. Ray and McLaughlin; Sept. 17, 1942.

DISTRIBUTION: Known only from the type locality.

**Cercospora abromae** Hansford, n. sp.

(Listed in The East African Jour. Agric. **8**: 248. 1943)

Leaf spots subcircular, dull to dark brown, similar in shade to the dried leaf, later on the upper surface the center of the spots becomes grayish brown; fruiting epiphyllous, on the paler part of the lesion; stromata lacking or a few dark cells; conidiophores borne singly or in fascicles of 2-9, spreading, pale olivaceous brown, slightly paler and more narrow toward the tip, multiseptate, branched occasionally, 0-1 geniculate, almost straight, subtruncate tip, 3-5 x 40-200$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to curved, base truncate, tip acute to subacute, 3-5 x 50-250$\mu$.

HOST: Abroma sp.

TYPE: Kampala, Uganda; Abroma sp.; C. G. Hansford, No. 1812; May, 1936.

DISTRIBUTION: Known only from the type locality.

**Cercospora guazumae** Sydow

Ann. Mycol. **28**: 212. 1930

*Cercospora flocculosa* Sydow, Ann. Mycol. **28**: 213. 1930

Leaf spots subcircular to irregular, 2-6 mm. in diameter, tan to yellowish brown center, dark brown border; fruiting may occur as scantily effuse on lower surface before spots are evident, later when amphigenous, stromata with dense fascicles appear on the upper surface; stromata dark brown, subglobular, 20-50$\mu$ in diameter; fascicles dense; nonfasciculate below; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip when fasciculate, rarely septate or branched, not geniculate, straight to sinuate, 2-4 x 5-30$\mu$ or occasion-

ally 60$\mu$; when nonfasciculate, uniform in color and width, branches from procumbent threads, not geniculate, 2-4$\mu$ wide and of indefinite length; conidia pale to very pale olivaceous, obclavato-cylindric, straight to mildly curved, 3-6 septate, long obconically truncate base, blunt to conic tip, 2-4.5 x 20-70$\mu$.

HOSTS: *Guazuma ulmifolia* Lam., *G. tomentosa* H. B. & K. (*G. guazuma* Cockerell).

TYPES: La Victoria, Venezuela; *Guazuma ulmifolia;* H. Sydow, No. 396a; Febr. 2, 1928; (*C. flocculosa*) La Victoria, Venezuela; *Guazuma ulmifolia;* H. Sydow, No. 396b; Febr. 2, 1928.

DISTRIBUTION: A number of collections from Venezuela and one from San Domingo.

NOTE: See also *C. ulmifoliae.*

**Cercospora helicteris** H. & P. Sydow

Philipp. Jour. Sci. (Bot.) 9: 189. 1914

Leaf spots at first indistinct, finally becoming dark reddish brown specks 0.5-2 mm. in diameter; fruiting on corresponding lower surface, effuse, dark olivaceous; stromata lacking; fasciculate, 1-5, rarely 10-12 stalks; conidiophores pale olivaceous brown, uniform in color, attenuated, septate, not branched, 0-1 geniculate, subtruncate tip, 2.5-5 x 15-120$\mu$; conidia hyaline, cylindric, 3-6 septate, straight to mildly curved, both ends subtruncate when catenulate, or tip rounded bluntly, 2-3.5 x 20-60$\mu$.

HOST: *Helicteres hirsuta* Lour.

TYPE: Palawan Island, Philippines; *Helicteres hirsuta;* E. D. Merrill, No. 8907; May, 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: See the following key for differences among the species on Helicteres.

CERCOSPORAE ON HELICTERES

A. Conidia hyaline, 2-3.5 x 20-60$\mu$; stromata lacking; conidiophores rarely in fascicles, hypophyllous, 2.5-5 x 15-120$\mu$; fruiting effuse.
H. HIRSUTA — *C. helicteris*

AA. Conidia colored.

B. Conidia wide, 4-6.5 x 20-110$\mu$; conidiophores nonfasciculate, hypophyllous, 2.5-4 x 10-40$\mu$; fruiting effuse.
H. JAMAICENSIS — *C. trichophila*

BB. Conidia narrow, 2-3.5 x 25-125$\mu$; conidiophores in coremoid-like fascicles, chiefly epiphyllous, 2-3.5 x 25-85$\mu$; fruiting usually not effuse.
H. JAMAICENSIS — *C. meridiana*

**Cercospora kleinhofiae** von Höhnel

Sitzunsber. Math.-Naturw. Klasse K. Akad.

Wissensch. I. **116**: 150. 1907

Leaf spots circular to irregular, 2-10 mm. in diameter, brown, often with a yellow halo; fruiting amphigenous; stromata subglobular, dark brown, 15-40$\mu$ in diameter; fascicles dense, divergent; conidiophores pale to very pale brown, paler and more narrow toward the apex, not septate, not branched, not geniculate, straight to curved, bluntly rounded tip, 4-5 x 10-40$\mu$; conidia pale to very pale

olivaceous, obclavate, straight to mildly curved, 3-9 septate, base obconically truncate, tip obtuse, 3.5-5 x 20-90$\mu$.

HOST: *Kleinhofia hospita* L.

TYPE: Samoa; *Kleinhofia hospita;* Dr. Rechinger, No. 2305; 1905.

DISTRIBUTION: Samoa, Philippines (Ann. Mycol. 15: 264. 1917).

**Cercospora melanotes** Sydow

Ann. Mycol. 28: 215. 1930

Leaf spots none or indistinct yellowish areas on the upper surface; fruiting hypophyllous, effuse, olivaceous, 1-6 mm. in extent; stromata lacking; nonfasciculate; conidiophores branches from procumbent intertwined threads, pale to medium olivaceous brown, uniform in color and width or slightly clavate, multiseptate, not geniculate, straight to tortuous, tip rounded to conic, 3-4.5 x 20-150$\mu$; conidia pale to medium olivaceous brown, cylindric, straight to mildly curved, 3-7 septate, ends rounded bluntly or base short obconic, occasionally catenulate, 4-5.5 x 25-60$\mu$.

HOST: *Melochia tomentosa* (Eleuthera) L.

TYPE: Macuto near L. Guaira, Venezuela; *Melochia tomentosa;* H. Sydow, No. 888; Dec. 21, 1927.

DISTRIBUTION: San Domingo, and a number of collections from Venezuela.

NOTE: See the following key for the characters that separate this species from others on Melochia.

CERCOSPORAE ON MELOCHIA

A. Conidia often strongly curved, 4-6 x 20-65$\mu$; conidiophores subhyaline to very pale in color, 4-6$\mu$ wide, nonfasciculate. *C. melochiicola*

AA. Conidia straight to mildly curved; conidiophores pale to medium in color, 3-5$\mu$ in width.

B. Conidia occasionally catenulate, ends rounded bluntly, 4-5.5 x 25-60$\mu$; conidiophores nonfasciculate. *C. melanotes*

BB. Conidia not catenulate, tip often sharply conic, 2-4.5 x 40-150$\mu$; conidiophores may be fasciculate. *C. melochiae*

**Cercospora melochiae** P. Hennings

Hedwigia 43: 395. 1904

Leaf spots at first indefinite or none, later may be brown on upper surface; fruiting in dark olivaceous effuse patches, mostly on lower surface but occasionally on both surfaces; stromata lacking or small; mostly nonfasciculate, occasionally with dense fascicles especially when fruiting is epiphyllous; conidiophores pale olivaceous brown, when procumbent septate, branched, not or rarely geniculate, when fasciculate a small spore scar at rounded almost hyaline tip, straight to curved or undulate, 3-5 x 10-60$\mu$, or of indeterminate length; conidia cylindro-obclavate, pale to very pale olivaceous brown, straight to mildly curved, indistinctly multiseptate, base sharply obconic to obconically truncate, tip at least on longest ones sharply conic, 2-4.5 x 40-150$\mu$.

HOSTS: *Melochia corchorifolia* L., *M. lupulina* Sw., *M. melissifolia* Benth., *M. tomentosa* (Eleuthera) L., Melochia sp., *Waltheria indica* L. (*W. americana* L.).

TYPE: Rio Negro, Manaos, Brazil; *Melochia melissifolia;* E. Ule, No. 3005; Febr. 1902.

DISTRIBUTION: Studied material from Georgia, Brazil, Colombia, El Salvador, and presumably from Jamaica.

NOTE: In the New York Botanical Garden herbarium is a specimen labeled *C. Melochiae* Carleton collected by A. S. H. on *Melochia tomentosa.* Presumably the initials stand for A. S. Hitchcock, who in 1890, when the collection was made, was stationed at the Missouri Botanic Gardens, St. Louis, but in that year had made a trip to Jamaica. This collection is similar to Hennings species. The three species on Melochia all cause an effuse olivaceous growth (Cladosporium-like) on the foliage. The more nearly obclavate, colored conidia, 2-4.5 x 40-150$\mu$, separate this from the other species on Melochia. See key above.

**Cercospora melochiicola** Sydow

Ann. Mycol. **27**: 85. 1929

Leaf spots none or indistinct yellowish areas on the upper surface; fruiting effuse, hypophyllous, olivaceous, 1-3 mm. in extent; stromata lacking; nonfasciculate; conidiophores branches from procumbent intertwined threads, subhyaline to very pale yellowish olivaceous or olivaceous brown, uniform in color, irregular in width, multiseptate, not geniculate, straight to tortuous, bluntly rounded tip, 4-6$\mu$ in width and mostly of indeterminate length; conidia concolorous, cylindric, almost straight to strongly curved, 3-5 septate, long obconic base, obtuse tip, 4-6 x 20-65$\mu$.

HOST: *Melochia lupulina* Sw.

TYPE: Los Angeles de San Ramon, Costa Rica; *Melochia lupulina;* Prof. A. M. Brenes, No. 549; Nov. 28, 1925.

DISTRIBUTION: Costa Rica, San Domingo.

NOTE: The very pale fruiting and the wide strongly curved cylindric conidia separate this species from *C. melochiae* and *C. melanotes.* The Sydow material shows that the fungus also has characters that resemble the genus, Helicomina Olive (Mycologia **40**: 16. 1948). See key, page 556.

**Cercospora meridiana** sp. nov.

Maculae orbiculares, 0.5-2 mm. diam., sordide griseae, in epiphyllo zonula purpurea cinctae; caespituli fere epiphylli; stromata minuta, atro-fusca; conidiophora coremioidea, dense fasciculata, pallide olivaceo-brunnea, recta vel sinuosa, simplicia, spurie septata, haud geniculata, ad apicem subacuta, 2-3.5 x 25-85$\mu$; conidia subhyalina vel pallide olivacea, cylindrata, leniter curvata vel sinuosa, spurie multiseptata, utrimque obtusa, 2-3.5 x 25-125$\mu$.

Leaf spots circular, 0.5-2 mm. in diameter, dingy gray to tan center, dark purple or brown margin; fruiting chiefly epiphyllous; stromata small, dark brown; fascicles dense, coremoid in compactness; conidiophores pale olivaceous brown, straight to undulate, not branched, indistinctly septate, not geniculate, rounded to conic tip, 2-3.5 x 25-85$\mu$; conidia subhyaline to pale olivaceous, cylindric to slightly attenuated toward the tip, mildly curved to undulate, indistinctly multiseptate, ends bluntly rounded, rarely base subtruncate, 2-3.5 x 25-125$\mu$.

HOST: *Helicteres jamaicensis* Jacq.

TYPE: Long Mt. Jamaica; *Helicteres jamaicensis;* E. B. Martyn, No. 214; Oct. 1947.

DISTRIBUTION: Known only from the type locality.

NOTE: The name signifies "southern." See key, page 555.

**Cercospora trichophila** Stevens
Ill. Acad. Sci. Trans. **10**: 212. 1917

Leaf spots at first none, then brown subcircular to angular areas on upper surface, 0.5-4 mm. in diameter; effuse olivaceous fruiting causing slight darkening on corresponding lower surface; stromata lacking; nonfasciculate; conidiophores short branches from narrow procumbent threads, pale olivaceous to olivaceous brown, not geniculate, branches rarely septate, minute spore scar at conic tip, 2.5-4 x 10-40$\mu$; conidia cylindric to cylindro-obclavate, pale olivaceous, straight to mildly curved, 1-5 or even 11-septate, base medium long to long sharply obconic, tip obtuse, 4-6.5 x 20-110$\mu$.

HOST: *Helicteres jamaicensis* Jacq.

TYPE: Penuelas, Puerto Rico; *Helicteres jamaicensis;* F. L. Stevens, No. 4888; 1913.

DISTRIBUTION: Known only from the type locality.

NOTE: Stevens described *C. trichophila* on three hosts: Helicteres, *Solanum torvum,* and *S. verbascifolium.* The three collections represent three distinct species of Cercospora. Since the first named host is Helicteres, the species on that genus is considered as the true *C. trichophila.* The others are *C. solani-torvi* and *C. costeroana* respectively. Some of Stevens' collections of 1913 were placed in herbaria and labeled *C. helicteris* Stevens. See key, page 555.

**Cercospora ulmifoliae** Obregón-Botero
Caldasia **3**: 51. 1941

Leaf spots circular, 4-8 mm. in diameter, dark to black center, yellowish to orange margin; fruiting amphigenous; stromata globular, dark brown, 20-50$\mu$ in diameter; fascicles coremoid in density; conidiophores in mass dark brown, singly pale olivaceous brown, uniform in color or paler near base, clavate, indistinctly septate, not branched, not geniculate, tip bluntly rounded to subtruncate, 3-5.5 x 40-150$\mu$; conidia pale to medium olivaceous, cylindric to cylindro-obclavate, mildly curved, 3-9 septate, long obconically truncate base, blunt tip, 4-7.5 x 20-125$\mu$. These are not to be confused with the Alternaria spores which also may be present.

HOST: *Guazuma ulmifolia* Lam.

TYPE: Quipile, Colombia; *Guazuma ulmifolia;* R. Obregón-Botero and G. J. Quintana, No. 901; April 16, 1940.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. guazumae* for differences between the two species on this host.

**Cercospora waltheriae** Thirumalachar & Chupp
Mycologia **40**: 361. 1948

Leaf spots at first indistinct, then becoming reddish brown, angular, 0.5-5 mm. in diameter or coalescing into large part of leaf surface, when dry sometimes dehiscing; fruiting on corresponding areas of the lower surface, effuse, faintly grayish to distinctly olivaceous; stromata globular, pale brown, 20-60$\mu$ in diameter; fascicles dense; conidiophores subhyaline to very pale olivaceous brown, straight to curved, not or rarely septate, mostly not geniculate, not branched, bluntly rounded tip, 2-3.5 x 5-25$\mu$, or when conidia are persistent appearing much longer; conidia subhyaline to very pale olivaceous, obclavate to almost linear, indistinctly

multiseptate, straight to curved, base obconically truncate to rounded, tip subacute to blunt, 2-4 x 35-150$\mu$.

HOST: *Waltheria indica* L. (*W. americana* L.)

TYPE: Yashavantapur, Bangalore, India; *Waltheria indica;* M. J. Thirumalachar; Sept. 2, 1945.

DISTRIBUTION: Known only from the type locality.

NOTE: See *C. melochiae* for differences of the two species on Waltheria.

**Cercospora halesiae** Dearness

Mycologia **33**: 365. 1941

Leaf spots large rusty brown blotches, 5-20 mm. in diameter, immarginate; fruiting amphigenous; stromata rarely 30$\mu$ in diameter, mostly a few dark brown to almost black cells; fascicles 3-15 stalks; conidiophores dark brown, uniform in color, at times slightly wider near the tip, plainly 2-5 septate, not branched, straight to 1-3 geniculate, small spore scar at rounded to conic tip, 4-5.5 x 20-75$\mu$; conidia pale to medium olivaceous, obclavate, shortest ones only slightly attenuated, plainly multiseptate, straight to mildly curved, base obconic, tip obtuse, 3-5.5 x 15-105$\mu$.

HOST: *Halesia tetraptera* L. (*H. carolina* L.)

TYPE: Bote Mt. Blount Co., Great Smoky Mountains National Park, Tenn.; *Halesia carolina;* C. W. Greene (L. R. Hesler, No. 11280; Dearness 8959); Aug. 18, 1937.

DISTRIBUTION: Known only from the type locality.

**Cercospora fukuokaensis** Chupp

Yokohama Nat. Univ. Sci. Reports. II. **1**: 2. 1952

Leaf spots reddish brown to grayish brown, subangular, at times vein limited, 1-3 mm. in diameter, often confluent, especially along the margin of the leaf; fruiting amphigenous; stromata subglobose, dark brown, 15-35$\mu$ in diameter; fascicles dense; conidiophores olivaceous brown, continuous, straight to flexuous, not branched, 2.5-4 x 5-30$\mu$, mostly 3 x 20$\mu$; conidia hyaline, acicular to obclavate, straight to curved, 1-7 septate, base truncate to subtruncate, tip acute, 2-3.5 x 30-70$\mu$.

HOST: *Styrax japonica* Sieb. et Zucc.

TYPE: Futsukaichi-machi, Pref. Fukuoka, Japan; *Styrax japonica;* S. Katsuki; July 5, 1950. Several other collections in 1950 and 1951 are given.

DISTRIBUTION: Japan.

NOTE: See also *C. styracae.*

**Cercospora styracae** sp. nov.

Maculae suborbiculares vel irregulares, 0.5-1.5 mm. diam., numerosae, brunneae, corona flava; caespituli hypophylli; stromata atro-fuscae, 10-30 mm. diam.; conidiophora laxe vel dense fasciculata, aequabiliter brunnea, evidenter multiseptata, vix ramosa, recta vel subito flexuosa, ad apicem anguste rotundata, 3-5 x 40-220$\mu$; conidia subhyalina vel pallide olivacea, cylindrato-obclavata, recta, 1-5 septata, ad basim subtruncata, ad apicem obtusa, 3-5 x 20-50$\mu$.

Leaf spots minute, subcircular to irregular, 0.5-1.5 mm. in diameter, numerous, brown with yellowish halo; fruiting hypophyllous; stromata dark brown, filling stomatal opening, up to 30$\mu$ in diameter; fascicles mostly 2-15 stalks; conidiophores medium dark brown, fairly uniform in color and width, plainly multisep-

tate, rarely branched, straight to tortuous, occasionally once abruptly geniculate, small spore scar at narrowly rounded tip, 3-5 x 40-220$\mu$; conidia subhyaline to pale olivaceous, cylindro-obclavate, straight, indistinctly 1-5 septate, base long obconically truncate, tip obtuse, 3-5 x 20-50$\mu$.

HOST: *Styrax americana* Lam.

TYPE: Waynesboro, Miss.; *Styrax americana;* L. E. Miles; Aug. 28, 1921.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. fukuokaensis.*

**Cercospora symploci** Sawada

Taiwan (Formosa) Agr. Res. Inst. Rept. 85: 122. 1943

Leaf spots subcircular to irregular, 1.5-5 mm. in diameter or occasionally elongating to 15 mm., a minute tan to dingy gray center, with a wide reddish brown to almost purple border; fruiting chiefly epiphyllous; stromata small, dark brown; fascicles partly dense; conidiophores pale olivaceous brown, paler and more narrow toward the conic or narrowly rounded tip, sparingly septate, slightly curved or undulate, not branched, rarely geniculate, 2.5-4 x 10-50$\mu$, mostly 10-25$\mu$; conidia pale olivaceous, obclavate, straight to mildly curved, indistinctly multiseptate, base subtruncate to obconically truncate, tip subacute, 2-4.5 x 35-125$\mu$.

HOST: *Symplocos crataegoides* Buch.-Ham var. *chinensis* Mak. et Nemoto.

TYPE: Exact type not known.

DISTRIBUTION: Formosa.

NOTE: A part of Sawada's 1945 collection is deposited in the U.S.D.A. Mycological Herbarium. See also *C. yerbae* (Aquifoliaceae).

**Cercospora taccae** (Sydow) n. comb.

*Cercosporina taccae* H. & P. Sydow, Ann. Mycol. 11: 406. 1913

Leaf spots circular, 2-10 mm. in diameter, slightly zonate, olivaceous to dull brown, no distinct margin; fruiting amphigenous; stromata a few brown cells to 25$\mu$ in diameter, subglobular; fascicles 2-12 diverging stalks; conidiophores pale to medium brown, fairly uniform in color and width, sparingly septate, branched occasionally, not geniculate, almost straight, subtruncate tip, 4-6 x 25-75$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, truncate base, acute tip, 2-4 x 50-150$\mu$.

HOST: *Tacca palmata* Blume.

TYPE: Los Banos, Philippines; *Tacca palmata;* M. B. Raimundo, No. 1533; Aug. 8, 1913.

DISTRIBUTION: Known only from the type locality.

**Cercospora caloloma** Petrak

Sydowia (Ann. Mycol.) 4: 569. 1950

Leaf spots 10-25 mm. in diameter, circular to angular, on the upper surface yellowish green to grayish brown and limited by a narrow raised violet colored line, on the lower surface obscurely grayish brown; fruiting always hypophyllous, punctiform, densely aggregated; stromata present, sometimes as large as 60-100$\mu$ in diameter; fascicles dense, divergent; conidiophores brown, paler and more narrow toward the tip, straight to undulate or curved, not branched, 2-4 septate, mildly geniculate, 5-7 x 25-100$\mu$; conidia cylindro-obclavate, subhyaline to pale

olivaceous brown, straight to curved, 2-9 septate, base rounded to subtruncate, tip obtuse, 5-7.5 x 25-120$\mu$.

HOST: *Freziera nervosa* Hump. & Bonpl. (*Eurya nervosa* Blume).

TYPE: Hacienda San Antonia near Banos, Prov. Tungurahua, Ecuador; *Eurya nervosa;* H. Sydow, No. 501; Dec. 10, 1937.

DISTRIBUTION: Ecuador.

NOTE: Dr. Sydow had intended to send this collection of Cercosporae to me, but war began before he was able to sort all the packets. Therefore, I have not studied this species.

**Cercospora theae** (Cavara) Breda de Haan

L'Inst. Bot. de Buitenzorg Bul. 6: 11. 1900

*Septoria theae* Cavara, Revue Mycol. **11**: 190. 1889

*Cercoseptoria theae* (Cav.) Curzi, Boll. R. Staz. Pat. Veg. n.s. 9: 373. 1929

Leaf spots circular to irregular, small to as large as 10-30 mm. in diameter, brown or center with gray, indistinctly zonate; fruiting hypophyllous; stromata dark brown, subglobular, 20-25$\mu$ in diameter; fascicles dense; conidiophores delicate, short, wavy, very pale olivaceous brown, paler and more narrow toward the tip, not septate, not branched, not geniculate, narrowly rounded apex, 2-3 x 5-15$\mu$; conidia subhyaline to very pale olivaceous, cylindric or tapering imperceptibly, indistinctly 3-5 septate, ends rounded or conic, straight to curved, 2-3 x 30-80$\mu$, mostly 30-60$\mu$.

HOSTS: *Camellia Thea* Link. (Thea sp.), (*T. viridis* L.), (*T. sinensis* L.)

TYPE: Buitenzorg, Java; Thea sp.; J. van Breda de Haan.

DISTRIBUTION: Java, Caucasus, Ceylon, Formosa, Japan, Pavia Botanical Garden (Italy), Mauritius.

NOTE: I have not been able to study this species.

**Cercospora edgeworthiae** Kanesuke Hara

Diseases of Arboreous Trees, p. 316. 1927

Leaf spots circular to irregular, 2-8 mm. in diameter, dark brown or grayish, margin dark; fruiting hypophyllous; conidiophores linear, brown, septate; conidia elongate, obclavate, many celled.

