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Some pathogens of cercosporiosis collected in Brazil

Toshihiko HINO and Hasime TOKESHI

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by

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Summary

Among the specimens collected in Brazil during the period extending from February 1974 to March 1976, the following 81 species were identified: *Cercospora tetragoniae*, *C. celosiae*, *C. oblecta*, *C. fukushiana*, *C. pyrostegiae*, *C. mamaonis*, *C. beticola*, *C. bidentis*, *C. calendulae*, *C. chrysanthemi*, *C. gerberae*, *C. grandissima*, *C. helianthicola*, *C. tegeticola*, *C. vernoniae*, *C. zinniae*, *C. ipomoeae*, *C. timorensis*, *C. cruciferarum*, *C. nasturtii*, *C. citrullina*, *C. ugandensis*, *C. kaki*, *C. acalyphae*, *C. pulcherrimae*, *C. ricinella*, *C. castaneae*, *C. fusimaculans*, *C. koepkei*, *C. oryzae*, *C. setariae*, *C. vaginae*, *C. leonuri*, *C. menthicola*, *C. purpurea*, *C. arachidicola*, *C. austrinae*, *C. bauhiniae*, *C. canescens*, *C. cruenta*, *C. flagellifera*, *C. kikuchii*, *C. stizolobii*, *C. wisteriae*, *C. asparagi*, *C. althaeina*, *C. sidae*, *C. morina*, *C. musae*, *C. eucalypti*, *C. myrticola*, *C. sawadae*, *C. sesami*, *C. punicae*, *C. cydoniae*, *C. laxipes*, *C. mali*, *C. prunicola*, *C. rosicola*, *C. spiraeicola*, *C. coffeicola*, *C. diodiae*, *C. salicina*, *C. salicis*, *C. hydrangeae*, *C. paulowniae*, *C. atromarginalis*, *C. capsici*, *C. nicotianae*, *C. triumfettae*, *C. apii*, *C. carotae*, *C. formosana*, *C. guianensis*, *Cercosporidium henningsii*, *C. personatum*, *Cercoseptoria theae*, *Phaeoramularia capsicicola*, *Sirosporium diffusum*, and *Stigmina mangiferae*. Besides, the writers proposed to designate the fungus observed on parsley as *Cercospora petroselinicola* n. sp.

Cercospora hitherto reported in Brazil were listed and 73 species belonging to *Cercospora* and related genera were proved to be common to Japanese species, which were mostly found on cultivated plants.

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I Introduction

Since G. Fresenius first described genus *Cercospora* in 1863 on the basis of *C. apii* observed in celery, thousands of *Cercospora* species have been reported worldwide. In Brazil, the studies on *Cercospora* species seem to have been initiated at the end of the 19th century by C. Spegazzini, R. A. Sacca, F. Noack, A. Puttemans, P. Hennings, E. Rangel, A. Maublanc, etc. The studies gradually developed later on and C. Chupp and A. S. Muller in 1934 and 1936 published the list of *Cercospora* species found in Brazil, which amounted to 123 species. In 1945, the book "Alguns Fungos do Brasil - *Cercosporae*" was published by A. P. Viégas representing an essay on taxonomy of Brazilian fungus flora. Viégas described 102 species of the genus including 28 new species with illustrations.

Cercosporae reported in the world were compiled by C. Chupp in 1953 in the United States, in the book entitled "A Monograph of the Fungus Genus *Cercospora*" in which the author surveyed almost all the specimens so far described. According to his work, all the species reported in the world totalled about 1400 and the use of synonyms was clarified. Since the publication of this monograph, many species have been continuously reported.

It has been suggested to transfer a large number of *Cercospora* species corresponding to *Cercospora* (Chupp's Concept) to other genera such as *Cercosporidium* (Deighton 1976), *Mycovellosiella* (Muntañola 1960, Deighton 1975), *Phaeoramularia* (Muntañola 1960), *Pseudocercospora* (Katsuki 1965, Deighton 1976), etc. When the newly proposed nomenclature of these genera will be accepted, many *Cercospora* species will be transferred to these genera, especially to *Pseudocercospora* whose concept was proposed by F. C. Deighton in 1976. The characteristics of about 300 genera belonging to Dematiaceous Hyphomycetes which includes *Cercospora* and related genera were summarized by M. B. Ellis in 1971 and 1976.

Fungus *Cercospora* (Chupp's concept) is well known as pathogen of various crops and is widely distributed, being especially abundant in tropical and subtropical zones. A large number of *Cercospora* species are economically important, as well known, from the view point of crop protection, because of the severe damage, they inflict to crops as they are being transmitted by the wind or through seeds. This applies to *Cercospora musae* on banana, *C. kikuchii* on soybean, *C. purpurea* on avocado, *C. kaki* on persimmon, *C. canescens* on bean, *C. nicotianae* on tobacco, *C. oryzae* on rice, *C. coffeicola* on coffee, etc.

Though these important species have been subject to extensive studies, most of them were generally ignored only because they were not important from the angle of crop protection. However, it is likely that these presently harmless species might damage crops, e.g., following the introduction of new crops or new varieties, or as a result of shifting of cultivation seasons and areas and change in climate or soil conditions, etc.

Agriculture in Brazil whose territory extends from 6°N to 33°S in latitude has been chiefly developed in the southern states, such as Rio Grande do Sul, Paraná, São Paulo, Rio de Janeiro, etc., which belong to temperate to subtropical zones. In the future agricultural activities may involve the northern states, namely, the tropical rain forest area, the "Cerrado" area, and the "Caatinga" area. Among them, as agriculture in the "Cerrado" area is expected to experience a rapid development in the very near future, new situations including diseases which had never occurred in temperate zones, such as in the southern states of Brazil, Europe, the United States of America and Japan might take place.

In order to prepare the conditions for future agricultural development, it is essential to obtain information about the microflora of some important fungi commonly found in Brazil,

which are considered to be *Cercospora*, *Colletotrichum*, *Gloeosporium*, *Drechslera*, *Sphaceloma*, *Oidium*, *Puccinia*, *Uromyces*, etc. The writers intended to investigate one of them and were able to identify some species of *Cercospora* and related genera collected in Brazil, mostly in the State of São Paulo, during the period extending from February 1974 to March 1976. Also, *Cercosporae* hitherto reported in Brazil were listed including synonyms and host plants.

The writers wish to express their cordial thanks to Prof. Dr. Ferdinando Galli, Prof. Dr. Paulo de C. T. de Cavalho, Prof. Dr. Eric Balmer, Prof. Dr. Hiroshi Kimati, Prof. Dr. Caio O. N. Cardoso, Prof. Dr. Elike J. B. N. Cardoso, Prof. Dr. Clélio L. Salgado, Prof. Dr. Armando Bergamin Filho, and all the members of Departamento de Fitopatologia, Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo, for their proper management and guidance.

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II *Cercosporae* and related genera collected in Brazil

Fungi belonging to *Cercospora* and related genera collected in Brazil during the period extending from February 1974 to March 1976 were classified below in alphabetical order according to each host plant family, also listed in alphabetical order. In the description of each fungus, synonyms were limited only to those used in Brazil. Localities which frequently appeared in this report were abbreviated as follows: ESALQ : Escola Superior de Agricultura "Luiz de Queiroz". FCMBB : Faculdade de Ciências Médicas e Biológicas de Botucatu (Presently Faculdade de Ciências Agronômicas, Campus de Botucatu). S.P. : São Paulo.

AIZOACEAE

1) *Cercospora tetragoniae* (Speg.) Chupp, Monograph F. G. *Cercospora*: 27. 1953.

Leaf spots amphigenous, circular, 1-10 mm in diameter, black to dark brown, central parts paler or dull gray, 1-2 zonate in large lesions, sunken, surrounded with yellowish green halos, lower surface darker; fruiting amphigenous; stromata lacking or minute; fascicles 1-10 stalks; conidiophores pale olivaceous to olivaceous brown, uniformly colored, tip slightly paler, 2-8 septate, tip truncate, mildly or slightly geniculate, not branched, spore scars large, attenuated toward tip, 3-5 × 32-164 μm; conidia hyaline, acicular, base truncate, tip acute to obtuse, straight to mildly curved, indistinctly multiseptate, 2.5-4 × 64-274 μm (Fig. 1).

Hab. on *Tetragonia expansa*, at local market, Piracicaba, S. P., 11 March 1975, No. C 113; at Rua General Telles 403, Botucatu, S. P., 18 December 1975, No. C 176.

AMARANTHACEAE

2) *Cercospora celosiae* Sydow, Ann. Mycol. 27 : 430. 1929.

Contaminated leaf spots with pycnidia-forming fungi circular to subcircular, 2 mm in size up to large blotches, dark brown with darker margins, sometimes zonate; fruiting chiefly hypophyllous; stromata medium in size, up to 30 μm , brown, variously shaped; fascicles 2-13 stalks; conidiophores brown, paler and narrower toward tip, not branched, distinctly multiseptate, spore scars medium in size and distinct, 4-6 \times 72-152 μm ; conidia hyaline, acicular, straight to curved, base truncate, tip acute, often tip obtuse to round when short, indistinctly multiseptate, 3-4 \times 40-160 μm (Fig. 2).

Hab. on *Celosia cristata*, at Caucaia do Alto, Cotia, S. P., 8 June 1975, No. C 135.

ANACARDIACEAE

3) *Stigmina mangiferae* (Koorders) M. B. Ellis, Mycol. Papers 72 : 49. 1959.

Syn. *Cercospora mangiferae* Koorders, Verh. K. Akad. Wetensch. II. 13 : 236. 1907.

Leaf spots amphigenous, black, circular to irregular, vein-limited, 1-2 mm in size, central parts slightly sunken, surrounded by yellow halos; fruiting hypophyllous; stromata globular, 28-60 μm in diameter; fascicles dense; conidiophores short, not geniculate, olivaceous brown, uniformly colored, spore scars invisible, 5-6 \times 4-18 μm ; conidia obclavate to spindle-shaped, curved, olivaceous brown to brown, distinctly 4-10 septate, tip slightly paler, base obconically truncate, tip round, 5-7 \times 44-88 μm (Fig. 3).

Hab. on *Mangifera indica*, at ESALQ, Piracicaba, S. P., 15 February 1975, No. C 101; at Estação Experimental de Presidente Medici de FCMBB, Botucatu, S. P., 10 December 1975, No. C 160.

ANONACEAE

4) *Cercospora oblecta* Sydow, Ann. Mycol. 33 : 235. 1935.

Leaf spots amphigenous, appearing at first from upper surface, brownish black, irregular in shape, vein-limited, 1-6 mm in size, mostly 3-4 mm, sometimes fusing, lower leaf surface dull dark brown; fruiting chiefly epiphyllous; stromata globular, brown, 28-120 μm in diameter; fascicles dense to very dense; conidiophores pale brown, uniformly colored, short, tip truncate to obconic, 0-1 septate, not geniculate, not branched, spore scars distinct, 4.5-6 \times 12-20 μm ; conidia dull olivaceous, cylindrical, base obconic, tip round, straight to slightly curved, sometimes catenulate, mostly 1-3 septate, scars medium in size, often detached with conidiophores, 4.5 \times 28-76 μm (Fig. 4).

Hab. on *Anona* sp., at Fazenda Regina, Itatinga, S. P., 26 January 1975, No. C 92.

BALSAMINACEAE

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

Leaf spots amphigenous, circular, reddish brown, sometimes dark brown, occasionally zonate, central parts brownish white, 1-8 mm in diameter, often coalescing to form large blotches; fruiting amphigenous; stromata minute or sometimes lacking; fascicles a few stalks to dense; conidiophores olivaceous brown, tip truncate, slightly paler and slightly narrower toward tip, multiseptate, usually 1-7 septate, very rarely branched, straight or geniculate, spore scars distinct, 3.5-5.5 \times 56-136 μm ; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip obtuse to subacute, scars distinct, 3-4 \times 48-300 μm (Fig. 5).

Hab. on *Impatiens balsamina*, at ESALQ, Piracicaba, S. P., 11 June 1975, No. C 141.

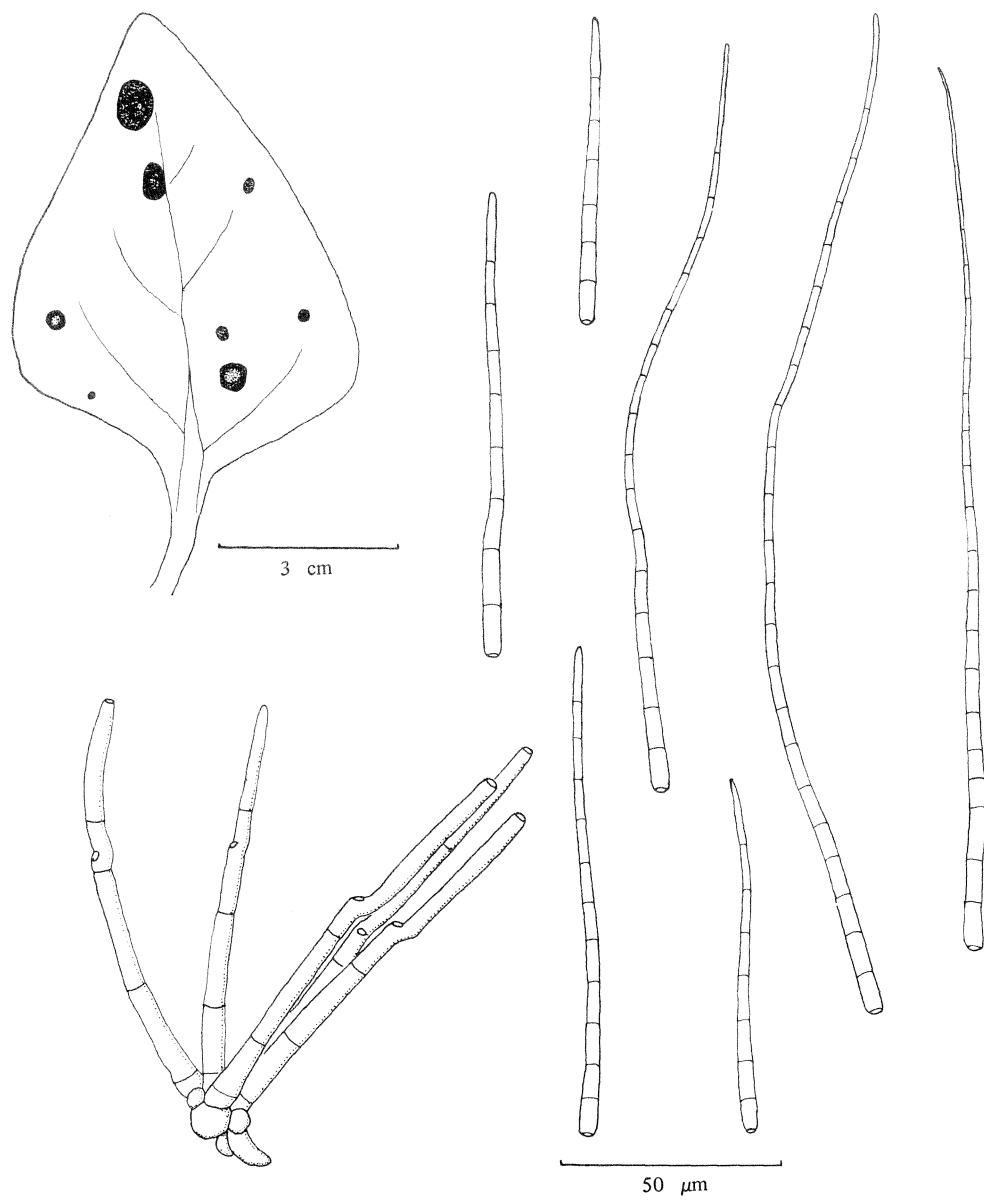


Fig. 1. *Cercospora tetragoniae* (Speg.) Chupp on *Tetragonia expansa*. No. C 113.

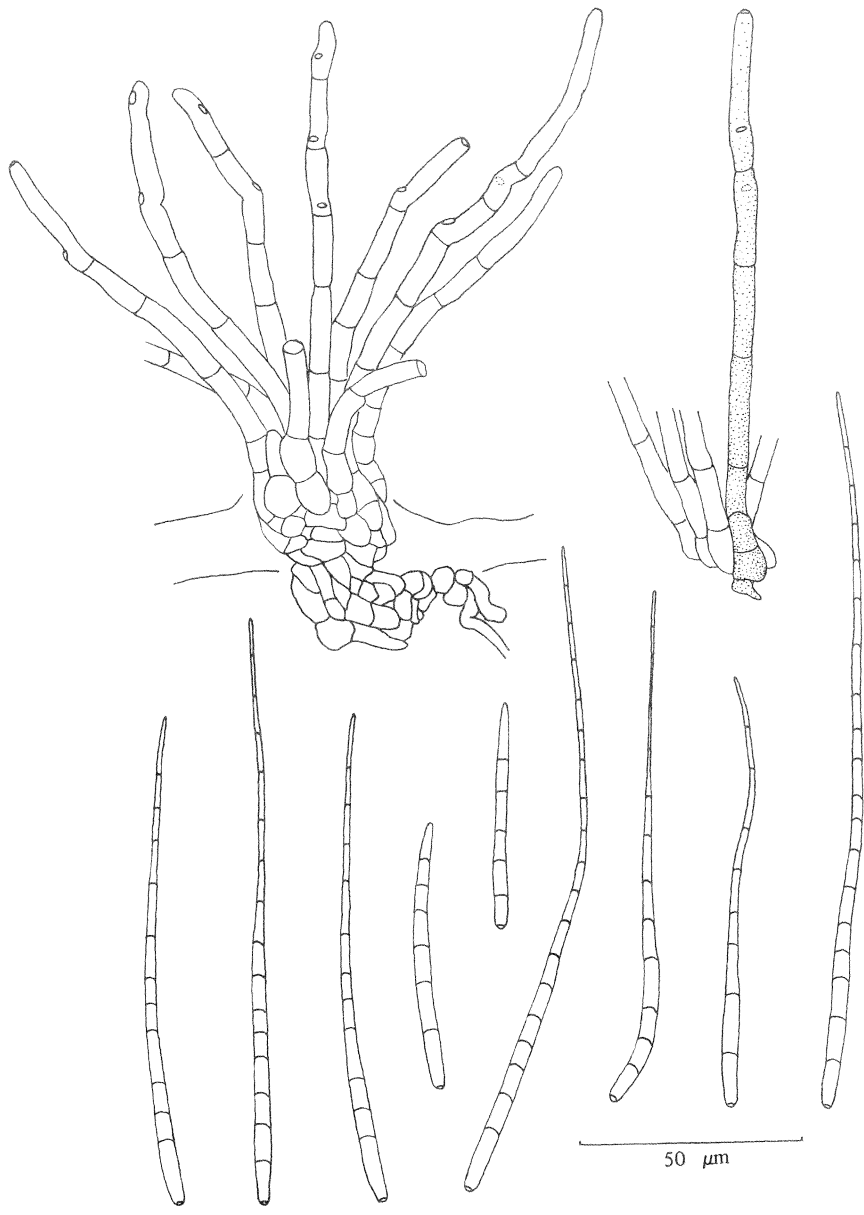


Fig. 2. *Cercospora celosiae* Sydow on *Celosia cristata*. No. C 135.

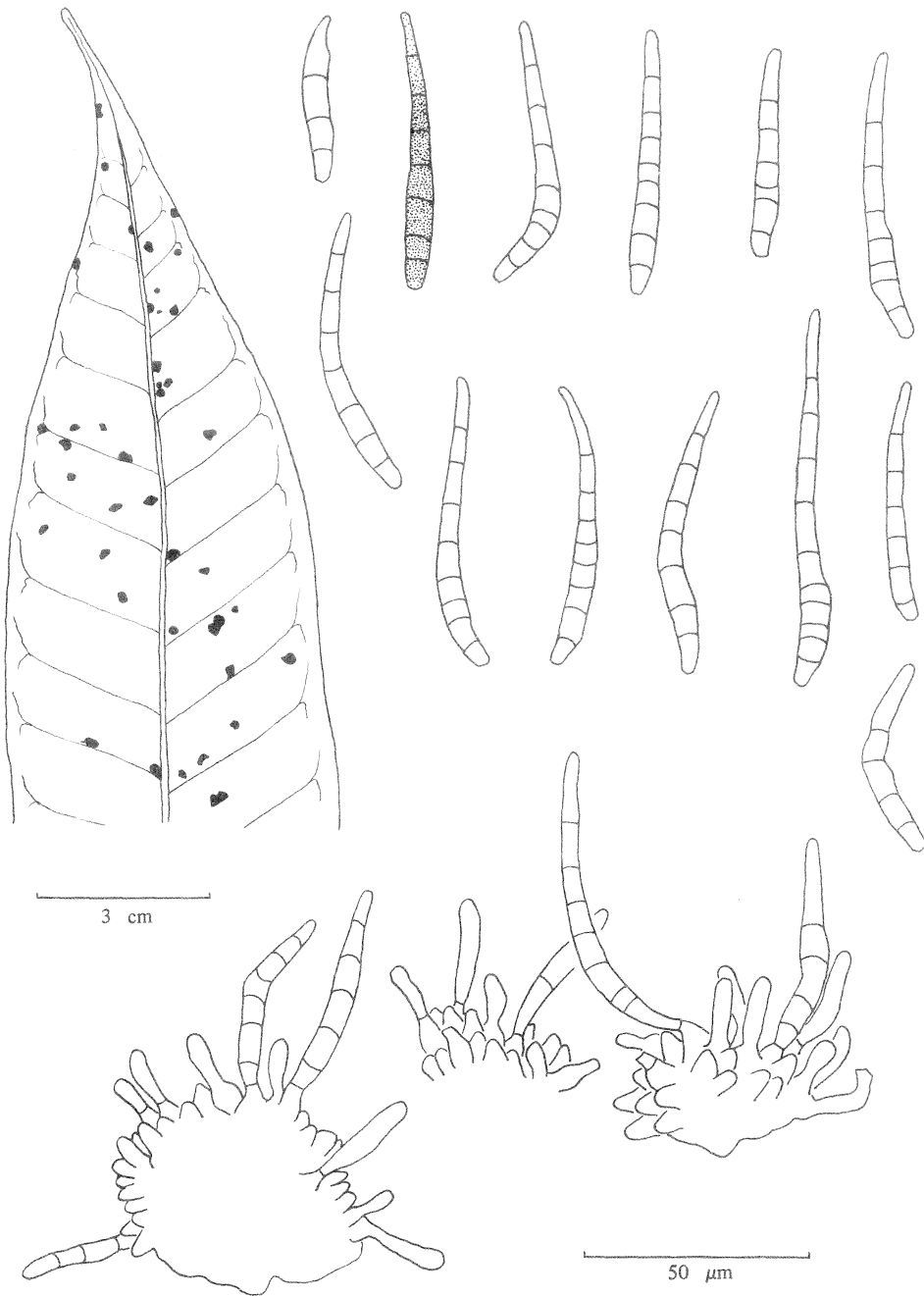


Fig. 3. *Stigmata mangiferae* (Koorders) M. B. Ellis,
Syn. *Cercospora mangiferae* Koorders on *Mangifera indica*. No. C 101.

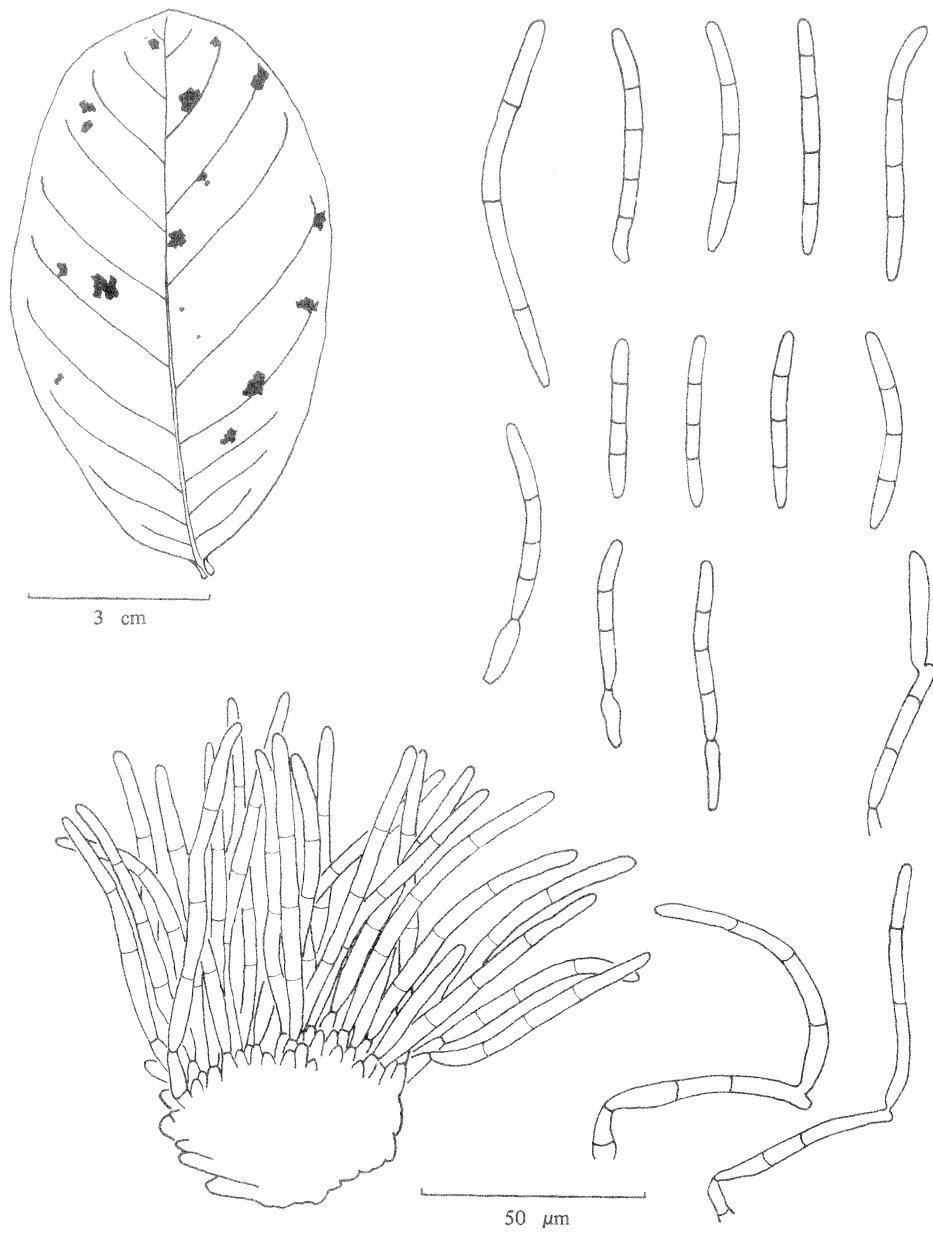


Fig. 4. *Cercospora oblecta* Sydow on *Anona* sp. No. C 92.

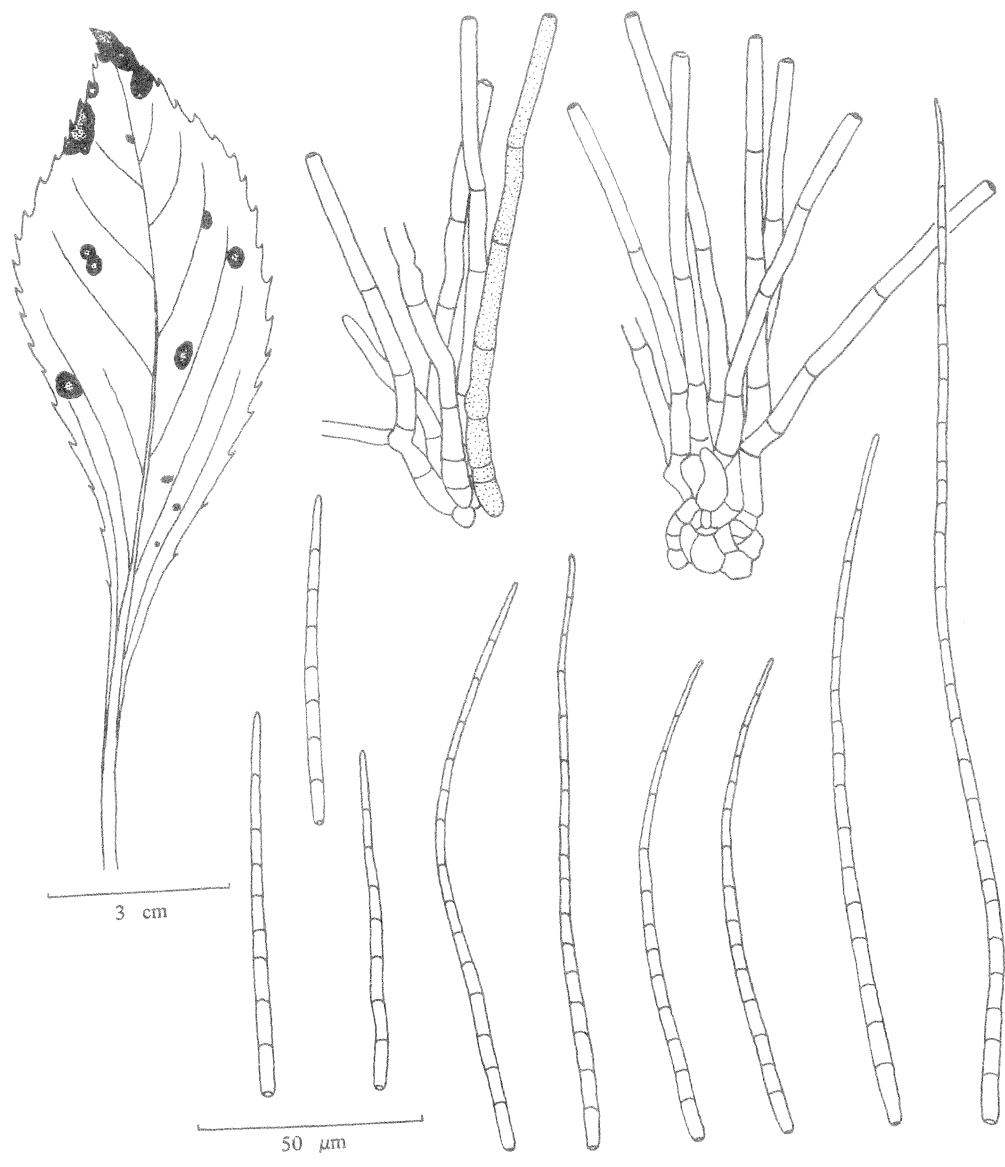


Fig. 5. *Cercospora fukushiana* (Matsuura) Yamamoto on *Impatiens balsamina*. No. C 141.

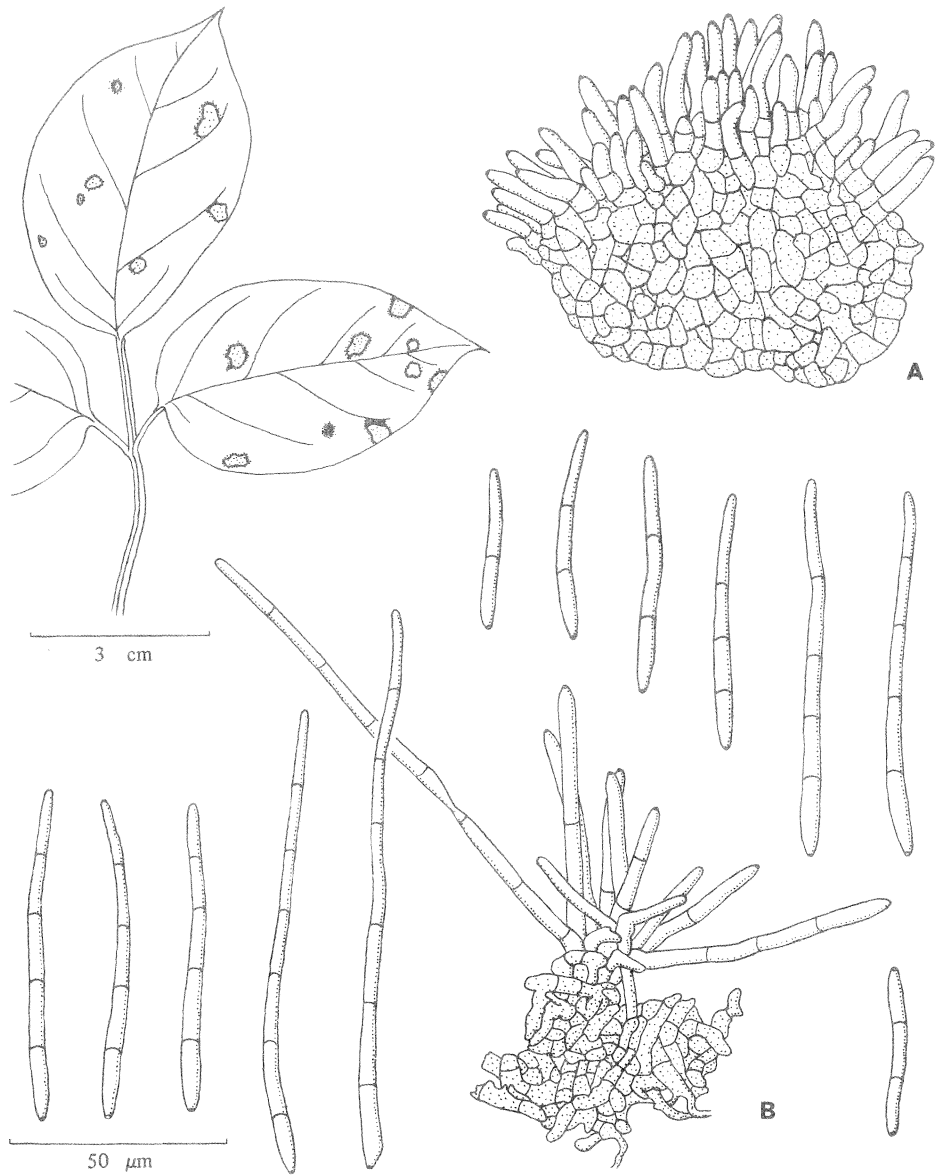


Fig. 6. *Cercospora pyrostegiae* Viégas on *Pyrostegia venusta*. No. C 50.
 A & B : stroma and conidiophores on upper and lower surface of lesions respectively.

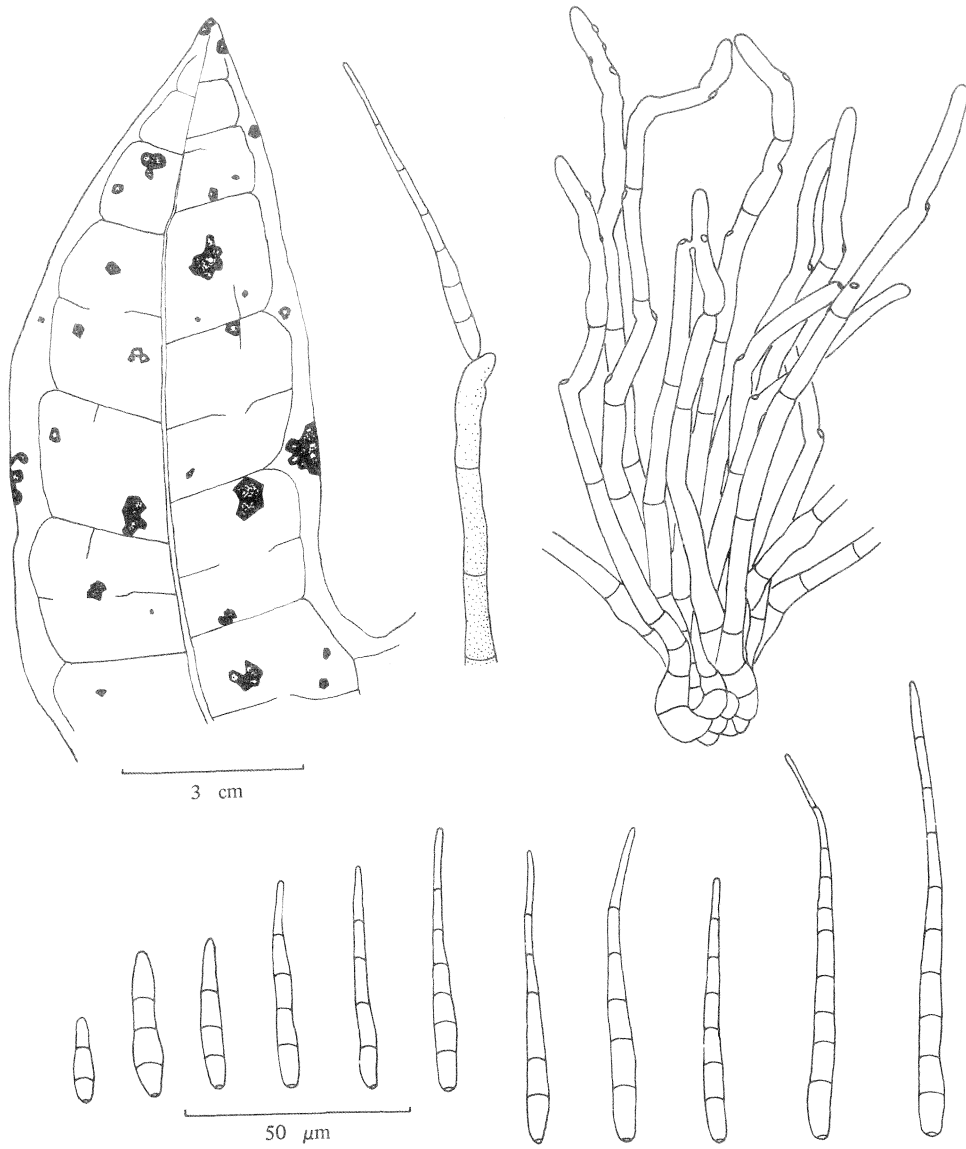


Fig. 7. *Cercospora mamaonis* Viégas et Chupp on *Carica papaya*. No. C 144.

BIGNONIACEAE

6) *Cercospora pyrostegiae* Viégas, Bol. Soc. Brasil. Agron. 8 : 46. 1945.

Leaf spots amphigenous, circular to angular, vein-limited, 1-5 mm in size, grayish brown to white with dark brownish sooty margins, often with minute black dots; fruiting amphigenous; stromata globular, brown, 20-92 μm in diameter; fascicles dense to very dense; conidiophores pale olivaceous, uniformly colored, mostly straight, equal in width, tip obconically truncate, spore scars distinct and medium in size, not branched, not geniculate, indistinctly sparsely septate, 3.5-4 \times 12-52 μm ; conidia pale olivaceous, cylindric to obclavato-cylindric, straight to slightly curved, base obconically truncate, tip round, scars distinct and medium in size, indistinctly 0-8 septate, rarely catenulate, 2.5-4 \times 16-140 μm (Fig. 6).

Hab. on *Pyrostegia venusta*, at Km467, Rodovia SP 304, Borborema, S.P., 16 August 1974, No. C 50; at FCMBB, Rubião Junior, Botucatu, S. P., 15 December 1975, No. C 168.

CARICACEAE

7) *Cercospora mamaonis* Viégas et Chupp, Monograph F. G. *Cercospora* : 107. 1953.

Syn. *Cercospora papayae* Viégas et Chupp, Bol. Soc. Brasil. Agron. 8 : 42. 1945.

Leaf spots amphigenous, angular, sometimes circular when small, 0.5-5 mm in size, coalescing to form larger lesions, reddish brown with darker margins, often with brownish gray centers, sometimes surrounded by yellowish green areas; fruiting amphigenous; stromata a few brown cells to minute; fascicles 2 stalks to dense; conidiophores brown, distinctly paler and slightly narrower toward tip, distinctly multiseptate, straight to geniculate, not branched, spore scars distinct and medium in size, tip bluntly round or subtruncate, 4-6 \times 28-160 μm ; conidia hyaline, acicular to obclavato-cylindric, shortest ones almost cylindric, base subtruncate, tip round to obtuse, indistinctly uni- to multiseptate, straight to mildly curved, 4-7 \times 24-116 μm (Fig. 7).

Hab. on *Carica papaya*, at ESALQ, Piracicaba, S. P., 20 June 1975, No. C 144.

Note : Viégas (1945) described a new species, *Cercospora papayae* Viégas et Chupp. Before his description, the name of *C. papayae* had been already used by Hansford in 1943. Chupp (1953) then changed the name of *C. papayae* Viégas et Chupp to *C. mamaonis* Viégas et Chupp and supplied an English description. Chupp's description of *C. mamaonis* is somewhat different from Viégas' original description in Latin and Portuguese. The species observed by the writers is identical to *C. papayae* Viégas et Chupp according to Viégas' description, and shows intermediate characters between *C. papayae* Hansford and *C. mamaonis* Viégas et Chupp according to Chupp's description (1953). Description of these two species which appeared in Chupp's Monograph (1953) might represent extreme variation forms of one species, though the writers did not have the opportunity to check the type of these species. The writers at first considered that the species collected belonged to *C. papayae* Hansford (Hino & Tokeshi 1976c). However, at present the writers consider it appropriate to use the term *C. mamaonis* Viégas et Chupp, simply because the writers' species is identical to *C. papayae* Viégas et Chupp.

CHENOPODIACEAE

8) *Cercospora beticola* Saccardo, Nuov. Giorn. Bot. Ital. 8 : 189. 1876.

Syn. *Cercospora anthelmintica* Atkinson, Jour. Elisha Mitchell Scien. Soc. 8 : 49. 1892. (Muller & Chupp 1934 on *Chenopodium ambrosioides*).

Leaf spots amphigenous, circular to subcircular, reddish brown with dull gray centers, often coalescing to form large blotches, 2-5 mm in diameter; fruiting amphigenous; stromata minute or up to 60 μm in diameter; fascicles a few stalks to dense; conidiophores pale olivaceous

brown, paler toward tip, often attenuated, straight to geniculate, not branched, tip truncate to obconically truncate, sparingly septate, spore scars small and distinct, $2.5-5 \times 16-40 \mu\text{m}$; conidia hyaline, acicular, shorter ones seldom cylindrical, base truncate to obconically truncate, tip subacute to acute, straight to mildly curved, indistinctly multiseptate, $2.5-4 \times 32-164 \mu\text{m}$ (Fig. 8).

Hab. on *Beta vulgaris*, *B. vulgaris* var. *cycla*, at ESALQ, Piracicaba, S. P., 30 July 1974, No. C 23; at ESALQ, Piracicaba, S. P., 30 July 1974, No. C 24; at Estação Experimental de Presidente Medici de FCMBB, Botucatu, S. P., 10 December 1975, No. C 171.

Note : This description applies to the fungus found on *Beta vulgaris*, No. C 23. Conidiophores of the fungus present on *B. vulgaris* var. *cycla*, No. C 24, were sometimes branched.

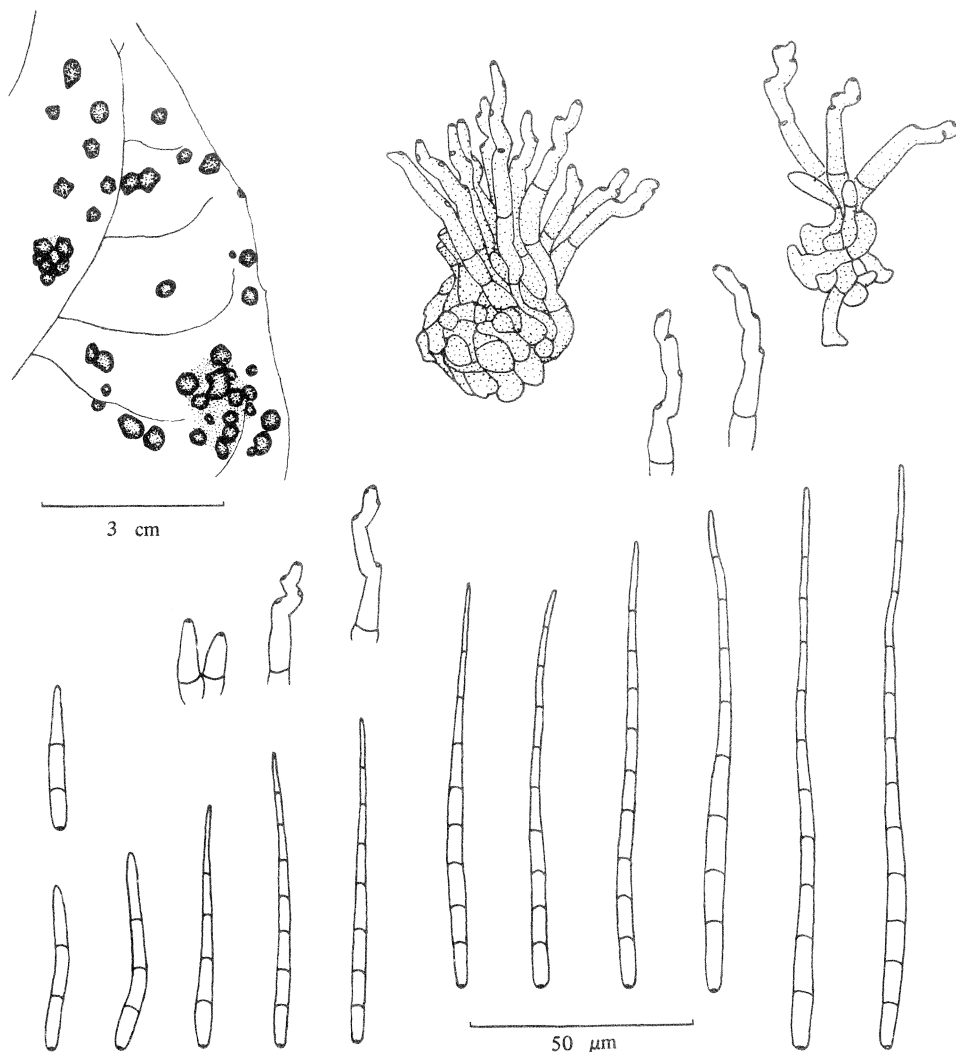


Fig. 8. *Cercospora beticola* Saccardo on *Beta vulgaris*. No. C 23.

COMPOSITAE

9) *Cercospora bidentis* Tharp, Mycologia 9 : 108. 1917.

Leaf spots circular, 0.5-10 mm in diameter, black with effuse clear margins on upper surface, dull black with minute brown centers on lower surface; fruiting amphigenous; stromata lacking to minute; fascicles 2-27 stalks; conidiophores medium brown when old, pale olivaceous when young, paler and narrower toward tip when old, mostly uniformly colored when young, sometimes irregular in width, straight or abruptly 1-2 geniculate, not branched, distinctly sparsely septate, tip truncate, spore scars distinct and medium in size, $4-6 \times 24-84 \mu\text{m}$; conidia hyaline to subhyaline, acicular, base truncate, tip subacute, sometimes obtuse to almost round, indistinctly multiseptate, straight to mildly curved, scars distinct, $2.5-4.5 \times 52-184 \mu\text{m}$ (Fig. 9).

Hab. on *Bidens pilosa*, at ESALQ, Piracicaba, S. P., 9 August 1974, No. C 43.

Note : Chupp (1953) noted that leaf spots are brown and difficult to distinguish on dried herbarium material of *Bidens* spp. However, in Brazil the symptoms shown by *Bidens*

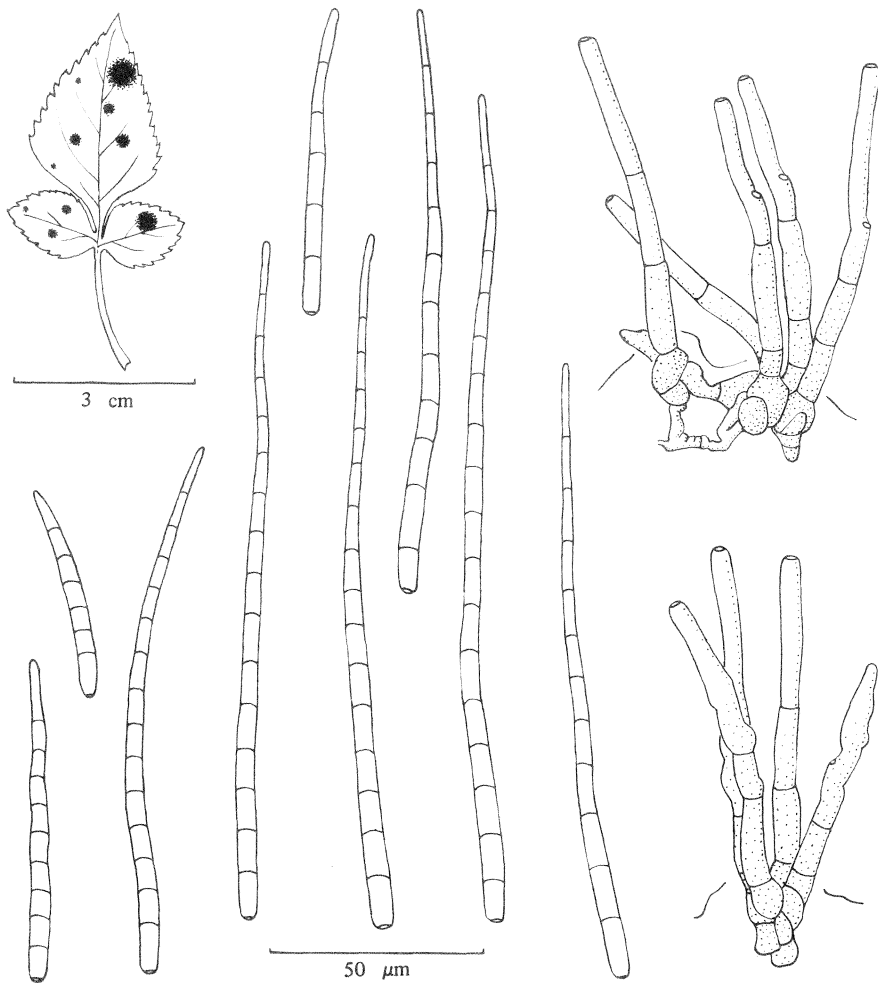


Fig. 9. *Cercospora bidentis* Tharp on *Bidens pilosa*. No. C 43.

pilosa are very distinct and easily identified in living and dried material. The symptoms of the specimen studied by the writers are very common in Brazil and are identical to those described by Viégas (1945a).

10) ***Cercospora calendulae*** Saccardo, *Michelia* 1 : 267. 1879.

Leaf spots amphigenous, circular to irregular in shape, brown, center paler brown to dull white, margins sooty brown and clear, often sunken, sometimes coalescing to form blotches, 1-10 mm in size; fruiting amphigenous, more abundant on upper surface; stromata minute to a few olivaceous brown cells; fascicles 1-18 stalks; conidiophores brown, paler toward tip, straight to mildly curved, often attenuated, sometimes geniculate, not branched, tip truncate, distinctly uni- to multiseptate, spore scars distinct and medium in size, $3.5-5 \times 20-180 \mu\text{m}$; conidia hyaline, acicular, base truncate, tip acute, straight to curved, indistinctly multiseptate, scars distinct and medium in size, $3.5-5 \times 92-336 \mu\text{m}$ (Fig. 10).

Hab. on *Calendula officinalis*, at ESALQ, Piracicaba, S. P., 1 August 1974, No. C 28.

11) ***Cercospora chrysanthemi*** Heald et Wolf, *Mycologia* 3 : 15. 1911.

Syn. *Cercospora chrysanthemi* Puttemans, *Bull. Soc. Roy. Bot. Belg.* 48: 244. 1912.

Leaf spots amphigenous, dark reddish brown, sometimes central parts paler, 3-10 mm in size, circular to irregular, coalescing to form large blotches, lower surface slightly paler; fruiting chiefly hypophyllous; stromata minute; fascicles a few stalks, occasionally dense; conidiophores pale to medium olivaceous brown, paler and narrower toward tip, sometimes irregular in width, multiseptate, tip truncate, not branched, spore scars medium in size and distinct, $3-6 \times 20-120 \mu\text{m}$; conidia hyaline, acicular, base truncate, tip acute, straight to mildly curved, multiseptate, $3-4 \times 80-380 \mu\text{m}$ (Fig. 11).

Hab. on *Chrysanthemum* sp. (cultivated), *Callistephus chinensis*, at ESALQ, Piracicaba, S. P., 11 June 1975, No. C 137; at Fazenda Experimental de São Manuel de FCMBB, São Manuel S. P., 13 December 1975, No. C 170.

Note : The plants, *Chrysanthemum* sp., which were used as materials were also infected by pycnidia-forming fungi, showing almost the same symptoms as those mentioned above. However, the central parts of the lesions caused by the latter fungi showed a brighter brown color, clearer borders between paler centers and darker areas at the periphery in comparison with the lesions caused by *C. chrysanthemi*.

12) ***Cercospora gerberae*** Chupp et Viégas, *Bol. Soc. Brasil. Agron.* 8 : 27. 1945.

Leaf spots amphigenous, mostly circular, sometimes irregular in shape, 1-5 mm in diameter, later coalescing to form large blotches, sometimes broken with holes, dark to light brown, occasionally dull gray in central parts, peripheral areas dull purple, 1-4 mm in width; fruiting amphigenous. stromata lacking or minute; fascicles 2-9 stalks; conidiophores medium brown, sometimes pale olivaceous brown when young, paler and narrower toward tip, straight or mildly geniculate, distinctly multiseptate, tip truncate to subtruncate, spore scars distinct, $4-6 \times 48-244 \mu\text{m}$; conidia hyaline, acicular, base truncate to subtruncate, tip acute, straight to mildly curved, indistinctly multiseptate, scars distinct, $2.5-4 \times 28-294 \mu\text{m}$ (Fig. 12).

Hab. on *Gerbera jamesonii*, at ESALQ, Piracicaba, S. P., 14 May 1975, No. C 118; at ESALQ, Piracicaba, S. P., 1 August 1974, No. C 29.

Note : From observations conducted at ESALQ, Piracicaba, throughout a year, it appears that the disease is severe during the period extending from May to August, e.g., during the dry season.

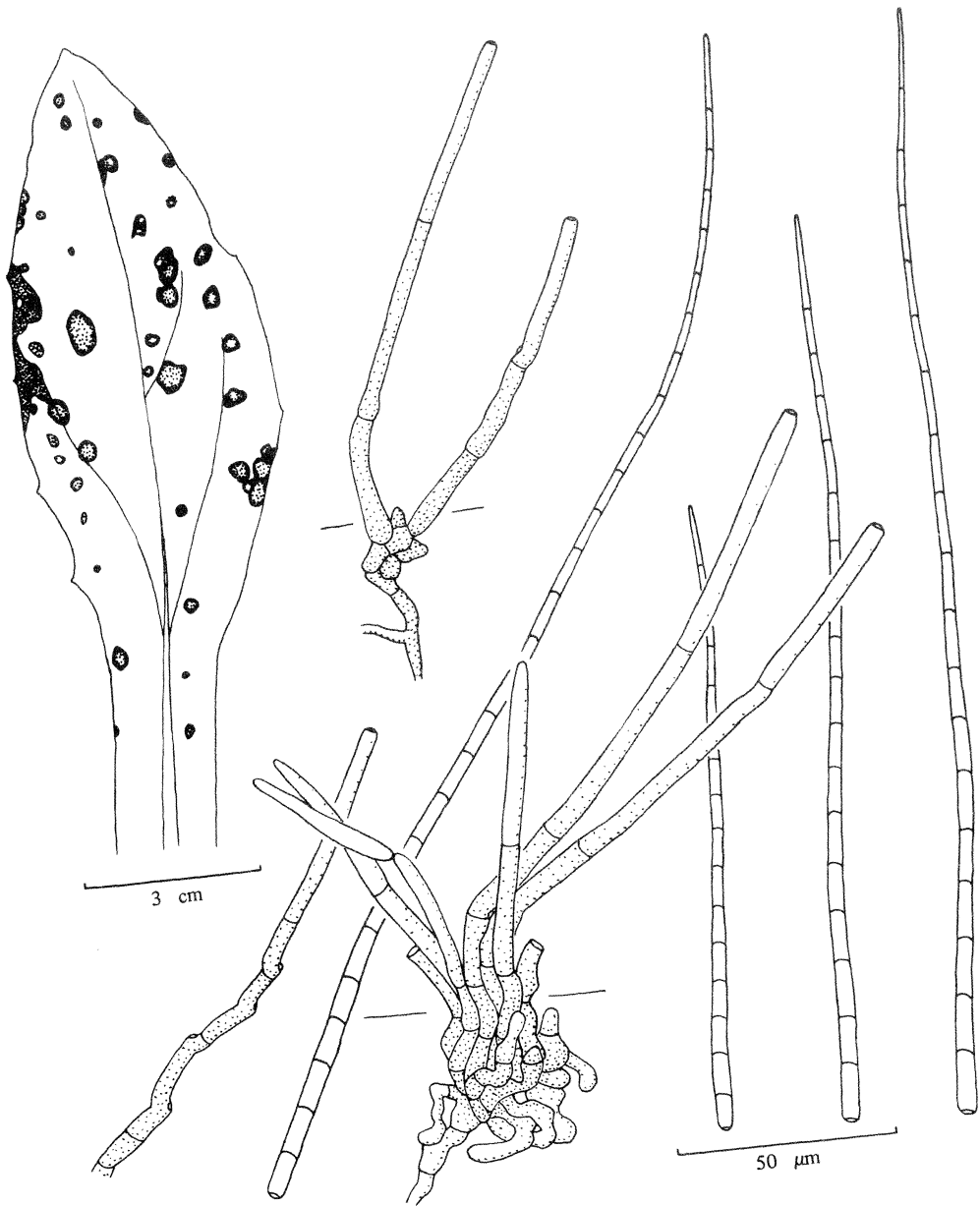


Fig. 10. *Cercospora calendulae* Saccardo on *Calendula officinalis*. No. C 28.