HOST: Edgeworthia sp.

TYPE: Not known.

DISTRIBUTION: Japan.

NOTE: I have not seen this species. It is unfortunate that the only available description is too meager to present a mental picture of the fungus.

**Cercospora genkwa** Sydow

Ann. Mycol. **27**: 431. 1929

Leaf spots subcircular, 0.5-2.5 mm. in length, dark brown to almost black on the upper surface and pale brown below; fruiting amphigenous; stromata when present brown, subglobular, 20-30$\mu$; fascicles sometimes dense; conidiophores subhyaline to very pale olivaceous brown, paler and more narrow toward the tip, not septate, not branched, not geniculate, straight to undulate, narrowly rounded tip, 2-3 x 5-25$\mu$; conidia subhyaline to very pale olivaceous, narrowly linear or mildly attenuated, curved to sigmoid, indistinctly septate, base subtruncate, tip acute, 1.5-2.5 x 35-100$\mu$.

HOST: *Daphne genkwa* Sieb. & Zucc.
TYPE: Pu-Chi, Prov. Hupeh, China; *Daphne genkwa;* T. F. Yii, No. 2355; Aug. 3, 1928.
DISTRIBUTION: Known only from the type locality.

CERCOSPORAE ON CORCHORUS

A. Conidia hyaline to subhyaline, acicular to obclavate, 2.5-5 x 35-240$\mu$; conidiophores in loose fascicles, 4-6 x 25-150$\mu$.
CORCHORUS spp. *C. corchori*
AA. Conidia subhyaline to pale olivaceous, not acicular.
B. Conidia cylindric, 1-7 septate, 3-6 x 15-95$\mu$; conidiophores mostly non-fasciculate, 3-5 x 15-60$\mu$, medium olivaceous brown.
C. HIRSUTUS *C. corchorica*
BB. Conidia obclavate, multiseptate, 2.5-4 x 40-120$\mu$; conidiophores in loose fascicles, 3.5-5 x 15-60$\mu$, pale to very pale olivaceous brown.
C. PILOLOBUS *C. macutensis*

**Cercospora corchori** Kaneyoshi Sawada
Agr. Exp. Sta. Formosa 1 (Special Bul. 19): 37, 667. 1919

Leaf spots angular or irregular, bounded by the veins, 3-14 mm. in diameter, dark brown; fruiting amphigenous but chiefly on the lower surface; stromata when present small, dark brown; fascicles 4-10 or rarely as many as 20 spreading stalks;

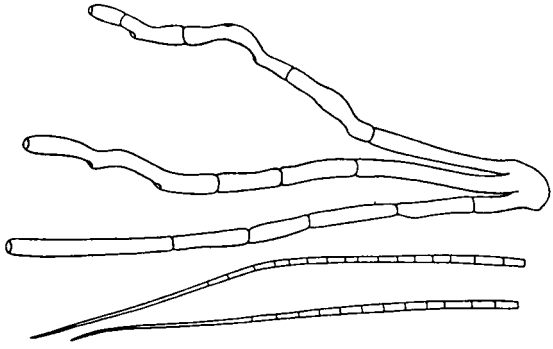


Fig. 210
*C. corchori*

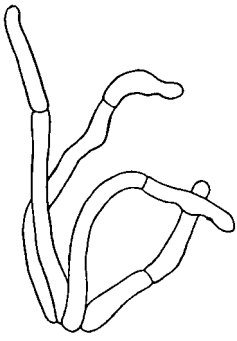


Fig. 211
*C. corchorica*

conidiophores pale to medium brown, slightly paler and more narrow toward the tip, sparingly septate, not branched, rarely geniculate, almost straight, subtruncate tip, 4-6 x 25-150$\mu$, mostly 25-75$\mu$; conidia hyaline to subhyaline, acicular to obclavate, straight to curved, indistinctly multiseptate, base truncate or subtruncate, tip acute, 2.5-5 x 35-240$\mu$.
HOSTS: *Corchorus capsularis* L., *C. olitorius* L., *C. pilolobus* Link, *C. tridens* L., Corchorus sp.
TYPE: Not known. Dr. Lee Ling sent me a specimen collected in Taiwan, Sept. 27, 1922.
DISTRIBUTION: Formosa, South Africa, Minas Geraes (Brazil), India (Jour. Indian Bot. Soc. **26**: 227. 1948).
NOTE: See key above for differences among the species on this host genus.

**Cercospora corchorica** Petrak & Ciferri
Ann. Mycol. 30: 310. 1932

Leaf spots none or indistinct; fruiting effuse, epiphyllous, black, 0.5-3 mm. in extent; stromata rare, almost black, globular, 15-25$\mu$ in diameter; masses of dark brown mycelium at the base of the stellate leaf hairs resemble stromata somewhat; mostly nonfasciculate, arising as single branches from threads along the hair branches, but occasionally a stroma with fascicle is present; conidiophores medium olivaceous brown, slightly paler and more narrow toward the apex, rarely septate, not geniculate, straight to gnarled, bluntly rounded tip, 3-5 x 15-60$\mu$; conidia subhyaline to very pale olivaceous brown, cylindric, straight to mildly curved or undulate, 1-7 septate, ends rounded, or base almost subtruncate, 3-6 x 15-95$\mu$.

HOST: *Corchorus hirsutus* L.

TYPE: Santiago, San Domingo; *Corchorus hirsutus;* R. Ciferri and E. L. Ekman, Nos. 3864 and 3956; Nov. 16 and Nov. 23, 1930. Cotype distributed as Mycoflora Domingensis, Nos. 3864 and 3956.

DISTRIBUTION: San Domingo. Also reported from India.

NOTE: See key above for differences among the species on this host genus.

**Cercospora grewiae** Srivastava & Mehta
India Phytopath. 4: 67. 1951

Spots regular or irregular, more or less circular, epiphyllous, gregarious, frequently involving large areas of the leaf, black, cushion-like growth; conidiophores effused on the mycelium, arising from a loose stroma, amphigenous, fasciculate, moderately or densely tufted, simple or occasionally branched, walls smooth or irregular, 2.8-3.8 x 58-106$\mu$, many septate, dark colored; conidial scars minute and distinct, conidia fusoid, somewhat curved in the center, the upper end tapering acutely, 1-6, mainly 2-4 septate, 4-8 x 28-52$\mu$.

HOST: *Grewia asiatica* L.

TYPE: Botanical Garden, Kampur, U. P., India; *Grewia asiatica;* H. C. Srivastava and P. R. Mehta; 1951.

DISTRIBUTION: India.

NOTE: I have not seen this species.

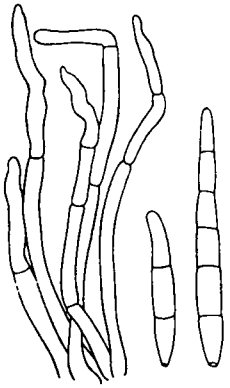


Fig. 212
*C. luheae*

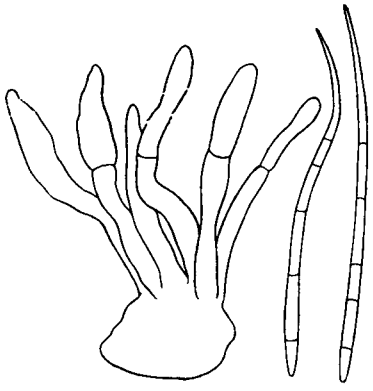


Fig. 213
*C. macutensis*

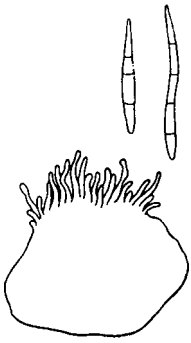


Fig. 214
*C. microsora*

**Cercospora luheae** Chupp & Viégas
Bol. da Soc. Brasil. de Agron. **8**: 36. 1945

Leaf spots subcircular, 0.5-2 mm. in diameter, dark reddish brown; fruiting amphigenous; stromata slight, consisting mostly of the densely appressed bases of the conidiophores; fascicles dense, fairly compact; conidiophores very pale olivaceous brown, uniform in color and width or at times distinctly clavate, 1-5 septate, not branched, occasionally once geniculate, conic tip, 2.5-4 x 30-85$\mu$; conidia pale olivaceous to medium olivaceous brown, cylindric or obclavato-cylindric, straight to mildly curved, 1-7 septate, base obconically truncate, tip obtuse, 4-6 x 20-70$\mu$.

HOST: Luhea sp.

TYPE: Campinas, Sao Paulo, Brazil; Luhea sp.; A. P. Viégas, No. 4021, April 12, 1942.

DISTRIBUTION: Known only from the type locality.

**Cercospora macutensis** Sydow
Ann Mycol. **28**: 215. 1930

Leaf spots irregular yellowish blotches on the upper surface; fruiting on the corresponding lower surface, effuse, olivaceous to lead-colored; stromata indistinct or small, brown, irregular; fascicles 2-15 diverging stalks; conidiophores pale to very pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, slightly branched, not geniculate, straight to undulate, conic tip, 3.5-5 x 15-60$\mu$; conidia pale to very pale olivaceous brown, narrowly obclavate, straight to mildly curved, indistinctly multiseptate, obconic base, subacute tip, 2.5-4 x 40-120$\mu$.

HOST: *Corchorus pilolobus* Link.

TYPE: Macuto, near La Guaira, Venezuela; *Corchorus pilolobus;* H. Sydow, No. 76; July 27, 1927.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 562 for differences among the species on this host genus.

**Cercospora microsora** Saccardo
Michelia **2**: 128. 1880

*Cercospora tiliae* Peck, Bot. Gaz. **6**: 277. 1881
*Cercospora exitiosa* H. & P. Sydow, Ann. Mycol. **4**: 485. 1906
*Cercospora zahariadii* Savulescu & Sandu-Ville, Hedwigia **75**: 226. 1935
*Cercospora microsora* var. *tiliae platyphyllae* Roum., Rev. Mycol. **16**: 109. 1894

Affecting twigs and foliage; on twigs causing dark oval spots, occasionally with brown line border and gray center, 5-25 mm. in length; variable leaf spots on the different species of Tilia, some have large reddish brown circular spots with a dark line margin, others have small white specks with a wide dark margin, 1-5 mm. in diameter or coalescing into large part of leaf area; fruiting amphigenous, although some specimens show only epiphyllous fruiting and others only hypophyllous; stromata large and distinct on twigs, 75-200 in length; on the leaf the stromata are mostly small, globular, 20-30$\mu$ in diameter; fascicles usually dense; conidiophores when young may be almost hyaline, then pale olivaceous brown, and later become medium dark brown at the base and pale near the tip, many somewhat attenuated, commonly curved or bent or once abruptly geniculate, not branched, septa absent or indistinct, small spore scar at the narrowly rounded tip, 2-3.5 x 10-40$\mu$, base may be as wide as 5$\mu$; conidia subhyaline to very pale olivaceous, obclavato-cylin-

dric, straight or mildly curved, indistinctly 1-5 septate, base long obconically truncate, tip obtuse, 2.5-4 x 20-60$\mu$, rarely as large as 5 x 80$\mu$ (they have been reported as large at 6 x 100$\mu$).

HOSTS: Tilia sp., *T. americana* L. (*T. glabra* Vent.), *T. tomentosa* Moench (*T. argentia* DC.), *T. cordata* Mill. (*T. parvifolia* Ehrh.) (*T. ulmifolia* Scop.), *T. platyphyllos* Scop. (*T. grandifolia* Ehrh.), *T. vulgaris* Heyne (*T. europea* L.) (*T. intermedia* DC.).

TYPES: No definite type given. Saccardo states it is common on *Tilia europea* and *T. americana* in Europe and America. (*C. Tiliae*) Charlotte, Vermont; *Tilia americana;* C. G. Pringle; June, 1881; (*C. exitiosa*) Brandenburg, Germany; *Tilia platyphyllos;* P. Vogel; June, 1906; (*C. Zahariadii*) Ismail-Basarabia; *Tilia tomentosa;* C. Zahariadi; Sept. 4, 1933; (var. *tiliae platyphyllae*) Bois de la Cote-d'Or, France; *Tilia platyphyllous;* F. Fautrey; summer, 1893.

DISTRIBUTION: From Wisconsin and Kansas to New York and Delaware; in Europe from Italy to northern Germany and as far east as Russia; in Scotland, New South Wales, Colombia, Caucasus, and Central Asia.

NOTE: Peck wrote on the type packet of *C. tiliae* that it was a synonym of *C. microsora.* The packet in his collection marked as type was collected at Sandlake, N. Y. by Peck in July, 1881. Savulescu and Sandu-Ville base their species on conidiophores which measure 3-4 x 35-100$\mu$. It may be new, but nearly every mount has some conidiophores of various Hyphomycetes, which are large and noticeable. Killian reports the perfect stage as *Mycosphaerella millegrana* (*Klebahn*) (Ann. Sci. Nat. Bot. X **10**: 101. 1928). Sydow (Ann. Mycol. **38**: 453. 1940) reports it as *Mycosphaerella microsora* Sydow.

**Cercospora phaea** Sydow
Ann. Mycol. **21**: 105. 1923

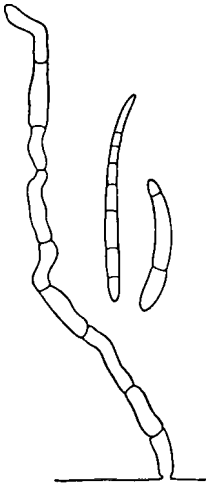


Fig. 215
*C. phaea*

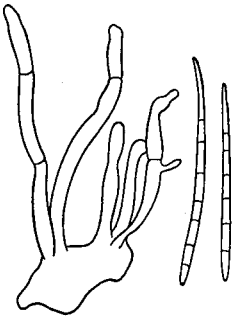


Fig. 216
*C. triumfettae*

Leaf spots indistinct brown to yellow specks on the upper surface; fruiting on the corresponding lower surface, effuse, dark olivaceous to almost black, 0.25-3

mm. in extent; stromata lacking; nonfasciculate; conidiophores long, intertwining, dark brown, slightly paler toward the rounded to conic tip, irregular in width, plainly multiseptate, sparingly branched, rarely geniculate, sinuate to tortuous, 4.5-7 x 50-500$\mu$; conidia cylindric or slightly attenuated, subhyaline to very pale olivaceous brown, 1-7 septate, base rounded to obconically truncate, tip obtuse, 4-7 x 40-85$\mu$.

HOST: ? Trichospermum sp.

TYPE: Bonton Subprovince, Luzon, Philippines; ? Trichospermum sp.; H. S. Yates, No. 25220; March 6, 1916.

DISTRIBUTION: Known only from the type locality.

**Cercospora triumfettae** Sydow

Ann. Mycol. **28**: 218. 1930

*Cercospora pilosa* Ramakrishnan, Proc. Indian Acad. Sci. Sect. B. **34**: 68. 1951

Leaf spots indistinct yellowish areas on the upper leaf surfaces; fruiting on the corresponding lower surface, effuse, olivaceous, 3-10 mm. in extent; stromata lacking; nonfasciculate; conidiophores branches from procumbent intertwining threads, pale to medium brown, uniform in color and fairly so in width, multiseptate, not geniculate, straight to tortuous, tip rounded to conic, 3.5-5 x 30-80$\mu$; conidia subhyaline to very pale olivaceous, cylindro-obclavate, straight to mildly curved, indistinctly multiseptate, base rounded to obconic, tip subobtuse, 3-5 x 30-100$\mu$.

HOSTS: *Triumfetta pilosa* Benth., *T. semitriloba* Jacq., *T. tomentosa* Boj.

TYPES: Puerto La Cruz, Venezuela; *Triumfetta semitriloba;* H. Sydow, No. 78; Dec. 23, 1927; Kodaikanal, Madras, India; *Triumfetta pilosa;* K. V. Srinivasan; Dec. 24, 1949.

DISTRIBUTION: Venezuela, Brazil, Bermuda, Uganda, India.

NOTE: Ramakrishnan says his species is distinct because it has smaller conidia, 5-7 x 25-80$\mu$, that have fewer septa, 1-4. These differences are not considered sufficient for making a new species.

**Cercospora eupteleae** Togashi et Katsuki

Bot. Magazine, Tokyo **65**: 21. 1952

Leaf spots distinct, angular, vein-limited, 1-4 mm. in diameter, above reddish brown to fuscous, below grayish brown, sometimes confluent and occupying most of the leaf area; fruiting chiefly hypophyllous; conidiophores borne singly or in fascicles from stromata, pale olivaceous brown, 0-3 septate, 2.5-4 x 12-50$\mu$, mostly 12-25$\mu$ in length; conidia pale colored, cylindro-obclavate to elongato-fusiform, base obconic, tip conic, 2-5 septate, straight to much curved, 2.5-4 x 30-60$\mu$.

HOST: *Euptelea polyandra* Sieb. et Zucc.

TYPE: Kagoshima City, Pref. Kagoshima, Japan; *Euptelea polyandra;* S. Katsuki; Oct. 26, 1949.

DISTRIBUTION: Japan.

NOTE: Dr. Togashi sent me a type specimen.

**Cercospora tropaeoli** Atkinson

Jour. Elisha Mitchell Sci. Soc. **8**: 59. 1892

Leaf spots circular to angular, 1-4 mm. in diameter, tan to pale brown, narrow raised line border; fruiting epiphyllous; stromata lacking or a few brown cells;

conidiophores borne singly or in fascicles of 2-7, pale olivaceous brown, uniform in color and width, not branched, rarely geniculate, medium spore scar at rounded to subtruncate tip, 4-5 x 20-60$\mu$, rarely 500$\mu$ in length; conidia hyaline, acicular, straight to variously curved, indistinctly multiseptate, base truncate, tip acute, 3-4.5 x 30-150$\mu$, rarely 300$\mu$.

HOSTS: *Tropaeolum majus* L., Tropaeolum sp.

TYPE: Auburn, Ala.; cultivated Tropaeolum; Geo. F. Atkinson, No. 2110; Sept. 7, 1891.

DISTRIBUTION: Studied material from Brazil, Alabama, and Virginia. Uganda (East Afr. Jour. Agr. **2**: 419. 1937).

NOTE: *C. nasturtii*, because of confusion in names, has been reported on garden nasturtiums (Tropaeolum) but this is incorrect.

**Cercospora pilicola** Petrak & Ciferri

Ann. Mycol. **30**: 330. 1932

Leaf spots indistinct or none; fruiting in effuse olivaceous to sooty layers on lower leaf surface; stromata lacking; nonfasciculate; conidiophores subhyaline to pale olivaceous or olivaceous brown, branched, sparingly septate, not geniculate, sometimes sinuous, minute spore scar at rounded tip; 3-4$\mu$ wide and of indeterminate length; conidia cylindric, subhyaline to pale olivaceous brown, 1-8 septate, mostly straight, base sharply obconic, tip bluntly rounded, 4-6.5 x 20-70$\mu$, usually 20-50$\mu$.

HOSTS: *Piriqueta ovata* Urban (*Turnera ovata* Bel. & Esp.), *P. villosa* Aubl. (*P. cistoides* [L.] Meyer).

TYPE: Santiago, San Domingo; *Piriqueta ovata;* E. L. Ekman, No. 3904; Dec. 15, 1930. Cotype distributed as Micoflora Domingensis, No. 3904.

DISTRIBUTION: San Domingo and Puerto Rico.

NOTE: Dr. M. F. Barrus made a collection on *Piriqueta cistoides,* Mar. 5, 1936, Experiment Station, Rio Piedras, P. R. See also *C. turnerae.*

**Cercospora turnerae** Ellis & Everhart

Mo. Bot. Gard. Ann. Rept. **9**: 119. 1898

*Cercospora turnericola* H. & P. Sydow, Ann. Mycol. **14**: 97. 1916

Leaf spots mostly indistinct, sometimes pale tan to gray on upper leaf surface; fruiting amphigenous, in olivaceous to purplish effuse patches on lower leaf surface; stromata lacking or up to 50$\mu$ in diameter; nonfasciculate to dense fascicles; conidiophores shorter and in denser fascicles when on upper leaf surface, pale to medium dark olivaceous brown, multiseptate, sometimes constricted at septa or otherwise irregular in width, branched, rarely once geniculate, occasionally slightly sinuous, small spore scar at conic tip, 4-5 x 20-125$\mu$, some collections show only short conidiophores; conidia pale olivaceous, obclavate to obclavato-cylindric, multiseptate, straight to mildly curved, base long and sharply obconic, tip subobtuse, 3-5 x 35-100$\mu$.

HOSTS: *Turnera pumilea* L., *T. ulmifolia* L. (*T. mollis* H. B. & K.).

TYPES: Nassau, Brit. W. Indies; *Turnera ulmifolia;* A. S. Hitchcock; Nov. 1890; (*C. turnericola*) Rio Branco, S. Marcos, Brazil; *Turnera pumilea;* E. Ule, No. 3362; June 1909.

DISTRIBUTION: Apparently common in northern South America, Central America, and the West Indies.

**Cercospora anethi** Saccardo

Nuovo Giorn. Bot. Ital. n.s. **23**: 219. 1916

HOST: *Anethum graveolens* L.

TYPE: Kulm, Germany; *Anethum graveolens;* No. 850; October.

NOTE: Saccardo says that Fuckel, by wrong interpretation, referred this fungus to *Phoma Anethi,* and that Moesz in Mag. Bot. Lapok, p. 14, 1912, considered it identical with *Marssonina kirchneri* Hegyi which he referred to *Fusicladium depressum* var. *Petroselini* Sacc. (Syll. Fungorum 14: 1077). Von Höhnel also stated that it was a Fusicladium. The wide 0-2 septate conidia show that it is not a Cercospora. The elongated stroma and the extremely compact fascicle of short conidiophores would indicate that Fusicladium probably was the correct classification. V. Bontea (Anal. Inst. Cerc. Agron. Roman. **15**: 208. 1945) reports it as causing blackening of apple stems. This seems doubtful to one who has not made cross inoculations.

**Cercospora angelicae** comb. nov.

*Cercospora apii* var. *angelicae* Sacc. & Scalia, Harriman Alaska Exp. Crypt. Bot. **5**: 16. 1904

Leaf spots subcircular, pale brown, sometimes with dingy gray center; fruiting amphigenous; stromata small, globular, brown; fascicles dense; conidiophores very short, occasionally only slightly elongated cells of the stromatal periphery, longest ones undulate to tortuous near the tip, brown near base, 4 x 5-20$\mu$; conidia hyaline, acicular, indistinctly multiseptate, straight to mildly curved, base truncate, tip subacute, 2-5 x 40-100$\mu$.

HOST: Angelica sp.

TYPE: St. Paul Island, Bering Sea, Alaska; Angelica sp.; Wm. Trelease.

DISTRIBUTION: Known only from the type locality.

NOTE: Although no good material has been studied, it apparently is not a synonym of *C. polytaeniae* as was suggested by Saccardo. Neither does it resemble *C. apii.*

**Cercospora apii** Fresenius

Beiträge zur Mycol. Drittes Heft. p. 91. 1863

*Cercospora penicillata* var. *apii Fuckel,* Hedwigia **2**: 132-136. 1863

Leaf spots ashen or pale brown to fairly dark in color, the paler colored ones often with darker margins, irregular in shape, mostly large, 2-6 mm. in diameter or covering the entire leaflet; fruiting amphigenous; stromata slight or none; fascicles none to dense, sometimes dense on upper surface, and not dense on lower leaf surface, or one specimen will show dense fascicles and another, 1 to 5 stalks in the fascicle; conidiophores quite variable in length, occasionally short and geniculate on upper surface and long and non-geniculate on lower leaf surface, pale to medium dark olivaceous brown, multiseptate, rarely branched, spore scars present, 4-6.5 x 20-300$\mu$; conidia acicular, hyaline, straight to strongly curved, rather closely septate, truncate base, acute to subacute tip, 3-6 x 25-315$\mu$. Some specimens grown under unfavorable conditions for the fungus will have only short conidia.