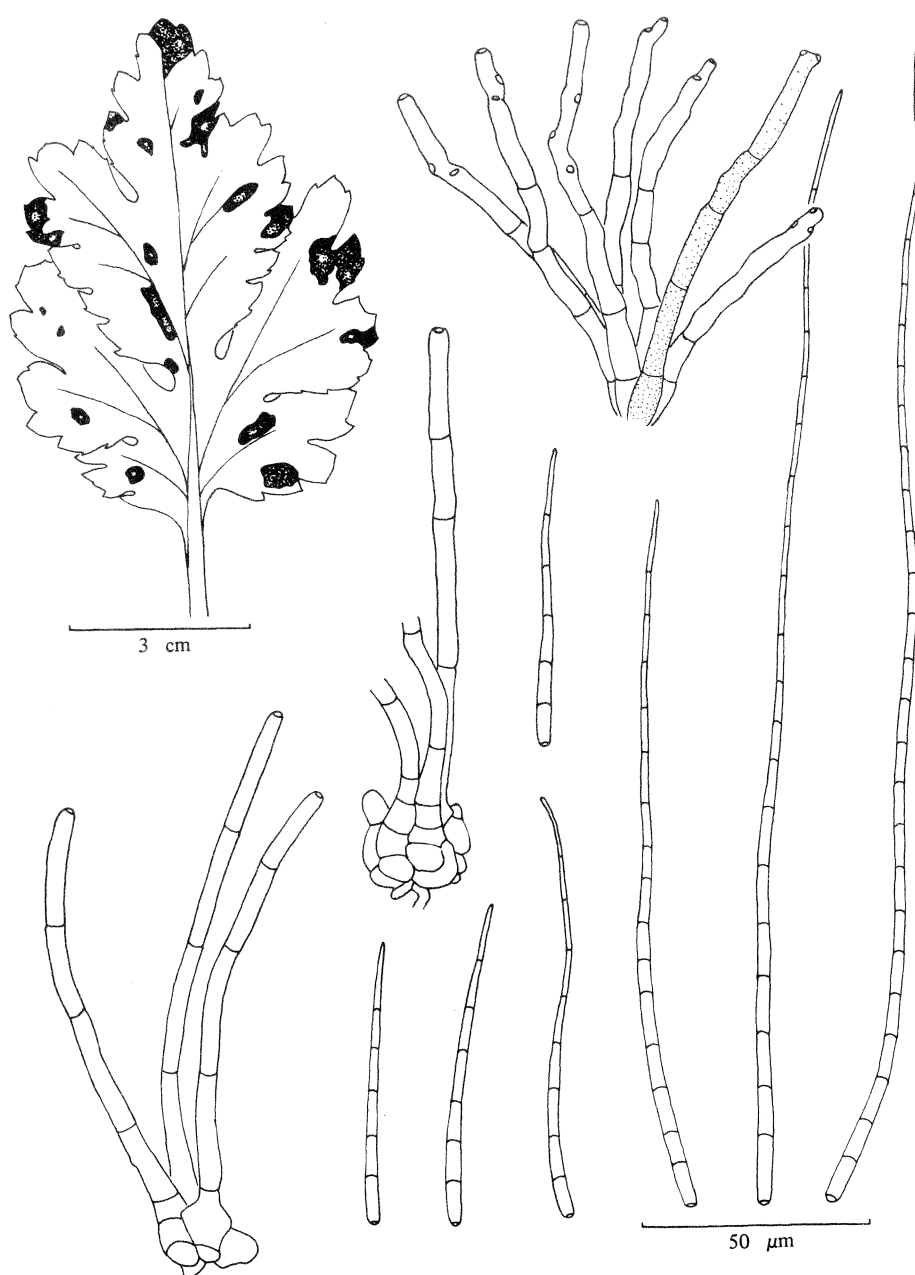


Fig. 11. *Cercospora chrysanthemi* Heald et Wolf on *Chrysanthemum* sp. No. C 137.

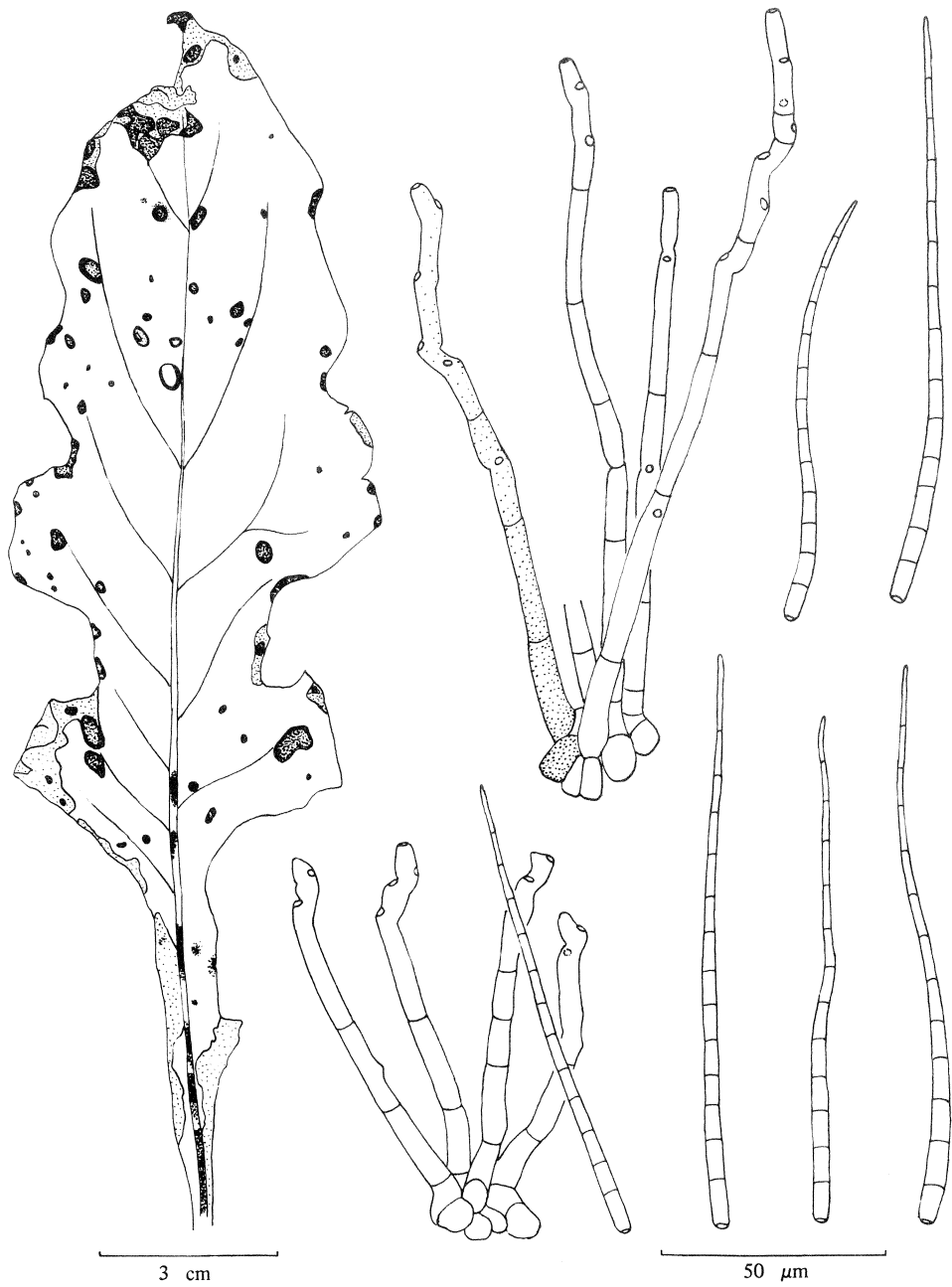


Fig. 12. *Cercospora gerberae* Chupp et Viégas on *Gerbera jamesonii*. No. C 118.

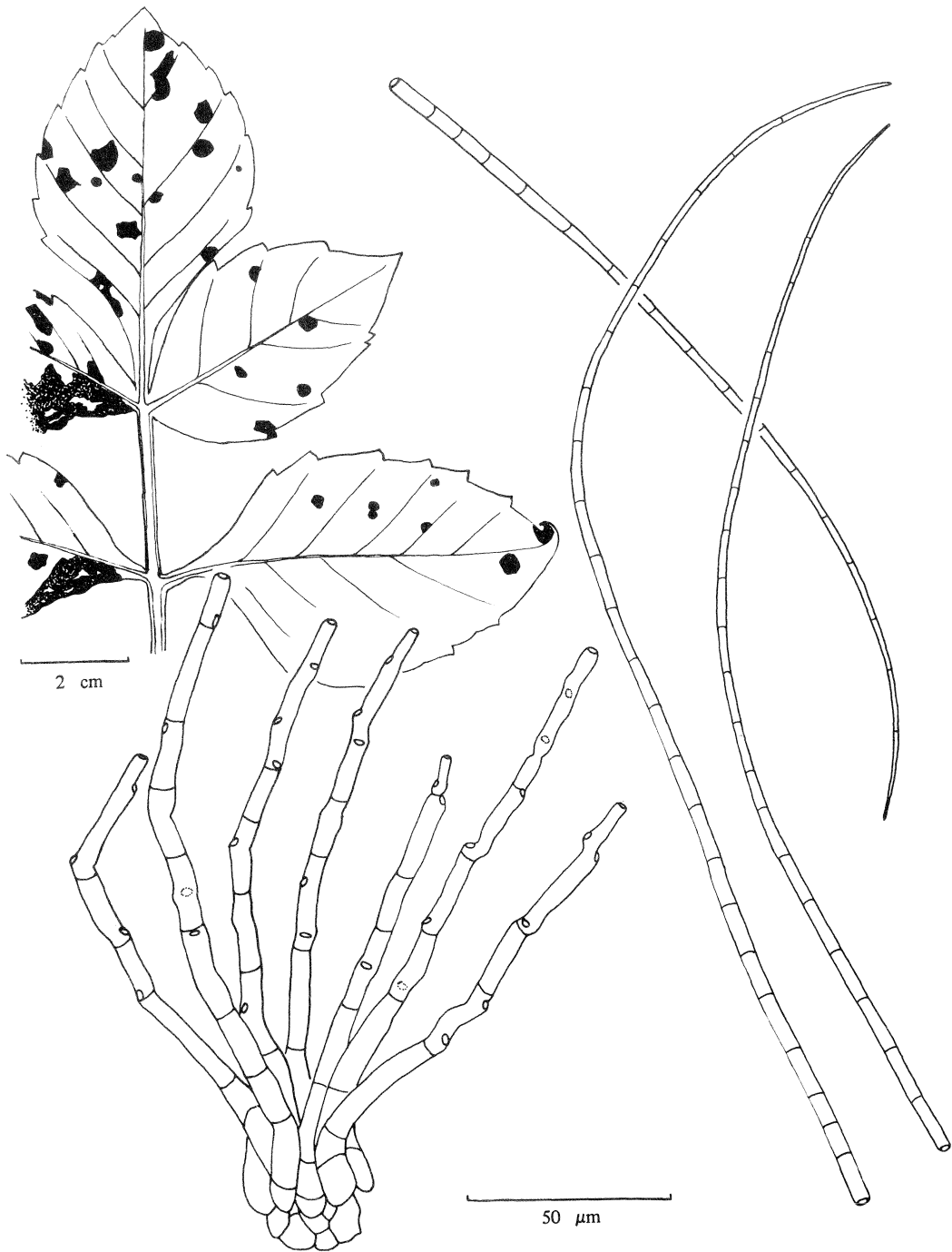


Fig. 13. *Cercospora grandissima* Rangel on *Dahlia* sp. No. C 98.

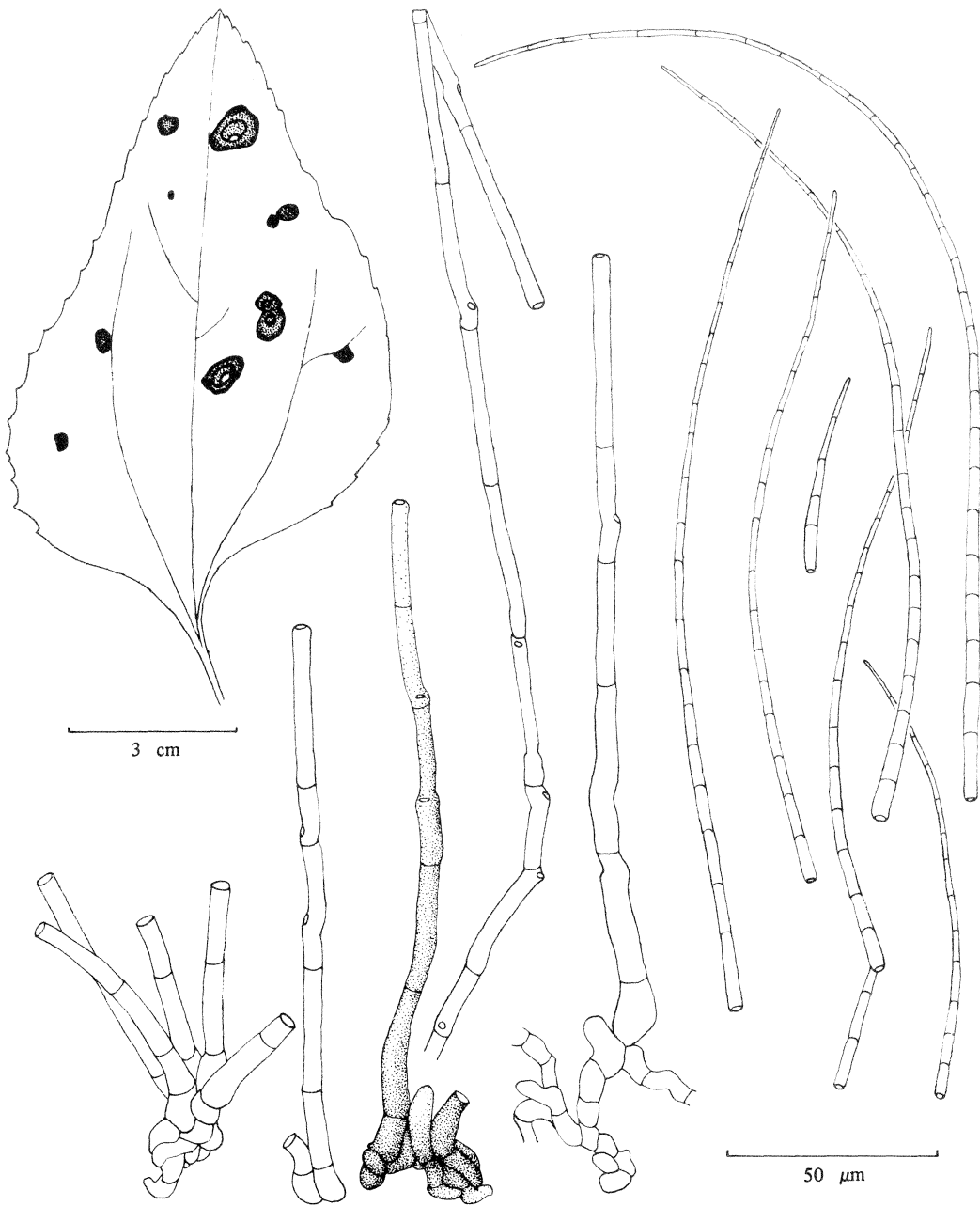


Fig. 14. *Cercospora helianthicola* Chupp et Viégas on *Helianthus* sp. No. C 180.

13) ***Cercospora grandissima*** Rangel, Bol. Soc. Agr. Ind. Com. Est. S. Paulo Ser. 16 : 322. 1915.

Leaf spots subcircular to irregular, 2-6 mm in diameter, later coalescing to form large blotches, brown to sooty brown, sometimes central parts paler, peripheral areas pale green; fruiting amphigenous, chiefly epiphyllous; stromata minute; fascicles 1-11 stalks; conidiophores pale to medium brown, almost equally colored but apical zones slightly paler, straight to geniculate, not branched, tip truncate, distinctly 5-7 septate, 4-5 × 84-140 μm; conidia hyaline, acicular, base truncate, tip acute, indistinctly multiseptate, straight to curved, 3-4 × 192-360 μm (Fig. 13).

Hab. on *Dahlia* sp. (cultivated), at ESALQ, Piracicaba, S. P., 5 February 1975, No. C 98.

Note : Symptoms produced by the present fungus are identical to those of Viégas' species (1945a), but are somewhat different from those described by Chupp (1953).

14) ***Cercospora helianthicola*** Chupp et Viégas, Bol. Soc. Brasil. Agron. 8 : 29. 1945.

Leaf spots amphigenous, brown, central parts slightly paler, sometimes zonate, 1-10 mm in size; fruiting amphigenous; stromata lacking to a few brown cells; fascicles 1-9 stalks; conidiophores medium brown, uniformly colored to slightly paler toward tip, slightly attenuated, sometimes irregular in width, multiseptate, undulate or abruptly geniculate, rarely branched, tip truncate, spore scars distinct and medium in size, 4-6 × 41-536 μm; conidia hyaline, acicular, base truncate, tip acute, indistinctly multiseptate, straight to curved, 2.5-4 × 40-333 μm (Fig. 14).

Hab. on *Helianthus* sp. (cultivated), at Estrada São Fernando 245, Santa Cruz, near Itaguaí, Rio de Janeiro, 1 January 1976, No. C 180.

15) ***Cercospora tegeticola*** Ellis et Everhart, Jour. Mycol. 8 : 72. 1902.

Leaf spots poorly defined, infected leaves die starting from the tip, easily contaminated by other fungi, *Alternaria*, *Cladosporium*, etc.; fruiting amphigenous; stromata lacking to minute, brown; fascicles 1-13 stalks; conidiophores medium to dark brown, paler toward tip, often attenuated, not branched, not geniculate, distinctly uni- to multiseptate, mostly straight, tip truncate, spore scars distinct and medium in size, 3.5-4.5 × 40-104 μm; conidia hyaline, acicular, base truncate, tip acute to subacute, straight to mildly curved, indistinctly multiseptate, scars distinct, 3.5-4.5 × 76-320 μm, mostly shorter than 250 μm (Fig. 15).

Hab. on *Tagetes* sp. (cultivated), at ESALQ, Piracicaba, S. P., 6 August 1974, No. C 38.

16) ***Cercospora vernoniae*** Ellis et Kellerman, Amer. Nat. 17 : 1166. 1883.

Leaf spots amphigenous, irregular in shape, 0.5-50 mm in size, later developing to form large blotches, reddish dark brown, almost uniformly colored, occasionally with small paler centers, peripheral areas yellow to greenish yellow and 1-10 mm in width, primary leaf spots yellow; fruiting chiefly epiphyllous; stromata brown, 16-48 μm; fascicles dense; conidiophores pale olivaceous brown, uniformly colored, sometimes attenuated, tip obconic, rarely branched, sparingly septate, straight to mildly geniculate, spore scars small and indistinct, 2-4 × 8-36 μm; conidia pale olivaceous, narrowly obclavato-cylindric, base obconic, tip subacute to obtuse, straight to mildly curved, indistinctly multiseptate, mostly 3-6 septate, 2-3.5 × 32-96 μm (Fig. 16).

Hab. on *Vernonia scorpioides*, at ESALQ, Piracicaba, S. P., 3 August 1974, No. C 32.

Note : Conidia of the present fungus are pale olivaceous brown in color, base is obconic and tip is subacute to obtuse. According to Chupp's description (1953), conidia of *C. vernoniae* are hyaline to subhyaline, base is obconically truncate, and tip is acute to subacute. Though these differences were observed, the fungus is at present considered to belong to *C. vernoniae*.

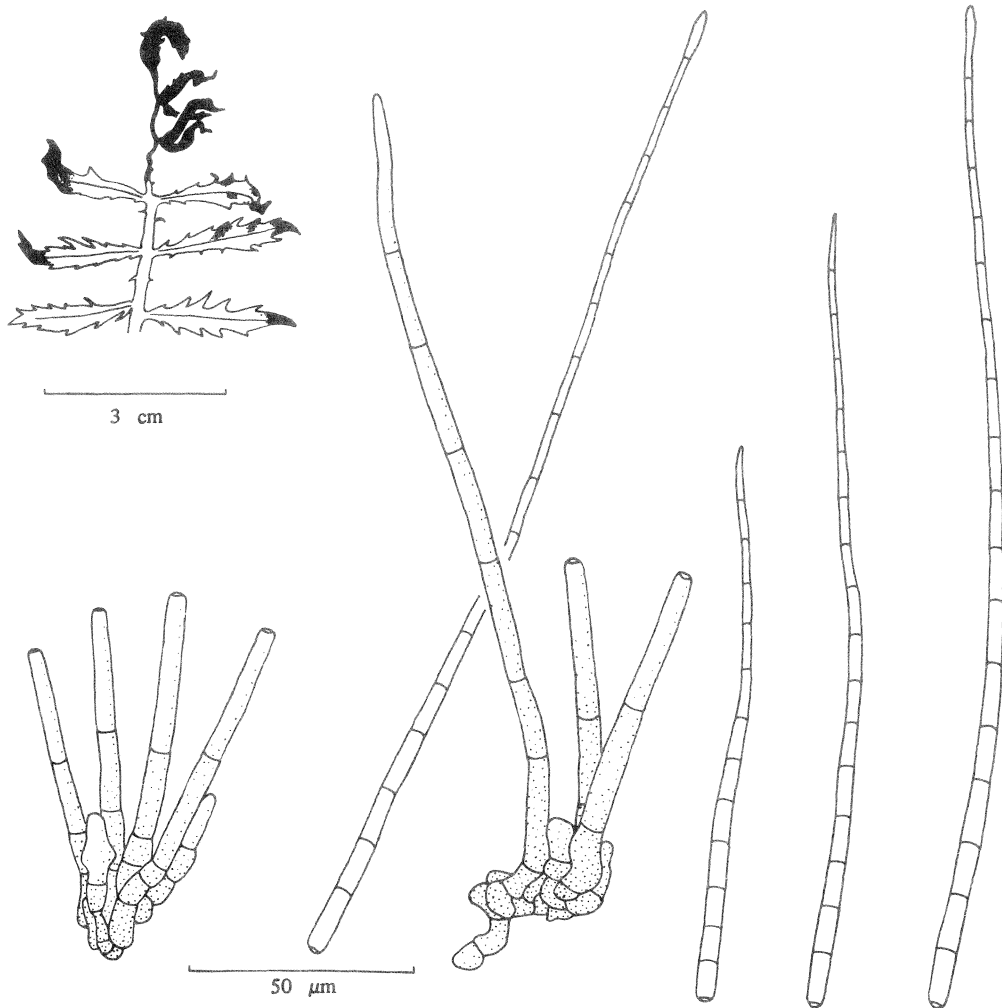


Fig. 15. *Cercospora tegeticola* Ellis et Everhart on *Tagetes* sp. No. C 38.

17) ***Cercospora zinniae*** Ellis et Martin, Jour. Mycol. 1 : 20. 1885.

Syn. *Cercospora atricincta* Heald et Wolf, Mycologia 3 : 14. 1911.

Leaf spots angular, dark to light brown to white, 1-5 mm in size, margins sooty brown, peripheral areas of lesions especially those of white lesions sometimes dull purplish green; fruiting amphigenous, abundant on lower surface; stromata a few brown cells; fascicles 2-8 stalks; conidiophores medium brown, short forms pale olivaceous brown, slightly paler and slightly attenuated toward tip, sinuous, mildly geniculate, distinctly multiseptate, tip obconically truncate, spore scars distinct and small in size, sometimes branched, $3.5 \times 24-156 \mu\text{m}$; conidia hyaline, acicular, straight to curved, base subtruncate, tip acute, indistinctly multiseptate, scars distinct, $2-4 \times 24-268 \mu\text{m}$ (Fig. 17).

Hab. on *Zinnia elegans*, at Chácara Yogo, Itubera, Bahia, 20 November 1975, No. C 174.

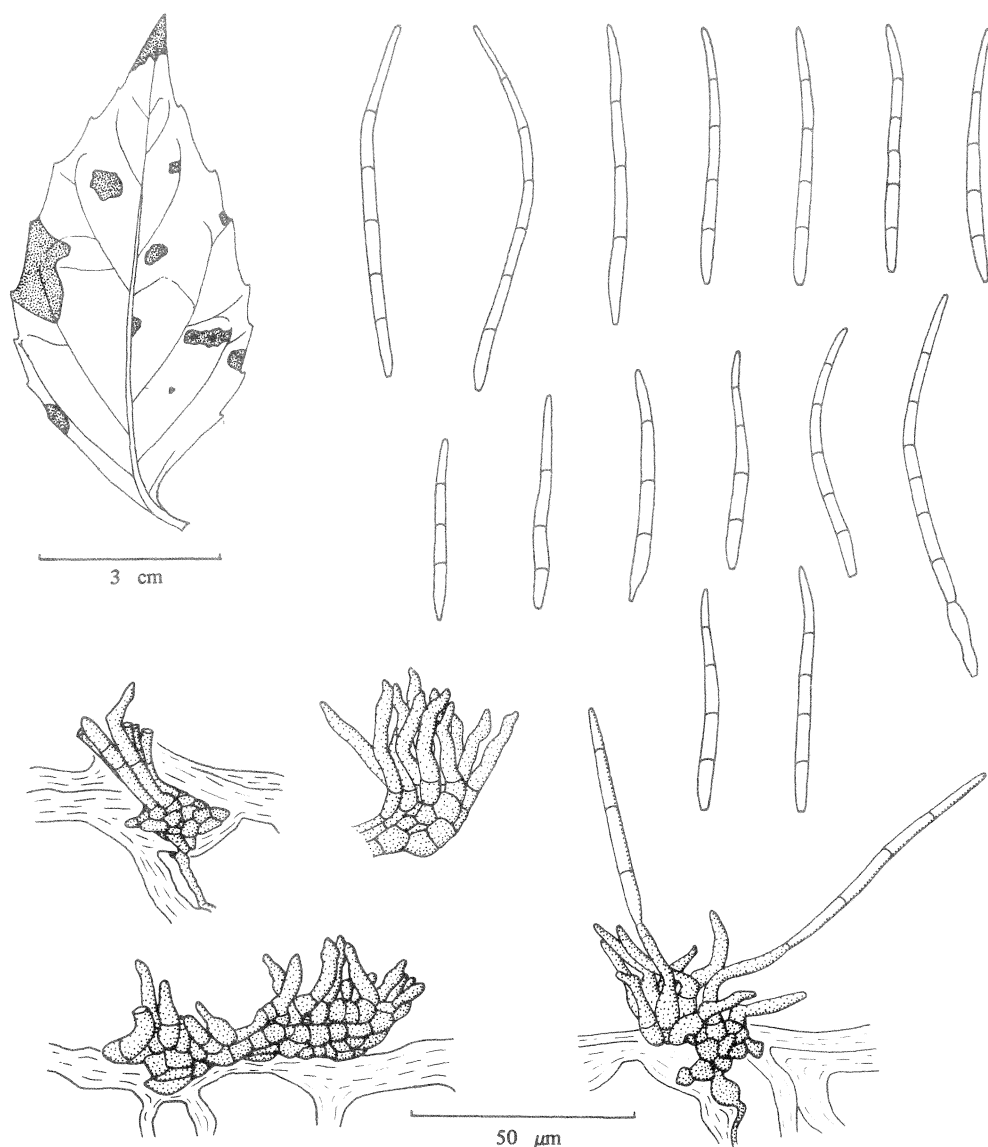


Fig. 16. *Cercospora vernoniae* Ellis et Kellerman on *Vernonia scorpioides*. No. C 32.

CONVOLVULACEAE

18) *Cercospora ipomoeae* Winter, Hedwigia 26 : 34. 1887.

Leaf spots dark reddish brown, central parts dull gray, irregular in shape, vein-limited, 1-5 mm in size; primary lesions water-soaked, dark green, central parts paler; fruiting amphigenous; stromata lacking or a few brown cells; fascicles 1-12 stalks; conidiophores short, straight, tip truncate, 1-4 septate, pale olivaceous brown, uniformly colored, $4-5 \times 16-72 \mu\text{m}$; conidia hyaline, acicular, curved, base truncate, tip acute, indistinctly multiseptate, $3.5-4 \times 44-352 \mu\text{m}$ (Fig. 18).

Hab. on *Ipomoea longicuspis*, at ESALQ, Piracicaba, S. P., 15 February 1975, No. C 100.

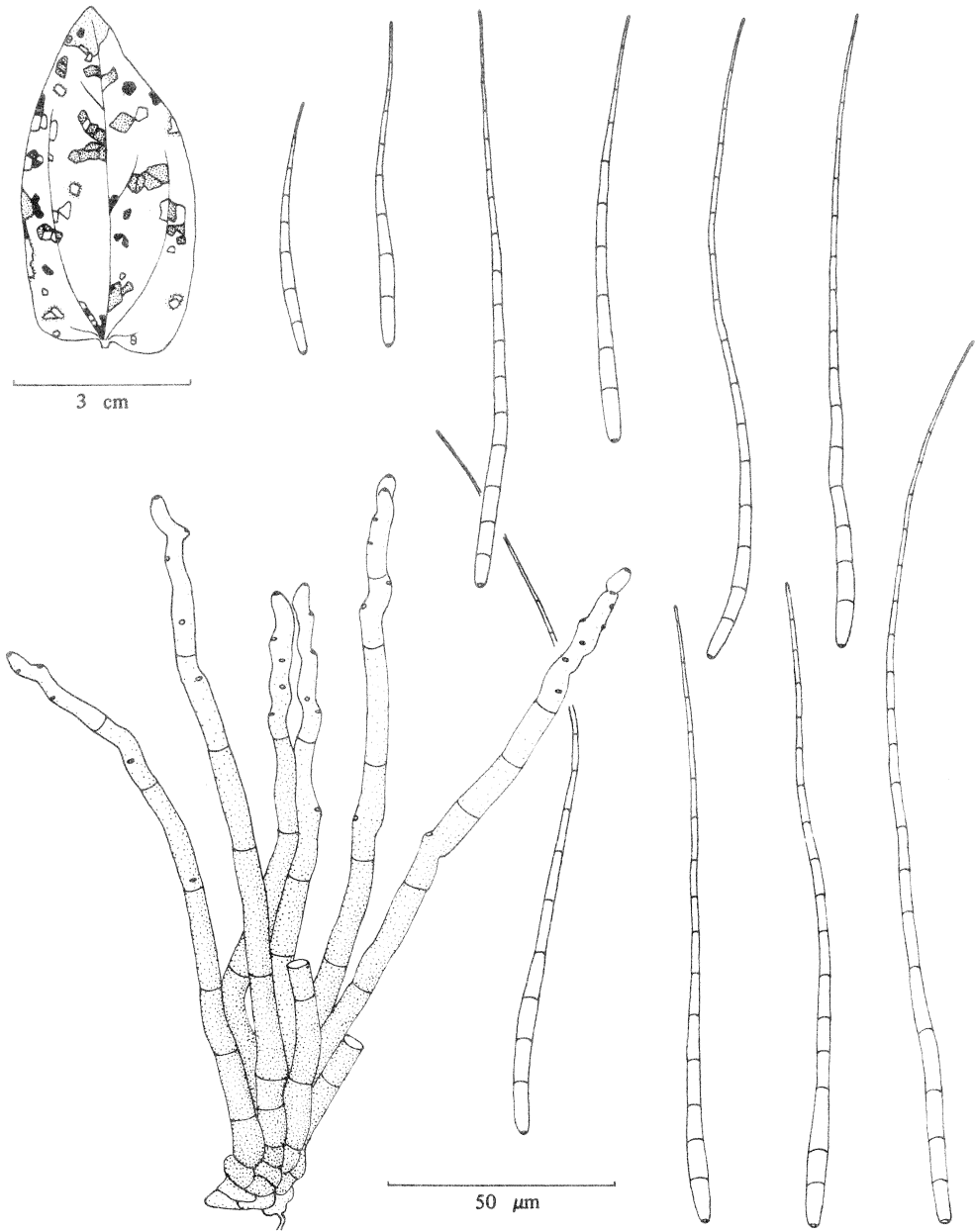


Fig. 17. *Cercospora zinniae* Ellis et Martin on *Zinnia elegans*. No. C 174.

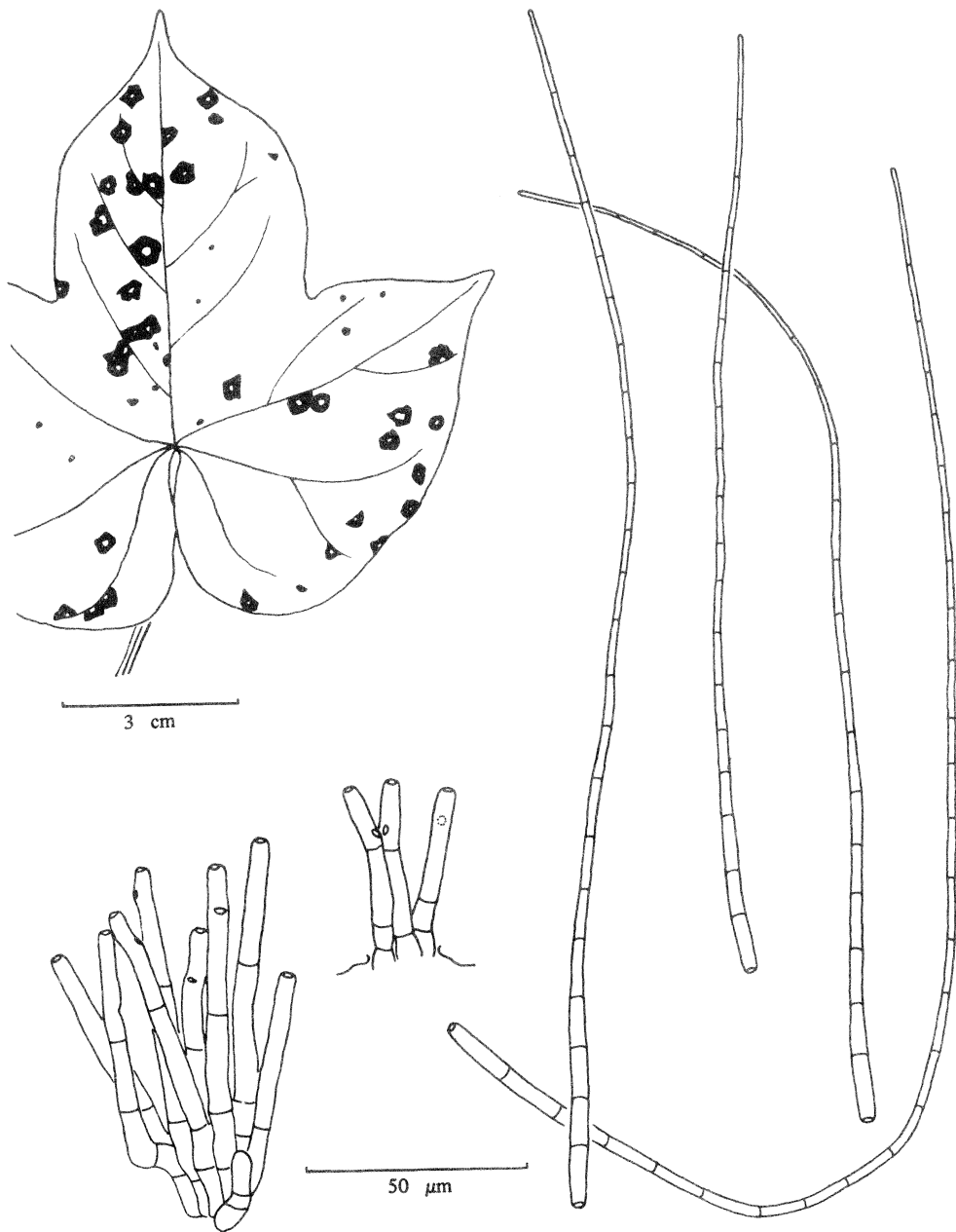


Fig. 18. *Cercospora ipomoeae* Winter on *Ipomoea longicuspis*. No. C 100.

19) *Cercospora timorensis* Cooke, Grevillea 12 : 38. 1883.

Leaf spots subcircular to irregular in shape, 1-10 mm in size, coalescing to form large blotches, dark reddish brown with darker margins, often with paler centers, sunken, peripheral areas narrowly yellow, lower surface paler; fruiting chiefly hypophyllous; stromata minute, medium brown when old; fascicles a few stalks to dense; conidiophores medium brown, apical parts paler, sometimes irregular in width, straight or geniculate, not branched, sparingly septate, tip subtruncate, spore scars distinct and medium in size, basal cells seldom bulbous, $3-6 \times 20-64 \mu\text{m}$; conidia hyaline, obclavato-cylindric to subacicular, base subtruncate to obconically truncate, tip obtuse, straight to mildly curved, indistinctly 0-9 septate, spore scars distinct, $3-4 \times 16-112 \mu\text{m}$ (Fig. 19).

Hab. on *Ipomoea batatas*, at ESALQ, Piracicaba, S. P., 27 June 1975, No. C 148.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora timorensis* (Cooke) Deighton.

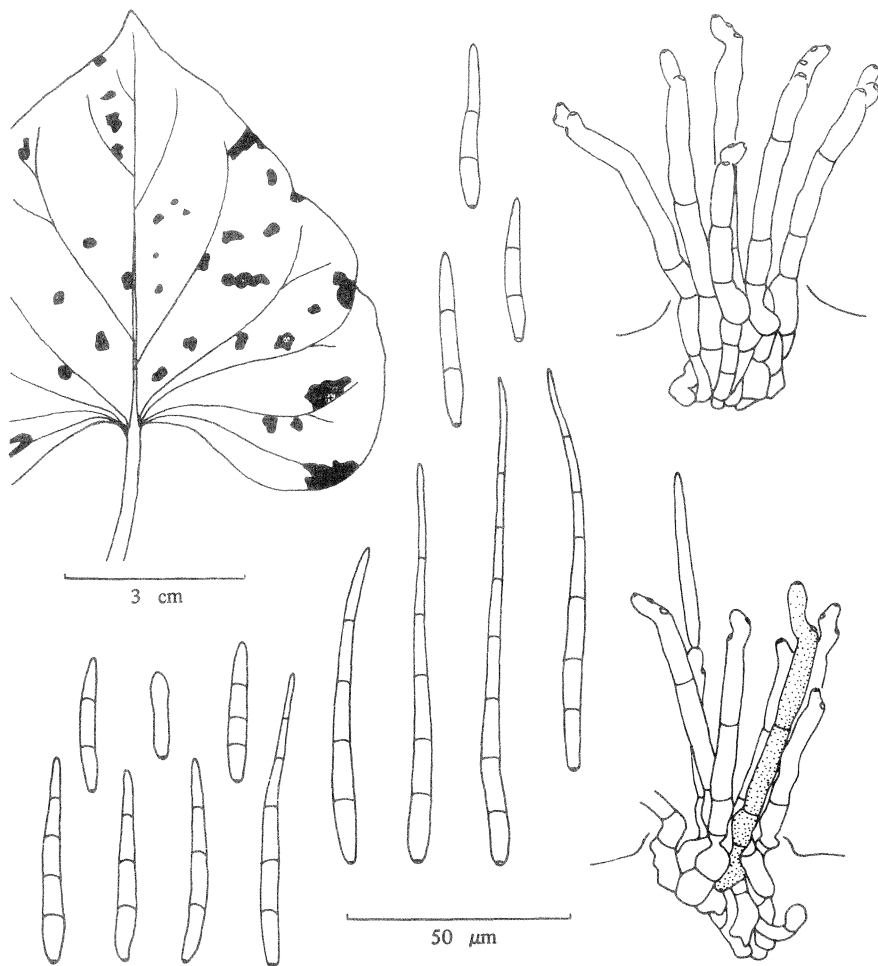


Fig. 19. *Cercospora timorensis* Cooke on *Ipomoea batatas*. No. C 148.

CRUCIFERAE

20) *Cercospora cruciferarum* Ellis et Everhart, Jour. Mycol. 3 : 17. 1887.

Leaf spots amphigenous, circular to elliptic, 0.5-3 mm in diameter, brownish white with dark brown margins, vein-limited; lesions on stems and petioles elliptic, 0.5-2 x 1-4 mm in size, dark brown with dull white centers; fruiting amphigenous; stromata a few pale olivaceous cells to small pale brown mass; fascicles 4-17 stalks; conidiophores very pale to pale olivaceous brown, uniformly colored, sometimes irregular in width, mostly not geniculate, rarely branched, sparingly septate, mostly uni-septate at lower half, tip obconically truncate, spore scars distinct and medium to small in size, $4-7 \times 20-56 \mu\text{m}$; conidia hyaline, acicular when long, cylindrical to obclavato-cylindric when short, straight to mildly curved, base mostly obconically truncate, sometimes truncate, tip round to obtuse and sometimes subacute, indistinctly multiseptate, scars distinct and medium to small in size, sometimes constricted at septa, $3.5-5 \times 32-116 \mu\text{m}$, rarely

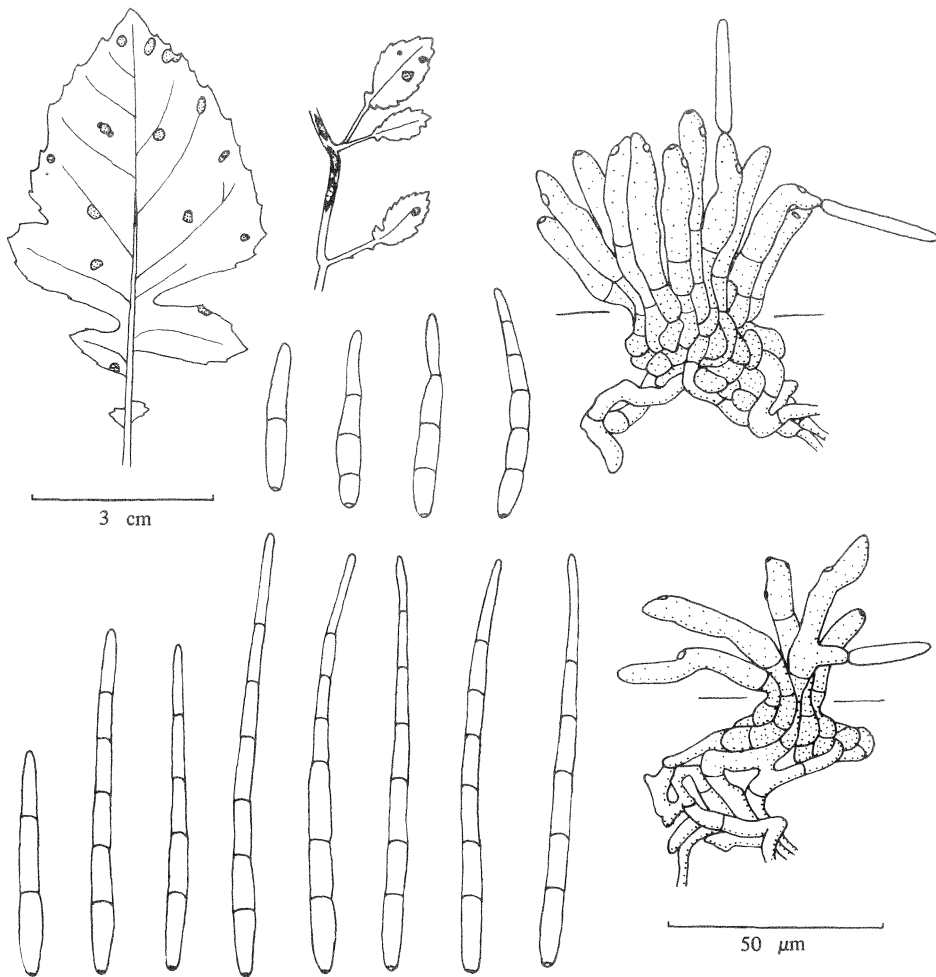


Fig. 20. *Cercospora cruciferarum* Ellis et Everhart on *Raphanus sativus*. No. C 41.

6 μm in width (Fig. 20).

Hab. on *Raphanus sativus* (radish for forage), at Chácara Repouso, Limeira, S. P., 8 August 1974, No. C 41.

21) *Cercospora nasturtii* Passerini, Hedwigia 16 : 124. 1877.

Leaf spots amphigenous, circular, light to dark brown with brownish gray centers, 1-8 mm in diameter, peripheral areas yellow; fruiting amphigenous; stromata lacking to a few brown cells; fascicles 1-14 stalks; conidiophores pale olivaceous brown, paler and narrower toward tip, sparingly septate, tip truncate, not branched, spore scars large and distinct, sometimes 1-3 geniculate, 4-6 \times 20-124 μm ; conidia hyaline, acicular to narrowly obclavato-cylindric, indistinctly multiseptate, straight to curved, base truncate, tip obtuse to subobtuse, scars large, 3-4 \times 44-150 μm (Fig. 21).

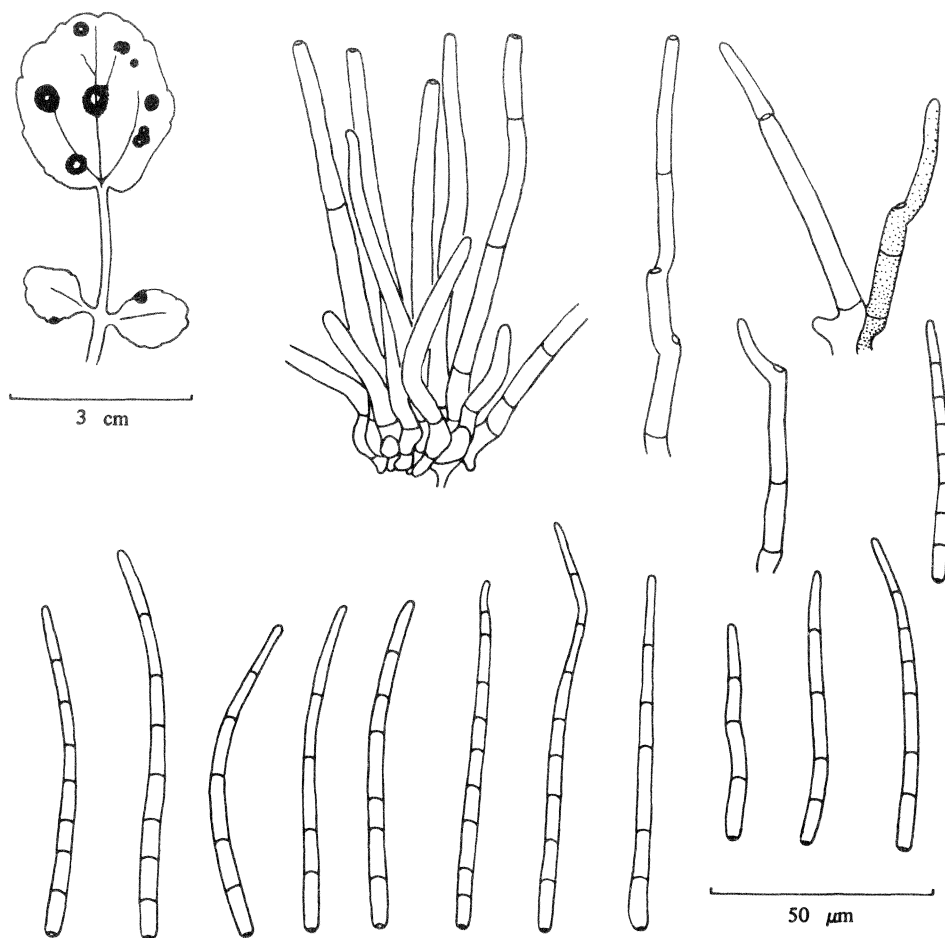


Fig. 21. *Cercospora nasturtii* Passerini on *Nasturtium officinale*. No. C 66.

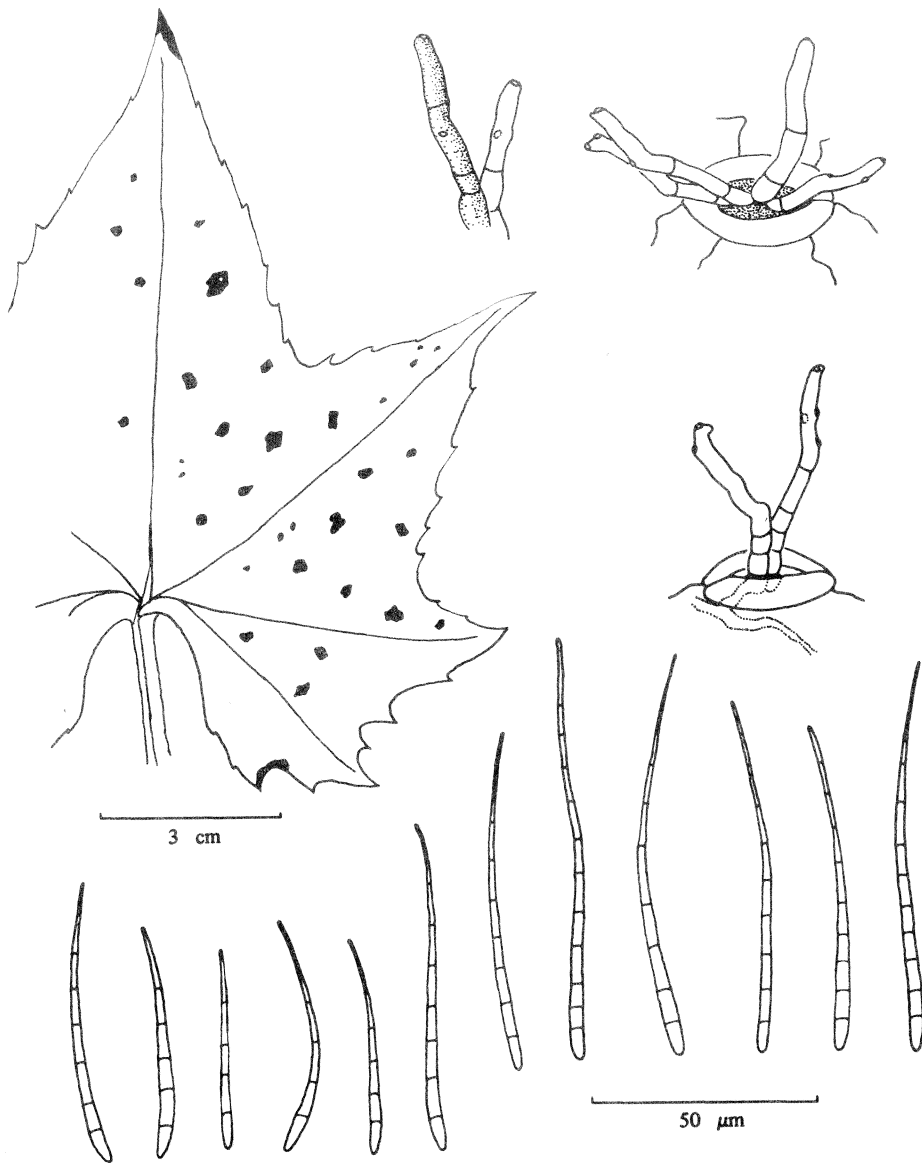


Fig. 22. *Cercospora citrullina* Cooke on *Luffa cylindrica*. No. C 104.

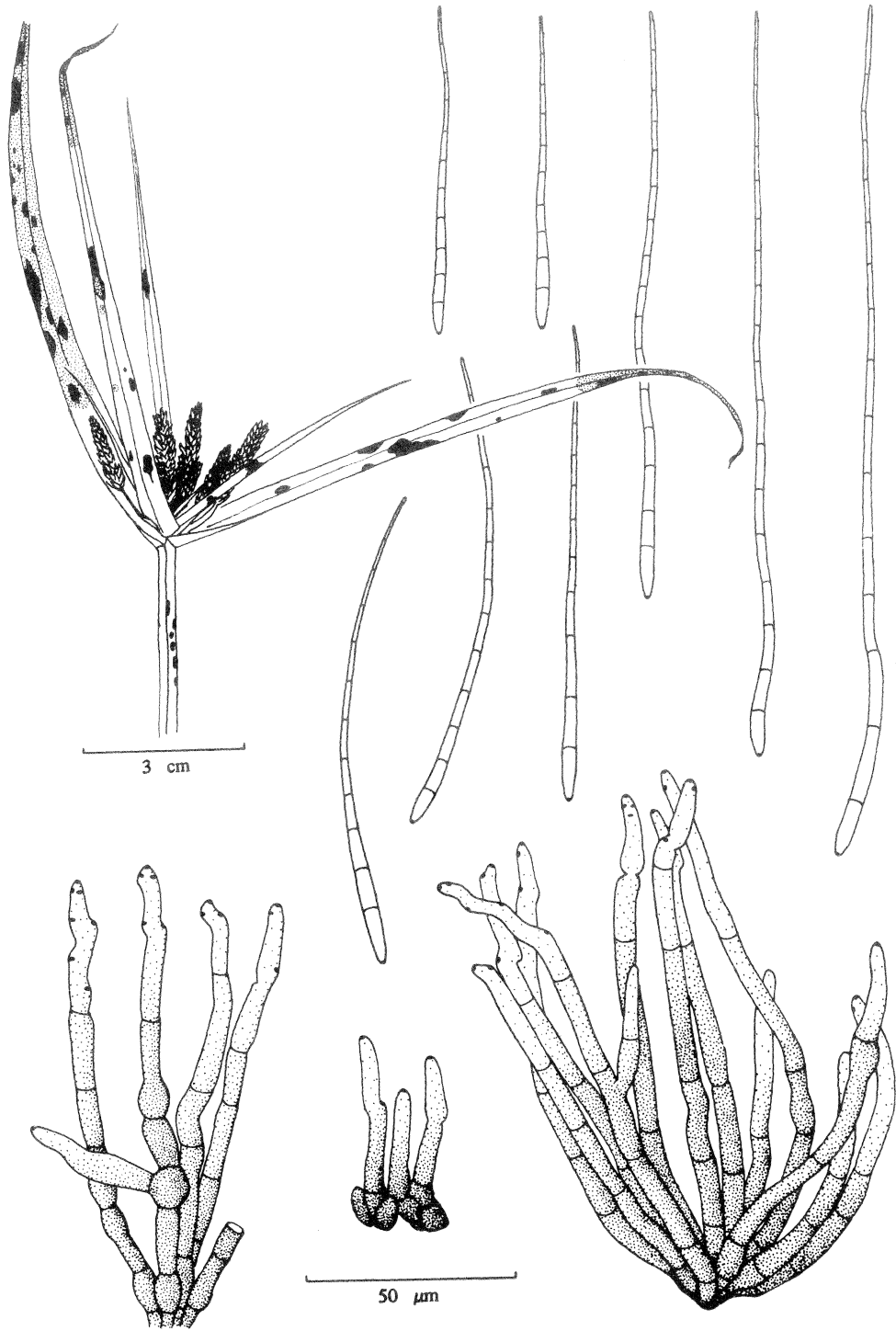


Fig. 23. *Cercospora ugandensis* Hansford on *Cyperus* sp. No. C 169.

Hab. on *Nasturtium officinale*, at local market, Piracicaba, S. P., 12 November 1974, No. C 66.

CUCURBITACEAE

22) *Cercospora citrullina* Cooke, Grevillea 12 : 31. 1883.

Leaf spots amphigenous, angular, vein-limited, black to brown, sometimes central parts grayish white on upper surface, dull black to brownish green on lower surface, 0.5-3 mm in diameter, sometimes coalescing to form blotches at leaf edges; fruiting amphigenous; stromata lacking; fascicles 1-10 stalks, mostly 3-5 stalks; conidiophores short, very pale olivaceous brown and uniformly colored when young, pale olivaceous brown and paler toward tip when old, sometimes geniculate, uniformly wide, indistinctly 1-4 septate, tip subtruncate, $4.5 \times 20-52 \mu\text{m}$; conidia hyaline, acicular, mostly curved, base subtruncate, tip acute, indistinctly 2-7 septate when short, indistinctly multiseptate when long, $2.3-3.5 \times 32-140 \mu\text{m}$ (Fig. 22).

Hab. on *Luffa cylindrica*, at ESALQ, Piracicaba, S. P., 19 February 1975, No. C 104.

CYPERACEAE

23) *Cercospora ugandensis* Hansford, Proc. Linnean Soc. London 1942-3 : 59. 1943.

Leaf spots circular to elliptic, orange in color, central parts reddish brown; old lesions elliptic to irregular, dark to light reddish brown, peripheral areas greenish yellow, leaf tips or whole leaves often die when severely infected, darker on lower surface; lesions often appear on culms and rarely on panicles; fruiting amphigenous; stromata lacking to minute; fascicles 1-15 stalks; conidiophores sooty brown, medium in color, paler and slightly attenuated toward tip, indistinctly multiseptate, tip obconically truncate to round, seldom branched, occasionally swollen at some points, sometimes abruptly geniculate, spore scars small in size, $3-5 \times 24-76 \mu\text{m}$; conidia subhyaline to very pale olivaceous, obclavate, long ones almost acicular, mostly curved, base long obconically truncate, tip acute to subacute, indistinctly multiseptate, scars small in size, $2.5-4 \times 52-192 \mu\text{m}$ (Fig. 23).