HOST: *Apium graveolens.* Other hosts have been reported but apparently these reports are erroneous.

TYPE: No one collection used as the type. Fresenius studied several collections available in herbaria in 1863.

DISTRIBUTION: As widely distributed as is celery, unless it were in the farthest northern and southern celery limits.

NOTE: The following varieties of *C. apii* have been described, but since none of them resembles the species on celery, each one is considered as a separate species: varieties *angelicae, carotae, foeniculi, pastinacae, petroselini,* and *selini-gmelini.* Oudemans later thought *C. apii* var. *foeniculi* was a synonym of the species on Petroselinum. Camera lucida drawings of the two forms seem to show enough differences to consider them distinct. *C. apii* has been reported also on Myrrhis sp. (Rabenhorst, Kryptogamen-flora 9: 123. 1910) but the species on this host probably is *C. scandicearum* or *C. torilidis. C. apii* is considered the type species for the genus, Cercospora. Johnson and Valleau (Phytopath. 39: 763-770. 1949) say that the following are synonyms of *C. apii: C. acetosella, C. alabamensis* Atk., *C. althaeina, C. anthelmintica, C. arctiambrosiae, C. avicularis, C. bliti, C. bloxami, C. brachiata, C. canescens, C. Chrysanthemi, C. citrullina, C. columnaris, C. convolvuli, C. cruenta, C. cucurbitae, C. diffusa, C. festucae, C. filispora, C. flagellaris, C. ipomoeae, C. kellermani, C. lathyri, C. lathyrina, C. longispora, C. lupini, C. lupinicola, C. omphacodes, C. phaseolorum, C. phyllitidis, C. physalicola, C. physalidis, C. plantaginella, C. plantaginis, C. polygonacea, C. ricinella, C. rosigena, C. Rubi, C. septorioides, C. solanicola, C. violae, C. viridula,* and *C. zebrina.* Since some of these species have hyaline acicular conidia, and others obclavate or cylindric colored ones, some have no fascicles, others have dense compact ones; some have short conidiophores, others long ones, and other characters which differentiate them under the microscope, I believe the conclusions of these authors are incorrect.

## CERCOSPORAE ON ARRACACIA

A. Conidia pale to medium olivaceous, mostly obclavate, 3-6.5 x 25-75$\mu$; conidiophores nonfasciculate to dense fascicles, without stromata, 4-6 x 20-80$\mu$.
A. RIGIDA *C. arrectaria*

AA. Conidia hyaline or rarely subhyaline, not obclavate.

B. Conidia hyaline, acicular, 3-5 x 40-200$\mu$; conidiophores in fascicles of 2-10, medium dark brown, 4.5-6 x 40-200$\mu$.
A. XANTHORPHIZA *C. arracacina*

BB. Conidia hyaline to subhyaline, cylindric, 5-7 x 10-50$\mu$; conidiophores in fascicles of 2-15, very pale brown, 5-12.5 x 10-60$\mu$.
ARRACACIA sp. *C. arracachae*

**Cercospora arracachae** Patouillard

Bul. Soc. Mycol. de France 8: 137. 1892

Leaf spots indistinct, irregular yellowish patches; fruiting hypophyllous, almost microscopic; stromata few large dark brown cells; fascicles 2-15 spreading stalks; conidiophores very pale olivaceous brown, uniform in color, extremely irregular in shape, gnarled or knobby, incipient branching, 0-5 abrupt geniculations, sparingly septate, 1-5 conic tips, 5-12.5 x 10-60$\mu$; conidia hyaline to subhyaline, cylindric, straight to mildly curved, 1-5 septate, ends rounded bluntly or base long obconically truncate, 5-7 x 10-50$\mu$.

HOST: Arracacia sp. (Arracacha sp.)

TYPE: Entre yervas buenas et Pangor, Prov. d. Chimborazo, Ecuador; Arracacha sp.; G. de Lagerheim; Sept. 1891.

DISTRIBUTION: Known only from the type locality.

NOTE: See key above for differences among the species on Arracacha. Certain collections of this species may have only 1-septate conidia and could then be mistaken for a Didymaria.

**Cercospora arracacina** sp. nov.

Macula angulatae, plerumque venulis limitatae, brunneae vel sordide griseae, 1-10 mm. diam.; caespituli amphigeni; stromata minutissima, fusca; conidiophora unica aut 2-10 fasciculata, brunnea, sursum pallidiora et attenuata, multiseptata, simplicia, fere recta, ad apicem subtruncata, 4.5-6 x 40-200$\mu$; conidia hyalina, anguste obclavata, leniter curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 3-5 x 40-200$\mu$.

Leaf spots angular, mostly vein limited, various shades of brown to dingy gray, 1-10 mm. in length; fruiting amphigenous; stromata a few brown cells; conidiophores borne singly or in fascicles of 2-10, medium dark brown, paler and slightly more narrow toward the tip, multiseptate, not branched, nearly straight or slightly geniculate, subtruncate tip, 4.5-6 x 40-200$\mu$; conidia hyaline, acicular, mildly curved, indistinctly multiseptate, base truncate, tip acute, 3-5 x 40-200$\mu$.

HOST: *Arracacia xanthorrhiza* Bancr.

TYPE: Baruta, Edo. Miranda, Venezuela; *Arracacia xanthorrhiza;* M. F. Barrus, No. 3516; Oct. 13, 1939.

DISTRIBUTION: Known only from the type locality.

NOTE: See key above for differences among the species on this host.

**Cercospora arrectaria** sp. nov.

Maculae obscurae, angulatae, pallidissime olivaceae vel sordide griseae, 0.5-3 mm. diam., margine brunneo; caespituli hypophylli, olivacei, tenuiter effusi; stromata carentia; conidiophora nonfasciculata aut dense fasciculata, aequabiliter olivaceo-brunnea, evidenter multiseptata, vix ramosa, torulosa vel tortuosa, interdum geniculata, ad apicem acuta, 4-6 x 20-80$\mu$; conidia olivacea, fere recta, 1-5 septata, cylindrato-obclavata, utrimque obtusa, 3-6.5 x 25-75$\mu$.

Leaf spots indistinct on upper surface, angular, 0.5-3 mm. in diameter, at first faintly olivaceous, then becoming almost gray with pale to dark brown narrow margin; on corresponding lower surface sparingly effuse olivaceous fruiting; stromata lacking; nonfasciculate to dense fascicles; conidiophores erect, medium dark olivaceous brown, uniform in color, irregular in width, plainly multiseptate, sometimes constricted at septa, rarely branched, often torulose or sinuous, occasionally 1-2 abruptly geniculate, small spore scar at conic tip, 4-6 x 20-80$\mu$; conidia obclavate to almost cylindric, pale to medium olivaceous, mostly straight, 1-5 septate, base broadly rounded to obconically truncate, tip obtuse, 3-6.5 x 25-75$\mu$.

HOST: *Arracacia rigida* Coulter and Rose.

TYPE: El Deserto, Mexico D. F.; *Arracacia rigida;* O. A. Plunkett, No. 23; July 8, 1932.

DISTRIBUTION: Known only from the type locality.

NOTE: See key above for differences among the species on this host genus. The name of this species refers to the erect conidiophores.

**Cercospora bupleuri** Passerini

Sylloge Fungorum **4**: 442. 1886

*Cercospora bupleurina* Lobik, Bolezni Rast. (Morbi Plantarum) **17**: 193. 1928

Leaf spots subcircular to irregular, 3-7 mm. in diameter, reddish brown to almost black, or when occurring on stems, elliptic and with pale center; fruiting on foliage amphigenous but chiefly hypophyllous; stromata small, pale brown; fascicles mostly dense; conidiophores pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not branched, undulate or mildly geniculate, narrowly rounded tip, 3.5-5 x 5-45$\mu$; conidia hyaline, obclavato-cylindric, straight to curved, 1-5 septate, long obconically truncate base, obtuse tip, 2.5-5 x 25-65$\mu$.

HOSTS: *Bupleurum rotundifolium* L., *B. tenuissimum* L.

TYPES: Parma, Italy; *Bupleurum tenuissimum;* Prof. Passerini; Sept. 1878. (Cotype distributed as de Thümen Mycoth. Universalis 1375); (*C. bupleurina*) In a vegetable garden near Georgiewsk, Russia; *Bupleurum rotundifolium;* A. I. Lobik; June 25, 1925.

DISTRIBUTION: Apparently lower Europe.

NOTE: Lobik separates his species by the statement that it has larger spores (3.3-3.9 x 46-64$\mu$), but this measurement is easily included in that made from the cotype material of *C. bupleuri.*

**Cercospora cari** Westerdijk & Van Luijk

Meded. Phyt. Lab. "Willie Commelin Scholten" Baarn. **8**: 51. 1924

TYPE: Holland; *Carum carvi* L.

NOTE: No definite type is given. A specimen was sent to Dr. Westerdijk in 1923. This was described as being hyaline and with appendages on the conidia, therefore is not a Cercospora. A collection was made by F. W. Anderson (Parasitic Fungi of Montana No. 267) on *Carum gairdneri* (H. & A.) Gray, and named *C. cari* Ellis & Holway. It is unlike the Holland collection and is considered identical with the one described on Taenidia (Zizia, Pimpinella) as *C. platyspora* E. & H. Recently Dr. A. G. Newhall found a fungus identical to the one on *Carum carvi* causing a serious storage rot of celery. This in culture has almost enough color to be classified as a Cercospora. But the fact that like the Holland collection it bears conidia with appendages, I am excluding it from the genus, Cercospora. Furthermore no proved Cercospora causes rapid decay of invaded tissue. *Cercospora macrospora* Osterw. (Mitt. Thurg. Naturf. ges. **25**: 59. 1924) is identical with this species as shown by collections on pansy and violets from Alaska and California. Newhall renamed the fungus, *Ansatospora macrospora* (Phytopath. **34**: 92. 1944). Hansen and Tompkins, observing that the fungus on maple seedlings and which had been named *Cercospora acerina* had the same kind of fruiting, changed the name to *Ansatospora acerina* (Hartig) (Phytopath. **35**: 218-220. 1945). But before Newhall published a description of Ansatospora, Neergaard (Zentralbl. für Bakt. Parasitenkunde und Infektionskr II **104**: 407. 1942) named the same fungus, which he found on Petroselinum, *Centrospora ohlsenii.* Using Hansen's and Tompkins' nomenclature, the fungus finally should be named *Centrospora acerina* (Hartig) Newhall (Phytopath. **36**: 893. 1946).

**Cercospora carotae** (Passerini) Solheim

Bio. Monographs **12**: 43. 1929

*Cercospora apii* var. *carotae Pass.*, Atti. Real. Accad. Lincei, Roma. ser. 4. **6**: 469. 1889

Lesions on leaves and stems, subcircular to elliptic, pale tan to almost gray or brown to almost black, finally killing individual lobes of the leaflets or entire leaflets; fruiting amphigenous; stromata lacking; conidiophores borne singly or in groups of two or three, more rarely in fascicles of 5-15, often arranged along edge of leaf, very pale olivaceous brown, usually attenuated toward the tip, sometimes with bulbous base and with one abrupt geniculation, not septate, not branched, with minute spore scars, 2-5 x 10-45$\mu$; conidia cylindro-obclavate, hyaline to subhyaline, short obconic base, mostly mildly curved, septa 1-6, indistinct, tip subacute to subobtuse, 2-3.5 x 30-115$\mu$.

HOSTS: *Daucus carota* L. (*Carota sativa* Rupr.), *D. gingidium* L. (*D. hispanicus* Gouan), *D. maritimus* Lam., *D. maximus* Desf., *D. pulcherrimus* Koch, *D. pusillus* Michx. (Thomas, Phytopath. **33**: 114. 1943).

TYPE: Parma, Italy; *Carota sativa;* G. Passerini.

DISTRIBUTION: At least sparingly present wherever carrots are grown as far north as southern Canada, Germany and North Japan. Reported from China.

NOTE: This species is distinct in nearly every way from *C. apii* with which it was at first associated. von Höhnel (Ann. Mycol. **1**: 530. 1903) suggests that the variety could safely be considered as a species, but did not make the actual change. Siemaszko (Centralbl. f. Bakt. Abt. 2. **78**: 113. 1929) writes it *C. carotae* (Pass.) Kazn. & Siem. Solheim wrote his article in 1928 and had it published in the Monographs dated January 1929. On the inside page, however, is the note "Distributed March 7, 1930." Siemaszko's name was published after January 1929, but the exact date of its distribution is not known. Therefore, Solheim's name still is used.

**Cercospora coriandri** Jacz

Plant Protection, Leningrad, **8**: 185. 1931

Leaf spots circular to angular, 2-9, mostly 3 mm. in diameter, brown; conidia hyaline, acicular, 3-5 x 30-75$\mu$, 1-2 indistinctly septate.

HOST: *Coriandrum sativum* L.

TYPE: Russia; *Coriandrum sativum.* (Actual type not known).

DISTRIBUTION: Known only from the type locality.

NOTE: The original description has not yet been discovered. Nor could any other detailed description be found. It is considered a distinct species, at least until a study can be made of authentic material.

**Cercospora cryptotaeniae** Dearness

Mycologia **21**: 329. 1929

Leaf spots dark brown, angular, bounded by the veins, 1-3 mm. in diameter; fruiting hypophyllous; stromata not distinct; fascicles 3-7 stalks; conidiophores brownish, 0-2 septate, erect, 4-6 x 25-50$\mu$; conidia narrowly obclavate, subhyaline, pluriseptate, 3 x 45-90$\mu$.

HOST: *Cryptotaenia canadensis* (L.) DC.

TYPE: Hudson Falls, N. Y.; *Cryptotaenia canadensis;* S. H. Burnham, No. 400 (Dearness 5988); July 13, 1919.

DISTRIBUTION: Known only from the type locality.
NOTE: I have been unable to procure material of this for study. It cannot be found in the Burnham collection, and Dearness has only a single leaflet of the original specimen.

**Cercospora donnell-smithii** (Speg.) comb. nov.

*Cercosporina donnell-smithi* Speg., Bol. Acad. Nac. Cien. Cordoba **23**: 590. 1919

Leaf spots usually large and angular, more prominent on upper leaf surface, white with a ferruginous margin; fruiting epiphyllous; stromata slight or none; fascicles 3-7 stalks; conidiophores pale olivaceous brown, sparingly septate, rarely slightly branched, straight to somewhat flexuous, 5-6 x 75$\mu$; conidia hyaline, obclavato-cylindric, straight to mildly curved, obconic base, blunt tip, septa indistinct, 1-2.5 x 50-60$\mu$.

HOST: *Myrrhidendron donnell-smithii* Coult. & Rose.
TYPE: Bosques del Volcan Poás, Costa Rica; *Myrrhidendron donnell-smithii;* M. Donnell-Smith; Dec. 1896.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen this specimen. The description is distinct from the two species on the closely related host genus, Arracacia.

**Cercospora foeniculi** P. Magnus

Hedwigia **50**: 185. 1911

Spots appearing on foliage, stems, and pedicels, pale to medium brown, occasionally with a pale center, subcircular on the leaf, elliptic on the stems, 2-5 mm. in length; fruiting amphigenous; stromata slight, medium brown, composed mostly of the compressed bases of the conidiophores, which occur in dense fascicles, pale

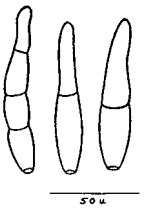



Fig. 217
*C. foeniculi*

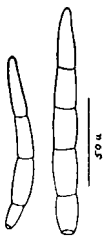



Fig. 218
*C. ligustici*

brown base, almost hyaline tip, irregular in width or attenuated, sparingly septate, not branched, smooth to strongly geniculate, undulate or curved, conic tip, 4.5-7 x 10-40$\mu$ or rarely 70$\mu$; conidia subhyaline, cylindric, straight to mildly curved, 1-5 septate, ends rounded bluntly to conic, frequently catenulate, 4-6.5 x 15-75$\mu$.

HOST: *Foeniculum vulgare* Mill. (*F. officinale* All.).
TYPE: Vahrn, South Tyrol; *Foeniculum officinale;* A. Heimerl.
DISTRIBUTION: Southern Europe, India.
NOTE: Sydow and McRae (Ann. Cryptog. Exot. **2**: 262. 1929) point out that if von Höhnel's suggestion is correct, this species with others should be classed with *Fusicladium depressum*. I see no resemblance of this species nor

of *C. arracachae* with the characters generally applied to Fusicladium. Some collections of both of these species, however, show only 1-septate conidia and then might be classed as a Didymaria. It is possible that *Ramularia foeniculi* Sibilia (Bol. d. R. Staz. di Patol. Veg. **12**: 210. 1932) is the same fungus. Sibilia failed to give measurements that can be compared with those of Cercospora.

**Cercospora hamasensis** Saccardo

Ann. Mycol. **8**: 340. 1910

*Cercospora peucedani* P. Hennings, in litt. (?)

HOSTS: *Peucedanum decursivum* Maxim., *P. fraxinifolium* Hiern.

TYPES: Nefasit ad Maha-bar, Hamasen, Erythraea; *Peucedanum fraxinifolium;* Adriano Fiori; Jan. 22, 1909; (*C. peucedani*) Tokyo, Japan; *Peucedanum decursivum;* N. Nambu, No. 201; Oct. 2, 1905.

NOTE: Type of the Hennings collection is in Berlin and in Stockholm, but I have not found a printed description of it. The wide, dark colored, thick walled, 1-3 septate conidia and dark, short conidiophores in compact fascicles place this fungus in the genus, Coryneum, rather than Cercospora.

**Cercospora hydrocotyles** Ellis & Everhart

Jour. Mycol. **3**: 16. 1887

Leaf spots circular, 1-3 mm. in diameter, pale brown, often with raised edge and sunken center; fruiting amphigenous; small dark brown stromata, 20-40$\mu$ in diameter; fascicles mostly dense; conidiophores pale brown, slightly paler and more narrow towards the tip, sparingly septate, not branched, longest ones slightly undulate, 0-3 mildly or rarely once abruptly geniculate, small spore scar at rounded tip, 3-4.5 x 10-60$\mu$; conidia cylindro-obclavate, subhyaline to very pale olivaceous, straight or nearly so, subtruncate base, subobtuse tip, septa indistinct, 2-3.5 x 20-90$\mu$.

HOSTS: *Hydrocotyle americana* L., *H. canbyi* Coult. & Rose, *H. mexicana* Cham. & Schlecht., *H. sibthorpioides* Lamk., *H. umbellata* L., *H. verticillata* Thunb. (*H. interrupta* Muhl.).

TYPE: Louisiana *Hydrocotyle interrupta;* A. B. Langlois, No. 681; June 20, 1886.

DISTRIBUTION: Studied material from Louisiana, Mississippi, Alabama, Florida, Delaware, Texas, Japan, and Guatemala. Also reported from San Domingo.

NOTE: Some collections show no distinct color in the conidia.

**Cercospora imperatoriae** Baudys & Picbauer

Moravske Prirodovedecke Spolecnosti **1**: 305. 1924

Leaf spots angular, small or coalescing into a large part of the leaf surface, yellowish to dark brown; fruiting hypophyllous; stromata a few large dark brown cells, or merely the closely appressed bases of the fascicles which are dense to almost coremoid; conidiophores in mass dark, singly very pale olivaceous brown, uniform in color, longest ones clavate, septation, geniculation, and branching not present, slightly undulate, apex rounded bluntly, 4-7 x 10-60$\mu$; conidia subhyaline, cylindric to cylindro-obclavate, occasionally catenulate, straight to mildly curved, ends rounded bluntly to obconic, or base sometimes obconically truncate, 1-5 septate, 4-7 x 30-70$\mu$.

HOST: *Peucedanum ostruthium* Koch (*Imperatoria ostruthium* L.).

TYPE: Upa River, at Pecer in the Concontix mountains, Bohemia; *Imperatoria ostruthium;* Ed. Baudys; Aug. 20, 1918.
DISTRIBUTION: Known only from the type material.
NOTE: *C. hamasensis,* which also was described as a Cercospora on Peucedanum, does not belong to this genus.

**Cercospora levistici** Kvashnina
Bul. North Caucasian Plant Prot. Sta. Rostov on the Don
4: 38. 1928

Leaf spots circular to irregular, 1.5-4 mm. in diameter, brown, white center, immarginate; fruiting amphigenous but chiefly epiphyllous; stromata dark brown, small; fascicles dense, compact; conidiophores pale olivaceous brown, paler and more narrow toward the tip, 0-2 septate, not branched, undulate to moderately geniculate, conic apex, 3.5-6 x 25-95$\mu$, mostly 50-65$\mu$; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly septate, base truncate to almost obconic, tip acute, 2.5-5 x 45-175$\mu$, generally 80-125$\mu$.
HOST: *Levisticum officinale* (L.) Koch.
TYPE: Kajala, Ciscaucasia; *Levisticum officinale;* E. S. Kvashnina; July, 1927.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen material of this species.

**Cercospora ligustici** Togashi
Trans. Sapporo Nat. Hist. Soc. 17: 100. 1942

Leaf spots angular, vein-limited, 1-5 mm. in length, dull brown to dingy gray, immarginate; fruiting hypophyllous; stromata small, dark brown, 15-40$\mu$ in diameter; fascicles dense to very dense, compact; conidiophores in mass dark, singly pale brown, almost hyaline tip, irregular in width or attenuated, sparingly septate, not branched, tortuous or strongly geniculate, rounded apex, 4-6 x 10-100; conidia hyaline, cylindric to cylindro-obclavate, 1-5 septate, straight to mildly curved, base subtruncate to long obconically truncate, tip obtuse, 4-6 x 15-80$\mu$.
HOST: *Ligusticum Hultenii* Fernald.
TYPE: Oshora, Prov. Ishikari, Japan; *Ligusticum Hultenii;* K. Togashi; June 29, 1920.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. ligusticicola* for differences between the species on this host genus. *C. arracachae, C. bupleuri, C. cordatae, C. foeniculi, C. imperatoriae, C. ligustici,* and *C. petroselini* have large percentages of 1-septate conidia, but as a few are as long as 5-septate, these species are continued in Cercospora.

**Cercospora ligusticicola** Bonar
Mycologia 38: 343. 1946

Leaf spots angular, small to entire lobe or even entire leaflet, yellowish to medium brown; fruiting amphigenous; stromata lacking or a few dark cells; conidiophores borne singly or in fascicles of 2-7, divergent, pale olivaceous to medium brown, fairly uniform in color and width, multiseptate, not branched, 0-2 geniculate, straight to slightly curved, apex conic, 4-6 x 30-150$\mu$; conidia hyaline, cylindric, straight to mildly curved, 1-7 septate, frequently catenulate, ends rounded bluntly to conic, 3-4.5 x 20-65$\mu$.

HOST: *Ligusticum grayii* Coult. & Rose.
TYPE: Moist meadow along Bear Creek near Elwell Lodge, Plumas Co., Cal.; *Ligusticum grayii;* Lee Bonar; July 30, 1942.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. ligustici* for differences between the species on this host genus.