Hab. on *Cyperus* sp., at FCMBB, Rubião Junior, Botucatu, S. P., 15 December 1975, No. C 169; at Estação Experimental de Presidente Medici de FCMBB, Botucatu, S. P., 10 December 1975, No. C 161; at Fazenda Experimental de São Manuel de FCMBB, São Manuel, S. P., 13 December 1975, No. C 162.

EBENACEAE

24) *Cercospora kaki* Ellis et Everhart, Jour. Mycol. 3 : 17. 1887.

Leaf spots amphigenous, angular, vein-limited, 1-8 mm in size, dark reddish brown, surrounded by linear black margins; fruiting chiefly epiphyllous; stromata globular, dark brown, $40-76 \mu\text{m}$ in diameter; fascicles very dense; conidiophores pale olivaceous, uniformly colored, mostly narrower toward tip, sometimes abruptly 1-2 geniculate, indistinctly sparsely septate when long, spore scars invisible, tip round to obtuse, $2-3.5 \times 12-20 \mu\text{m}$, rarely $36 \mu\text{m}$; conidia olivaceous, narrowly obclavato-cylindric to linear, mostly curved, base obconic to long obconically truncate, tip obtuse to round, scars indistinct, 2-7 septate, sometimes 10, septa often distinct, $2-3 \times 44-88 \mu\text{m}$ (Fig. 24).

Hab. on *Diospyros kaki*, at Mogi das Cruzes, S. P., 10 April 1974, No. C 8.

EUPHORBIACEAE

25) *Cercospora acalyphae* Peck, Ann. Rep. N. Y. State Mus. 34 : 48. 1881.

Leaf spots amphigenous, dark brown often with minute dull white centers, angular to

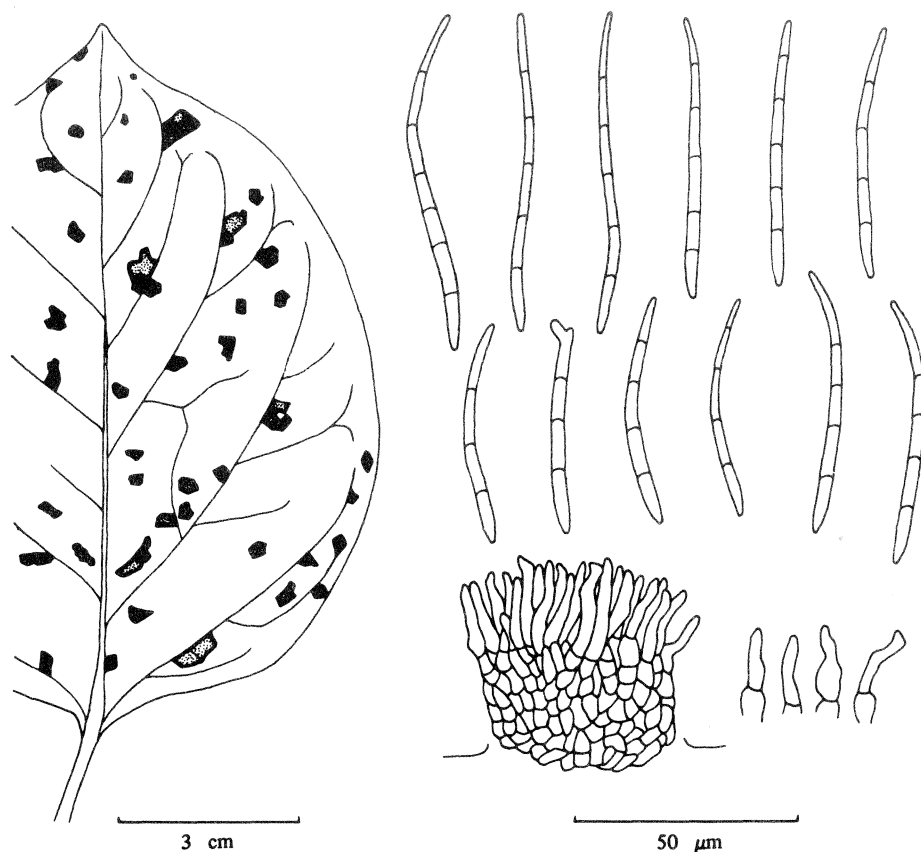


Fig. 24. *Cercospora kaki* Ellis et Everhart on *Diospyros kaki*. No. C 8.

irregular in shape, vein-limited, 1-5 mm in size, often coalescing to form large blotches; fruiting amphigenous; stromata minute; fascicles 2-14 stalks; conidiophores pale olivaceous brown, uniformly colored, sometimes slightly paler toward tip, often attenuated, sometimes constricted at septa, tip truncate, spore scars distinct and medium in size, distinctly uni- to multiseptate, not branched, occasionally mildly geniculate, $4-5 \times 20-72 \mu\text{m}$; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip subacute, $2.5-4 \times 56-244 \mu\text{m}$ (Fig. 25).

Hab. on *Acalypha marvorata*, at ESALQ, Piracicaba, S. P., 7 August 1974, No. C 40.

26) ***Cercosporidium henningsii*** (Allesch.) Deighton, More Dematiaceous Hyphomycetes: 295. 1976.

Syn. *Cercospora henningsii* Allescher, Engler's Pflanzenwelt Teil C : 35. 1895.

Leaf spots amphigenous, at first dark sooty brown, later brownish gray with dark sooty brown linear margins, irregular in shape, lower surface paler; fruiting amphigenous; stromata globular, yellowish brown, darker on lower surface, 20-80 μm in diameter; fascicles dense to

very dense; conidiophores pale olivaceous, equally colored, tip obconic, nearly uniformly wide, sometimes swollen at some points, sometimes indistinctly sparsely septate at lower half, mostly straight, not branched, not geniculate, spore scars small, $4-6 \times 20-40 \mu\text{m}$; conidia pale olivaceous, cylindrical, base obconic to round, tip round, mostly straight, indistinctly 2-7 septate, mostly 2-4 septate, $5-7 \times 40-60 \mu\text{m}$ (Fig. 26).

Hab. on *Manihot utilissima*, at Piranema, Itaguai, Rio de Janeiro, 19 October 1974, No. C 61; at Fazenda Regina, Itatinga, S. P., 27 July 1974, No. C 16.

27) ***Cercospora pulcherrimae*** Tharp, Mycologia 9 : 114. 1917.

Leaf spots amphigenous, circular to angular, vein-limited, 1-4 mm in size, dark reddish brown, sometimes with paler centers; fruiting amphigenous; stromata less than $50 \mu\text{m}$ in diameter, brown, mostly minute on lower surface; fascicles 2 stalks to dense; conidiophores pale olivaceous brown, almost equally colored, apical parts paler, sometimes slightly narrower toward apex, multiseptate, tip truncate, rarely branched, straight to geniculate, spore scars distinct and medium in size, $4-5.5 \times 12-120 \mu\text{m}$, mostly shorter than $60 \mu\text{m}$; conidia hyaline, acicular to obclavate, base truncate to subtruncate, tip acute when long and obtuse when short, indistinctly uni- to multiseptate, straight to mildly curved, $3-4.5 \times 20-288 \mu\text{m}$ (Fig. 27).

Hab. on *Poinsettia pulcherrima*, at 1063, Rua Dr. Alvim, Piracicaba, S. P., 23 June 1975, No. C 147; at ESALQ, Piracicaba, S. P., 29 July 1974, No. C 21.

Note : When materials were kept in moist chamber, conidia were somewhat longer than those under natural conditions and conidiophores often developed to hyphae.

28) ***Cercospora ricinella*** Saccardo et Berlese, Atti R. Inst. Ven. Sci. Lett. Arti. VI 3 : 721. 1885.

Leaf spots amphigenous, circular to angular, vein-limited, 0.5-5 mm in size, dark to light reddish brown with white minute centers, margins almost black, often zonate; primary lesions minute, circular, white, margins almost black; fruiting amphigenous, abundant on lower surface; stromata brown, very small mass up to $60 \mu\text{m}$; fascicles a few stalks to dense; conidiophores pale to medium olivaceous brown, straight to geniculate, uniformly colored, sometimes apical parts slightly paler, uniformly wide when young and short, sometimes attenuated when old and long, indistinctly multiseptate, tip truncate to subtruncate, not branched, spore scars distinct and medium in size, $3-5 \times 20-124 \mu\text{m}$; conidia hyaline, mostly acicular, sometimes obclavate to cylindrical when short, base truncate to obconically truncate, tip obtuse, indistinctly multiseptate, straight to mildly curved, often catenulate, scars distinct, $2-5 \times 16-176 \mu\text{m}$ (Fig. 28).

Hab. on *Ricinus communis*, at Jacarei, S. P., 29 November 1974, No. C 71; at Alambari, Itapetininga, S. P., 14 August 1974, No. C 47.

FAGACEAE

29) ***Cercospora castaneae*** Muller et Chupp, Arch. Inst. Biol. Vegetal Rio de Janeiro 3 : 92. 1936.

Leaf spots amphigenous, irregular in shape, primary lesions dark brown, 1-2 mm in size, later forming large blotches, 50 mm or more in size, dull reddish brown with dark brown margins, peripheral areas sometimes yellowish green, all the samples collected were contaminated by other fungi; fruiting amphigenous; stromata globular, pale olivaceous brown, $16-60 \mu\text{m}$ in diameter; fascicles very dense; conidiophores short, pale olivaceous brown, uniformly colored, occasionally indistinctly septate, tip round to obconic, not geniculate, not branched, $2.5-3.5 \times 8-20 \mu\text{m}$; conidia olivaceous, obclavato-cylindrical to linear, base obconic, tip round, mildly curved, rarely straight, indistinctly multiseptate, $2.5-3.5 \times 36-84 \mu\text{m}$ (Fig. 29).

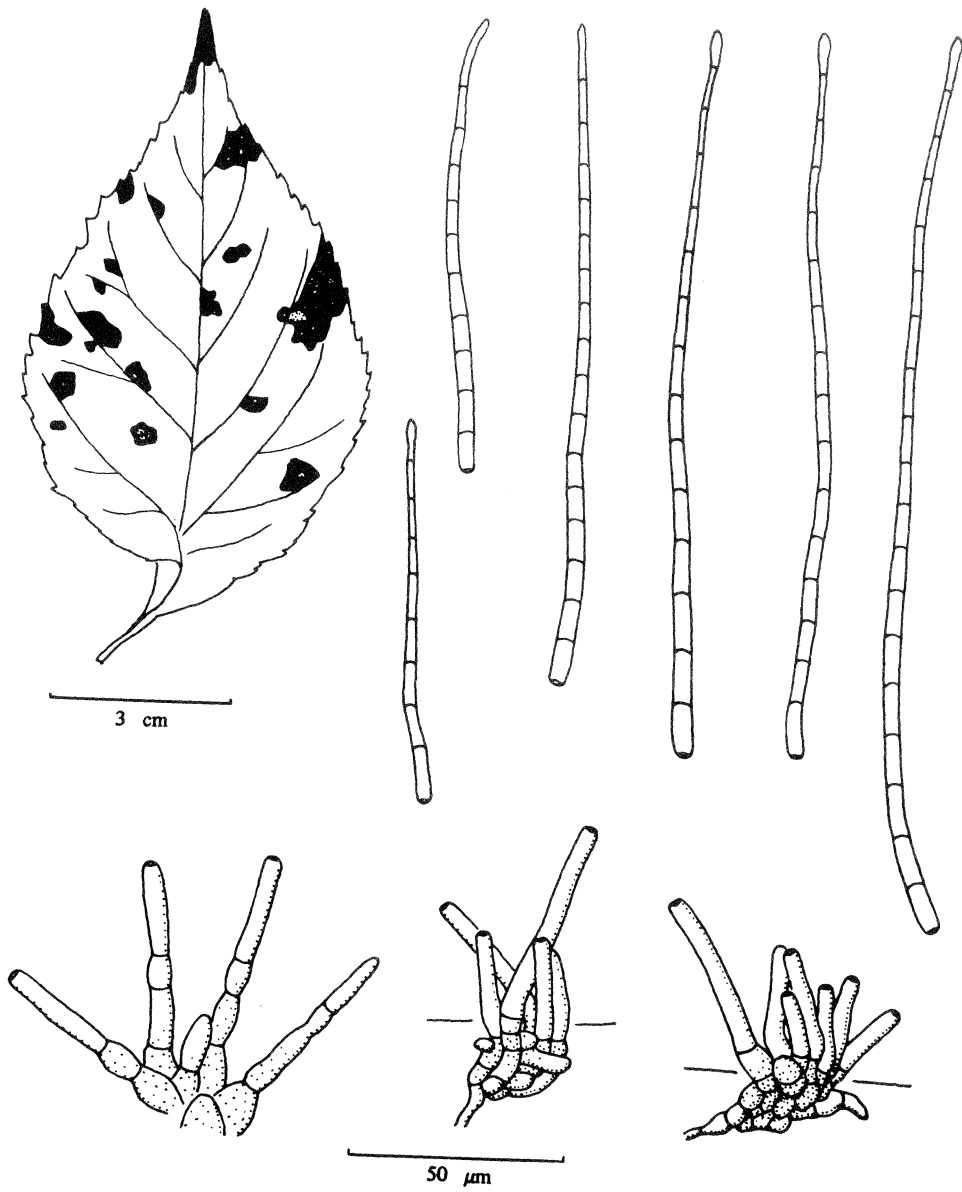


Fig. 25. *Cercospora acalyphae* Peck on *Acalypha marvorata*. No. C 40.

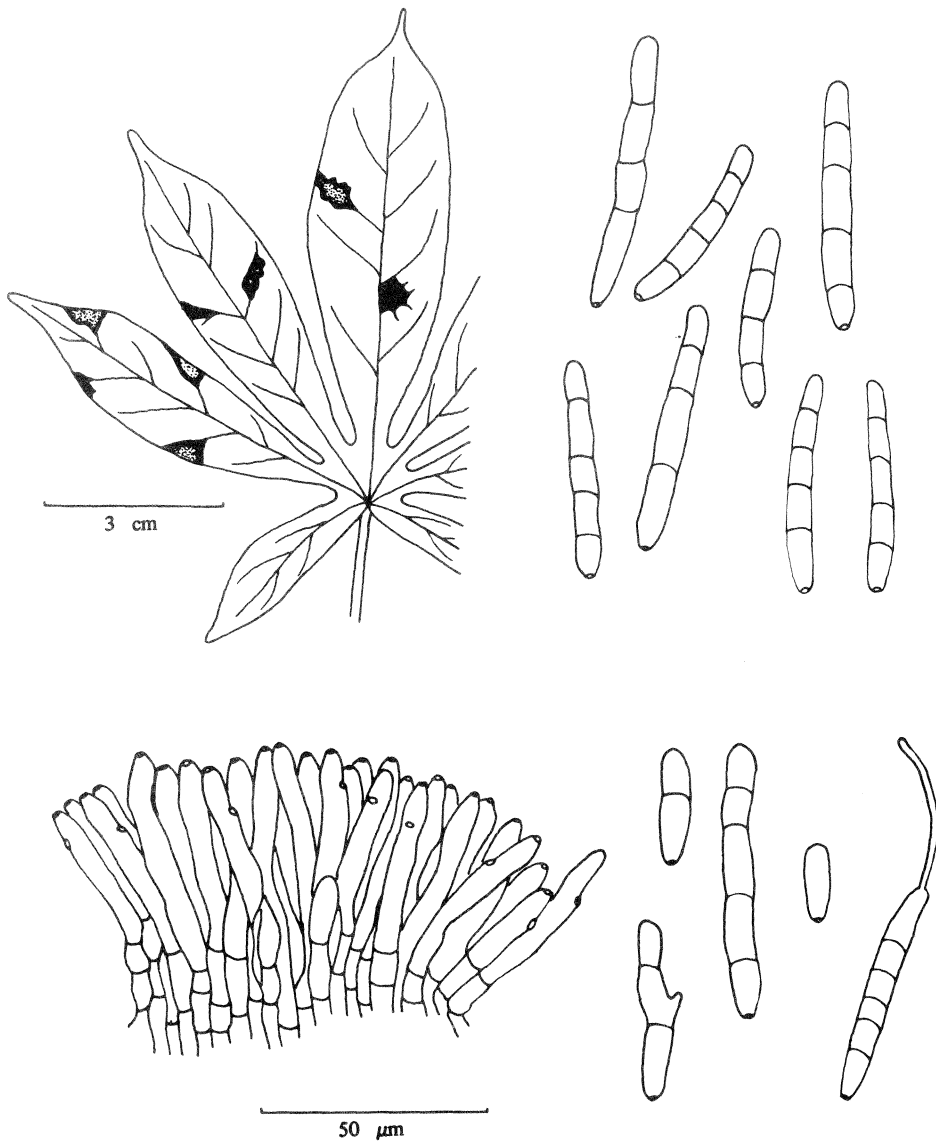


Fig. 26. *Cercosporidium henningsii* (Allesch.) Deighton,
Syn. *Cercospora henningsii* Allescher, on *Manihot utilissima*. No. C 61.

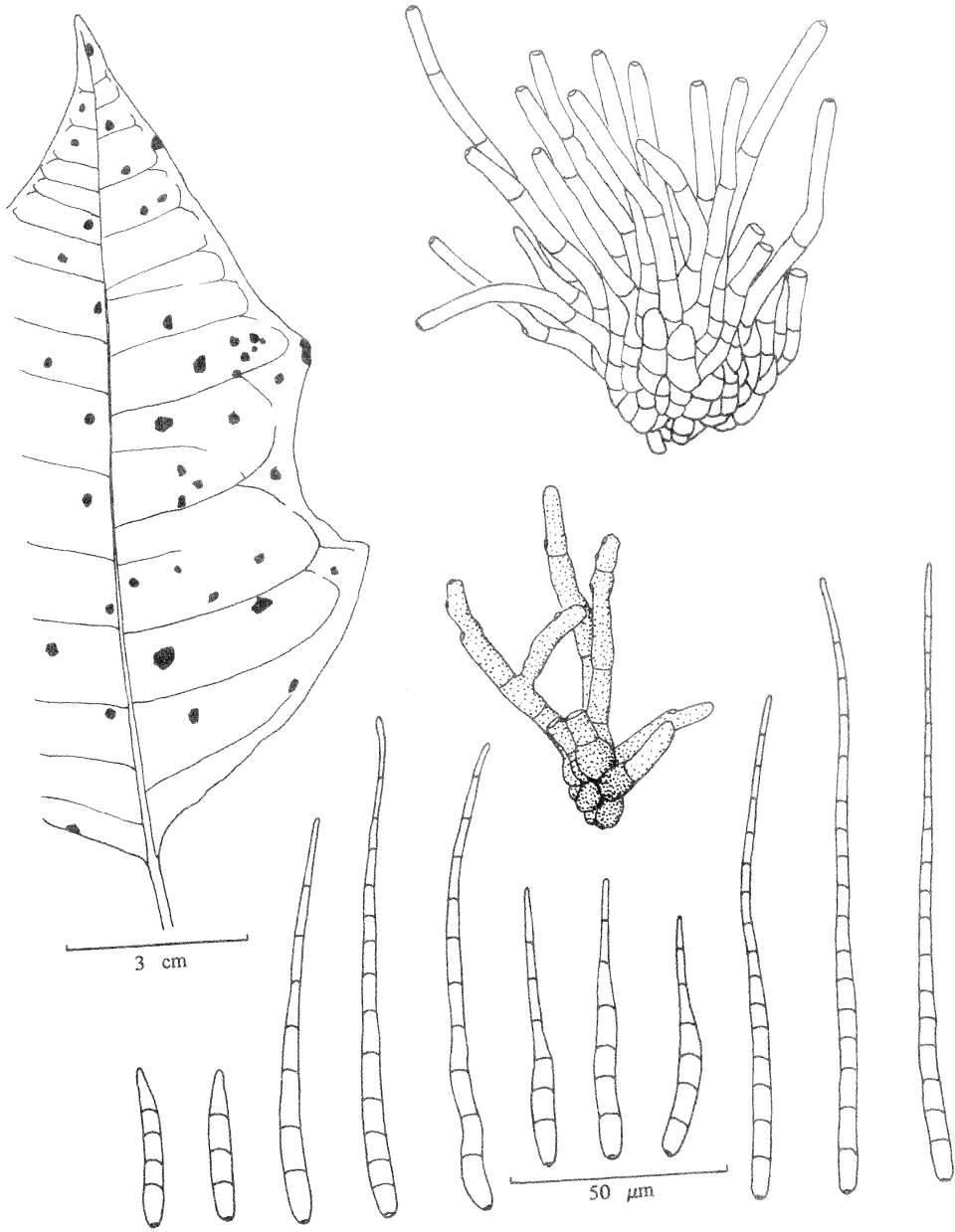


Fig. 27. *Cercospora pulcherrimae* Tharp on *Poinsettia pulcherrima*. No. C 147.

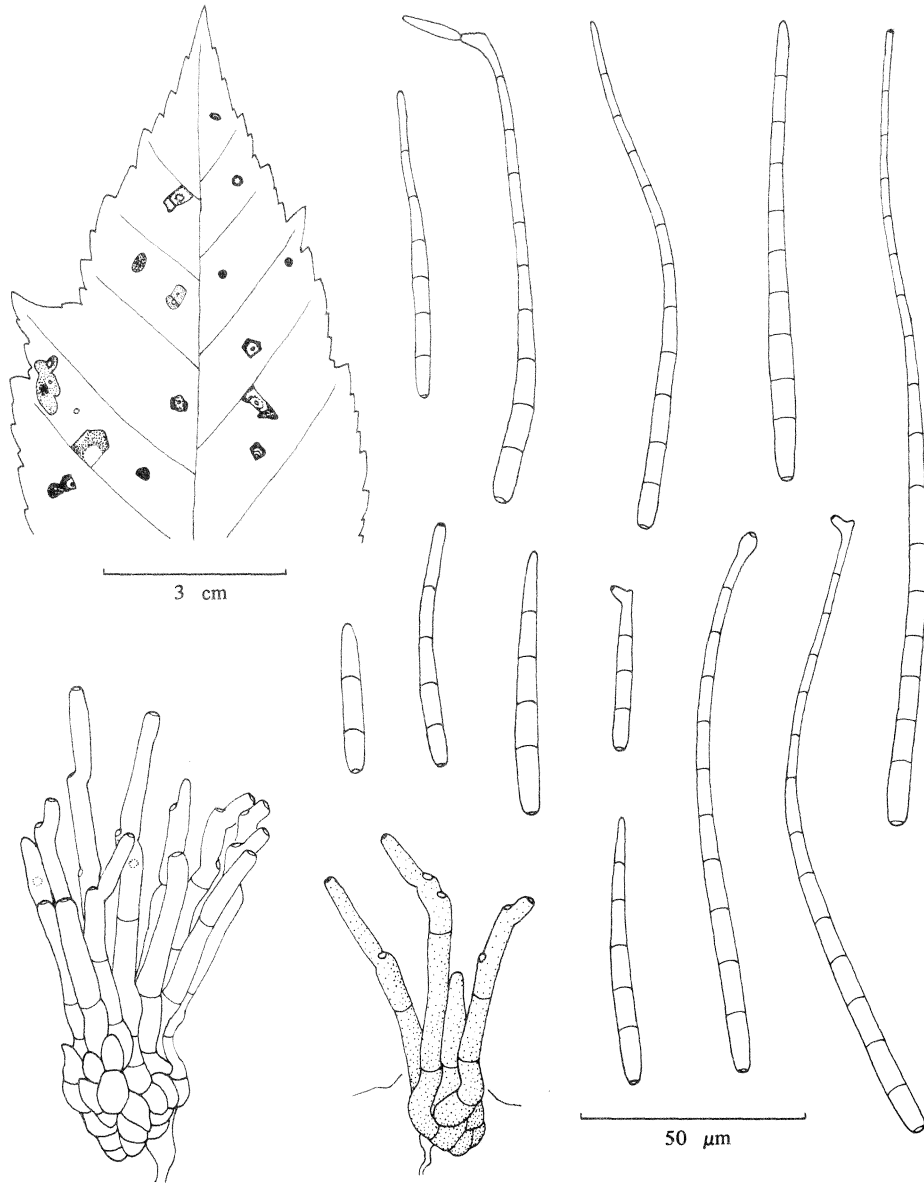


Fig. 28. *Cercospora ricinella* Saccardo et Berlese on *Ricinus communis*. No. C 71.

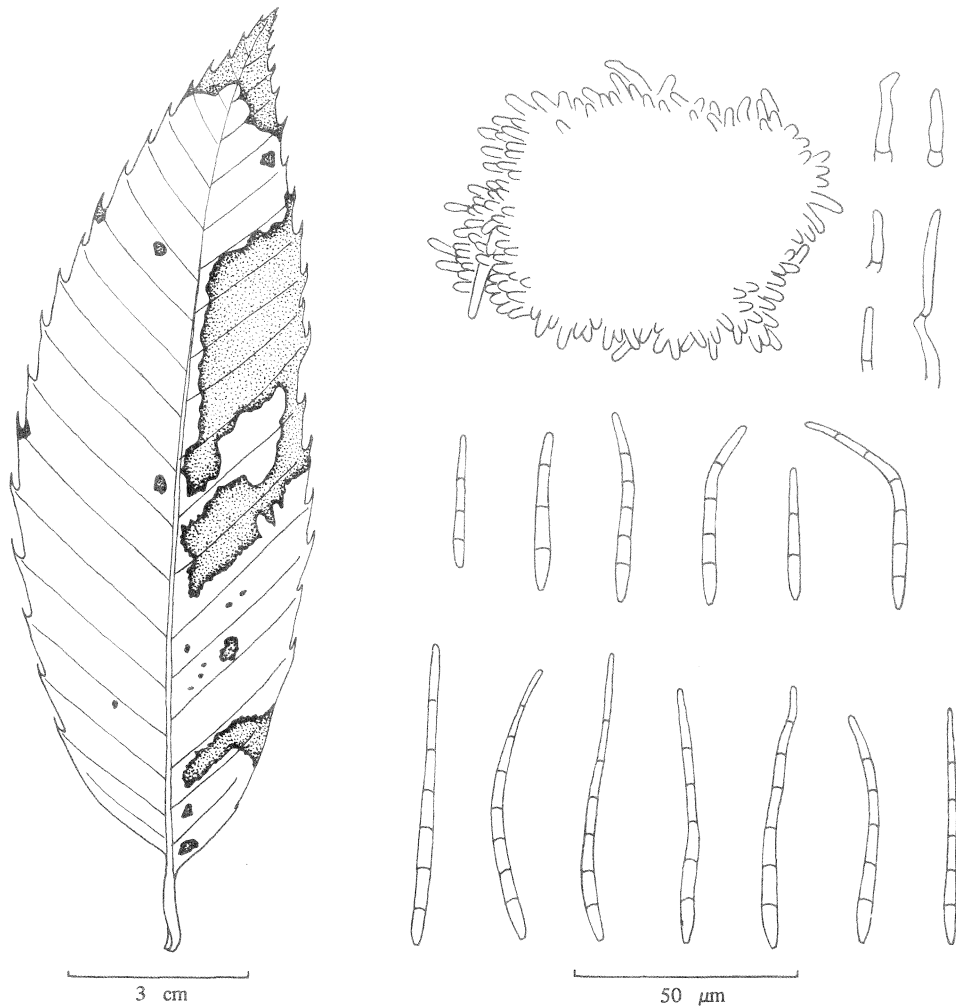


Fig. 29. *Cercospora castaneae* Muller et Chupp on *Castanea crenata*. No. C 125.

Hab. on *Castanea crenata*, at ESALQ, Piracicaba, S. P., 20 May 1975, No. C 125.

GRAMINEAE

30) *Cercospora fusimaculans* Atkinson, Jour. Elisha Mitchell Sci. Soc. 8 : 50. 1892.

Leaf spots amphigenous, linear, sometimes elliptic, dark reddish brown, central parts sometimes paler to white, distinctly intervenous, 0.3-1 × 1-5 mm in size, sometimes as long as 15 mm; fruiting amphigenous; stromata globular, dark brown, 16-44 µm in size, often lacking; fascicles single stalk to dense; conidiophores dark brown, paler toward tip, straight or geniculate, not branched, tip subtruncate to truncate, 1-9 septate, spore scars small in size, 3.5-4 × 24-100 µm; conidia hyaline, cylindric, straight, catenulate, rarely acicular, indistinctly 0-3 septate, base

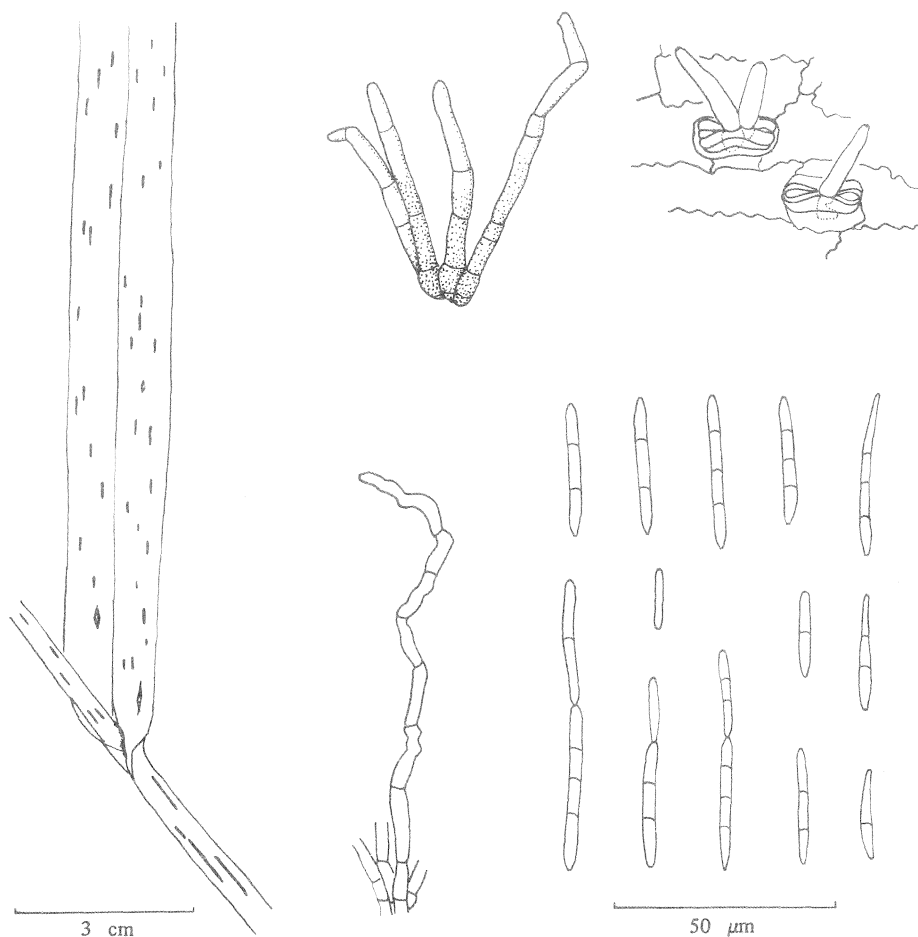


Fig. 30. *Cercospora fusimaculans* Atkinson on *Panicum maximum*. No. C 112.

obconic, tip round to obtuse when non-catenulate, $2.5-3.5 \times 16-40 \mu\text{m}$ (Fig. 30).

Hab. on *Panicum maximum*, *Trichachne insularis*, at ESALQ, Piracicaba, S. P., 3 March 1975, No. C 112; at Estação Experimental de Presidente Medici de FCMBB, Botucatu, S. P., 10 December 1975, No. C 157; at Est. Exp. Pres. Medici FCMBB, Botucatu, S. P., 10 December 1975, No. C 158.

31) ***Cercospora koepkei*** Krüger, Ber. Versuch. Zuckerr. W. Java 1 : 115. 1890

Syn. *Cercospora longipes* Butler, Dept. Agr. India. Mem. 1 : 115. 1906.

Leaf spots elliptic to spindle-shaped, rarely linear, less than 1 mm in width, 1-6 mm in length, red to brownish red, central parts often paler, depending on varieties sometimes $0.5-3 \times 1-12$ mm in size, red to brownish red with and without darker margins and dark reddish brown centers, peripheral areas yellow to greenish yellow; fruiting amphigenous; stromata minute; fascicles 2-15 stalks; conidiophores olivaceous brown, paler and narrower toward tip, distinctly

multiseptate, straight to abruptly geniculate, rarely branched, tip round to subtruncate, spore scars distinct and small in size, $2.5-5 \times 20-108 \mu\text{m}$; conidia hyaline, obclavate to obclavato-cylindric, straight to slightly curved, indistinctly 1-9 septate, base long obconically truncate, tip subacute to obtuse, scars distinct and small in size, $3-4 \times 24-100 \mu\text{m}$ (Fig. 31).

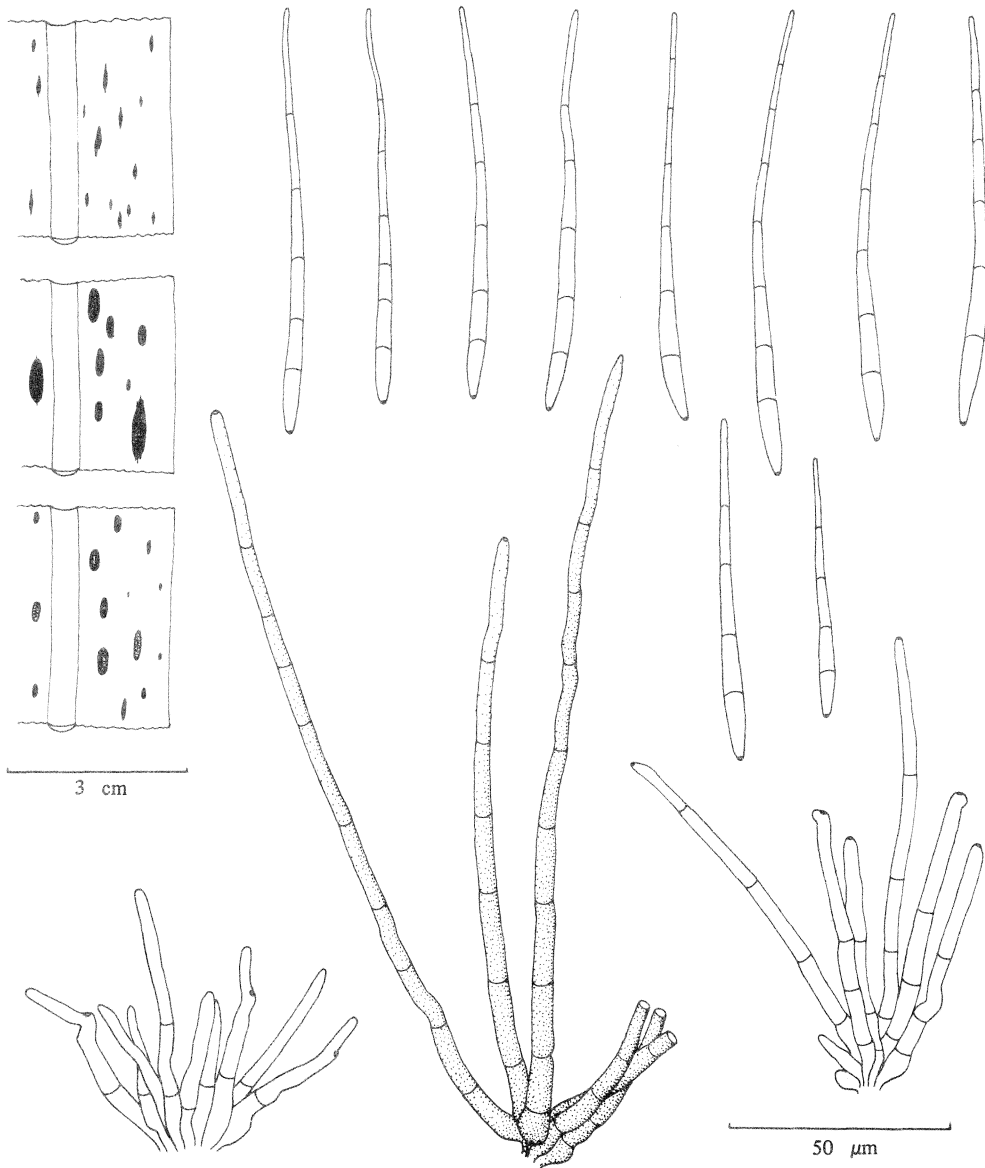


Fig. 31. *Cercospora koepkei* Krüger on *Saccharum officinarum*. No. C 5.

Hab. on *Saccharum officinarum*, at Copersucar Sugarcane Experiment Station, Piracicaba, S. P., 16 July 1974, collected by Fujio Akiba, No. C 5; at Estação Experimental de Cana, Araras, S. P., 16 July 1975 collected by Alonso Keese Dodson, No. C 153.

32) *Cercospora oryzae* Miyake, Jour. Coll. Agr. Imp. Univ. Tokyo 2 : 263. 1910.

Leaf spots mostly linear, vein-limited, dark brown with paler linear centers, sometimes long elliptic, mostly less than 10 mm long and less than 1 mm wide, peripheral areas often yellow to greenish yellow, causing death of leaf tips when severely infected; fruiting amphigenous; stromata lacking or a few brown cells; fascicles 1-6 stalks; conidiophores brown to sooty brown, narrower and paler toward tip, sometimes irregular in width, tip round to long obconic, spore scars medium in size, sparingly 1-3 septate, $3.5-5 \times 18-95 \mu\text{m}$; conidia hyaline, cylindrical to cylindro-obclavate, straight to mildly curved, base long obconically truncate, tip round, 1-4 septate, $4-5 \times 26-66 \mu\text{m}$ (Fig. 32).

Hab. on *Oryza sativa*, at Fazenda Itamarati, Ponta Porã, Mato Grosso, 22 January 1976, No. C 177.

Note : Viégas (1945) reported *Cercospora* sp. on *Oryza sativa*. Viégas' fungus is identical to *C. oryzae* judging from his description and drawing. Perfect state of the fungus is called *Sphaerulina oryzina* Hara (Yoshida 1948), though it could not be found on the specimen.

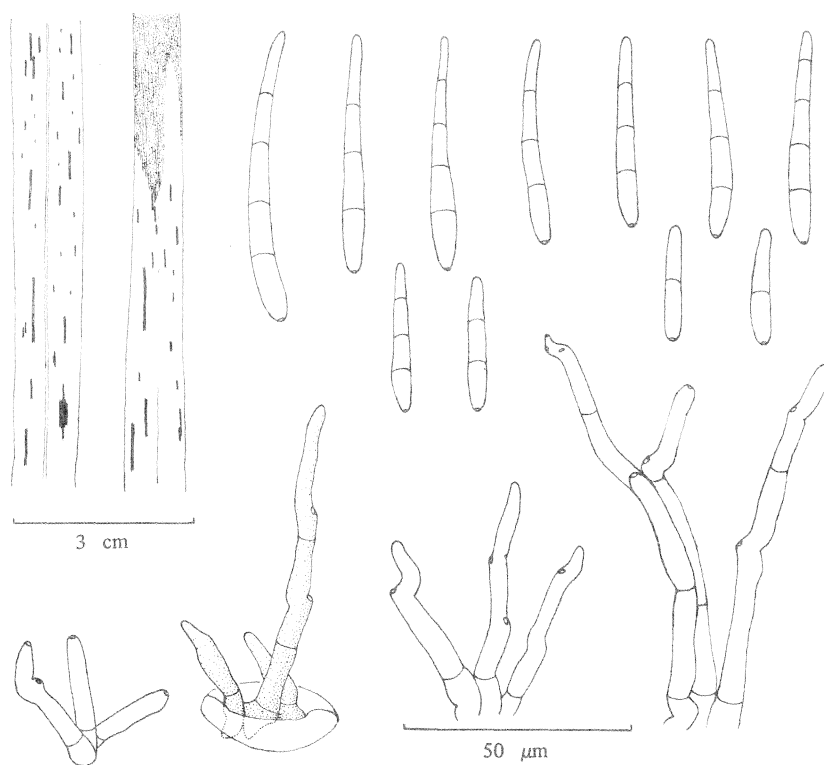


Fig. 32. *Cercospora oryzae* Miyake on *Oryza sativa*. No. C 177.

33) *Cercospora setariae* Atkinson, Jour. Elisha Mitchell Sci. Soc. 8 : 50. 1892.

Leaf spots amphigenous, linear along veins, very rarely elliptical, 0.1-1 mm in width, 0.5-20 mm in length, usually shorter than 8 mm, dark brown to reddish brown, often with light brown centers; fruiting chiefly ephiphyllous; stromata globular, developed in leaf tissues, brown, 24-52 μm in diameter; fascicles dense to very dense; conidiophores pale olivaceous, paler and narrower toward tip, sparingly septate, tip round to obconic, rarely branched, mildly geniculate, spore scars small, 2.5-4 \times 20-80 μm ; conidia hyaline, linear, straight to mildly curved, indistinctly multiseptate, base obconic, tip obtuse, 2-3 \times 44-132 μm (Fig. 33).

Hab. on *Setaria poiretiana*, at ESALQ, Piracicaba, S. P., 30 May 1975, No. C 132.

Note : The fungus collected showed dense fascicles. However, the fungus seems to belong to *C. setariae*.

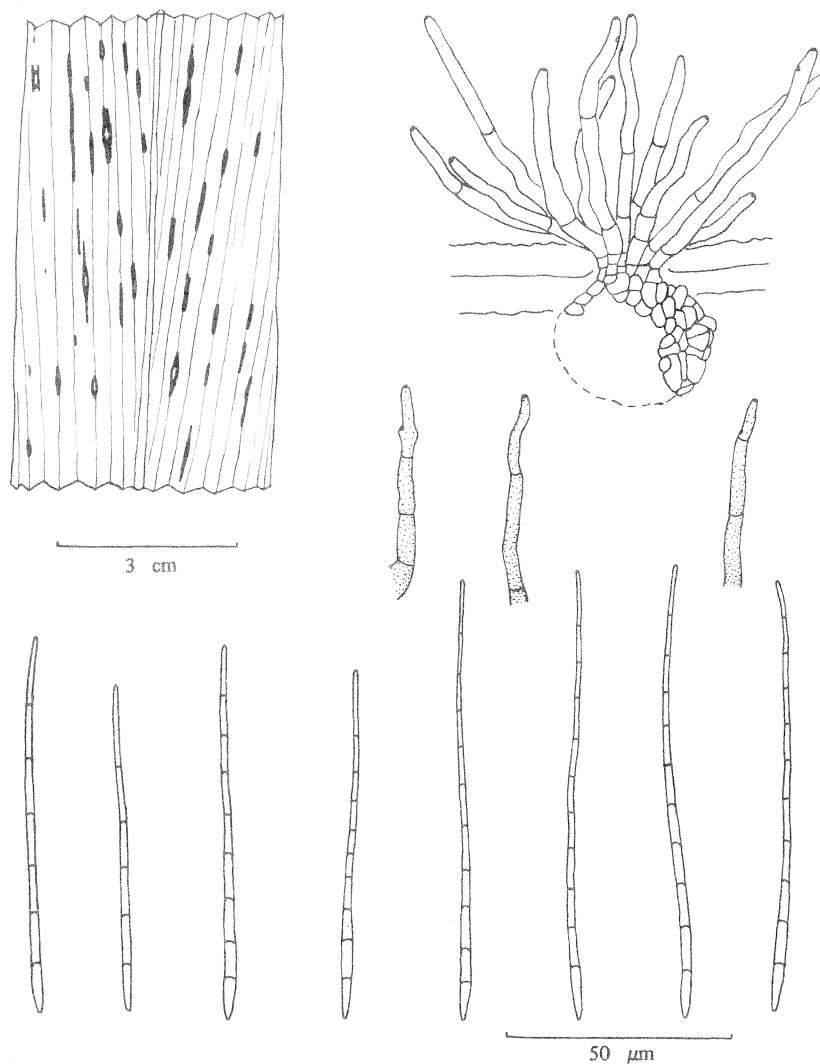


Fig. 33. *Cercospora setariae* Atkinson on *Setaria poiretiana*. No. C 132.

34) *Cercospora vaginae* Krüger, Ber. Vers. Stat. Zuckerr. West Java 1 : 64. 1890.

Lesions on leaf sheaths dark sooty reddish brown to reddish brown, irregular in shape, 1-50 mm in size or sometimes larger, margins well defined or poorly defined, inner surface usually reddish brown; fruiting usually on outer surface, also on inner surface of leaf sheath which gets air space between culm; stromata dark brown, 36-60 μm in size; conidiophores pale to medium dark brown, borne from procumbent hyphae, apical parts paler, mildly geniculate, often branched, spore scars indistinct, 2.5-4 \times 25-140 μm , sometimes 5 μm in width; conidia pale olivaceous, cylindric to obclavato-cylindric, mostly straight, base obconically truncate, tip obtuse, indistinctly 0-4 septate, scars small, 3-5 \times 20-58 μm (Fig. 34).

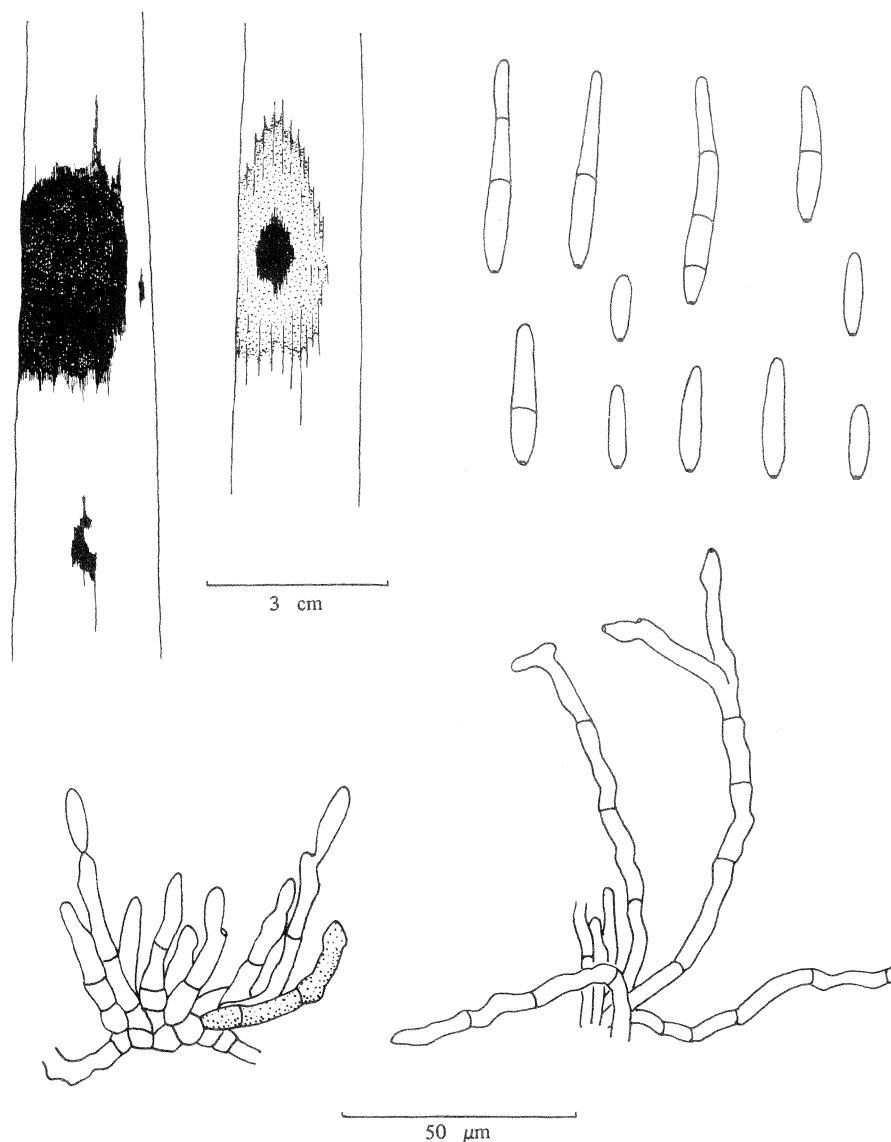


Fig. 34. *Cercospora vaginae* Krüger on *Saccharum officinarum*. No. C 59.

Hab. on *Saccharum officinarum*, at Estação Experimental de Cana, Araras, S. P., 18 October 1974, No. C 59.

JUGLANDACEAE

35) ***Sirosporium diffusum*** (Heald et Wolf) Deighton, More Dematiaceous Hyphomycetes 299. 1976.

Syn. *Cercospora fusca* (Heald et Wolf) Rand, Jour. Agr. Res. 1 : 318. 1914.

Leaf spots reddish brown, circular to irregular, 1-15 mm in size, often zonate, margins linear and dark brown, often coalescing to form large blotches, lower surface dark brown; primary lesions diffuse, reddish brown; fruiting hypophyllous; stromata lacking; conidiophores non-fasciculate, borne directly from procumbent hyphae which spread on leaf epidermis and often climb leaf hairs, very pale olivaceous, short, mostly straight, rarely branched, tip round to obconic, not geniculate, uniformly wide, not septate, spore scars minute, $4.6 \times 8.24 \mu\text{m}$; conidia olivaceous, cylindric to obclavato-cylindric, straight or curved, base obconic, tip round, 1-12 septate, $3.5-4.5 \times 20-112 \mu\text{m}$ (Fig. 35).

Hab. on *Carya illinoensis*, at ESALQ, Piracicaba, S. P., 25 February 1975, No. C 108.

Note : At Johnson Farm, Pedro Juan Caballero, Amanbay, Paraguay, which is close to the Brazilian border, *S. diffusum* was also found on *Carya illinoensis* giving rise to symptoms both similar to and different from those observed in the same host plant at ESALQ. Both specimens were collected at the same place in different years. Specimen showing identical symptoms, as mentioned above, was collected by the writers (No. C 178) on 21 January 1976, and that with different symptoms was collected on 18 January 1975 by Kunihei Kishi (No. C 94). Description of the latter fungus and of the lesions produced on the plant is as follows: Leaf spots amphigenous, effuse, dark brown, central parts almost black, lower surface dull brown, circular, not vein-limited, 1-10 mm in diameter, later coalescing to form very large lesions; fruiting amphigenous; conidiophores borne directly from procumbent hyphae which spread on leaf epidermis and often climb leaf hairs, olivaceous, uniformly colored, not geniculate, not branched, tip round to obconic, spore scars minute and almost invisible, not septate, $4.6 \times 10.28 \mu\text{m}$; conidia olivaceous, obclavato-cylindric, very often constricted at septa and bead-like shaped, straight to curved, 0-18 septate, $3.4 \times 20.84 \mu\text{m}$ when obclavato-cylindric, $6.8 \mu\text{m}$ in width when bead-like shaped (Fig. 36).

LABIATAE

36) ***Cercospora leonuri*** Stevens et Solheim, Mycologia 23 : 395. 1931.

Leaf spots amphigenous, circular, dark brown with clear white centers, 0.5-3 mm in diameter, usually smaller than 1.5 mm, peripheral areas greenish yellow on young leaves; primary lesions minute, reddish brown with paler centers; fruiting chiefly hypophyllous; stromata a few brown cells; fascicles 2-10 stalks; conidiophores pale olivaceous brown, paler and narrower toward tip, sparingly septate, straight to geniculate, not branched, tip truncate and almost hyaline, spore scars distinct and medium in size, $3.5-6 \times 28-96 \mu\text{m}$; conidia hyaline, acicular, straight to mildly curved, base truncate, tip acute and obtuse when short, indistinctly multiseptate, $2.4 \times 40-220 \mu\text{m}$ (Fig. 37).

Hab. on *Leonurus sibiricus*, at Fazenda Regina, Itatinga, S. P., 27 July 1974, No. C 15; at ESALQ, Piracicaba, S. P., 22 July 1974, No. C 7.

37) ***Cercospora menthicola*** Tehon et Daniels, Mycologia 17 : 247. 1925.

Leaf spots amphigenous, irregular in shape, brownish black, 0.5-30 mm in size, later

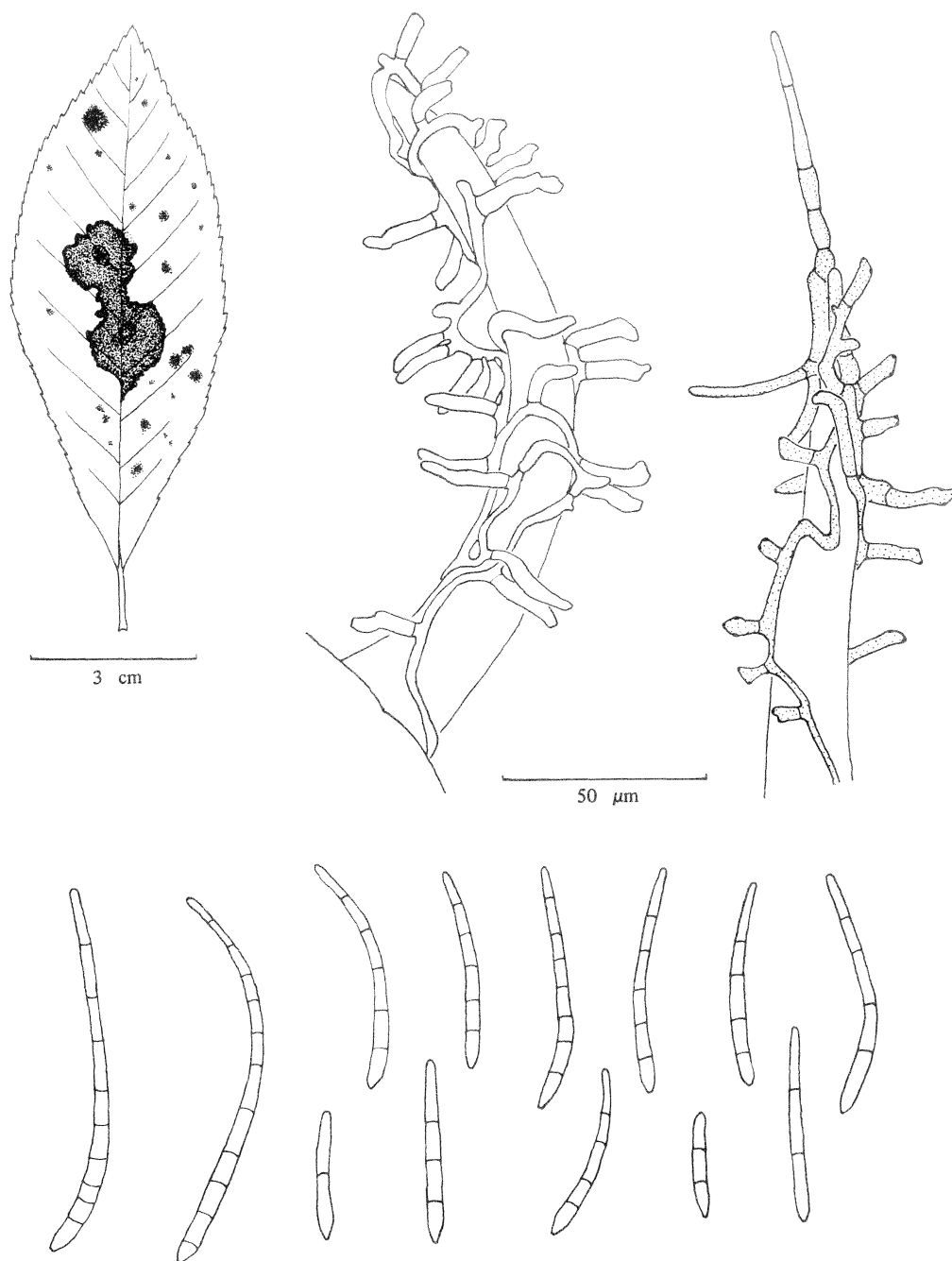


Fig. 35. *Sirosporium diffusum* (Heald et Wolf) Deighton,
Syn. *Cercospora fusca* (Heald et Wolf) Rand, on *Carya illinoensis*. No. C 108.