**Cercospora malkoffii** Bubák
Ann. Mycol. 4: 121. 1906

Leaf spots elongate, sometimes including the entire lobe or leaflet, pale to medium brown; fruiting amphigenous; stromata consisting merely of the swollen, closely aggregated bases of conidiophores, 3-25 or more in a fascicle; conidiophores barely more than slightly elongated cells, pale to very pale yellowish olivaceous, uniform in color, much attenuated toward the tip, not septate, not geniculate, not branched, conic apex, 3-5 x 5-20$\mu$; conidia hyaline, cylindric, 1-5 septate, straight to mildly curved, base long obconically truncate, tip obtuse, 2-4.5 x 20-90$\mu$.

HOST: *Pimpinella anisum* L.
TYPE: Sadovo, near Philippopel, Bulgaria; *Pimpinella anisum;* K. Malkoff.
DISTRIBUTION: Known only from the type locality.
NOTE: Woronichin (Moniteur du Jard. Bot. de Tiflis **12:** 103. 1917) lists this species as being present in the vicinity of Tiflis on *Caucalis anthriscus* Huds.

**Cercospora osmorrhizae** Ellis & Everhart
Proc. Acad. Nat. Sci. Phila. **43:** 89. 1891

Leaf spots subcircular to angular, 3-4 mm. in diameter, dark to almost black, mostly with a reddish brown margin; fruiting amphigenous; stromata none to small, brown; fascicles 2-15 stalks; conidiophores pale to medium brown, uniform in color and width, multiseptate, not branched, straight to undulate or 1-3 geniculate, large spore scar at subtruncate base, 4-5 x 35-80$\mu$, some specimens have only short ones; conidia hyaline, acicular to obclavate, curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse, 3-4 x 25-125$\mu$.

HOSTS: *Osmorrhiza brevistylis* DC. (*O. claytoni* C. A. Clarke), *O. longistylis* (Torr.) DC. (*Washingtonia longistylis* Britton), Osmorrhiza sp.
TYPE: Wilmington, Del.; *Osmorrhiza longistylis;* A. Commons, No. 1416; May 22, 1890.
DISTRIBUTION: Manitoba, Wisconsin, Delaware and New Jersey.
NOTE: See also *C. praegrandis* for differences between the two species on this host genus. J. J. Davis reports *C. osmorrhizae* on *Osmorrhiza claytoni* C. B. Clarke (= *O. brevistylis* DC.).

**Cercospora pastinacae** (Saccardo) Peck
N. Y. State Mus. Bul. 157: 45. 1912

*Cercospora apii* var. *pastinacae* Sacc., Syll. Fung. **4:** 442. 1886

Leaf spots angular, bounded by the smaller veins, 1-3 mm. in diameter, yellowish green to dark brown, sometimes with a yellow halo; fruiting chiefly hypophyllous, when plentiful darkening center of the spot; stromata lacking or a few brown cells in the stomatal openings; large globular brown sclerotia, 30-80$\mu$ may form in old spots and by which the fungus lives over the winter; conidiophores borne singly or in groups of 2-10, subhyaline to pale lemon color or yellowish

brown, longer ones gnarled or crooked or 1-2 abruptly geniculate, sparingly septate, not branched, commonly much attenuated, though rarely may be wider near tip, medium spore scar at subtruncate tip, 5-7.5 x 10-50$\mu$, base may be 10-12$\mu$ wide; conidia hyaline, cylindric to cylindro-obclavate, straight to slightly curved, 1-8 septate, base long obconically truncate, tip blunt, frequently catenulate, 4-8 x 25-80$\mu$.

HOST: *Pastinaca sativa* L.

TYPE: Saccardo does not designate a type, but refers only to Ellis's discussion (Jour. Mycol. 1: 37. 1885). The Peck type is from Red Cloud, Nebr.

DISTRIBUTION: From Wisconsin, Nebraska, and Alabama eastwards; also reported from Siberia.

NOTE: See also the following species.

**Cercospora pastinacina** Solheim

Ill. Biol. Monogr. **12**: 45. 1929

*Cercosporella pastinacae* P. Karst., Hedwigia **23**: 63. 1884

Leaf spots subcircular, 0.5-3 mm. in diameter, more or less confluent, at first brown, then becoming white centered, border definite, slightly raised; fruiting amphigenous; small compact stromata; fascicles dense; conidiophores subhyaline to very pale yellow, septa lacking or indistinct, tapering, straight to subflexuous, not branched, several spore scars at and near tip, 2-3 x 10-30$\mu$; conidia subhyaline to pale yellowish, narrowly obclavate to bacilliform, obscurely 1-6 septate, ends rounded, 1-2.5 x 20-110$\mu$.

HOST: *Pastinaca sativa* L.

TYPE: Mustiala, Finland; *Pastinaca sativa;* P. Karsten.

DISTRIBUTION: It has been reported in England, Finland, Germany, and North America.

NOTE: I have not been able to examine specimens of this species. In the various herbaria I visited, all the American collections marked *Cercosporella pastinacae* were either *Cercospora pastinacae* or *Ramularia pastinacae*. B.D.O. Saville of Canada wrote me in 1944 that he proved rather definitely that the fungus named Cercosporella was Ramularia. Prof. F. C. Stewart (Letter dated Febr. 24, 1926) was of the same opinion. If we accept their statements, the Solheim nomenclature is doubtful.

**Cercospora petroselini** Saccardo

Ann. Mycol. **10**: 321. 1912

*Cercospora apii* var. *petroselini* Sacc., Syll. Fung. **4**: 442. 1886

HOST: *Petroselinum hortense* Hoffm. (*P. sativum* Hoffmn.)

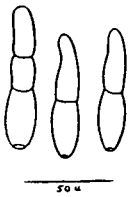



Fig. 219
*C. petroselina*

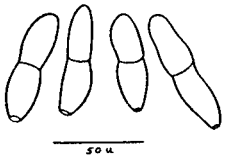



Fig. 220
*C. platyspora*

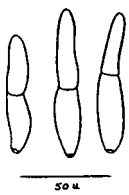



Fig. 221
*C. sii*

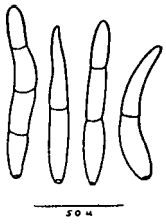



Fig. 222
*C. cordatae*

TYPE: Parma, Italy; *Petroselinum sativum;* G. Passerini; Nov. 1874; cotype distributed as Rabenhorst, Fungi europaei No. 2071.
DISTRIBUTION: Apparently fairly common in Europe (Germany, Poland, Denmark, Holland, Italy, Lower Russia); also collected in New Jersey.
NOTE: Nearly all of the conidia being 1-septate, this species is labeled Didymaria.

**Cercospora platyspora** Ellis & Holway
Jour. Mycol. **3**: 16. 1887

HOSTS: *Taenidia integerrima* (L.) Drude (*Zizia integerrima* DC.) (*Pimpinella integerrima* Benth. & Hook.), *Carum gairdneri* (H. & A.) Gray.
TYPE: Racine, Wisc.; *Zizia integerrima;* J. J. Davis, No. 15; June 18, 1886.
NOTE: von Höhnel (Ann. Mycol. **1**: 530) believes this species is a synonym of *Fusicladium depressum.* But the fungus does not appear like a Fusicladium. (Fungi Columbiani No. 423 on *Taenidia integerrima* is labeled *Fusicladium depressum*). Weese (Centralbl. f. Bakt. etc., Abt. 2 **60**:) publishes a note of von Höhnel saying that it should be *Passalora punctiformis* (Wint.) Höhnel. A collection made by F. W. Anderson was distributed as Parasitic Fungi of Montana, No. 267, under the name, *Cercospora cari* Ellis & Holway. The host was considered to be *Carum gairdneri* (H. & A.) Gray, but there is some doubt that this identification is correct. The Cercospora appears to be identical with the type of *C. platyspora,* which having nearly all 1-septate conidia is considered a Didymaria.

**Cercospora polytaeniae** Ellis & Kellerman
Jour. Mycol. **3**: 104. 1887

Leaf spots oval to elongated, 3-6 mm. in length, center pale tan to ashen, dark colored irregular margin; fruiting amphigenous, plainly visible as numerous black pustules; stromata globular, dark brown, 25-75$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, uniform in color and width, mostly straight, rarely with one abrupt geniculation, longest ones sparingly septate, large spore scar at subtruncate tip, 5-7 x 20-85$\mu$; conidia hyaline, acicular, curved, indistinctly multiseptate, base truncate, tip subacute, 4-5 x 75-175$\mu$.
HOST: *Polytaenia nuttallii* DC.
TYPE: Manhattan, Kansas; *Polytaenia nuttallii;* W. A. Kellerman; June, 1887.
DISTRIBUTION: I have studied material only from Kansas and Wisconsin.
NOTE: *C. apii* var. *angelicae* on Angelica has been suggested as a possible synonym, but material was not available for comparison (Harriman. Alaska Exp. Crypt. Bot. **5**: 16. 1904).

**Cercospora praegrandis** Sprague
Mycologia **29**: 431. 1937

HOST: *Osmorrhiza brevipes* (Coult. & Rose) Suks.
TYPE: On moist shaded bank, Yew Creek near upper (highway) bridge, Alsea Mountain, (Benton Co.), Oregon; *Osmorrhiza brevipes;* R. Sprague, No. 10,664; April 25, 1936.
NOTE: The type specimen of this shows the wide, long, whip-like, hyaline conidia so characteristic of the same fungus on Carum and other hosts and named *Centrospora acerina* (see *Cercospora cari*).

**Cercospora saniculae** Davis

Wisc. Acad. Trans. **19**: 687. 1919

Leaf spots angular, 1-3 mm. in diameter or coalescing and covering large part of the leaflet, dark brown; fruiting hypophyllous; stromata lacking; fascicles 2-4 stalks; conidiophores arising from gnarled procumbent threads, pale brown, slightly paler and more narrow toward the tip, 1-2 septa may occur near the base, not branched, sometimes 1-2 mildly geniculate, more often numerous small spore scars at and near the tip, 3.5-5 x 10-50$\mu$; conidia obclavate, shortest ones may be cylindric, pale olivaceous, straight or mildly curved, indistinctly multiseptate, guttulate, base long obconically truncate, tip subacute to subobtuse, 3.5-5 x 25-120$\mu$.

HOST: *Sanicula gregaria* Bicknell.

TYPE: Gays Mills, Wisc.; *Sanicula gregaria;* J. J. Davis; Sept. 15, 1915.

DISTRIBUTION: Several collections from Wisconsin.

**Cercospora scandicearum** Magnus

Verh. d. Bot. Vereins von Brandenburg **35**: 68. 1894

*Cercospora chaerophylli* von Höhnel, Ann. Mycol. **1**: 530. 1903

Leaf spots angular to irregular, 3-8 mm. in diameter, or including most of the leaflet, brown to almost black, occasionally with a yellow border; fruiting hypophyllous, when abundant semi-effuse, dark; stromata when present small, dark brown; conidiophores borne singly or in fascicles of 2-20 spreading stalks; conidiophores pale to very pale brown, paler and more narrow toward the tip, sparingly septate, branched, 1-5 abruptly geniculate, subtruncate tip, 3-4.5 x 20-80$\mu$; conidia hyaline to subhyaline, cylindric or slightly attenuated, straight to mildly curved, base subtruncate to long obconically truncate, tip obtuse, sometimes catenulate, 3-5.5 x 30-75$\mu$.

HOSTS: Anthriscus sp., *Caucalis trichosperma* Delile (*Anthriscus trichosperma* Pers.), *Chaerophyllum hirsutum* L. (*Anthriscus sylvestris* Hoffm.) (*Ch. silvestre* L.), *Ch. temulum* L., Chaerophyllum sp.

TYPES: Berlin, Germany; *Chaerophyllum temulum;* P. Sydow; July 1888 (cotype distributed as Mycotheca Marchica, No. 2173); (*Cercospora chaerophylli*) Tamsel, Brandenburg, Germany; *Chaerophyllum temulum;* P. Vogel, No. 2305; 1905 (cotype distributed as Sydow Mycotheca Germ. No. 442).

DISTRIBUTION: Germany, Hungary, Switzerland, Poland, and possibly Transcaucasia.

NOTE: Von Höhnel, often examining exsiccati material of *C. scandicearum,* came to the conclusion that it was *Ramularia anthrisci.* The cotype and various other collections show that a true Cercospora is present. *C. scandicearum* has been reported also on *Caucalis anthriscus* Huds. (*Torilis anthriscus* Bernh.), (Rabenhorst, Krypt.-flora **9**: 125. 1910) but the Krieger exsiccati collection of this host shows a new species. *Cercospora apii* has been reported on Myrrhis sp. (Rabenhorst, Krypt.-flora **9**: 123. 1910) but the species probably was *C. scandicearum* or *C. torilidis.* Woronichin (Moniteur du Jardin Bot. de Tiflis **12**: 103. 1917) reports *C. malkoffii* on *Caucalis anthriscus* Scop. (?). His description resembles that of *C. scandicearum.*

**Cercospora selini-gmelini** comb. nov.

*Cercospora apii selini-gmelini* Sacc. & Scalia, Harriman Alaska Exp. Crypt. Bot. p. 16. 1904

Leaf spots minute, 0.5-2 mm., gray center, pale brown margin, occasionally elongated when at the edge of the leaf; fruiting chiefly hypophyllous; stromata subglobose, brown, 15-40$\mu$ in diameter; fascicles dense, compact; conidiophores pale brown, irregular in width or gradually attenuated toward the rounded tip, rarely incipient branching, 0-5 septate, strongly geniculate to tortuous, 4-6 x 10-100$\mu$; conidia hyaline, cylindric to obclavato-cylindric, 1-5 septate, base long obconically truncate, tip obtuse, 4-6 x 15-80$\mu$.

HOSTS: *Conioselinum gmelini* (Bray) Steud. (*Selinum gmelini* Bray), *Oenanthe stronifera* DC.

TYPE: Cape Phipps, Yakutat Bay, Alaska; *Selinum gmelini.*

DISTRIBUTION: Alaska, Japan.

NOTE: Since *C. apii* is distinct from the above species, the Cercospora on Selinum is considered distinct. Dr. Togashi sent me the material on the other host.

**Cercospora sii** Ellis & Everhart

Jour. Mycol. 5: 71. 1889

Leaf spots indefinite on upper surface; small angular areas on lower surface slightly darkened by close aggregations of minute black fruit pustules; stromata a few dark brown cells; most fascicles dense; conidiophores pale olivaceous or olivaceous brown, uniform in color, variously curved, rarely septate, not branched, repeatedly abruptly geniculate (rachis-like), incipient branches at some geniculations, large spore scar at rounded to subtruncate tip, 3.5-5 x 15-90$\mu$; conidia hyaline, cylindric, straight to mildly curved, usually 1-septate, base subtruncate to long obconically truncate, tip obtuse, 5-7 x 10-50$\mu$.

HOST: *Sium cicutifolium* Schrank.

TYPE: Racine, Wisc.; *Sium cicutifolium;* J. J. Davis, No. 62; Sept. 9, 1888.

DISTRIBUTION: Studied several collections from Wisconsin, and one from New York. Also reported from Iowa.

NOTE: Petrak (Ann. Mycol. 1: 530. 1903) suggests that this is a synonym of *Fusicladium depressum.* It does not seem related in any way to Fusicladium, but the spores being nearly all 1-septate, the stromata slight, and the conidiophores relatively long, the fungus is here classed under Piricularia rather than Cercospora.

## CERCOSPORAE ON THASPIUM

(All conidia hyaline)

A. Conidia more nearly cylindric than obclavate, 0-5 septate, 4-6 x 15-65$\mu$; fascicles dense, compact; conidiophores subhyaline to pale brown, 4-7 x 10-45$\mu$.
T. AUREUM, ZIZIA CORDATA — *C. thaspiicola*

AA. Conidia acicular or more nearly obclavate than cylindric; dense fascicles not compact; conidiophores medium dark brown, mostly longer than 45$\mu$.

B. Conidia cylindro-obclavate, 1-7 septate, 4-6 x 35-120$\mu$; conidiophores rarely branched, 4-5.5 x 35-160$\mu$.
T. TRIFOLIATUM — *C. thaspii*

BB. Conidia acicular to obclavate, multiseptate, 2-4 x 30-200$\mu$; conidiophores not branched, 4-6.5 x 25-125$\mu$.
T. AUREUM, ZIZIA CORDATA — *C. ziziae*

**Cercospora thaspii** Ellis & Everhart
Jour. Elisha Mitchell Sci. Soc. 8: 61. 1892

Leaf spots circular to angular, 1-5 mm. in diameter, center pale brown to gray, border reddish brown to purplish; fruiting amphigenous; stromata dark brown, 15-50$\mu$ in diameter; most fascicles dense; conidiophores medium dark brown, uniform in color and width, multiseptate, rarely branched, longest ones undulate or multigeniculate, small spore scar at bluntly rounded tip, 4-5.5 x 35-160$\mu$; conidia hyaline, cylindro-obclavate, shortest ones cylindric, straight to mildly curved, mostly 1-7 septate, base long obconically truncate, tip obtuse, 4-6 x 35-120$\mu$.

HOSTS: *Thaspium trifoliatum* (L.) Gray. The host of *C. Thaspii* has been given also as *Angelica hirsuta* Muhl.

TYPE: Wilmington, Delaware; *Thaspium trifoliatum;* A. Commons; Nov. 23, 1889.

DISTRIBUTION: Studied material from Alabama and Delaware. Also reported from China and New York.

NOTE: This species was described by Atkinson. See key above.

**Cercospora thaspiicola** Davis
Wisc. Acad. Trans. 24: 291. 1929

*Cercospora cordatae* Chupp & Greene, Trans. Wisc. Acad. Sci., Arts, Letters 36: 265. 1946

*Cylindrosporium ziziae* E. & E., Proc. Acad. Nat. Sciences, Phila. 43: 83. 1891

Leaf spots angular to elongate, 1-2 x 2-5 mm., brown; fruiting chiefly hypophyllous; stromata substomatal, almost hyaline, a few cells to 30$\mu$ in diameter; fascicles mostly dense, compact, sheaf-like when constricted by the stomatal opening; conidiophores subhyaline to pale brown, tip almost hyaline, irregular in width, not or rarely septate, not branched, 0-4 geniculate, bluntly rounded tip with large spore scar, occasionally with several other scars near tip, 4-7 x 10-45$\mu$; conidia hyaline, cylindric to cylindro-obclavate, 0-5 septate, straight to mildly curved, base obconically truncate, tip obtuse, 4-6 x 15-65$\mu$.

HOSTS: *Thaspium aureum* Nutt. [*Zizia aurea* (L.) Koch], *Zizia cordata* (Walt.) DC.

TYPES: South Wayne, Wisconsin; *Thaspium aureum;* J. J. Davis; June 27, 1927; (*C. cordatae*) Racine, Wisc.; *Zizia cordata;* J. J. Davis; June 22, 1890.

DISTRIBUTION: Several collections from Wisconsin.

NOTE: See key, page 580 for differences among the species on this host genus. Greene (The Amer. Midland Naturalist 39: 447. 1948) points out the synonymy of *C. cordatae.*

**Cercospora torilidis** sp. nov.

Maculae angulatae vel irregulares, 1-3 mm. diam., atro-fuscae; caespituli hypophylli; stromata minuta, fusca; conidiophora laxe fasciculata, pallidissime brunnea, sursum fortiter attenuata, vix septata atque geniculata, simplicia, ad apicem subtruncata, 2.5-4 x 10-50$\mu$; conidia hyalina, cylindrata vel anguste obclavata, recta vel leniter curvata, 3-5 septata, saepe catenulata, utrimque obtusa, 2.5-4 x 20-75$\mu$.

Leaf spots angular to irregular, 1-3 mm. in diameter, dark brown to almost black; fruiting hypophyllous; stromata, when present, small, pale to medium brown; fascicles mostly 5-12 spreading stalks; conidiophores pale to very pale

olivaceous brown, uniform in color, strongly attenuated, sparingly septate, not branched, 0-1 geniculate, subtruncate tip, 2.5-4 x 10-50$\mu$; conidia hyaline, cylindric to almost acicular, straight to mildly curved, usually 3-5 septate, commonly catenulate, ends subtruncate to long obconically truncate, 2.5-4 x 20-75$\mu$.

HOST: *Caucalis anthriscus* Huds. (*Torilis anthriscus* Bernh.) (*Chaerophyllum hispidum* Thunb. & Miq.)

TYPE: Königstein, Saxony, Germany; *Torilis anthriscus;* W. Krieger; July 7-8, 1894. Cotype distributed as Krieger, Fungi Saxonici, No. 983.

DISTRIBUTION: Known only from the type locality.

NOTE: Krieger's collection was named *Cercospora scandinacearum,* but the species on Torilis has more narrow, hyaline conidia, and paler, more narrow, shorter conidiophores that are not strongly geniculate, nor branched. Woronichin (Moniteur du Jard. Bot. de Tiflis **12:** 103. 1917.) reports *C. malkoffii* as present in the vicinity of Tiflis on *Caucalis anthriscus* Scop. (?). His description does not fit the species but possibly that of *C. scandicearum* or this new species.

**Cercospora ziziae** Ellis & Everhart

Jour. Mycol. **3:** 16. 1887

Leaf spots circular or somewhat elongate, 2-5 mm. in length, often bulging upward, white to gray center, wide dark brown border, often with yellow halo; fruiting amphigenous; stromata dark brown, globular, 30-50$\mu$ in diameter; fascicles dense; conidiophores medium dark brown, uniform in color, rather irregular in width, plainly multiseptate, not branched, straight, sinuous, or multigeniculate, medium spore scar at subtruncate tip, 4-6.5 x 25-125$\mu$; conidia acicular to obclavate, hyaline, straight to curved, closely multiseptate, base truncate to long obconically truncate, tip acute, 2-4 x 30-200$\mu$.

HOSTS: *Thaspium aureum* Nutt. [*Zizia aurea* (L.) Koch], *Zizia cordata* (Walt.) DC.

TYPE: West Chester, Pa.; *Zizia cordata;* B. M. Everhart, No. 536; July, 1886.

DISTRIBUTION: From Pennsylvania and New York west to Manitoba, Dakotas, Wisconsin and Missouri.

NOTE: See key, page 580 for differences among the species on Zizia. Dearness and House (N. Y. State Museum Bul. 233-234: 32. 1920) report this species on *Thaspium barbinode* (Michx.) Nutt. This seems doubtful.

**Cercospora boehmeriae** Peck

N. Y. State Mus. Nat. Hist. Ann. Rept. **34:** 48. 1881

*Cercospora boehmeriae* Fukui, Jour. Plant Prot. **5:** 734. 1918

*Cercospora fukuii* Yam., Jour. Soc. Trop. Agr. **6:** 601. 1934

Leaf spots circular to angular, sometimes limited by leaf veins, brown, occasionally grayish; fruiting apparently chiefly hypophyllous; stromata small, brown, globular; fascicles 1-10; conidiophores pale olivaceous brown, sparingly septate, rarely geniculate, sometimes slightly wavy, spore scars not present, longer ones attenuated, 2.5-4 x 15-60$\mu$, rarely as long as 100$\mu$; conidia obclavate to obclavato-cylindric, usually curved, subhyaline to very pale olivaceous brown, septa mostly not prominent, base obconically truncate to obconic, tip subacute, 2.5-4 x 40-125$\mu$.

HOSTS: *Boehmeria cylindrica* (L.) Sw., *B. frutescens* Thunb. var. *concolor* Nak., *B. japonica* Miq., *B. nivea* Gaud., *Urtica membranacea* Poir.