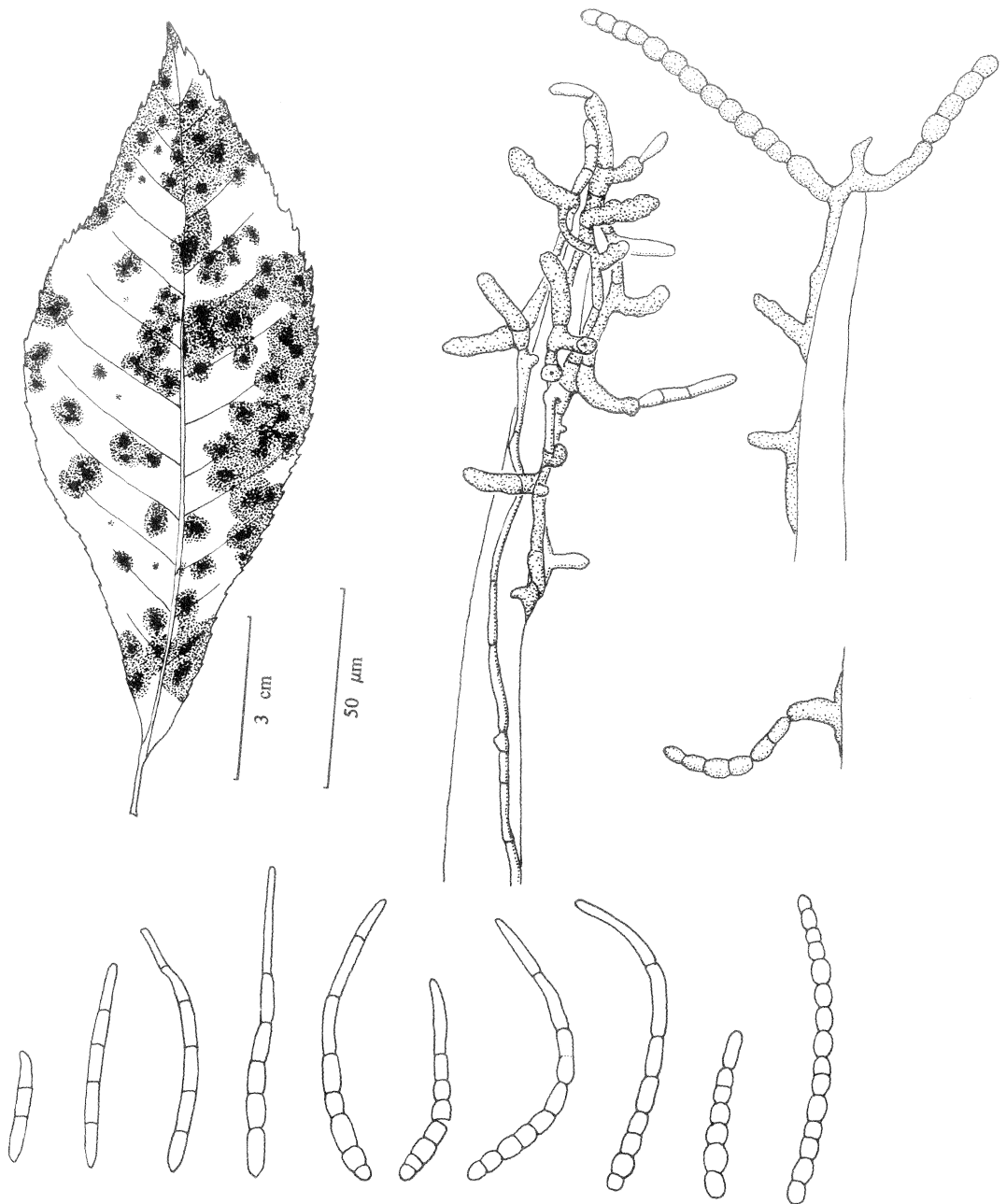


Fig. 36. *Sirosporium diffusum* (Heald et Wolf) Deighton,
 Syn. *Cercospora fusca* (Heald et Wolf) Rand, on *Carya illinoensis*. No. C 94.

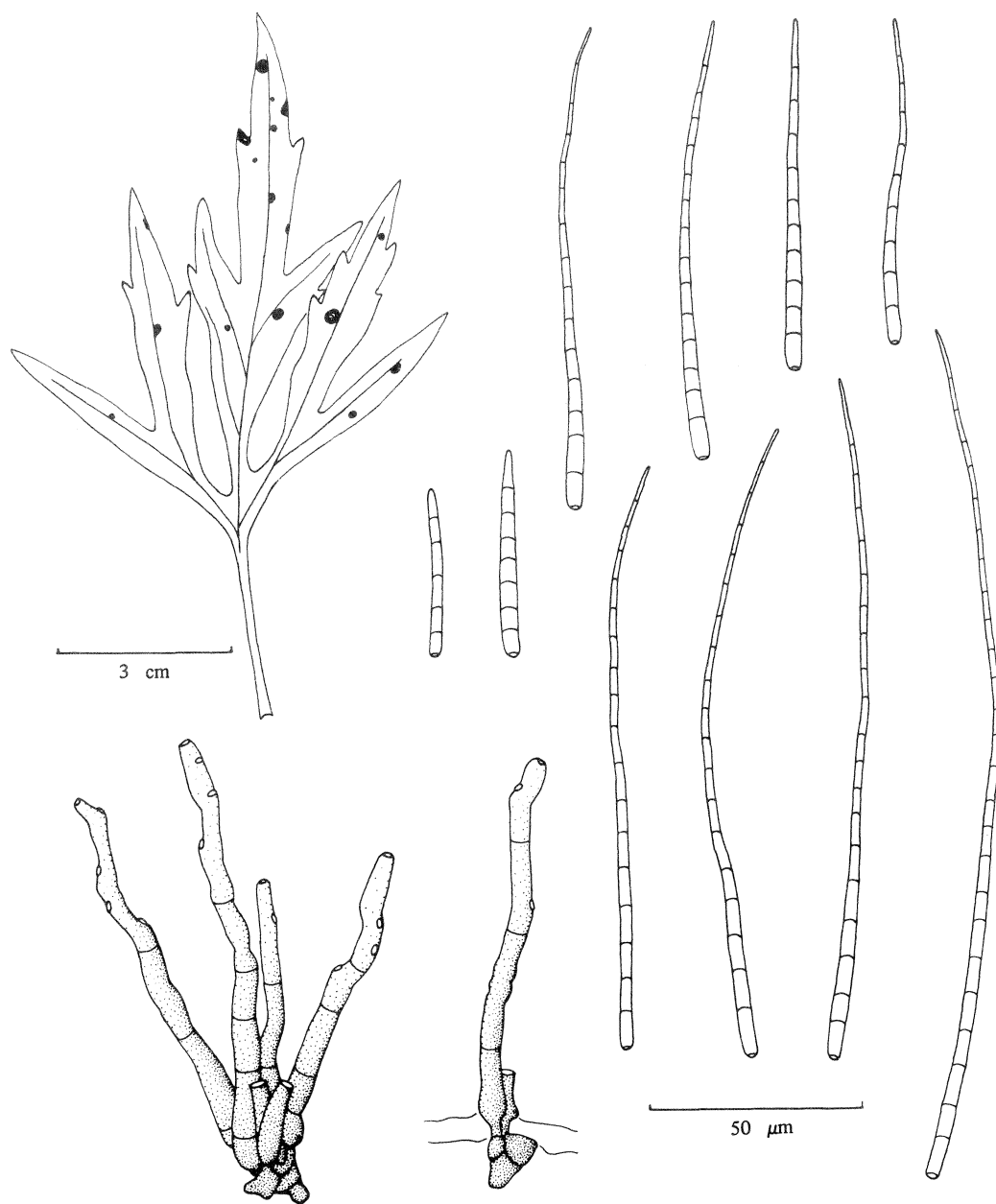


Fig. 37. *Cercospora leonuri* Stevens et Solheim on *Leonurus sibiricus*. No. C 15.

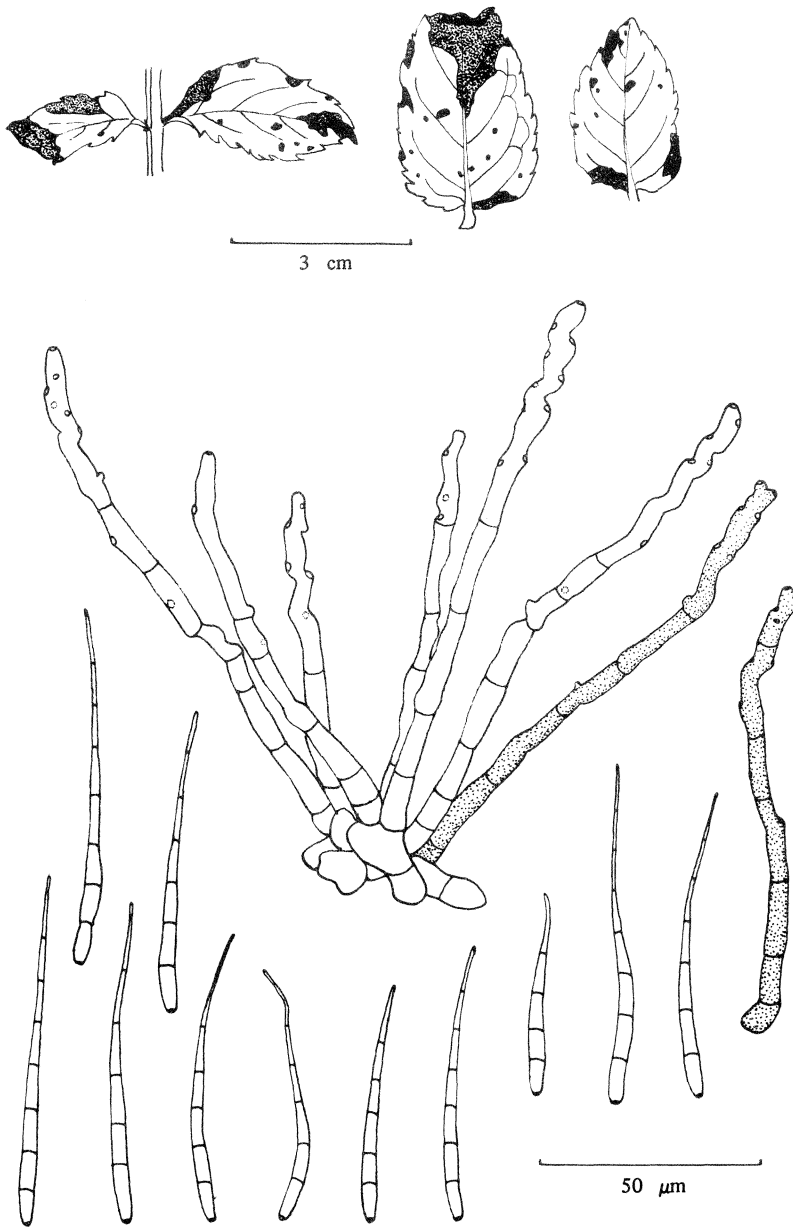


Fig. 38. *Cercospora menthicola* Tehon et Daniels on *Mentha canadensis*. No. C 119.

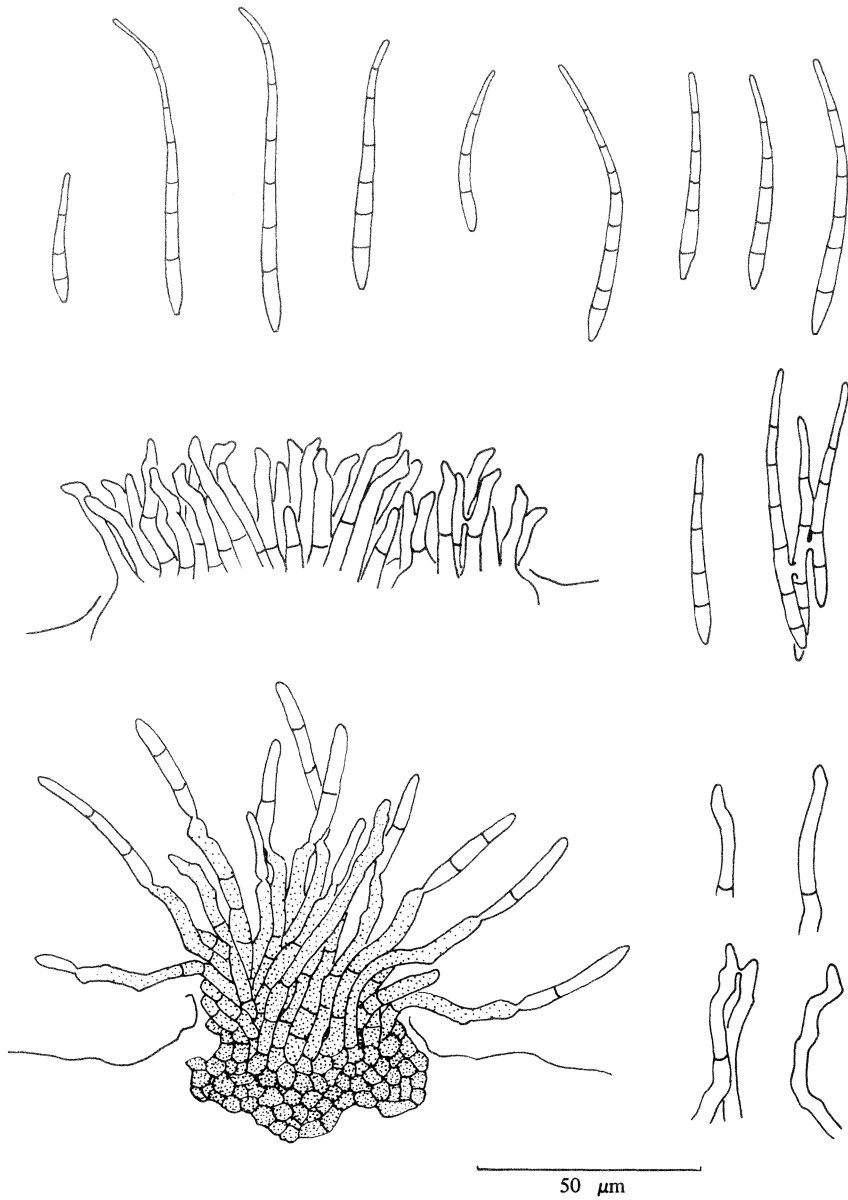


Fig. 39. *Cercospora purpurea* Cooke on *Persea americana*. No. C 1.

usually spreading to leaf edges, surrounding areas yellow to greenish yellow, leaves with large lesions easily fall or die; fruiting amphigenous; stromata minute; fascicles 1-8 stalks; conidiophores medium brown, apical parts paler and round to subtruncate, spore scars distinct, often geniculate, distinctly multiseptate, rarely constricted at septa, irregular in width, $3-6 \times 68-132 \mu\text{m}$; conidia hyaline, acicular, base subtruncate, tip acute, indistinctly multiseptate, straight to mildly curved, $2.5-3.5 \times 48-96 \mu\text{m}$ (Fig. 38).

Hab. on *Mentha canadensis*, *M. sp.*, at ESALQ, Piracicaba, S. P., 14 May 1975, No. C 119; at ESALQ, Piracicaba, S. P., 31 July 1974, No. C 26; at ESALQ, Piracicaba, S. P., 12 August 1974, No. C 45.

Note : The fungus is commonly observed during the dry season.

LAURACEAE

38) ***Cercospora purpurea*** Cooke, Grevillea 7 : 34. 1878.

Leaf spots angular, 1-3 mm in size, dark brown with yellowish green halos, lower leaf surface brownish black with hazy halos, later coalescing to form large lesions; lesions on fruit pedicels black, at first small and circular, later expanding laterally and causing fruit to drop; lesions on fruits black, circular, 1-5 mm in diameter, sunken; fruiting hypophyllous; stromata globular, medium brown, $28-48 \mu\text{m}$ in size; fascicles very dense; conidiophores pale olivaceous, uniformly colored, tip obconic, often geniculate, sometimes branched, 1-5 septate, $2.5-4 \times 12-60 \mu\text{m}$; conidia pale olivaceous, linear to obclavate, mostly obclavato-cylindric, base obconic to obconically truncate, tip obtuse to subacute, indistinctly 3-7 septate, mostly mildly curved, $2.5-3.5 \times 40-100 \mu\text{m}$ (Fig. 39).

Hab. on *Persea americana*, *P. drymifolia*, at ESALQ, Piracicaba, S. P., 30 May 1974, No. C 1; at ESALQ, Piracicaba, S. P., 23 July 1974, No. C 12; Chácara Paineira, Km 121, Rodovia SP 147, Limeira, S. P., 5 August 1974, No. C 39; at ESALQ, Piracicaba, S. P., 6 October 1975, No. C 155.

Note : *Mycosphaerella* sp. was found on the lesions of fallen leaves and also on leaves still attached to the plant at ESALQ, Piracicaba on 25 October (No. C 63), on 30 October (No. C 64), and on 6 November (No. C 67) in 1974 (Hino & Tokeshi 1976b). Deighton (1976) transferred the fungus to the species *Pseudocercospora purpurea* (Cooke) Deighton.

LEGUMINOSAE

39) ***Cercospora arachidicola*** Hori, Nishigahara Agr. Exp. Sta. Tokyo Ann. Rept. : 26. 1917.

Leaf spots circular to irregular, 2-5 mm in size, dark brown on upper surface, sooty brown on lower surface, primary spots brown; fruiting epiphyllous; stromata brown, globular, $20-56 \mu\text{m}$ in diameter fascicles dense; conidiophores pale sooty brown, uniformly colored, uniformly wide, not branched, spore scars medium in size, tip obconic to subtruncate, $4-5 \times 20-32 \mu\text{m}$; conidia pale olivaceous, obclavate to obclavato-cylindric, straight to mildly curved, base obconic, tip round to obtuse, indistinctly 3-8 septate, $4 \times 46-88 \mu\text{m}$ (Fig. 40).

Hab. on *Arachis hypogaea*, at Videira, Santa Catarina, 1 January 1975, No. C 85; at Fazenda Experimental de São Manuel de FCMBB, São Manuel, S. P., 8 December 1975, No. C 164.

40) ***Cercospora austrinae*** Chupp et Viégas, Bol. Soc. Brasil. Agron. 8 : 10. 1945.

Leaf spots amphigenous, circular to irregular in shape, 0.5-8 mm in size, dull brown with dark brown margins, vaguely zonate in large lesions; fruiting amphigenous but chiefly hypophyllous; stromata lacking or minute; fascicles 1-6 stalks; conidiophores medium brown,

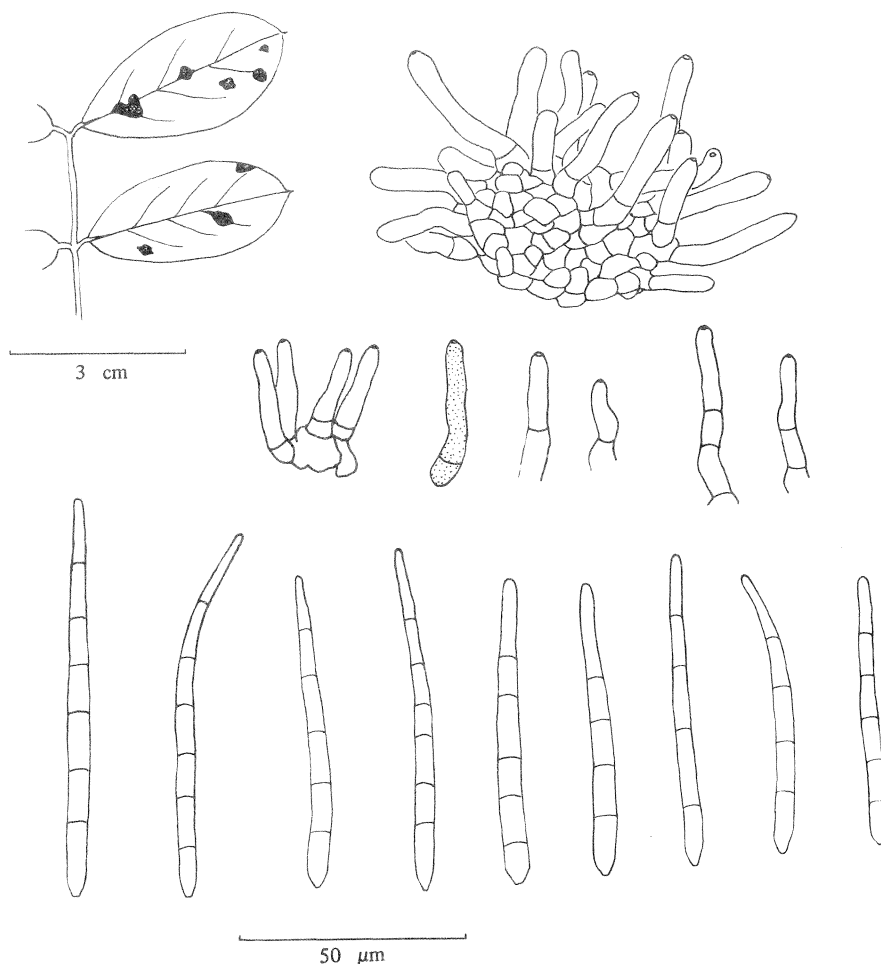


Fig. 40. *Cercospora arachidicola* Hori on *Arachis hypogaea*. No. C 85.

paler and narrower toward tip, distinctly multiseptate, tip subtruncate, spore scars distinct, sometimes branched, $2.5-6 \times 68-428 \mu\text{m}$; conidia hyaline, acicular, base truncate, tip acute to subacute, straight to curved, indistinctly multiseptate, $2.5-6 \times 56-332 \mu\text{m}$ (Fig. 41).

Hab. on *Pueraria* sp., at ESALQ, Piracicaba, S. P., 27 May 1975, No. C 126.

Note : Germ-tubes of conidia immediately changed into conidiophores without any special branching, and formed secondary spores. Germinated cells of conidia including newly borne conidiophores became pale brown when the cells reached the stage of the sporulation leading to secondary spores.

41) ***Cercospora bauhiniae*** H. et P. Sydow, Ann. Mycol. 12 : 202, 1914.

Leaf spots amphigenous, circular to irregular, 0.5-5 mm in size, enlarging to big blotches, reddish brown with darker margins; fruiting epiphyllous; stromata globular, 12-44 μm in diameter; fascicles dense to very dense; conidiophores very short and very pale olivaceous when young, olivaceous when old, uniformly colored, sometimes branched, 0-4 septate when

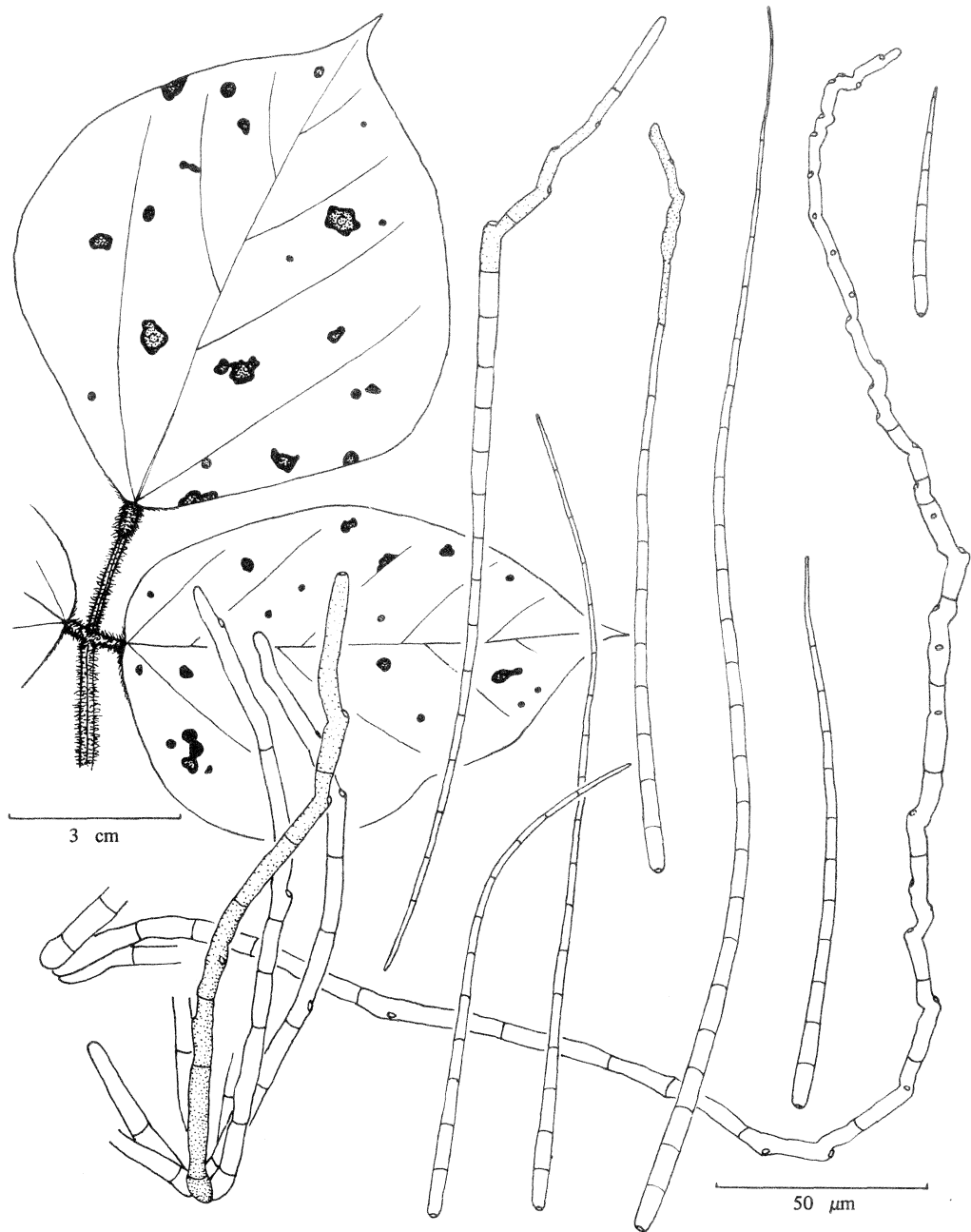


Fig. 41. *Cercospora austrinae* Chupp et Viégas on *Pueraria* sp. No. C 126.

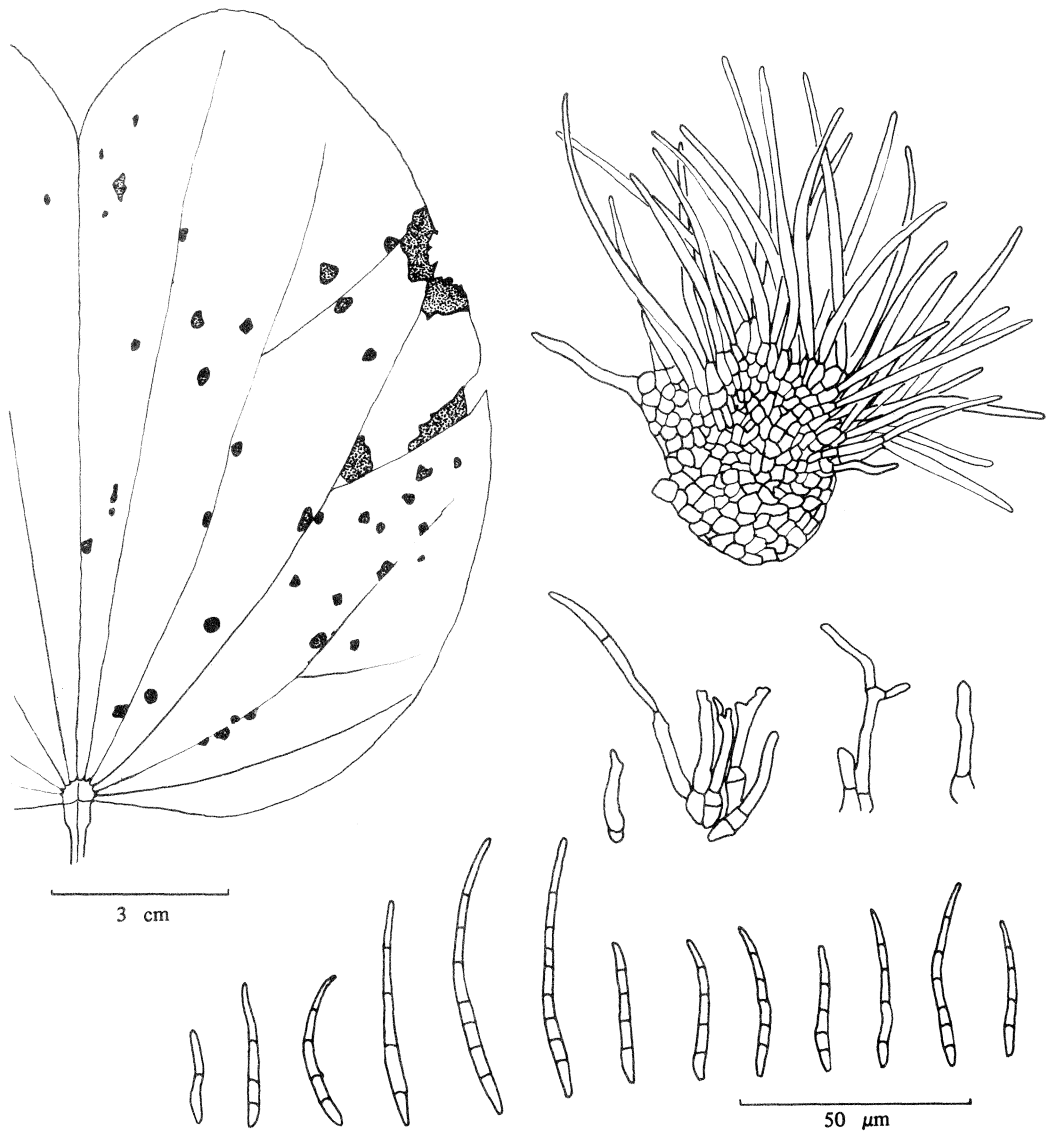


Fig. 42. *Cercospora bauhiniae* H. et P. Sydow on *Bauhinia variegata*. No. C 103.

old, $3.4 \times 8.56 \mu\text{m}$; conidia hyaline to very pale olivaceous, obclavato-cylindric, base obconic, tip obtuse, mildly curved, indistinctly 1-10 septate, $2.5.4 \times 32.64 \mu\text{m}$ (Fig. 42).