TYPE: South Ballston, N. Y.; *Boehmeria cylindrica;* C. H. Peck; Sept.
DISTRIBUTION: From Gulf States to Nebraska and Wisconsin, then eastward. Materials received also from Bermuda, Japan, and Uganda. Also reported from the Philippines.
NOTE: The only other species on Boehmeria, *C. krugiana,* has hyaline acicular conidia. A specimen labelled *C. boehmeriae* Sawada is deposited in the Mycological Herbarium of the U. S. Bureau of Plant Industry, but Dr. Togashi in a letter (Dec. 1, 1949) says it should be *C. boehmeriae* Peck. Clara and Castillo (The Philipp. Jour. Agr. **15:** 9. 1950) describe *C. boehmeriana* Wor. on *Boehmeria nivea.* Their description indicates that they were dealing with the Peck species. *C. boehmeriana* Woronichin, as stated in a letter dated Nov. 26, 1951 from John A. Stevenson, was mentioned in three reports from Jaczewski's Yearbook of information on the diseases of plants: **1903:** 166; **1910:** 488; and **1911-12:** ?page. Later Russian authors, however, refer only to *C. boehmeriae* Peck.

**Cercospora krugiana** Muller & Chupp
Arch. Inst. Biol. Veget. R. de Janeiro **3:** 94. 1936

Leaf spots angular to irregular, 0.5-5 mm. in diameter, dark brown; fruiting hypophyllous, effuse, slightly darkening the white pubescence, rarely almost lavender; stromata lacking or only a few brown cells; loosely fasciculate, 2-12 stalks; conidiophores medium olivaceous brown, uniform in color, and almost so in width, multiseptate, not branched, straight to curved or undulate, occasionally 1-2 geniculate, subtruncate tip, 4.5-6 x 30-230$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip almost acute, 2.5-4 x 40-120$\mu$.

HOST: *Boehmeria nivea* Gaudich.
TYPE: Instituto Agronomico, Campinas; Brazil; *Boehmeria nivea;* H. P. Krug and A. S. Costa, No. 427; May 21, 1935. Cotype—Minas Geraes; *Boehmeria nivea;* A. S. Muller, No. 837; Aug. 27, 1934.
DISTRIBUTION: Campinas and Minas Geraes, Brazil.
NOTE: See also *C. boehmeriae* for differences between the species on this host genus.

**Cercospora mysorensis** Thirumalachar & Chupp
Mycologia **40:** 357. 1948

*Cercospora pouzolziae* Sawada, Formosa Agr. Res. Inst. Rept. 87: 86. 1944

Leaf spots subcircular to angular, 1-4 mm. in diameter, dull brown, sometimes surrounded by a raised line border and a yellowish to orange halo; fruiting amphigenous; stromata none or a few dark cells; nonfasciculate or fascicles of 2-10 divergent stalks; conidiophores pale to very pale fuligenous, uniform in color, somewhat irregular in width, 1-7 septate, straight to undulate or curved, branched especially when nonfasciculate, rarely geniculate, bluntly rounded tip, 4-6 x 20-150$\mu$; conidia subhyaline to pale fuligenous, distinctly cylindric to cylindro-obclavate, straight to strongly curved, 1-7 septate, base long obconically truncate, tip usually obtuse, 4-6 x 20-80$\mu$.

HOSTS: *Pouzolzia bennettiana* Wight, *P. indica* Gaudich. (*P. zeylanica* Benn. var. *alienata* Sasaki).
TYPES: Nandi Hills, Mysore, India; *Pouzolzia bennettiana;* M. J. Thirumalachar;

Dec. 17, 1945; (*C. pouzolziae*) Taipeh, Taiwan; *Pouzolzia zeylanica* var. *alienata;* Y. Fujikuro; Febr. 12, 1914.
DISTRIBUTION: India, Formosa.
NOTE: The wide conidiophores and conidia separate this species from others with colored conidia on the Urticaceae.

**Cercospora nanocnides** Nakato Naito

Mem. Coll. Agr. Kyoto Imp. Univ. (Phytopath. Ser. IX). 47: 50. 1940

Leaf spots subcircular to irregular, 5-10 mm. in diameter, yellowish above, grayish white below, immarginate; fruiting hypophyllous; stromata present; fasciculate; conidiophores pale olivaceous brown, sparingly septate, not branched, 2.5-3 x 30-50$\mu$; conidia hyaline, acicular, straight to curved, 4-12 septate, 2.5-3 x 50-100$\mu$.

HOST: *Nanocnide japonica* Blume.
TYPE: Kyoto, Pref. Kyoto, Japan; *Nanocnide japonica;* Nakato Naito; Oct. 23, 1935.
DISTRIBUTION: Known only from the type locality.
NOTE: I have not seen this species.

**Cercospora pellioniae** Togashi & Katsuki

Bot. Magazine, Tokyo 65: 22. 1952

Leaf spots subcircular, 2-8 mm. in diameter, pale tan to dull brown, older ones with gray center, occasionally with narrow raised line border; fruiting amphigenous, chiefly epiphyllous; stromata slight, usually a few brown cells; fascicles mostly not dense, divergent; conidiophores pale olivaceous brown, or subtruncate tip almost hyaline, irregular in width, sparingly septate, straight to rachiform with geniculations, 4-5 x 15-65$\mu$; conidia hyaline, acicular to almost cylindric, straight to mildly curved, indistinctly multiseptate, base truncate, tip obtuse to subobtuse, 3-4.5 x 20-85$\mu$.

HOST: *Pellionia scabra* Benth.
TYPE: Mt. Tara, Pref. Saga, Japan; *Pellionia scabra;* S. Katsuki; May 22, 1942.
DISTRIBUTION: Japan.

**Cercospora pileae** Tai

Lloydia 11: 51. 1948

Indefinite yellowish spots on the upper surface; fruiting hypophyllous, forming a sooty layer; stromata absent; conidiophores loosely fasciculate, slightly curved, undulating, brownish olivaceous, 2-5 septate, spore scars not conspicuous, 4-5 x 63-100$\mu$; conidia subcylindric, obconically truncate at base, slightly curved, often enlarged near the middle, 5-8 septate, pale olivaceous, 4-4.5 x 54-104$\mu$.

HOST: Pilea sp.
TYPE: Chengtu, Szechuan, China; Pilea sp.; L. Ling, No. 8524; Sept. 9, 1941.
DISTRIBUTION: China.
NOTE: I have not seen this species.

**Cercospora pipturi** Stevens & Glick

Bernice P. Bishop Mus. Bul. 19: 155. 1925

Leaf spots none or indistinct; fruiting effuse, hypophyllous, olivaceous to dark, 2-4 mm. or more in extent; stromata lacking; nonfasciculate or pseudofasciculate;

conidiophores intertwining branches from procumbent threads, pale to medium olivaceous brown, uniform in color and width, multiseptate, not geniculate, tortuous, conic tip, 3-6 x 50-1200$\mu$; conidia concolorous, cylindric, straight to curved, 3-7 septate, base long obconically truncate to sharply obconic, tip obtuse, 5-8 x 40-115$\mu$.

HOST: *Pipturus gaudichaudianus* Wedd. (*P. albidus* A. Gray).

TYPE: Kauai: Kalalau Trail, Hawaii; *Pipturus albidus;* F. L. Stevens, No. 538; June 16, 1921.

DISTRIBUTION: Several collections in Hawaii.

NOTE: Some of the conidia have thick walls, so that the fungus could have been classed as an Helminthosporium.

**Cercospora pouzolziae** Sydow
Ann. Mycol. 33: 236. 1935

Leaf spots subcircular, 2-5 mm. in diameter, almost the same reddish brown as the dried leaves, occasionally with a grayish center; fruiting epiphyllous; stromata globular, pale to dark olivaceous brown, 20-50$\mu$ in diameter; fascicles dense to very dense, compact; conidiophores in mass medium dark, singly pale olivaceous brown, paler and more narrow toward the tip, not septate, not geniculate, not branched, curved or undulate, conic tip, 1.5-3 x 5-25$\mu$, or appearing much longer when conidia are persistent; conidia pale olivaceous, cylindric to somewhat attenuated, straight to curved, indistinctly multiseptate, base obconically truncate to subtruncate, tip conic, 2-4 x 25-110$\mu$.

HOST: *Pouzolzia hypoleuca* Wedd., *P. hirta* Hassk. (*Gonostegia hirta* Miq.)

TYPE: Nelspruit, Barberton, Transvaal; *Pouzolzia hypoleuca;* L. Liebenberg, No. 26013; May 1931.

DISTRIBUTION: Transvaal, Japan.

NOTE: K. Sawada, Formosa Agr. Res. Inst. Rept. 87: 86. 1944, briefly describes *Cercospora pouzolziae* Sawada on *Pouzolzia zeylanica* Benn. (*P. indica* Gaudich.). It is unlike the Sydow species, therefore is renamed *Cercospora mysorensis.*

**Cercospora spegazzinii** Saccardo
Syll. Fungorum. 4: 475. 1886

*Cercospora dubia* Speg., Anal. Soc. Cien. Argentina 9: 191. 1880

Leaf spots circular to irregular, 2-7 mm. in diameter, sometimes bulging on one side and depressed on the other, yellowish gray to silvery gray, immarginate; fruiting chiefly hypophyllous, when abundant appearing as a sparse sooty layer; stromata brown, globular, 30-60$\mu$ in diameter; fascicles dense to very dense; conidiophores pale olivaceous brown or yellowish brown, septation, geniculation, spore scars, and branching absent or indistinct, subconic to rounded tip, 4-5.5 x 5-25$\mu$, persistent conidia may sometimes make them appear much longer; conidia cylindric to cylindro-obclavate, subhyaline to pale olivaceous, 0-5, mostly 3-septate, straight to mildly curved, base long obconically truncate, tip obtuse, 4-5 x 20-45$\mu$. (Spegazzini says 5-7 x 30-70$\mu$).

HOSTS: *Celtis tala* Gill. and possibly *C. occidentalis* L. Reported on Pteroceltis, but this seems distinct.

TYPE: Barracas del Sur, Buenos Aires, Argentine; *Celtis tala;* C. Spegazzini; Febr. 1880.

DISTRIBUTION: Known only from the type locality. Reported present in Kansas. I was unable to verify this in the herbaria which I visited.

NOTE: The name, *Cercospora dubia,* had been used previously by Riess and Winter. K. Sawada, Formosa Agr. Res. Inst. Rept. **85**: 100. 1943, lists *Cercospora celtidis* Sawada on *Celtis sinensis* Pers. He says that some of the conidia are muriform, therefore the species must be considered an Alternaria.

**Cercospora sphaeriaeformis** Cooke

Grevillea **6**: 140. 1878

*Cercospora ulmi* Sydow, Ann. Mycol. **27**: 433. 1929

Leaf spots circular to irregular, 2-6 mm. in diameter, dark reddish brown, oldest spots with grayish centers; fruiting epiphyllous, in grayish areas; stromata globular to elongate, dark brown, 30-120$\mu$ in diameter; nonfasciculate as branches from procumbent threads or very dense fascicles on stroma; conidiophores pale fuligenous or olivaceous brown, uniform in color, inclined to be irregular in width, variously curved or undulate, sparingly septate, not geniculate, when in fascicles not branched, minute spore scar at narrowly rounded tip, 3-4 x 10-35$\mu$; conidia subhyaline to pale olivaceous, obclavate to obclavato-cylindric, straight to mildly curved, longest ones multiseptate, base obconically truncate, or sometimes variable, tip subobtuse, 3-4.5 x 20-75$\mu$.

HOSTS: *Ulmus pumila* L., Ulmus sp., *U. parvifolia* Jacq.

TYPES: Fernandina, Florida; Ulmus sp.?; H. W. Ravenel, No. 63 (Cooke 129); (*C. ulmi*) China; *Ulmus pumila;* F. L. Tai, No. 2248; Sept. 6, 1928.

DISTRIBUTION: Studied material from Florida, Texas, Japan, and China. Also reported from Louisiana, Georgia and South Carolina.

NOTE: See also *C. ulmicola* for differences between the two species on Ulmus. Material from Texas had both species in same mount. Dr. Togashi sent material from Japan.

**Cercospora tremae** (Stevens & Solheim) Chupp n. comb.

*Ragnhildiana tremae* Stev. & Solh., Mycologia **23**: 405. 1931

Leaf spots none to distinct, circular to irregular, 3-6 mm. in diameter, purple to almost black margin, gray center; when leaf spot is lacking, fruiting scantily effuse, hypophyllous, olivaceous; stromata none or a few olivaceous cells; nonfasciculate (single branches from procumbent threads) or loosely fasciculate, branched; conidiophores pale olivaceous to medium olivaceous brown, uniform in color, irregular in width, sparingly septate, not geniculate, curved to tortuous, rounded to conic tip, 3-5 x 20-60$\mu$; conidia pale to very pale olivaceous, cylindric, catenulate, straight to mildly curved, mostly 3-5 septate, ends rounded to obconically truncate, 2-4.5 x 25-65$\mu$.

HOSTS: *Trema bracteolata* Blume, *T. guineensis* (Schum.) Ficalho, *T. micrantha* (L.) Blume.

TYPE: St. Clair, Trinidad; *Trema micrantha;* F. L. Stevens, No. 889; Aug. 19, 1922.

DISTRIBUTION: Studied collections from Trinidad, Venezuela, San Domingo, and South Africa.

NOTE: Ragnhildiana is based on the character, catenulate conidia. K. Sawada, Formosa Agr. Res. Inst. Rept. 87: 89. 1944, briefly describes *Cercospora tremae* Sawada on *Trema orientalis* Bl.: Leaf spots 0.8-1.5 mm., brown; conidiophores chiefly hypophyllous, yellowish brown to brown, 7-9 septate, 4.5-5.5 x 90-120$\mu$;

conidia yellowish brown, 3-8 septate, 4.5-6 x 35-90$\mu$. Apparently it is not the same as the Stevens and Solheim species, but the characters enumerated are too meager to classify it accurately. C. G. Hansford (Proc. Linnean Soc. London 1943-4: 122. 1944) also describes a *Cercospora tremae* Hansford. The type is listed as: Rifle Range, Kiagwe, Uganda; *Trema guinensis* Priemer; Hansford, 2697. It resembles the Stevens and Solheim fungus in every respect except that he gives the measurements of the conidiophores as 5-7 x 50-110$\mu$ and of the conidia as 5-7 x 70-200$\mu$. It may be that he and Sawada have the same fungus in mind.

**Cercospora ulmicola** sp. nov.

Maculae irregulares, saepe confluentes, fuscae vel griseo-fuscae; caespituli hypophylli; stromata minuta, atro-fusca; conidiophora dense fasciculata, aequabiliter olivaceo-brunnea, multiseptata, simplicia, recta vel curvata, 0-2 geniculata, ad apicem subtruncata, 4-5.5 x 65-220$\mu$; conidia hyalina, anguste obclavata, recta vel curvata, spurie multiseptata, ad basim truncata, ad apicem acuta, 2-4.5 x 25-220$\mu$.

Leaf spots irregular, often coalescing into large part of leaf area, brown to grayish brown, mostly immarginate; fruiting hypophyllous; stromata lacking or small, dark brown; fascicles mostly dense; conidiophores pale to medium olivaceous brown, uniform in color and width, multiseptate, not branched, straight to curved, occasionally 1-2 abruptly geniculate, medium sized spore scar at the subtruncate tip, 4-5.5 x 65-220$\mu$; conidia hyaline, acicular, straight to curved, indistinctly multiseptate, base truncate, tip acute, 2-4.5 x 25-220$\mu$.

HOSTS: *Ulmus fulva* Michx., Ulmus sp.

TYPE: Agricultural Experiment Station, Bermuda; *Ulmus fulva;* R. Ogilvie; Oct. 1927.

DISTRIBUTION: Texas and Bermuda.

NOTE: See also *C. sphaeriaeformis* for differences between the two species on this host genus.

**Cercospora villebruneae** von Höhnel

Sitzungsber. K. Akad. Wissensch. Math.-Naturw. Klasse, Wien. 121: 413. 1912

HOST: *Villebrunea integrifolia* Gaudich. (*V. sylvatica* Blume).

TYPE: Botanical Garden, Buitenzorg, Java; *Villebrunea sylvatica;* F. v. Höhnel; 1907.

NOTE: von Höhnel describes the fungus as having muriform spores. Therefore it probably is an Alternaria. Other parts of the description also support this supposition.

**Cercospora zelkowae** Hori

Nambu, N., Jour. Plant Protection 8: 492. 1921

Leaf spots subcircular, 0.5-5 mm. in diameter, at first purplish, then brown, and finally with a gray center, mostly dull brown on the lower surface; fruiting amphigenous; stromata dark brown to black, subspherical, 15-50$\mu$ in diameter; fascicles usually dense, divergent; conidiophores pale to medium olivaceous brown, straight to undulate or curved, paler and more narrow toward the tip, indistinctly multiseptate, not branched, rarely geniculate, 3-4.5 x 10-45$\mu$; conidia

hyaline, obclavate or only slightly attenuated, 3-6 septate, base obconically truncate, tip acute, sometimes strongly bent, 2.5-4 x 30-60$\mu$.

HOST: *Zelkowa serrata* Makino.

TYPE: Forest Experiment Station, Tokyo, Japan; *Zelkowa serrata;* June, 1920.

DISTRIBUTION: Japan.

NOTE: Dr. Togashi sent me a specimen collected by S. Katsuki, Oct. 22, 1947, in the Fukuoka Prefecture.

**Cercospora bakeri** H. & P. Sydow

Philipp. Jour. Sci. (Bot.) **8**: 284. 1913

Leaf spots circular to irregular, 2-10 mm. in diameter, yellowish brown; fruiting hypophyllous; stromata a few dark brown cells; fascicles mostly dense, compact to almost coremoid; conidiophores pale olivaceous brown, uniform in color and width, multiseptate, branched, not geniculate, almost straight, bluntly rounded tip, 3-4.5 x 60-200$\mu$; conidia very pale olivaceous, cylindric or slightly attenuated, straight to mildly curved, 3-6 septate, ends rounded to conic, 4-6.5 x 30-60$\mu$.

HOSTS: Clerodendron sp. (Volkameria sp.), *C. fragrans* Vent.

TYPE: Los Banos, Philippines; Clerodendron sp.; C. F. Baker, No. 719; Jan. 20, 1913.

DISTRIBUTION: Philippines, Formosa.

NOTE: Fungi Malayana No. 214, determined by H. & P. Sydow and sent out by C. F. Baker, is labeled *Cercospora bakeri* on *Leucas linifolia* Spreng. (Labiatae). When this collection was examined both at Harvard and in Berlin, the fungus was found to be a Septoria or possibly a Cylindrosporium. See following key.

CERCOSPORAE ON CLERODENDRON

A. Conidia hyaline to subhyaline, 3-6 x 20-200$\mu$, stromata usually none; fascicles 3-20 divergent stalks; conidiophores medium brown, 3-6.5 x 30-150$\mu$. *C. volkameriae*

AA. Conidia colored.

B. Conidiophores arising as solitary branches from procumbent threads, pale, 3.5-6 x 30-85$\mu$; conidia very pale, 3.5-5 x 50-135$\mu$. *C. kashotoensis*

BB. Conidiophores in dense fascicles.

C. Conidia obclavate, pale to medium, 2.5-5 x 30-95$\mu$; conidiophores 3.5-5 x 10-70$\mu$. *C. clerodendri*

CC. Conidia cylindric, very pale, 4-6.5 x 30-60$\mu$; conidiophores 3-4.5 x 60-200$\mu$. *C. bakeri*

**Cercospora callicarpae** Cooke

Grevillea **6**: 140. 1878

*Cercospora callicarpicola* Nakato, Mem. Coll. Agr. Kyoto Imp. Univ. **47**: 49. 1940

*Cercospora callicarpicola* Sawada, Taiwan Agr. Res. Inst. Rept. 85: 100. 1943

Leaf spots indistinct or irregular brown to reddish brown blotches, without definite border, gradually fading into the green of the leaf, 4-12 mm. in diameter; fruiting amphigenous, but more readily visible on the upper surface as minute black tufts, scantily effuse on lower surface; small black stromata and dense fascicles on upper surface; mostly no stromata and non-fasciculate on lower surface;

conidiophores pale olivaceous brown, fairly uniform in color, septa not distinct, rarely or mildly geniculate, when in fascicles seldom branched, rounded to conic tip, spore scars mostly lacking, 2.5-4 x 40-125$\mu$, when non-fasciculate may be of indefinite length; conidia cylindric to obclavato-cylindric, occasionally distinctly obclavate, or swollen near base, pale olivaceous or olivaceous brown, straight to mildly curved, obconic to rounded base, bluntly rounded tip, indistinctly 2-7 septate, 2.5-5 x 20-85$\mu$.

HOSTS: *Callicarpa americana* L., *C. formosana* Rolfe, *C. japonica* Thunb., *C. mollis* Sieb. + Zucc., Callicarpa sp.

TYPES: Gainesville, Fla.; Callicarpa sp.; W. H. Ravenel, No. 64 (121); (*C. callicarpicola*) Kyoto, Japan; *Callicarpa mollis;* N. Naito; Nov. 23, 1935.

DISTRIBUTION: Southern tier of states; in Japan and Formosa.

NOTE: Nakato states that his species differs from *C. callicarpae* in its somewhat longer spores (34-76$\mu$) and also because it develops on the under surface of the leaf. These two characters, however, agree with the type of Cooke's species.

**Cercospora cardiostegiae** B. Davis

Mycologia **32**: 170. 1940

Leaf spots indistinct, on upper surface slight browning, on lower leaf surface indistinctly effuse fruiting that causes a slight darkening in small areas; stromata lacking or small, dark; nonfasciculate or 2-12 in fascicle; conidiophores pale to medium olivaceous brown, irregular in width, longest ones 1-4 septate, usually constricted at septa, branched, straight to variously curved, sometimes 1-2 mildly to abruptly geniculate, minute spore scar at bluntly rounded tip, 4-6.5 x 10-65$\mu$; conidia pale to medium olivaceous brown, straight to much curved, cylindric to cylindro-obclavate, rarely narrow near the center, frequently catenulate, 1-7 plainly septate, ends bluntly rounded to obconic, 4-6 x 20-75$\mu$.

HOST: *Lippia polycephala* Briq. (*L. cardiostegia* Benth.).

TYPE: Laguna, Guatemala; *Lippia cardiostegia;* W. A. Kellerman; Jan. 20, 1906.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. lippiae* for differences between species on this host genus.

**Cercospora clerodendri** Miyake

Bot. Magazine, Tokyo. **27** (315): 53. 1913

*Cercospora clerodendri* Sawada, Formosa Agr. Rev. **38**: 695. 1942

Leaf spots suborbicular to angular, often vein-bound, 2-5 mm. in length, dark reddish brown, occasionally with a grayish center; fruiting amphigenous, chiefly epiphyllous; stromata slight to 60$\mu$ in diameter, dark brown, larger on the upper leaf surface; fascicles 3-30 divergent stalks; conidiophores pale to medium olivaceous brown, uniform in color and width, multiseptate, rarely branched, straight to undulate, seldom geniculate, rounded to conic tip, 3.5-5 x 10-70$\mu$, mostly 10-35$\mu$ on upper leaf surface; conidia obclavate, pale to medium olivaceous, straight to mildly curved, 3-7 septate, base obconically truncate, tip subobtuse to conic, 2.5-5 x 30-95$\mu$.

HOSTS: *Clerodendron cyrtophyllum* Turcz., *C. myricoides* R.Br., *C. trichotomum* Thunb., Clerodendron sp. (Volkameria sp.).

TYPE: Chinshi, Hunan, China; Clerodendron sp.; I. Miyake; Oct. 11, 1908.

DISTRIBUTION: Japan, China, Transvaal, Formosa.

NOTE: See key, page 588 for differences among the species on this host genus.

I am not sure of the synonymy of the Sawada species. His descriptions are too unsatisfactory to make exact comparisons.

**Cercospora delicatissima** Kalchbrenner & Cooke
Grevillea **9**: 24. 1881

HOST: *Priva leptostachya* Juss. (*P. dentata* Juss.).
TYPE: Somerset East, South Africa; *Priva dentata;* P. MacOwan, No. 1109; 1875.
NOTE: Material of this collection was studied at Kew and Berlin. Miss Doidge sent additional material from South Africa. All the mounts showed only hyaline fruiting, so that under the present system of classification this should be named *Cercosporella delicatissima* (Kalch. & Cooke). See also *C. privae.*

**Cercospora duplicans** n. comb.
*Cercospora stachytarphetae* P. Hennings, Hedwigia **48**: 18. 1909

Leaf spots subcircular, small, reddish brown, difficult to distinguish on dried material; fruiting hypophyllous, very scantily effuse; stromata lacking or small, pale brown; conidiophores borne singly as branches from procumbent threads or in small fascicles from the stromata, very pale olivaceous, paler and more narrow toward the tip, rarely septate or geniculate, straight to undulate, conic tip, 2-3.5 x 10-30$\mu$; conidia hyaline to subhyaline, cylindro-obclavate, straight to mildly curved, ends conic to rounded bluntly, 1-5 septate, 2.5-4 x 15-50$\mu$.

HOST: Stachytarpheta sp.
TYPE: Capital, Sao Paulo, Brazil; Stachytarpheta sp.; A. Puttemans, No. 639; Febr. 1903.
DISTRIBUTION: Known only from the type locality.
NOTE: See also *C. stachytarphetae* E. & E. It has acicular, long conidia and wide, long conidiophores.

**Cercospora durantae** Chupp & Muller
Bol. Soc. Venez. Cien. Nat. **8** (52): 43. 1942

Leaf spots circular to angular, 0.5-3 mm. in diameter, pale yellowish to yellowish brown, difficult to see on the dried leaf; fruiting on the corresponding lower surface, sparingly effuse; stromata filling stomatal openings, pale brown; fascicles mostly not dense, divergent; conidiophores pale to very pale olivaceous, paler and more narrow toward the tip, not septate, not branched, not geniculate, wavy, narrowly rounded tip, 2-3.5 x 10-40$\mu$; conidia subhyaline to pale olivaceous, narrowly linear, (Septoria-like), straight to mildly curved, indistinctly multiseptate, base obconic, tip subacute, 2-3.5 x 15-60$\mu$.

HOST: *Duranta mutisii* L.
TYPE: Caracas, Venezuela; *Duranta mutisii;* A. S. Muller, No. 2327; July 28, 1938.
DISTRIBUTION: Known only from the type locality.

**Cercospora formosana** Yamamoto
Jour. Soc. Trop. Agr. **6**: 600. 1934
Phytopath. Lab. Taihoku Imp. Univ. Contr. **28**: 600. 1934

Leaf spots angular to irregular, vein-limited, 1-5 mm. in diameter, brown to almost purple, sometimes with a pale center; fruiting hypophyllous; stromata lacking; nonfasciculate; conidiophores arise as single branches from procumbent threads, very pale olivaceous, uniform in color and width, sparingly septate, not

geniculate, straight to undulate, rounded to conic tip, 2-4 x 10-40$\mu$; conidia narrowly obclavate, very pale olivaceous, straight to curved, indistinctly multiseptate, base long obconically truncate, tip subacute, 2-3.5 x 35-130$\mu$.

HOSTS: *Lantana camara* L., *L. mista* L.

TYPE: Taihoku, Formosa; *Lantana mista;* W. Yamamoto; Jan. 20, 1933.

DISTRIBUTION: Known only from the type locality.

NOTE: The narrow colored conidia arising from nonfasciculate conidiophores separate this species from the others on Lantana. See key, page 592.

**Cercospora guianensis** Stevens & Solheim

Mycologia **23:** 375. 1931

Leaf spots subcircular to irregular, 2-8 mm. in diameter, pale rusty brown above or sometimes almost cinereous, pale brown below; fruiting amphigenous; stromata dark brown, globular, 30-60$\mu$; fascicles dense to very dense, compact; conidiophores pale brown, paler and more narrow toward the tip, 1-3 septate, not branched, straight to undulate or slightly geniculate, rounded to conic apex, 3-5 x 20-120$\mu$; conidia pale olivaceous, cylindro-obclavate, straight to mildly curved, 3-9 septate, base obconically truncate, tip obtuse to conic, 3-5 x 25-150$\mu$, mostly 35-70$\mu$.

HOSTS: *Lantana camara* L., Lantana sp.

TYPE: Rockstone, British Guiana; Lantana sp.; F. L. Stevens, No. 253; July 13, 1922.

DISTRIBUTION: British Guiana, Venezuela, Bermuda.

NOTE: See key, page 592 for differences among the species on this host genus.

**Cercospora kashotoensis** Yamamoto

Trans. Nat. Hist. Soc. Formosa **26:** 282. 1936

Leaf spots none or indistinct; fruiting hypophyllous, effuse, olivaceous, 2-10 mm. in extent; stromata lacking or slight; conidiophores arising as solitary branches from procumbent threads or loosely fasciculate, pale olivaceous, uniform in color, irregular in width, 1-6 septate, slightly branched, straight to subflexuous, 3.5-6 x 30-85$\mu$; conidia obclavato-cylindric to almost acicular, subhyaline to very pale olivaceous, base subtruncate to long obconically truncate, tip subobtuse, straight to mildly curved, 3-11 septate, 3.5-5 x 50-135$\mu$.

HOST: *Clerodendron inerme* (L.) Gaertn.

TYPE: The island Kashoto near Taito, Formosa; *Clerodendron inerme;* Wataro Yamamoto; July 11, 1934. [Huishaotao, Taitung, Taiwan (Formosa), July 12, 1934, also listed in the herbarium as type.]

DISTRIBUTION: Known only from the type locality.

**Cercospora lantanae** Chupp

Jour. Dept. Agr. Puerto Rico. **15:** 10. 1931

Leaf spots none or small indistinctly brownish areas with yellow halo; on corresponding lower surface olivaceous to ferruginous effuse fruiting; stromata lacking or small; mostly nonfasciculate, sometimes on leaf hairs; conidiophores subhyaline to very pale olivaceous brown, short branches from procumbent threads or more rarely in fascicles, sometimes septate, 0-1 mildly geniculate, minute spore scar at rounded tip, 3-5 x 10-50$\mu$ or even as long as 70$\mu$; conidia cylindric, very pale olivaceous, straight, 1-5 septate, base obconic, tip obtuse, 3-5 x 15-60$\mu$.

HOST: *Lantana camara* L.

TYPE: Penuelas-Finca Pretoria, Puerto Rico; *Lantana camara;* C. E. Chardon, No. 1200; July 21, 1920.

DISTRIBUTION: Studied material from Bermuda, Puerto Rico, Brazil, and Venezuela.

NOTE: The effuse fruiting and relatively wide, cylindric conidia separate this species from the others on Lantana. See also *C. guianensis, C. lantanicola,* and *C. formosana.* The conidia of *C. lantanae* being almost entirely 1-3 septate, the fungus could also be classed as a Passalora. See key below.

**Cercospora lantanicola** sp. nov.

Maculae orbiculares vel irregulares, 1-5 mm. diam., in epiphyllo atra, in hypophyllo brunnea; caespituli hypophylli; stromata carentia; conidiophora fere nonfasciculata, olivaceo-brunnea, sursum pallidiora et attenuata, multiseptata, recta vel sinuosa, vix geniculata, ad apicem acuta, 2-4 x 15-110$\mu$; conidia hyalina, angustissime cylindrata, recta vel sinuosa, spurie 1-5 septata, utrimque obtusa, 1.5-3.5 x 15-50$\mu$.

Leaf spots circular to irregular, 1-5 mm. in diameter, on upper surface uniformly black or nearly so, below pale to dark brown; fruiting hypophyllous; stromata lacking or rarely a few brown cells; nonfasciculate as branches from procumbent threads or 2-4 stalks arising from the stromata; conidiophores pale to medium dark olivaceous brown, paler and more narrow toward the apex, multiseptate, straight to undulate, rarely geniculate, conic tip, 2-4 x 15-110$\mu$; conidia hyaline, narrowly linear (Septoria-like), straight, undulate or curved, indistinctly 1-5 septate, base long obconically truncate, tip subobtuse, 1.5-3.5 x 15-50$\mu$.

HOST: *Lantana camara* L.

TYPE: Guateque (Boyacá), Colombia; *Lantana camara;* R. Obregon and G. Quintana, No. 602; Oct. 25, 1940.

DISTRIBUTION: Known only from the type locality.

NOTE: The nonfasciculate conidiophores and very narrow, hyaline conidia separate this from the other species on Lantana. See also *C. guianensis, C. lantanae, C. formosana,* and following key.

CERCOSPORAE ON LANTANA

A. Conidia colored, mostly obclavate, not catenulate.
  B. Stromata prominent; fascicles dense; fruiting mostly on upper leaf surface; conidiophores not branched, 2-3.5 x 5-45$\mu$; conidia 3-5 x 25-65$\mu$, cylindro-obclavate. *C. guianensis*
  BB. Stromata absent; mostly nonfasciculate; fruiting hypophyllous; conidiophores branched, 3.5-5 x 10-40$\mu$; conidia 2-3.5 x 35-130$\mu$, narrowly obclavate. *C. formosana*
AA. Conidia hyaline, mostly cylindric, sometimes catenulate.
  B. Conidiophores very pale colored, mostly short branches from procumbent threads, irregular in width; conidia 3-5 x 15-60$\mu$. *C. lantanae*
  BB. Conidiophores pale to medium dark in color, 2-4 x 15-110$\mu$, often in fascicles of 2-5, from small stromata, attenuated toward tip; conidia 1.5-3.5 x 15-50$\mu$. *C. lantanicola*

**Cercospora lippiae** Ellis & Everhart

Jour. Mycol. 3: 20. 1887

Leaf spots circular, 2-4 mm. in diameter, pale tan to dingy gray, raised line

border, lavender to brown outer zone; fruiting amphigenous but chiefly on upper surface; stromata small, brown, filling stomatal openings; fascicles dense; conidiophores subhyaline to very pale olivaceous brown, septa indistinct, not branched, slightly attenuated, 0-2 mildly geniculate, small spore scar at subtruncate tip, often 2-6 minute spore scars near tip, 3-4.5 x 10-40$\mu$; conidia hyaline, acicular to obclavate, straight to curved, septa indistinct, base truncate to subtruncate, tip acute, 2-3 x 30-140$\mu$.

HOSTS: *Lippia lanceolata* Michx., *L. nodiflora* (L.) Michx.

TYPE: Louisiana; *Lippia nodiflora;* A. B. Langlois, No. 826; Nov. 22, 1886.

DISTRIBUTION: States of Mississippi Valley as far north as Wisconsin; also present in Bermuda.

NOTE: See also *C. cardiostegiae* for differences between the two species on this host genus.

**Cercospora papillosa** Atkinson

Jour. Elisha Mitchell Sci. Soc. 8: 52. 1892

Leaf spots circular to irregular, 2-5 mm. in diameter, various shades of brown to dingy gray; fruiting amphigenous; stromata lacking to small, brown, 30$\mu$ in diameter; some fascicles dense; conidiophores straight, pale fuligenous or olivaceous brown, fairly uniform in color, slightly attenuated, sparingly septate, sometimes once abruptly geniculate, not branched, medium spore scar at subtruncate tip, 4-5 x 20-100$\mu$, mostly 20-60$\mu$ long; conidia acicular, hyaline, indistinctly multiseptate, straight to curved, base truncate, tip acute, 2.5-4 x 50-200$\mu$.

HOST: Verbena sp.

TYPE: Auburn, Ala.; cultivated Verbena; G. F. Atkinson, No. 2376; Dec. 24, 1891.

DISTRIBUTION: Alabama and Puerto Rico.

NOTE: The type in the herbarium is under the name, *C. papillata.* Atkinson later thought this was a synonym of *C. verbenicola* (Cornell Univ. 3 (1): 44. 1897), but the two do not seem related. The conidiophores which Atkinson described apparently belong to the Alternaria always accompanying this species. Pale colored, long conidiophores and hyaline, acicular conidia separate this species from the others on Verbena. See following key.

CERCOSPORAE ON VERBENA

A. Conidia colored, obclavate, 2.5-4 x 20-100$\mu$; conidiophores in mass dark brown, 3-5 x 10-40$\mu$, or single ones as long as 100$\mu$. *C. verbeniphila*

AA. Conidia hyaline, acicular.

B. Fascicles usually not dense; conidiophores medium dark brown, 3.5-5 x 10-60$\mu$; conidia 2.5-4 x 50-100$\mu$. *C. septatissima*

BB. Fascicles mostly dense; conidiophores pale in color.

C. Conidiophores 4-7 x 5-35$\mu$, branched occasionally; conidia 2.5-4 x 25-100$\mu$. *C. verbenicola*

CC. Conidiophores 4-5 x 20-100$\mu$, not branched; conidia 2.5-4 x 50-200$\mu$. *C. papillosa*

**Cercospora premnae** Castellani,

Nuovo Giorn. Bot. Ital. 54: 781. 1947

Leaf spots subcircular to irregular, 2-6 mm. in diameter, grayish to olivaceous brown, rarely with a pale outer zone, on lower surface sometimes velvety because

of the effuse olivaceous fruiting layer; stromata slight to none; conidiophores in fascicles of 4-8 or rarely borne singly, pale olivaceous brown, paler and more narrow toward the tip, sparingly septate, moderately geniculate, not branched, straight to curved or undulate, 4-5 x 20-80$\mu$; conidia obclavate to cylindro-obclavate, pale olivaceous, straight to mildly curved, 3-10 septate, base rounded to obconic, tip subobtuse, 4-6 x 20-70$\mu$.

HOST: *Premna schimperi* Engl., Premna sp.

TYPE: Between Bonga and Sacca in Caffa, East Africa; *Premna schimperi.*

DISTRIBUTION: East Africa. Dr. Thirumalachar in 1947 sent me a specimen on Premna sp. from India which apparently is the same.

NOTE: I have not seen the type of this species.

**Cercospora privae** sp. nov.

Maculae suborbiculares, 0.5-3 mm. diam., albae, in epiphyllo zonula purpurea cinctae; caespituli hypophylli; stromata minutissima; conidiophora laxe fasciculata, aequabiliter olivaceo-brunnea, sursum attenuata, recta vel sinuosa, vix septata, 0-2 geniculata, simplicia, ad apicem subtruncata, 4-6 x 30-120$\mu$; conidia hyalina, anguste obclavata, recta vel fortiter curvata, spurie septata, ad basim truncata, ad apicem acuta, 2-3.5 x 20-100$\mu$.

Leaf spots subcircular, 0.5-3 mm. in diameter, white center, brown to purple border; fruiting chiefly hypophyllous; stromata none or a few brown cells; fascicles 2-12 spreading stalks; conidiophores pale to medium olivaceous brown, uniform in color, somewhat attenuated toward the subtruncate tip, straight to curved or sinuous, sparingly septate, 0-2 geniculate, not branched, 4-6 x 30-120$\mu$; conidia hyaline, acicular, straight to strongly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 20-100$\mu$.

HOST: *Priva echinata* Juss.

TYPE: Mona, Jamaica; *Priva echinata;* E. B. Martyn, No. 457; March, 1949.

DISTRIBUTION: Jamaica.

NOTE: See also *C. delicatissima.*

**Cercospora septatissima** Tracy & Earle

Bul. Torrey Bot. Club **23**: 206. 1896

Leaf spots at first indistinct, then may become angular and brown on upper surface; fruiting in dark to black effuse patches on corresponding lower surface; stromata none to as large as 60$\mu$ in diameter, black; fascicles 3-20 spreading stalks; conidiophores medium dark brown, undulate to curved, fairly uniform in color and width, plainly and sometimes closely septate, often constricted at septa, not branched, sparingly geniculate, spore scars indistinct, tip rounded to subtruncate, 3.5-5 x 10-60$\mu$; conidia hyaline, acicular to obclavate, straight or nearly so. indistinctly multiseptate, base truncate to obconically truncate, tip subacute, 2.5-4 x 50-100$\mu$.

HOST: *Verbena caroliniana* Michx.

TYPE: Columbus, Miss.; *Verbena caroliniana;* Tracy and Earle; Oct. 12, 1896.

DISTRIBUTION: Known only from the type locality.

NOTE: Dark colored, closely septate conidiophores and hyaline, acicular conidia separate this species from the others on Verbena. See key, page 593.

**Cercospora stachytarphetae** Ellis & Everhart
Missouri Bot. Gard. Ann. Rept. 9: 120. 1898

Leaf spots circular, 1-4 mm. in diameter, gray with a raised brown line margin, largest ones may be slightly zonate; fruiting amphigenous; stromata lacking or dark brown, usually filling stomatal opening, sometimes as large as 50$\mu$ in diameter; most fascicles dense; conidiophores pale to medium dark brown, uniform in color and width, sparingly septate, not branched, longer ones undulate or 1-3 geniculate, medium spore scar at subtruncate tip, 4.5-7 x 30-200$\mu$, some collections show only short ones; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to obconic, tip subacute, 3-6 x 15-140$\mu$.

HOSTS: *Stachytarpheta indica* Vahl. [*S. jamaicensis* (L.) Vahl.], *S. mutabilis* (Jacq.) Vahl.

TYPE: Nassau, Brit. W. Indies; *Stachytarpheta jamaicensis;* A. S. Hitchcock; Nov. 1890.

DISTRIBUTION: Material studied from Nassau, Barbados, Tobago, Puerto Rico, Venezuela, Florida, and Bermuda.

NOTE: Hennings (Hedwigia 48: 18. 1909) also described a *C. stachytarphetae* but his species is distinct, with small obclavato-cylindric, 1-5 septate conidia. See *C. duplicans.*

**Cercospora tectoniae** Stevens
Bernice P. Bishop Mus. Bul. 19: 155. 1925

Leaf spots angular, vein-limited, 1-4 mm. in diameter or coalescing into large blotches between the veins, dull brown to grayish brown or white, sometimes containing one or more small gray specks; fruiting amphigenous but chiefly hypophyllous; conidiophores solitary or loosely fasciculate, pale olivaceous brown to medium brown, uniform in color and width, septate, 0-5 geniculate, rarely branched, variously curved or bent, subtruncate to conic tip, 3-5 x 35-250$\mu$, mostly 35-85$\mu$; conidia hyaline, acicular to obclavate or shortest ones cylindric, straight to curved, indistinctly multiseptate, base truncate to long obconically truncate, tip subacute, 2-4 x 30-300$\mu$.

HOST: *Tectonia grandis* L.

TYPE: Honolulu, Oahu, Hawaii; *Tectonia grandis;* F. L. Stevens, No. 52; May 22, 1921.

DISTRIBUTION: Hawaii, Trinidad, India.

**Cercospora verbenicola** Ellis & Everhart
Jour. Mycol. 3: 19. 1887

*Cercospora verbenae-strictae* Peck, N. Y. State Mus. Bul. 150: 51. 1911

Leaf spots indistinct, yellowish to brownish, 2-4 mm. in extent; fruiting amphigenous but chiefly hypophyllous, when plentiful appearing as faintly grayish effuse patches on lower leaf surface; stromata mostly a few large dark brown cells; fascicles dense; conidiophores pale brown to olivaceous brown, paler tip, rarely almost hyaline, irregular in width, multiseptate, curved or tortuous, rarely branched or geniculate, small spore scars near and at tip, 4-7 x 5-35$\mu$; conidia hyaline, acicular to cylindric, straight to curved, indistinctly multiseptate, base truncate to subtruncate, tip subobtuse, 2.5-4 x 25-100$\mu$.

HOSTS: *Verbena stricta* Vent., *V. xutha* Lehm.

TYPES: Louisiana; *Verbena xutha;* A. B. Langlois, No. 686; July 26, 1886; (*C. verbenae-strictae*) Stockton, Kansas; *Verbena stricta;* Bartholomew and Swingle, No. 3901; Aug. 28, 1908.

DISTRIBUTION: Studied material from Alabama, Louisiana, Kansas, and Wisconsin. Also reported from Texas and Illinois.

NOTE: This resembles *C. papillosa* but has distinctly wider conidiophores. See also *C. verbeniphila, C. septatissima,* and *C. papillosa* for differences among the species on this host genus. See key, page 593.

**Cercospora verbeniphila** Spegazzini

Bol. Acad. Nacion. Cienc. Repub. Argentine **29**: 179. 1926

Leaf spots irregular in shape, (elliptic on stems) 2-4 mm. in diameter to almost half the leaf area; on upper surface yellowish to almost black, the dark portion being bounded by an irregular reddish brown band, on the lower surface dull brown; fruiting hypophyllous; stromata when present dark brown, subspherical, 15-40$\mu$; fascicles 2 or 3 stalks to dense or very dense, compact; conidiophores in mass dark brown, singly pale olivaceous brown, paler and more narrow toward the tip, rarely septate, not branched, 0-1 geniculate, undulate, conic apex, when in dense fascicles 3-5 x 10-40$\mu$, when not in dense fascicles, may be as long as 100$\mu$; conidia subhyaline to pale olivaceous, obclavate to almost linear, straight to mildly curved, 3-9 septate, base obconically truncate, tip rounded to conic, 2.5-4 x 20-100$\mu$.

HOSTS: *Verbena bonariensis* L., Verbena sp.

TYPE: Cordoba, Argentine; *Verbena bonariensis;* C. Spegazzini, No. 221.

DISTRIBUTION: Argentine, Venezuela, Guatemala.

NOTE: The narrowly linear, subhyaline to colored conidia and the short pale conidiophores in densely compact fascicles separate this species from the others on Verbena. See key, page 593.

**Cercospora viticis** Ellis & Everhart

Jour. Mycol. **3**: 18. 1887

*Cercospora viticis* Sawada, Formosa Agr. Res. Inst. Rept. No. 87: 90. 1944

Leaf spots irregular in shape, 2-5 mm. in diameter, dull brown or grayish brown to dingy gray, sometimes with a dark line margin; fruiting chiefly epiphyllous; stromata few cells to 30$\mu$ in diameter, globular, dark brown; fascicles dense to very dense; conidiophores pale olivaceous brown, paler and more narrow toward the conic tip, septation, geniculation, branching and spore scars absent or indistinct, 1.5-3 x 5-20$\mu$; conidia pale olivaceous, linear to narrowly obclavate, variously curved, septa indistinct, base obconic to short obconically truncate, tip subacute, 2-4.5 x 20-75$\mu$.

HOSTS: *Vitex agnus-castus* L., *V. negundo* L.

TYPE: Lafayette, La.; *Vitex agnus-castus;* A. B. Langlois, No. 727; Sept. 21, 1886.

DISTRIBUTION: Louisiana, China, Formosa, and possibly India.

NOTE: See also *C. weberi* for differences between the two species on Vitex. The two species cause almost identical symptoms. This was first described as *C. viteae,* but Ellis (Jour. Mycol. 3: 34. 1887) later changed the spelling. I did not see Sawada's collection but the meager description he gives fits the Ellis type closely.

**Cercospora volkameriae** Spegazzini
Revista del Museo de La Plata **15**: 47. 1908

Leaf spots angular to irregular, 1-20 mm. in diameter, dingy gray; stromata lacking or only a few dark cells (Spegazzini says 80-150$\mu$ in diameter); fascicles 3-20 divergent stalks; conidiophores medium brown, uniform in color, irregular in width, plainly multiseptate, not branched, 0-5 geniculate, tortuous, bluntly rounded tip, 3-6.5 x 30-150$\mu$; conidia hyaline to subhyaline, obclavate to almost acicular, straight to curved, indistinctly multiseptate, base subtruncate to rounded, tip subacute, 3-6 x 20-200$\mu$. In the same mounts are very narrowly acicular conidia, or conidia-like bodies, 1.5-3 x 50-150$\mu$, which may be immature conidia or branch-like appendages near the tip of the conidiophore.

HOST: *Clerodendron fragrans* Vent. (*Volkameria fragrans* Vent.) (*Volkameria japonica* Thunb.)

TYPE: Botanical Garden, Sao Paulo, Brazil; *Volkameria fragrans;* A. Usteri, No. 36; Sept. 1905.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 588.

**Cercospora weberi** sp. nov.

Maculae suborbiculares, 2-12 mm. diam., griseo-brunneae vel sordide griseae; caespituli epiphylli; stromata carentia aut 10-30$\mu$ diam., atro-fusca, globosa; conidiophora nonfasciculata vel dense fasciculata, brunnea, sursum pallidiora et attenuata, multiseptata, interdum ramosa, sinuosa vel leniter geniculata, ad apicem acuta, 2-3.5 x 10-80$\mu$; conidia pallide olivacea, cylindrata, recta vel curvata, 1-5 septata, utrimque obtusa, 1.5-3.5 x 10-55$\mu$.

Leaf spots subcircular to irregular, 2-12 mm. in diameter, grayish brown to dingy gray, sometimes with a dark line border; fruiting epiphyllous; stromata lacking or a few cells to 30$\mu$ in diameter, dark brown, globular; nonfasciculate to dense fascicles; conidiophores medium dark brown, slightly paler and more narrow toward the tip, multiseptate, often branches from procumbent threads, longest ones may be undulate to mildly multigeniculate, small spore scar at conic tip, 2-3.5 x 10-80$\mu$; conidia cylindric, pale olivaceous, straight to curved, mostly 1-5 septate, base subtruncate to obconically truncate, tip subobtuse, 1.5-3 x 10-55$\mu$.

HOST: *Vitex agnus-castus* L.

TYPE: Gainesville, Florida; *Vitex agnus-castus;* Geo. Weber; Sept. 23, 1938.

DISTRIBUTION: Known only from the type locality.

NOTE: See also *C. viticis* for differences between the two species. The principal difference lies in the nonfasciculate conidiophores, which are dark, septate, and relatively long. The conidia also differ in form.

**Violaceae**

A. Conidia colored, 4-6 x 20-60$\mu$, cylindric; conidiophores nonfasciculate, hypophyllous, 3-4 x 10-100$\mu$.
VIOLA — *C. murina*

AA. Conidia hyaline, (or *C. granuliformis* sometimes colored); conidiophores fasciculate, amphigenous.

B. Conidia cylindric, subhyaline, 2-3.5 x 15-60$\mu$; conidiophores 3-5 x 10-30$\mu$, in dense fascicles.
VIOLA — *C. granuliformis*

BB. Conidia acicular, hyaline; conidiophores 4-6 x 15-150$\mu$ or longer, mostly not in dense fascicles.

C. Conidia 2-3.5 x 30-100$\mu$, with acute tip; conidiophores pale to medium, rarely geniculate.

HYBANTHUS (IONIDIUM) *C. tandilensis*

CC. Conidia 2-5 x 25-250$\mu$, subacute tip; conidiophores pale, 0-4 geniculate.

VIOLA *C. Violae*

**Cercospora granuliformis** Ellis & Holway

Jour. Mycol. **1**: 6. 1885

*Cercospora sororiae* Tehon, Mycologia **40**: 323. 1948

Leaf spots large irregular blotches, 4-12 mm. in diameter, yellowish tan to dingy gray or dull brown, without any distinct border; fruiting amphigenous, showing as minute black stipples; stromata dark brown to almost black, globular, 20-50$\mu$ in diameter; fascicles dense; conidiophores pale olivaceous brown, slightly attenuated and paler toward the tip, sparingly septate, not branched, some collections without geniculations, others with 1-3 and stalks variously curved, tip rounded and with small spore scar, 3-5 x 10-40$\mu$; conidia hyaline to subhyaline, rarely faintly olivaceous, cylindric to obclavato-cylindric, straight or nearly so, 1-6 septate, base subtruncate to sharply obconic (varying in different collections), tip obtuse, 2.5-3.5 x 15-60$\mu$.

HOSTS: Viola sp., *V. blanda* Willd. (*V. pallens* Forst.), *V. cucullata* Ait. (*V. obliqua* Ait.) (*V. papilionacea* Pursh) (*V. sororia* Willd.) (*V. villosa* Walt.), *V. odorata* L., *V. pubescens* Ait., *V. sagittata* Ait., *V. scabruiscula* Shafer, *V. septentrionalis* Greene, *V. tricolor* L. (*V. arvensis* Murr.), *V. pedata* L.

TYPES: Decorah, Iowa; *Viola cucullata;* E. W. D. Holway; Aug. 1884; (*C. sororiae*) Kinderhook, Pike Co., Illinois; *Viola sororia;* L. R. Tehon, No. 30126; June 28, 1944.

DISTRIBUTION: Ontario and North Dakota to Alabama and eastward. Possibly present in China. Also sent me from Sao Paulo, Brazil.

NOTE: The hyaline to subhyaline cylindric conidia, fairly large stromata, and short conidiophores separate this species from the others on Viola. I did not see the Tehon named species but his fairly detailed description fits *C. granuliformis* accurately. See key above.

**Cercospora macrospora** Osterwalder

Mitt. Thurg. Naturf. Ges. **25**: 59. 1924

HOST: Pansy (*Viola tricolor* L.).

TYPE: No definite type is designated. Pure cultures are supposed to be kept at Baarn, Holland, and Kral's Bakteriologische Museum, Zimmermanngasse 3, Vienna IX, Austria; Pansy (*Viola tricolor*).

NOTE: Osterwalder states this species has hyaline conidiophores, and a collection from Wrangell, Alaska, collected by E. K. Cash, Sept. 3, 1934, and sent me by John A. Stevenson also had hyaline fruiting. Therefore I am considering it as some other genus than Cercospora. A specimen from California showed conidia with appendages like those of *C. cari.* The specimens on maple, celery, parsley, caraway, violet, and pansy are all alike, and are referred to *Centrospora acerina* (Hartig) Newhall. See Zentralbl. für Bakt. Parasitenkunde und Infektionskr. II. **104**: 407-412. 1943., and Phytopath. **36**: 893. 1946.

**Cercospora murina** Ellis & Kellerman

Bul. Torrey Bot. Club **11**: 122. 1884

*Cercospora ii* Trail, Scott. Nat. **10**: 75. 1889

*Cercospora lilacina* Bres., Hedwigia **31**: 41. 1892

Leaf spots indistinct or circular to irregular, 1-15 mm. in diameter, dingy gray to pale green, usually with a wide yellowish halo; fruiting hypophyllous, sometimes abundant enough to be in effuse mouse colored layers; nonfasciculate; stromata lacking; conidiophores branches from procumbent threads, subhyaline to pale olivaceous, sparingly septate, not geniculate, 1-3 minute black spore scars at the slightly enlarged tip, branches 3-4 x 10-100$\mu$; conidia pale olivaceous, cylindric to clavate; sharply obconic base, bluntly rounded tip, 1-5 septate, inclined to be curved and almost crescent shaped, 4-6 x 20-60$\mu$.

HOSTS: *Viola cucullata* Ait. (*V. obliqua* Ait.), *V. palustris* L., *V. pubescens* Ait.

TYPES: Manhattan, Kansas; *Viola cucullata;* W. A. Kellerman, No. 614; (*C. ii*) Dalmally and near Inveraray, Scotland; *Viola palustris;* James W. H. Trail; (*C. lilacina*) near Königstein and Nossen, Saxony; *Viola palustris;* W. Krieger.

DISTRIBUTION: Reported from Germany, Holland, Scotland, Kansas and Ohio.

NOTE: The nonfasciculate conidiophores and colored conidia separate this species from the others on Viola. Tehon (Mycologia **40**: 325. 1948) has an interesting key separating these three species. All of the specimens I studied, including the types, appeared identical according to the characters I use in separating species.

See key, page 597.

**Cercospora tandilensis** Spegazzini

Anal. Soc. Cien. Argentina **13**: 30. 1882

*Cercospora columbiensis* Ellis & Everhart, Jour. Mycol. **3**: 15. 1887

Leaf spots 0.5-1.5 mm. in diameter, circular, white center and dark reddish border; fruiting amphigenous; stromata small, dark brown; fascicles rarely dense; conidiophores pale to medium brown, pale tip, uniform in width, straight or sparingly geniculate, multiseptate, not branched, large spore scar at subtruncate tip, 4-6 x 15-300$\mu$, mostly 25-75$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute, 2-3.5 x 30-100$\mu$.

HOSTS: *Hybanthus atropurpureus* (St. Hil.) Taub., *H. concolor* (Forster) Spreng. (*Ionidium concolor* Benth. & Hook.), *H. glutinosum* Taub. (*Ionidium glutinosum* Vent.).

TYPES: Buenos Aires, Argentine; *Ionidium glutinosum;* C. Spegazzini, No. 917; Jan. 1881; (*C. columbiensis*) Columbia, Missouri; *Ionidium concolor;* B. T. Galloway, No. 71; July, 1886.

DISTRIBUTION: Argentine, Brazil, and Missouri.

See key, page 598.

**Cercospora violae** Saccardo

Nuov. Giorn. Bot. Ital. **8**: 187. 1876

*Cercospora violae-tricoloris* Briosi & Cavara, Atti Ist. Bot. Pavia. **2**: 285. 1892; Hedwigia **31**: 143. 1892

*Cercospora violae* var. *minor* Rota-Rossi, Atti Ist. Bot. Pavia. ser. 2. **13**: 199. 1914

*Cercospora trinctatis* Pass., in litt.

*Cercospora kiusana* Sawada, Formosan Agr. Res. Inst. Rept. 85: 126. 1943

*Cercospora difformis* Tehon, Mycologia **40**: 322. 1948

Leaf spots circular to irregular, 1-10 mm. (mostly 1-3) in diameter, gray to

white center, brown or red border; fruiting amphigenous; stromata when present dark brown, globular, few cells to 40$\mu$ in diameter; fascicles usually dense; conidiophores pale olivaceous brown, slightly paler tip, attenuated, 0-7 septate, not branched, straight or occasionally 1-4 abruptly geniculate, large spore scar at subtruncate tip, 4-5.5 x 15-65$\mu$ or even 6.5 x 200$\mu$; conidia hyaline, acicular to obclavate, straight to mildly curved, indistinctly multiseptate, base truncate to subtruncate, tip subacute, 2-5 x 25-250$\mu$.

HOSTS: Viola sp., *V. alba* Bess., *V. blanda* Willd. (*V. pallens* Forst.), *V. canina* L. (*V. conspersa* Reichenb.), *V cucullata* Ait. (*V. obliqua* Ait.) (*V. papilionacea* Pursh.) (*V. sororia* Willd.) (*V. villosa* Walt.), *V. hirta* L., *V. kiusiana* Mak., *V. magellanica* Forst., *V. odorata* L., *V. palmata* L., *V. pedata* L., *V. sylvestris* Lam. (*V. silvatica* Fries.), *V. tricolor* L. (*V. arvensis* Murr.).

TYPES: Selva, Italy; *Viola odorata;* Treviso; Aug. 1874; cotype distributed as Sacc. Mycotheca Veneta 279; (*C. violae-tricoloris*) Bot. Garden, Pavia, Italy; *Viola tricolor;* Briosi and Cavara; cotype distributed as Briosi & Cavara, Fung. parass. 185; (var. *minor*) Parre, Italy; Viola sp.; G. Rota-Rossi; Aug. 1907; (*C. difformis*) Vandalia, Ill.; *Viola papilionacea* L. R. Tehon, No. 30224; Oct. 11, 1944.

DISTRIBUTION: This species vies with *C. apii, C. beticola* and one or two other species in being the most widely distributed one in the world. It seems to have been reported from every state and country where fungi have been collected.

NOTE: *C. violae-tricoloris* shows slightly different conidiophores. *C. violae* var. *microcarpa* Bres. (Krieger, Fungi Sax. No. 1296) has coarser, somewhat darker colored conidiophores with constrictions or intercalary swellings, 5-7.5 x 60-155$\mu$. The acicular, hyaline, conidia separate this species from the other on Viola. I did not see a Sawada collection, but the incomplete description fits *C. violae* in the few characters mentioned. See key, page 598.

**Cercospora violae sylvaticae** Oudemans

Versl. en Meded. d. K. Ak. v. Wet. Afd. Naturk. 3, Reeks. 7: 323. 1890

HOST: *Viola sylvestris* Lam. (*V. silvatica* Fries.).

TYPE: Apeldoorn, Holland; *Viola silvatica;* C. A. J. A. Oudemans; July, 1889.

NOTE: I did not see the type of this species, but Professor B. H. Danser kindly sent me two collections which Oudemans made later. Both of these showed only Ramularia.

## CERCOSPORA ON VITACEAE

A. Conidia hyaline, mostly acicular.
  B. Conidia 2.5-4 x 40-120$\mu$, acicular, truncate base; conidiophores 4-5 x 20-130$\mu$, medium dark, epiphyllous.
    VITIS — *C. truncata*
  BB. Conidia 4-5 x 35-160$\mu$, acicular to cylindric, base subtruncate; conidiophores 4-5.5 x 40-120$\mu$, pale brown, hypophyllous.
    CISSUS — *C. cissi-japonicae*
AA. Conidia colored, not acicular.
  B. Conidiophores pale in color; conidia 2-3.5 to 3-6$\mu$.
    C. Fruiting chiefly hypophyllous; conidiophores not branched; fascicles dense, divergent.
      D. Stromata none or small; conidiophores 4-5 x 20-60$\mu$; conidia obclavate, 3-6 x 35-85$\mu$.
        AMPELOPSIS — *C. arboriae*

DD. Stromata 20-50$\mu$; conidiophores 3-4.5 x 5-35$\mu$; conida obclavato-cylindric, 2.5-5 x 20-125$\mu$.
CISSUS, PARTHENOCISSUS *C. riachueli*

CC. Fruiting epiphyllous; conidiophores branched occasionally; conidia obclavate.

D. Conidia 2-3.5 x 35-70$\mu$; conidiophores 2-3.5 x 10-35$\mu$; stromata medium; fascicles dense to very dense.
VITIS *C. brachypus*

DD. Conidia 3-5.5 x 20-85$\mu$; conidiophores 3-5.5 x 20-70$\mu$; stromata slight; fascicles not dense.
VITIS *C. vulpinae*

BB. Conidiophores medium dark in color; conidia wide, 3.5-6 to 4-8$\mu$.

C. Fruiting effuse, hypophyllous; fascicles rarely dense, not coremoid.

D. Conidia cylindric, medium dark, 4-6.5 x 30-120$\mu$; conidiophores 3.5-6 x 15-70$\mu$.
VITIS *C. vitis-heterophyllae*

DD. Conidia cylindro-obclavate, pale to very pale, 3.5-6 x 35-120$\mu$; conidiophores 3-5 x 10-55$\mu$.
RHOICISSUS *C. rhoicissi*

CC. Fruiting not effuse, amphigenous; fascicles dense, coremoid; conidia obclavate, tip sometimes drawn out in beak form.

D. Conidiophores 3-5.5 x 20-130$\mu$, slightly branched; conidia 4-8 x 30-130$\mu$.
AMPELOPSIS *C. ampelopsidis*

DD. Conidiophores 3-4 x 50-400$\mu$, not branched; conidia 4-7 x 20-80$\mu$.
VITIS *C. vitis*

**Cercospora ampelopsidis** Peck

N. Y. State Mus. Nat. Hist. Ann. Rept. **30**: 55. 1878

*Cercospora pustula* Cooke, Grevillea **12**: 30. 1883

*Cercospora psedericola* Tehon, Mycologia **16**: 139. 1924

Leaf spots circular to angular, 0.5-5 mm. in diameter, reddish brown to black, sometimes bulging on the upper surface; fruiting amphigenous but usually more abundant on lower surface; stromata few dark cells to 40$\mu$ in diameter, globular, black; fascicles mostly dense, rarely slightly coremoid in compactness; conidiophores medium dark brown or olivaceous brown, uniform in color, sometimes irregular in width or slightly clavate, plainly multiseptate, sparingly branched, straight to undulate or closely geniculate, sometimes only upper fourth tortuous, tip variable, narrowly subtruncate with medium sized spore scar to bluntly rounded or conic, occasionally geniculations at the tip producing a bi- or tri-scarred effect, 3.5-5.5 x 20-130$\mu$, rarely with a maximum width of 7$\mu$, some specimens show only short conidiophores; conidia pale olivaceous to medium dark olivaceous brown, obclavate to almost cylindric, rather frequently the tip drawn out narrowly and pale in color, 3 to multiseptate, mostly mildly curved, base medium to long obconically truncate, rarely sharply obconic, tip subobtuse, 4-8 x 30-130$\mu$.

HOST: *Parthenocissus quinquefolia* (L.) Planch., (*Ampelopsis quinquefolia* Michx.) (*Psedera quinquefolia* [L.] Greene), *Parthenocissus vitacea* A. S. Hitchcock (*Psedera vitacea* Greene), *Parthenocissus tricuspidata* Planch.

TYPES: Bethlehem, N. Y.; *Ampelopsis quinquefolia;* C. H. Peck. In the Albany Herbarium is a packet marked Gansevoort, Sept., which also has been con-

sidered type material. (*C. pustula*) Darien, Georgia; *Ampelopsis quinquefolia;* H. W. Ravenel, (No. 779), No. 3378; (*C. psedericola*) Buckner, Ill.; *Psedera quinquefolia;* P. A. Young, No. 2987; July 20, 1922.

DISTRIBUTION: From Manitoba to Texas and eastward. It also has been reported from France. M. Hori sent a specimen from Japan.

NOTE: On three occasions, I have studied the three named species. At one time I thought there might be two distinct species represented. But a detailed microscopic study of the types and many additional specimens does not reveal any constantly specific differences. See key above.

**Cercospora arboriae** Tharp

Mycologia 9: 108. 1917

Leaf spots irregular in shape, 0.5-3 mm. in diameter, reddish brown to almost black on the upper surface, paler and less distinct on the lower surface; fruiting amphigenous but chiefly hypophyllous; stromata none or small; fascicles dense, divergent; conidiophores pale yellowish brown, uniform in color, slightly irregular in width, sparingly septate, not branched, subgeniculate, 4-5 x 20-60$\mu$; conidia pale olivaceous, obclavate, straight to mildly curved, 3-7 septate, base short obconic to obconically truncate, tip rounded bluntly, 3-6 x 35-85$\mu$.

HOST: *Ampelopsis arborea* Koehne (*Cissus arborea* Des Moul.) (*Vitis bipinnata* Torrey & Gray).

TYPE: Austin, Texas; *Ampelopsis arborea;* Lewis and Tharp; Oct. 20, 1914.

DISTRIBUTION: Known only from the type locality.

NOTE: The conidiophores are not so long nor in such compact fascicles, and the conidia are smaller than are those of *C. ampelopsidis.* See key, page 600.

**Cercospora brachypus** Ellis & Everhart

Jour. Mycol. 8: 71. 1902

Leaf spots circular to irregular blotches, 2-8 mm. in diameter, brown, sometimes with a dark border; fruiting chiefly epiphyllous; stromata medium in size, brown, circular to elongate; fascicles dense to very dense; conidiophores pale olivaceous brown, slightly paler near the tip, wavy, mildly attenuated, sometimes with minute spore scar at tip, not visibly septate, not geniculate, not branched, 2-3.5 x 10-35$\mu$; conidia narrowly obclavate to cylindric, pale olivaceous brown, straight to strongly curved, base sharply obconic to truncate, tip subobtuse, 2-3.5 x 35-70$\mu$.

HOST: *Vitis rotundifolia* Michx.

TYPE: Tuskegee, Ala.; *Vitis rotundifolia;* Geo. W. Carver; Sept. 20, 1901; cotype distributed as Fungi Columbiani No. 1515.

DISTRIBUTION: Southern United States and China.

NOTE: This species differs from the others on Vitis in having very narrow conidia and conidiophores. Jenkins describes the perfect stage as *Mycosphaerella angulata* (Phytopath. 32: 71. 1942.). See key, page 601.

**Cercospora cissi-japonicae** Hori

Bot. Magazine Tokyo 65: 19. 1952

Leaf spots dark brown, angular, limited by veins or semi-circular, with indistinct margin when circular, 5-20 mm. in diameter; fruiting hypophyllous, indistinct to a white bloom-like layer; stromata small; fascicles scattered, 5-10 stalks;

conidiophores cylindric, straight to subgeniculate, 1-3 septate, subnodulose, denticulate, pale brown or fuligenous, apex rounded, base slightly dilated, 4-5.5 x 40-120$\mu$; conidia hyaline, acicular to cylindric, base subtruncate, straight to mildly curved, 3-13 septate, sometimes constricted at septa, 4-5 x 35-160$\mu$.

HOST: *Cissus japonica* Willd. (*C. japonica* Thunb.).

TYPE: Matsudo, Prov. Shimosa, Japan; *Cissus japonica;* Tadokoro; Nov. 7, 1912; cotype, E. Kurosawa; Nov. 7, 1918.

DISTRIBUTION: Japan.

NOTE: Dr. Togashi in a letter dated May 1, 1941, sent me the description and in 1950 sent me a specimen. It differs from *C. truncata,* the only other species on the Vitaceae with hyaline conidia. See key, page 600.

**Cercospora coryneoides** Savulescu & Rayss

Revue Path. Veg. & Entom. Agr. **22**: 223. 1935

*Cercospora judaica* Rayss, Palest. Jour. Bot. J. Ser. III. **50**: 22. 1943

HOST: *Vitis vinifera* L.

TYPES: Malia, Palestine; *Vitis vinifera;* J. de Léon; July 1935; (*C. judaica*) Palestine; *Vitis vinifera.*

NOTE: I have not seen *C. judaica* but excepting for shorter conidiophores the published description fits that of *C. coryneoides.* The wide, 3-5 septate, thick walled conidia and the dense compact fascicles and large stromata resemble more nearly Coryneum or Septosporium. Mounts of *Septosporium heterosporum* Ellis & Galloway, seem identical with the Rayss collections.

**Cercospora leoni** Savulescu & Rayss

Revue Path. Veg. & Entom. Agr. **22**: 222. 1935

HOST: *Vitis vinifera* L.

TYPE: Malia, Palestine; *Vitis vinifera:* J. de Léon; May 23, 1935.

NOTE: The wide, 1-3 septate conidia plainly have thick walls, which characterize the fungus as a Coryneum or Septosporium. Mounts of *Septosporium heterosporum* Ellis & Galloway, seem identical with or at least similar to the Léon collection.

**Cercospora rhoicissi** H. & P. Sydow

Ann. Mycol. **10**: 444. 1912

Leaf spots none or indistinct yellowish to brown areas on the upper leaf surface; fruiting effuse, hypophyllous, dark olivaceous to almost black, 1-3 mm. in extent; stromata lacking or dark brown, subglobular, 10-35$\mu$ in diameter; conidiophores arising as solitary branches from procumbent threads or in loose to compact fascicles from the stromata, pale to medium olivaceous brown, uniform in color, attenuated toward the conic tip, sparingly septate, not geniculate, undulate to tortuous, 3-5 x 10-55$\mu$; conidia pale to very pale olivaceous, cylindro-obclavate or shortest ones cylindric, straight to curved, 3-9 septate, base obconically truncate, tip subobtuse, 3.5-6 x 35-120$\mu$.

HOST: *Rhoicissus erythrodes* (Fres.) Planch.

TYPE: Barberton, Transvaal, South Africa; *Rhoicissus erythrodes;* C. P. Lounsbury, No. 1275; March, 1911.

DISTRIBUTION: Known only from the type locality.

NOTE: See key, page 601.

**Cercospora riachueli** Spegazzini
Anal. Soc. Cient. Argentina **10**: 38. 1880

*Cercospora horiana* Togashi & Katsuki, Sci. Repts. Yokohama Nat. Univ. Sect. II. **1**: 4. 1952

Leaf spots circular to irregular, 3-10 mm. in diameter, dull reddish brown, almost same color of dried leaf, on lower surface the spot is more easily recognized; fruiting amphigenous, but more abundant on lower surface; stromata globular, dark brown or fuligenous, 20-50$\mu$ in diameter; fascicles dense; conidiophores pale brown or fuligenous, medium dark in mass, fairly uniform in color and width, straight to slightly curved, septation, geniculation, branching and spore scars indistinct or lacking, tip rounded, 3-4.5 x 5-35$\mu$; conidia obclavato-cylindric, rarely distinctly obclavate, pale olivaceous, straight to slightly curved, 1-7 septate, base obconically truncate, tip subobtuse, 2.5-5 x 20-125$\mu$.

HOSTS: *Cissus palmata* Poir. (*Vitis commersoni* Baker), *C. simulans* C. A. Smith, *C. tweedieana* Planch., Cissus sp., *Parthenocissus tricuspidata* Planch.

TYPES: Boca del Riachuelo, Buenos Aires, Argentina; *Cissus palmata;* C. Spegazzini, No. 909; March, 1880; (*C. horiana*) Matsudo, Pref. Chiba, Japan; *Parthenocissus tricuspidata;* E. Kurosawa; Oct. 7, 1951.

DISTRIBUTION: Material studied from Argentina, Japan, and Puerto Rico. A collection on *Cissus simulans* from Transvaal had conidia measuring 2-3.5 x 30-150$\mu$ but otherwise resembling Spegazzini's type.

NOTE: Although *Cissus palmata* is known also as *Vitis commersoni,* this species because of its fasciculate, short conidiophores and conidial shape and size is distinct from the species on Vitis. See key, page 601.

**Cercospora roesleri** (Cattan.) Saccardo
Michelia **2**: 128. 1880

HOST: *Vitis vinifera* L.

TYPE: Eburense (Dep. de l'Eure) France; *Vitis vinifera;* A. Malbranche.

NOTE: I did not study the type collection, but the material entered under this name in various herbaria is not Cercospora. It is more nearly related to Coryneum or Septosporium. Du Plessis (Ann. Univ. Stellenbosch Ser. A. **20**: 1-26. 1942) states that it differs in spore shape, septation, and dimensions from *Septosporium fuckelii* Thüm. Mounts of *Septosporium heterosporum* Ellis & Galloway resemble closely those from herbarium material labeled *C. roesleri.* The name in literature also has been spelled rössleri, roessleri, and rösleri. Zaprometov (Materials for the Microflora of Middle Asia, part 1, p. 36. 1926) gives *Cercospora fuckelii* Jacz. on *Vitis vinifera* as a synonym of *C. roesleri.* I have not found where this species was described, nor have I seen any authentic material. Cattaneo (Boll. Com. Agrar. di Voghera, pp. 4. 1876) first named the fungus *Cladosporium rösleri,* but the short, wide conidiophores in distinct fascicles are not characteristic of this genus.

**Cercospora truncata** Ellis & Everhart
Jour. Mycol. **3**: 19. 1887

Leaf spots circular to irregular, 0.5-6 mm. in diameter, pale brown, dark margin; fruiting chiefly epiphyllous; stromata slight, mostly few dark to black cells; fascicles 2-15 stalks; conidiophores medium dark fuligenous or brown, uniform in color and width, multiseptate, not branched, straight to sinuous or 1-3 abruptly

geniculate, medium spore scar at subtruncate tip, 4-5 x 20-130$\mu$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, 2.5-4 x 40-120$\mu$.

HOSTS: *Vitis indivisa* Willd., *V. thunbergii*, Vitis sp.

TYPE: Pointe a la Hache, La.; *Vitis indivisa;* A. B. Langlois; Nov. 4, 1886; cotype distributed as Flora Ludoviciana No. 780.

DISTRIBUTION: Studied material from Puerto Rico and Louisiana. Reported from China (Tai, Lloydia **11**: 54. 1948).

NOTE: This usually is found accompanied by *C. brachypus* or *C. vitis*. The hyaline, acicular conidia separate this species from the others on Vitis. See key, page 600.

**Cercospora vitiphylla** (Speschnew) Barbarine

(See Zaprometov, Materials for the Microflora of Middle Asia, part 1, page 36, 1926)

HOST: *Vitis vinifera* L.

TYPE: Fusayne, Buaki, Samarkand; *Vitis vinifera;* N. Speschnew.

NOTE: Speschnew (Fungi Transcapici et Turkestanici **2**: 19. 1901) originally named this *Coryneum vitiphyllum*. This is more nearly correct than the name, Cercospora. The fungus has dense compact fascicles and wide 3-septate thick walled conidia. It resembles closely or is identical with *Septosporium heterosporum* Ellis & Galloway.

**Pseudocercospora vitis** (Lév.) Spegazzini

Anal. Mus. Nac. B. Aires **20**: 437. 1910

*Septonema vitis* Lév., Ann. Sci. Nat. III. **9**: 261. 1848

*Cladosporium viticolum* Ces., Flora **38**: 206. 1854

*Cercospora vitis* (Lév.) Sacc., Nuov. Giorn. Bot. Ital. **8**: 188. 1876

*Cercospora viticola* (Ces.) Sacc., Syll. Fung. **4**: 458. 1886

*Helminthosporium vitis* (Sacc.) Pirotta, Rev. Mycol. **11**: 185. 1889

*Cercospora vitis* var. *rupestris* Ciferri, Ann. Mycol. **20**: 45. 1922

Lindau (Rabenh. Krypt.-flora **9**: 116. 1910) lists still others as: *Graphium clavisporum* Berk. & Cooke; *Isariopsis clavispora* Sacc.; *Cercospora vitis* Sacc.; *Cladosporium vitis* Sacc.; and others.

Leaf spots subcircular to irregular, 2-12 mm. in diameter, dull to reddish brown or almost black, mostly immarginate, rarely with yellow zone; fruiting amphigenous; fascicles usually dense and strikingly coremoid; conidiophores pale to medium dark fuligenous or olivaceous brown, in mass dark, fairly uniform in color and width, multiseptate, not branched, straight or upper third undulate to mildly multigeniculate, small spore scar at conic tip, 3-4 x 50-400$\mu$; conidia pale olivaceous to medium dark olivaceous brown, obclavate, rarely with thick walls, 3-7 septate, straight to slightly curved, base long obconic to obconically truncate, tip subobtuse, 4-7 x 20-80$\mu$.

HOSTS: *Vitis aestivalis* Michx. (*V. palmata* Vahl.), *V. californica* Benth., *V. cordifolia* Lam., *V. labrusca* L., *V. labruscana* Bailey, *V. rotundifolia* Michx., *V. rupestris* Scheele, *V. vinifera* L., Vitis sp. Pl. Dis. Reporter **28**: 970. 1944 says *C. viticola* on *V. rotundifolia*.

TYPE: Italy; Vitis spp. No distinct type is suggested.

NOTE: Higgins (Amer. Jour. Bot. **16**: 287. 1929) describes a perfect stage,

naming it *Mycosphaerella personata.* The conidia being dark colored, thick walled, and somewhat beaked (Alternaria-like in outline), the fungus is not considered as a Cercospora. It seems justified in instances of this kind to make use of the genus, Pseudocercospora, which Spegazzini proposed in 1910 for the grape fungus. See key, page 601.

**Cercospora vitis-heterophyllae** P. Hennings
Bot. Jahrbücher von Engler **37**: 166. 1906

Leaf spots none or indistinct yellowing on the upper surface; fruiting hypophyllous, very scantily effuse, sooty in appearance; stromata lacking or small, globular, dark brown, as large as 20$\mu$ in diameter; conidiophores solitary or in divergent fascicles of 2-12, medium brown, uniform in color, slightly clavate, sparingly septate, not branched, not geniculate, undulate to tortuous, bluntly rounded tip, 3.5-6 x 15-70$\mu$; conidia medium brown, cylindric, plainly and closely septate (3-6$\mu$), straight to mildly curved, base rounded to obconically truncate, tip obtuse, 4-6.5 x 30-120$\mu$.

HOST: *Vitis heterophylla* Thunb.

TYPE: Tokyo, Nishiarai, Japan; *Vitis heterophylla;* N. Nambu, No. 18; Oct. 19, 1900.

DISTRIBUTION: Known only from the type locality.

NOTE: The hypophyllous effuse fruiting, the divergent fascicles, and the wide, cylindric, closely septate, dark conidia separate this species from the others on Vitis. See key, page 601.

**Cercospora vulpinae** Ellis & Kellerman
Jour. Mycol. **3**: 127. 1887

*?Cercospora sessilis* Sorokine, Krankheiten des Weinstocks, 1892 (Rev. in Zeitschr. Pflanzenkr. **3**: 154. 1893)

Leaf spots angular, 1-3 mm. in diameter or coalescing into large areas, dark brown, immarginate or with yellowish halo; fruiting chiefly epiphyllous; stromata a few dark cells; conidiophores solitary or in fascicles of 2-10, pale olivaceous brown, slightly paler and more narrow toward the tip, multiseptate, straight or 1-3 geniculations almost at the tip, rarely undulate or branched, minute spore scar on narrowly rounded, almost hyaline tip, 3-5.5 x 20-70$\mu$; conidia pale olivaceous to medium dark olivaceous brown, obclavate, inclined to be curved, 5-12 septate, base mostly sharply obconic, rarely obconically truncate, tip subacute to subobtuse, 4-5.5 x 20-85$\mu$.

HOSTS: *Vitis vulpina* L., Vitis sp.

TYPE: Manhattan, Kansas; *Vitis vulpina;* Kellerman and Swingle; Aug. 20, 1887; (*C. sessilis*) Tiflis; cultivated grape.

DISTRIBUTION: Kansas and Russia. Apparently also present in Missouri (Univ. of Missouri Studies **22** (3): 12. 1948).

NOTE: The color, shape, width, and length of conidiophores and conidia separate this species from the others on Vitis. Sorokine's description indicates that his species is synonymous, but I have not been able to study any of his material. See key, page 601.

**Cercospora xyridis** Miles
Mycologia **18**: 168. 1926

Leaf spots oval, 2-4 mm. in length, brown, margin purplish brown; fruiting

amphigenous; stromata lacking or a few almost black cells; conidiophores borne singly or in fascicles of 2-8, dark reddish brown, uniform in color and width, plainly multiseptate, not branched, straight to mildly undulate, rarely geniculate, small spore scar at conic tip, 4-5.5 x 50-150$\mu$; conidia subhyaline to very pale olivaceous, obclavate, straight to slightly curved, septa indistinct, base obconic, tip subobtuse, 2.5-4 x 39-90$\mu$.

HOST: *Xyris elata* Chapm.

TYPE: Wiggans, Miss.; *Xyris elata;* L. E. Miles, No. 455; Sept. 15, 1920.

DISTRIBUTION: Known only from the type locality.

**Cercospora alpiniae** H. & P. Sydow

Ann. Mycol. **12**: 202. 1914

Leaf spots none or indistinct yellowish areas on the upper leaf surface; fruiting effuse, hypophyllous, dark olivaceous to almost sooty; stromata lacking; conidiophores solitary or in loose fascicles of 2-5, medium to dark brown, uniform in width and color, plainly multiseptate, not branched, 0-6 geniculate, intertwined, tip rounded, 4-5.5 x 50-300$\mu$; conidia medium to dark olivaceous brown, cylindro-obclavate, shortest ones cylindric, straight to mildly curved, 1-9, mostly 3-7 septate, rarely catenulate, ends rounded bluntly or base obconic, 5-8 x 20-75$\mu$. (Katsuki: Kyushu Agr. Research **8**: 1850, says 65-130$\mu$).

HOST: Alpinia sp., *A. japonica* Miq.

TYPE: Mt. Maquiling near Los Banos, Philippines; Alpinia sp.; C. F. Baker, No. 2221; Dec. 18, 1913.

DISTRIBUTION: Philippines, Japan.

NOTE: The dark colored, thick walled, wide, slightly attenuated conidia are characteristic of Helminthosporium rather than of Cercospora. *H. alpiniae* (H. + P. Sydow).

**Cercospora costi** Stevens

Ill. Biol. Monogr. **11**: 57. 1927

Leaf spots large irregular blotches, sometimes 50 mm. in length, very pale tan to dingy white in color, with narrow yellowish brown border; fruiting amphigenous; stromata 20-40$\mu$ in diameter, globular, yellowish brown; fascicles dense; conidiophores delicate, very pale yellowish brown, 2-3 x 5-25$\mu$, septation, geniculation, branching and spore scars none or not evident; conidia narrowly linear or cylindric, nearly straight, subhyaline, base long obconic to subtruncate, tip subacute, septa indistinct, 2-3 x 25-95$\mu$.

HOST: Costus sp.

TYPE: Gatun, Panama; Costus sp.; F. L. Stevens, No. 1343; Aug. 24, 1923.

DISTRIBUTION: Known only from the type locality.

NOTE: For a further description see Mycologia **23**: 374. 1931. It is distinct from *C. costina* Sydow, which has effuse fruiting and very long conidiophores.

**Cercospora costina** H. & P. Sydow

Ann. Mycol. **14**: 372. 1916

Leaf spots none or indistinct yellowish areas on the upper leaf surface; fruiting effuse, hypophyllous, dark olivaceous to almost black; stromata slight, dark brown, subglobular; fascicles mostly dense; conidiophores medium to dark brown, uniform in color, slightly irregular in width, plainly multiseptate, not branched, occasionally

once geniculate, curved to intertwining, blunt tip, 4-6 x 70-400$\mu$; conidia subhyaline to pale olivaceous, cylindro-obclavate or almost cylindric, straight to strongly curved, 3-9 septate, ends rounded or base obconic, 5-7 x 35-85$\mu$.

HOST: *Costus speciosus* Bl.

TYPE: Los Banos, Philippines; *Costus speciosus;* C. F. Baker, No. 4149; Jan. 1916.

DISTRIBUTION: Philippines, Formosa.

NOTE: This species is a transition stage between Cercospora and Helminthosporium. Since not all of the conidia are thick walled and all of them are almost hyaline, it is retained under Cercospora.

**Cercospora zingiberi** Togashi et Katsuki

Bot. Magazine, Tokyo **65**: 25. 1952

Leaf spots linear to vein-limited, 0.5-1.5 x 2-8 mm., fuscous to grayish brown, sometimes confluent; fruiting chiefly hypophyllous; fascicles 6-10 stalks; conidiophores olivaceous brown, paler toward the tip, mildly denticulate, not branched, 3-5 septate, 4-5 x 50-100$\mu$; conidia very pale in color, obclavato-cylindric, straight to slightly curved, 3-5 septate, obconically truncate base, subacute tip, 3.5-5 x 25-90$\mu$.

HOST: *Zingiber Mioga* Rosc.

TYPE: Soeda, Takawa, Pref. Fukuoka, Japan; *Zingiber Mioga;* S. Katsuki; Sept. 13, 1949.

DISTRIBUTION: Japan.

NOTE: Dr. Togashi sent me some of the type specimen.

**Cercospora zygophylli** Szembel

Mat. Mikol. i Fitopatol. Ross. **1** (4): 111. 1915

Leaf spots subcircular to irregular, 2-4 mm. in diameter, pale tan; fruiting amphigenous, appearing as minute black effuse tufts in the centers of the spots; stromata small, brown; fascicles sometimes dense; conidiophores pale to very pale olivaceous brown, uniform in color and width, sparingly septate, rarely branched, not geniculate, 4-5.5 x 10-60$\mu$, occasionally so short that each appears as a periphery cell of the stroma; conidia hyaline, cylindric or longest ones distinctly acicular, straight to curved, multiseptate, base truncate, tip subobtuse, 3-5 x 30-100$\mu$.

HOST: *Zygophyllum fabago* L.

TYPE: Near Bashmakowka, Astrachan, Russia; *Zygophyllum fabago;* S. Szembel, No. 636; Aug. 1914.

DISTRIBUTION: Several collections in the District of Astrachan.

NOTE: Szembel kindly sent me some of the type collection and another one he made in 1929. He repeated his description of the species in Astrachan Plant Protection Station **1** (3): 11. 1924.

**Cercospora deformans** Patouillard & Hariot

Jour. de Botanique **14**: 245. 1900

TYPE: Lac Fati, Soudan; twigs of unknown plant; Chevalier; Aug. 1899.

NOTE: The type shows two twigs with black gall-like swellings 12 and 25 mm. in length. Where the black has worn away, the gall is dull brown. Several mounts were made, but no fungus resembling Cercospora could be found. This, together with the fact that in no other host has a Cercospora species caused a gall, makes it doubtful that the fungus named *C. deformans* is a true Cercospora.

**Cercospora pallida** (Berkeley & Curtis) Cooke
Grevillea 17: 21. 1888

*Cladosporium pallidum* Berk. & Curt., Proc. Amer. Acad. Arts. Sci. Boston. 4: 127. 1858

Leaf spots none or indistinct; fruiting in hypophyllous, olivaceous, effuse patches, 0.5-2 mm. in extent; stromata small, brown, 15-30$\mu$ in diameter; fascicles dense; conidiophores pale to medium brown, dark in mass, septate, constricted at septa or otherwise irregular in width, not geniculate, rarely slightly branched, small spore scar at bluntly rounded tip, 4.5-6 x 15-60$\mu$; conidia pale olivaceous, cylindro-obclavate, straight to mildly curved, 1-5 septate, obconic to rounded base, blunt tip, 3.5-5 x 20-55$\mu$.

TYPE: Greytown, Nicaragua; leaves; U. S. Pac. Ex. Ex. 354; 1856.

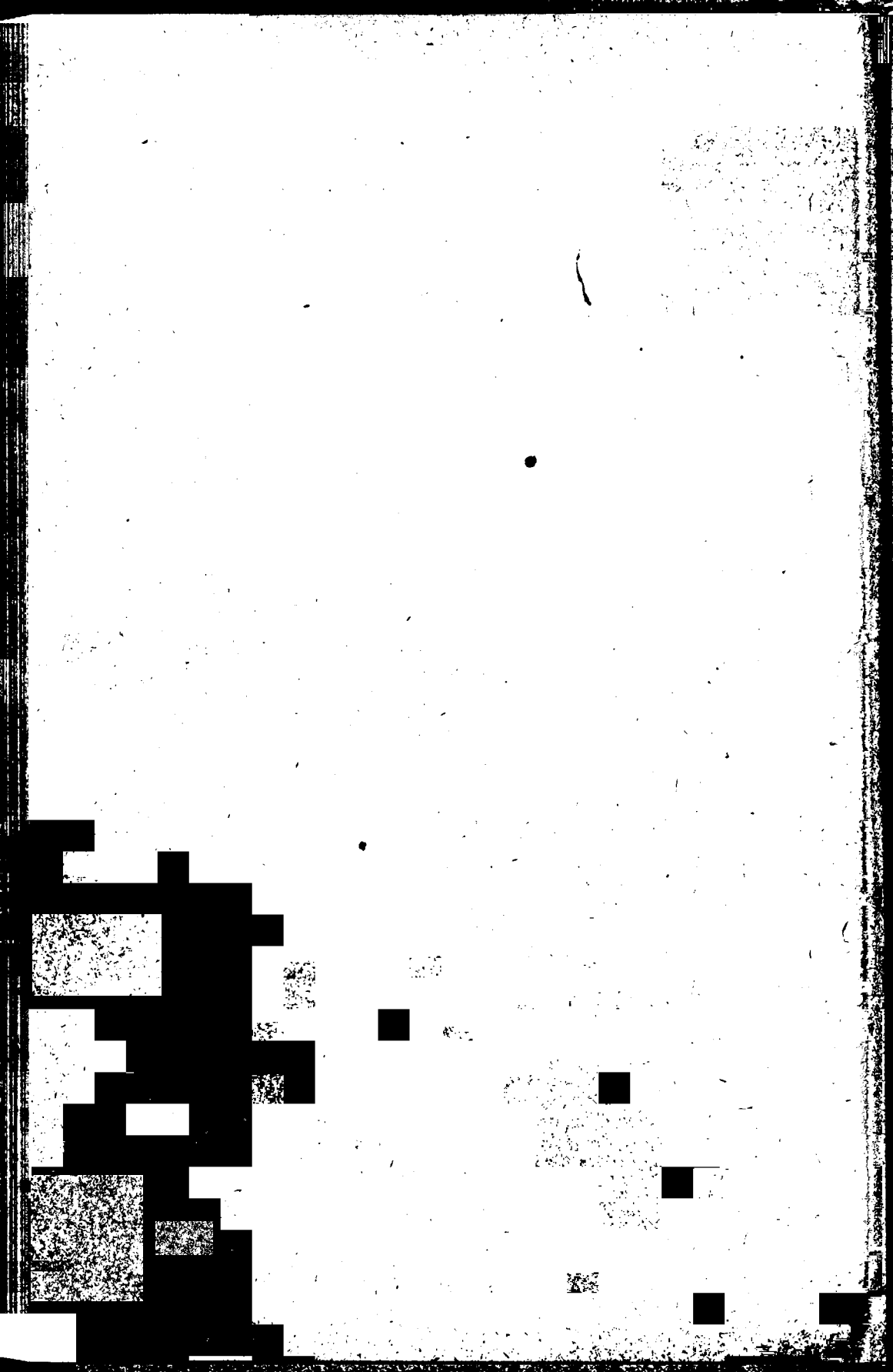
DISTRIBUTION: Known only from the type locality.

NOTE: This may later have been described under some other name, but as the host is not given by Berkeley, it is difficult to compare it in detail with all the species that are similar. Mr. Sandwith of the Royal Botanic Garden, Kew, was consulted but he was unable to make any suggestions regarding the possible host.

**Cercospora salina** Sutherland
New Phytol. 15: 43. 1916
Brit. Mycol. Soc. Trans. 5: 432. 1916

TYPE: Saprophytic on various seaweed along the coast of Aberdeen, Ayrshire, Dorset, and Orkney.

NOTE: Smith and Ramsbottom (second citation above) state that the dark, stout, thick walled conidia might be regarded as belonging to Helminthosporium but the type and habit of conidiophore, as well as the arrangement of conidia, is distinctly that of Cercospora. Material examined at Kew showed distinctly echinulate conidia. It may be a Heterosporium. It certainly is not a Cercospora.



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