Hab. on *Bauhinia variegata*, at ESALQ, Piracicaba, S. P., 18 February 1975, No. C 103.

Note: Deighton (1976) transferred the fungus to the species *Pseudocercospora bauhiniae* (H. et P. Syd.) Deighton.

42) ***Cercospora canescens*** Ellis et Martin, Amer. Nat. 16 : 1003. 1882.

Leaf spots on *Phaseolus vulgaris* (dry beans) at first epiphyllous, effuse, circular, sometimes

vein-limited, black velvety, 1-5 mm in size, later coalescing to form larger lesions, fruiting chiefly epiphyllous; leaf spots on *Phaseolus vulgaris* (vegetables) amphigenous, subcircular to angular, vein-limited, dark brown often with paler centers, 0.5-5 mm in size, coalescing to form large blotches, fruiting amphigenous; leaf spots on *Vigna sesquipedalis* amphigenous, circular, 0.5-4 mm in diameter, at first reddish brown, later with dull white centers, margins effuse, lower

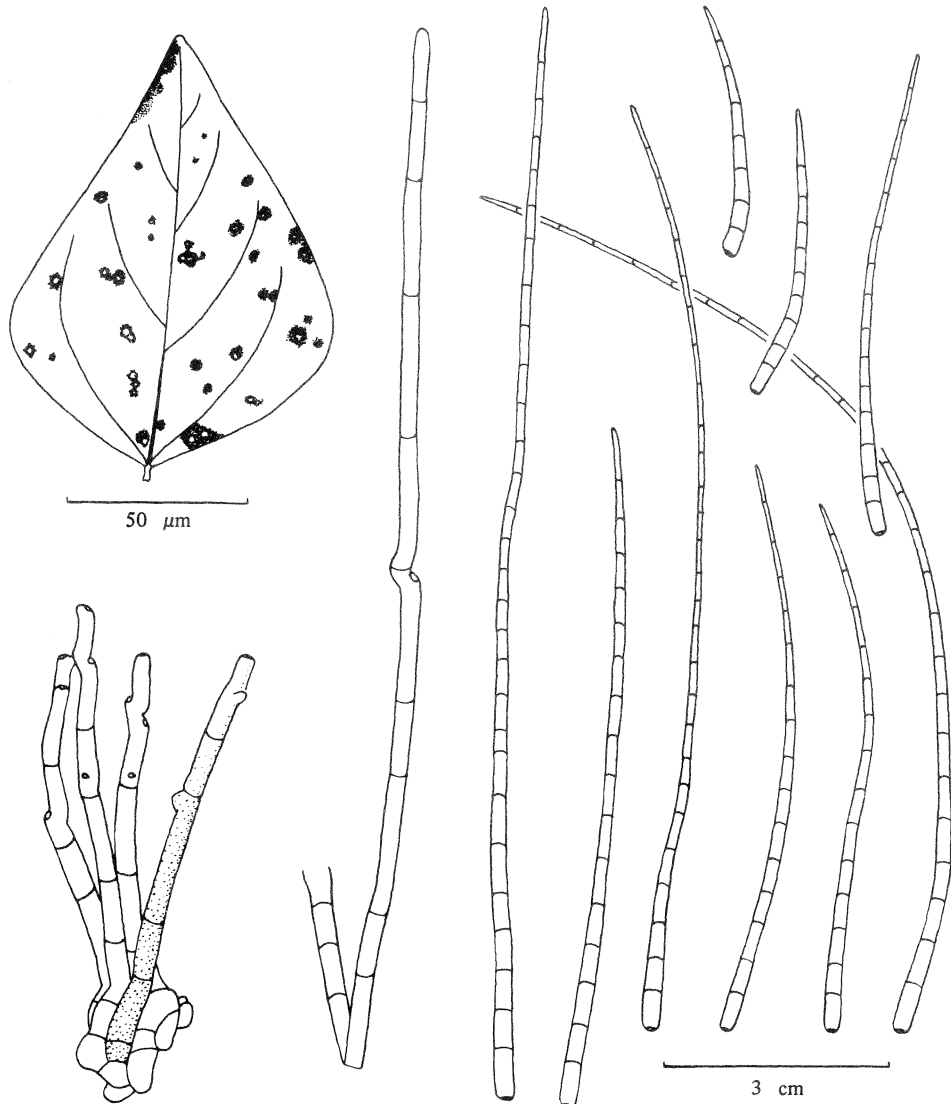


Fig. 43. *Cercospora canescens* Ellis et Martin on *Phaseolus vulgaris*. No. C 79.

surface more reddish with smaller dull white centers, fruiting epiphyllous, seldom chiefly epiphyllous; stromata a few brown cells; fascicles a few stalks to dense; conidiophores dark brown, paler toward tip, slightly attenuated, mildly geniculate, not branched, distinctly multiseptate, tip truncate, spore scars medium in size, $3-6 \times 40-144 \mu\text{m}$ conidia hyaline, acicular, mostly mildly curved, base truncate, tip acute, indistinctly multiseptate, $2.5-4 \times 32-280 \mu\text{m}$ (Fig. 43).

Hab. on *Phaseolus vulgaris*, *Vigna sesquipedalis*, *Dolichos lablab*, at ESALQ, Piracicaba, S. P., 26 June 1974, No. C 3; at ESALQ, Piracicaba, S. P., 2 August 1974, No. C 31; at ESALQ, Piracicaba, S.P., 5 August 1974, No. C 33; at Asaí, Paraná, 24 December 1974, No. C 79.

43) ***Cercospora cruenta*** Saccardo, *Michelia* 2 : 149. 1880.

Leaf spots chiefly epiphyllous, circular to angular, limited by large vein, effuse, 1-8 mm in size, dark reddish brown; fruiting epiphyllous; stroma-like structures under leaf stomata

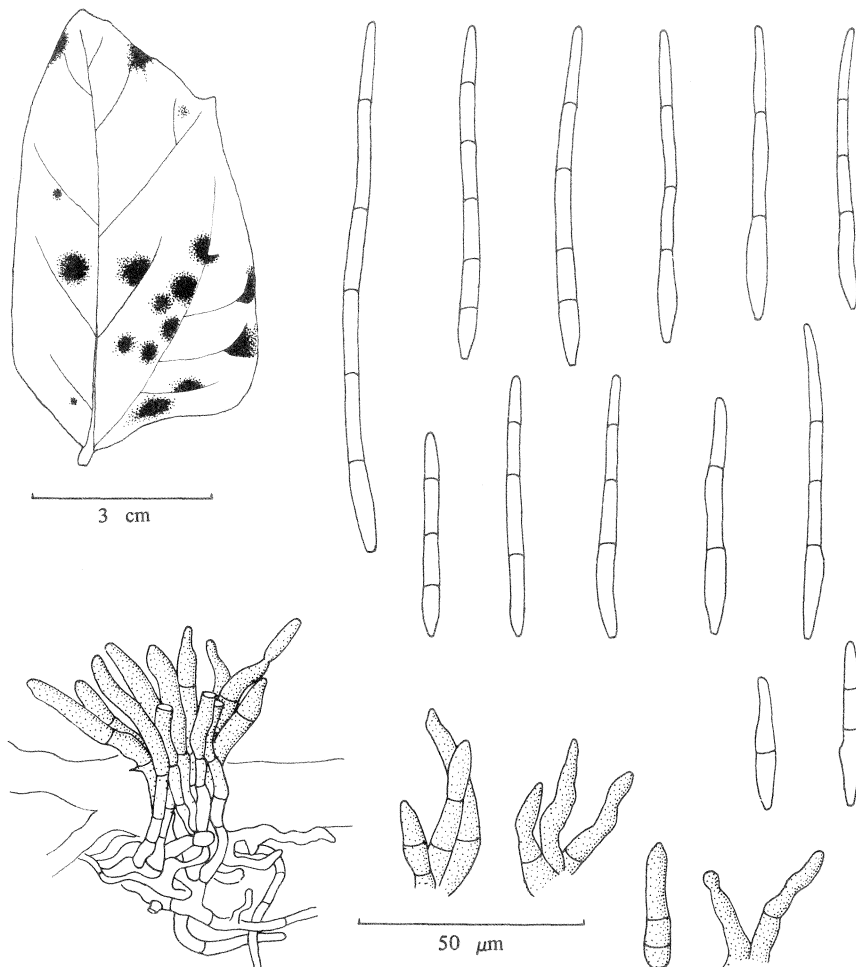


Fig. 44. *Cercospora cruenta* Saccardo on *Vigna sesquipedalis*. No. C 30.

small, hyaline, loosely gathered; fascicles dense; conidiophores olivaceous brown, uniformly colored, irregular in width, attenuated toward tip, sparingly septate, tip round to obconic, spore scars indistinct not branched, not geniculate, $3.5-5.5 \times 20-36 \mu\text{m}$; conidia olivaceous brown, obclavato-cylindric, base obconic and often concave, tip round, 1-7 septate, septa often distinct, mostly straight, sometimes mildly curved, scars visible but indistinct, $3.5-4.5 \times 20-136 \mu\text{m}$ (Fig. 44).

Hab. on *Vigna sesquipedalis*, at ESALQ, Piracicaba, S. P., 2 August 1974, No. C 30.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora cruenta* (Sacc.) Deighton.

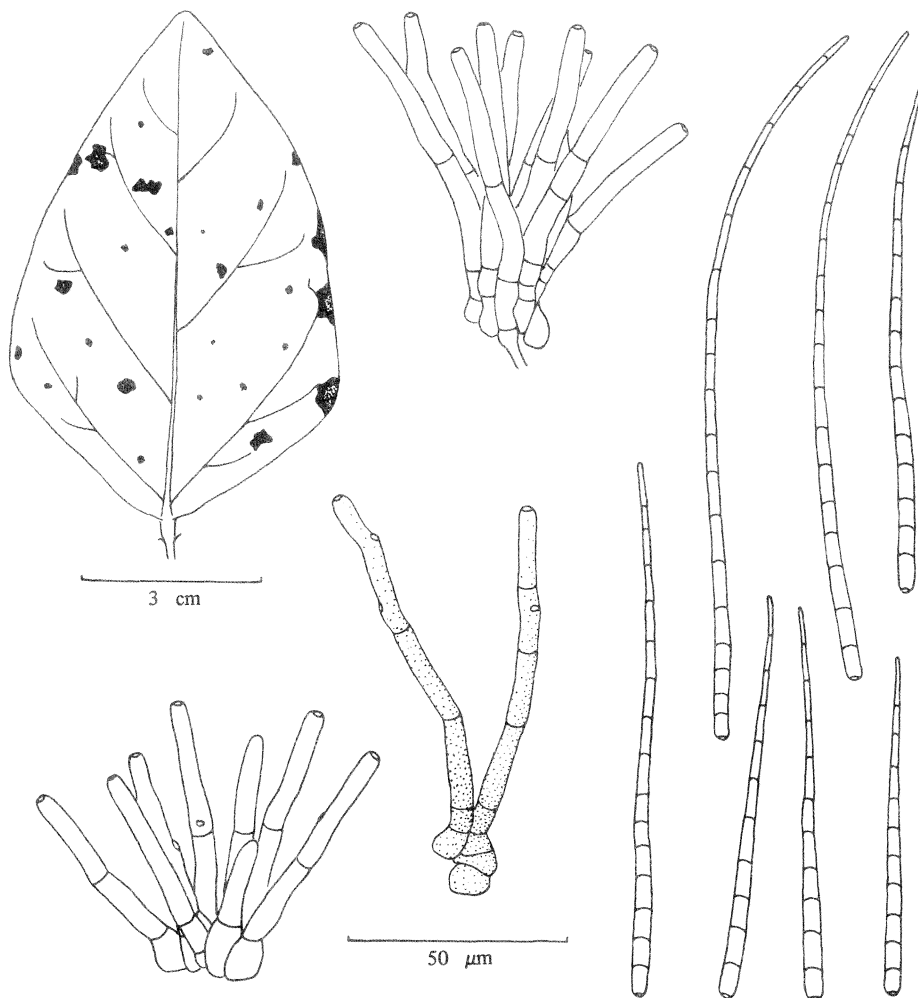


Fig. 45. *Cercospora flagellifera* Atkinson on *Galactia striata*. No. C 93.

44) ***Cercospora flagellifera*** Atkinson, Jour. Elisha Mitchell Sci. Soc. 8 : 51. 1892.

Leaf spots amphigenous, irregular in shape, 1-6 mm in size, sometimes coalescing to form larger lesions, brown with grayish brown centers; fascicles 1-13 stalks; conidiophores pale olivaceous brown, paler toward tip, 1-8 septate, not branched, tip truncate, 4-6 × 32-112 μm; conidia hyaline to pale olivaceous, acicular, straight or slightly curved, base truncate, tip subacute, indistinctly multiseptate, 3.5-4 × 44-208 μm (Fig. 45).

Hab. on *Galactia striata*, at ESALQ, Piracicaba, S. P., 29 January 1975, No. C 93.

Note : Material showed mixed infection with rust fungus. However, one month before the material was collected, only the present fungus, *C. flagellifera*, was observed giving rise to the same symptoms as those described above. The rust fungus was contaminated during the observation of symptom development.

45) ***Cercospora kikuchii*** Matsumoto et Tomoyasu, Ann. Phytopath. Soc. Japan 1 (6) : 1. 1925.

Leaf spots amphigenous, angular to irregular in shape, 1-5 mm in size, later coalescing to form large fragile blotches, central parts tan or sometimes dull gray; lesions on pods circular, effuse, tan black, 1-8 mm in diameter; fruiting amphigenous; stromata lacking or minute on leaves, small and brown on pods and stems; fascicles dense; conidiophores pale to medium olivaceous brown, paler toward tip, width irregular, tip round to subtruncate, distinctly multiseptate, spore scars medium to small, geniculate on leaves, slightly geniculate on pods, 4-7 × 36-164 μm on leaves, longest conidiophores on pods 272 μm; conidia hyaline, acicular, straight to curved, base truncate, tip obtuse to acute, indistinctly multiseptate, 3.5-5.5 × 44-260 μm on leaves and pods, sometimes almost cylindrical conidia were mixed on pods (Fig. 46).

Hab. on *Glycine max*, at ESALQ, Piracicaba, S. P., 14 May 1975, No. C 120.

46) ***Cercosporidium personatum*** (Berk. et Curt.) Deighton, Mycol. Papers 112 : 71. 1967.

Syn. *Cercospora personata* (Berk. et Curt.) Ellis et Everhart, Jour. Mycol. 1 : 63. 1885.

Syn. *Cercospora arachidis* P. Hennings, Hedwigia 41 : 18. 1902.

Leaf spots circular, 3-5 mm in diameter, dull black on upper surface, black to dull black on lower surface, not vein-limited, primary spots circular and brown; fruiting hypophyllous; stromata globular, dark brown, up to 100 μm or sometimes larger in diameter; fascicles extremely dense; conidiophores sooty brown, equally colored, uniformly wide, tip subtruncate to round, 6-8 × 32-48 μm; conidia olivaceous brown, medium dark, short, cylindrical, sometimes obclavate, straight to slightly curved, base obconic, tip round, 0-4 septate, 6-8 × 24-40 μm (Fig. 47).

Hab. on *Arachis hypogaea*, at Videira, Santa Catarina, 1 January 1975, No. C 81.

47) ***Cercospora stizobii*** H. et P. Sydow, Ann. Mycol. 11 : 270. 1913.

Leaf spots mostly circular to elliptic, sometimes irregular, amphigenous, reddish brown to brown, margins sooty brown and linear, 0.5-5 mm in size, primary lesions brown with paler sooty brown margins; fruiting amphigenous; stromata globular, 16-36 μm; fascicles dense; conidiophores short, straight to geniculate, 0-2 septate, pale sooty olivaceous brown, uniformly colored, not branched, 3.5-4 × 16-36 μm; conidia olivaceous to sooty olivaceous, cylindrical to obclavato-cylindric, base obconic, tip round to obtuse, straight to mildly curved, indistinctly 3-7 septate, 3.5-4 × 28-96 μm (Fig. 48).

Hab. on *Mucuna* sp., at ESALQ, Piracicaba, S. P., 15 February 1975, No. C 102.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora stizobii* (H. et P. Syd.) Deighton.

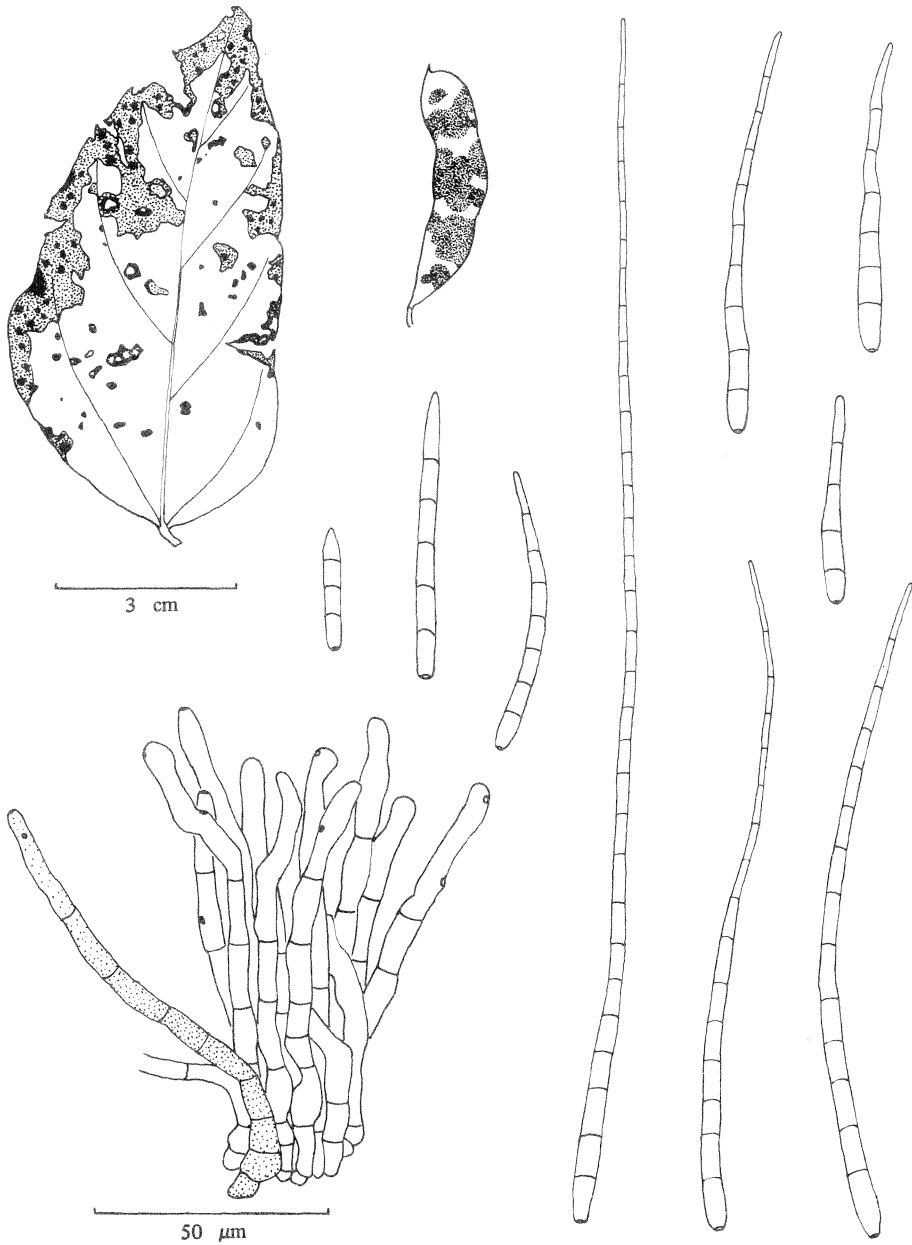


Fig. 46. *Cercospora kikuchii* Matsumoto et Tomoyasu on *Glycine max.* No. C 120.

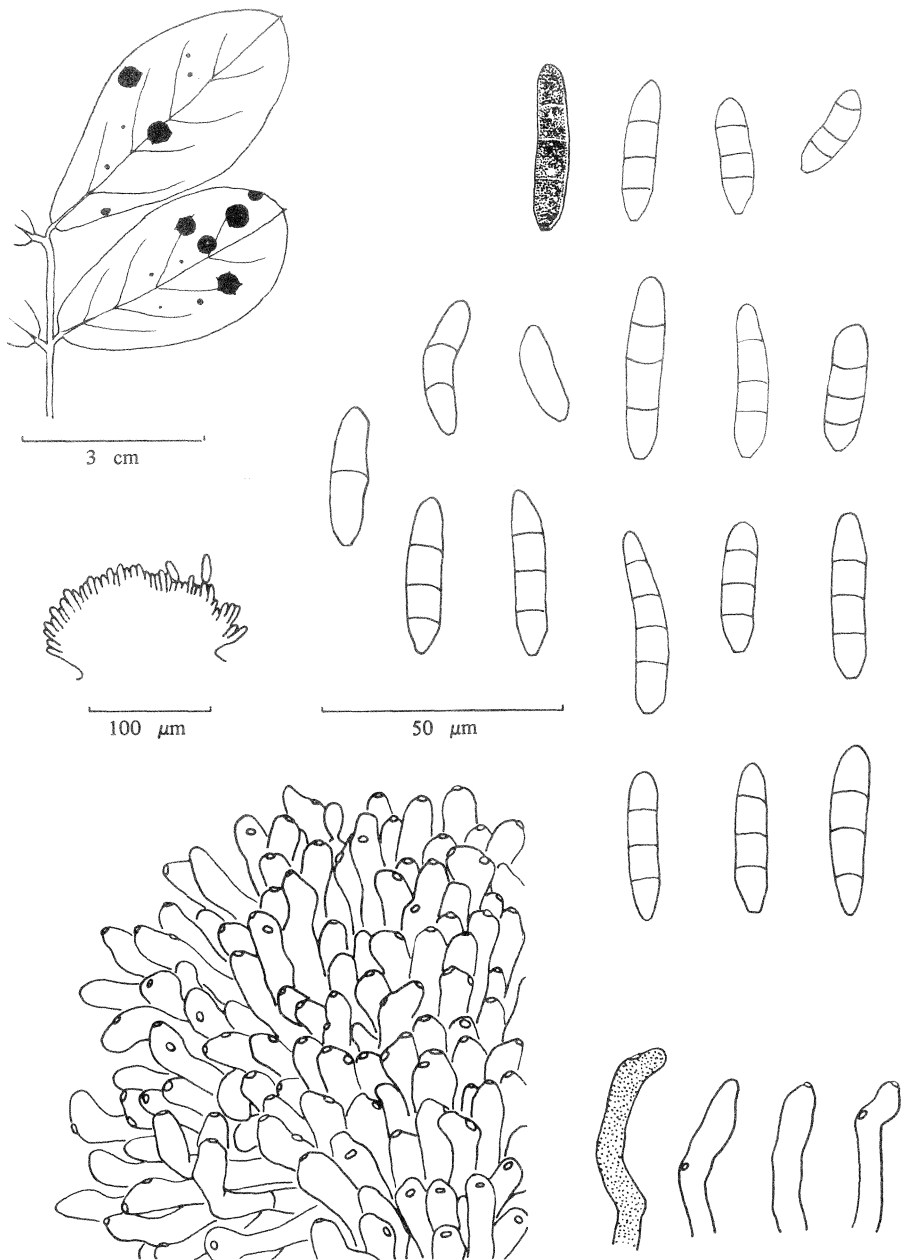


Fig. 47. *Cercosporidium personatum* (Berk. et Curt.) Deighton,
 Syn. *Cercospora personata* (Berk. et Curt.) Ellis et Everhart, on *Arachis hypogaea*. No. C 81.

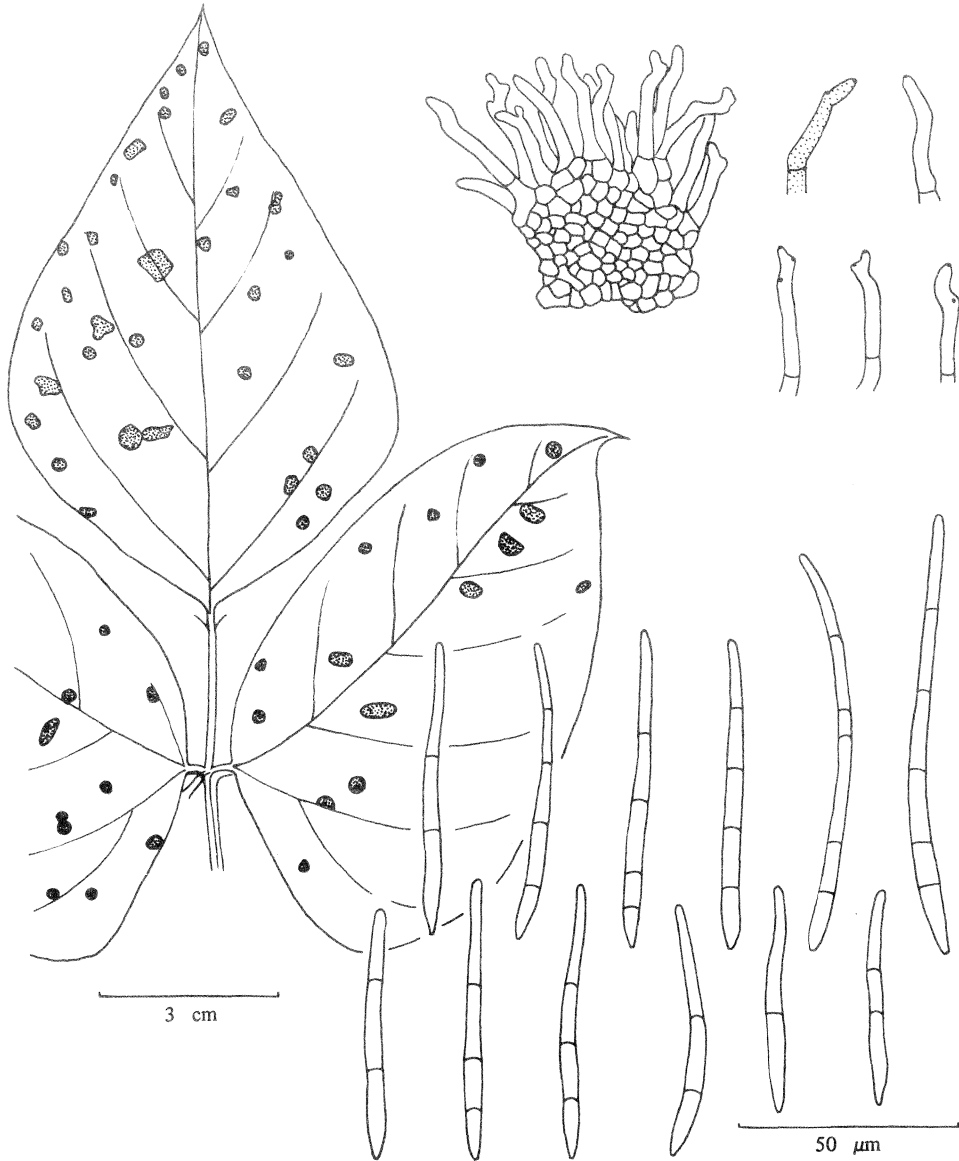


Fig. 48. *Cercospora stizolobii* H. et P. Sydow on *Mucuna* sp. No. C 102.

48) *Cercospora wisteriae* Muller et Chupp, Arch. Inst. Biol. Vegetal Rio de Janeiro 3 : 97. 1936.

Leaf spots amphigenous, circular to angular, reddish to dark brown with sooty brown margins, sometimes vaguely zonate, central parts sometimes dull gray, 1-10 mm in size; fruiting chiefly hypophyllous; stromata minute; fascicles a few stalks to dense, pale colored procumbent hyphae sometimes present; conidiophores pale olivaceous brown, slightly paler toward tip, short, mostly straight, tip round to obconic, spore scars small and indistinct, narrower toward tip, septa indistinct, $2.5-4 \times 12-20 \mu\text{m}$; conidia very pale olivaceous to hyaline, narrowly obclavato-cylindric or almost cylindric, base obconic, tip round to obtuse, indistinctly uni- to multiseptate, straight to mildly curved, $2.5-3.5 \times 16-52 \mu\text{m}$ (Fig. 49).

Hab. on *Wisteria floribunda*, at Avenida Brasil 1456, Campinas, S. P., 18 May 1975, No. C 122; at Caucaia do Alto, Cotia, S.P., 8 June 1975, No. C 133.

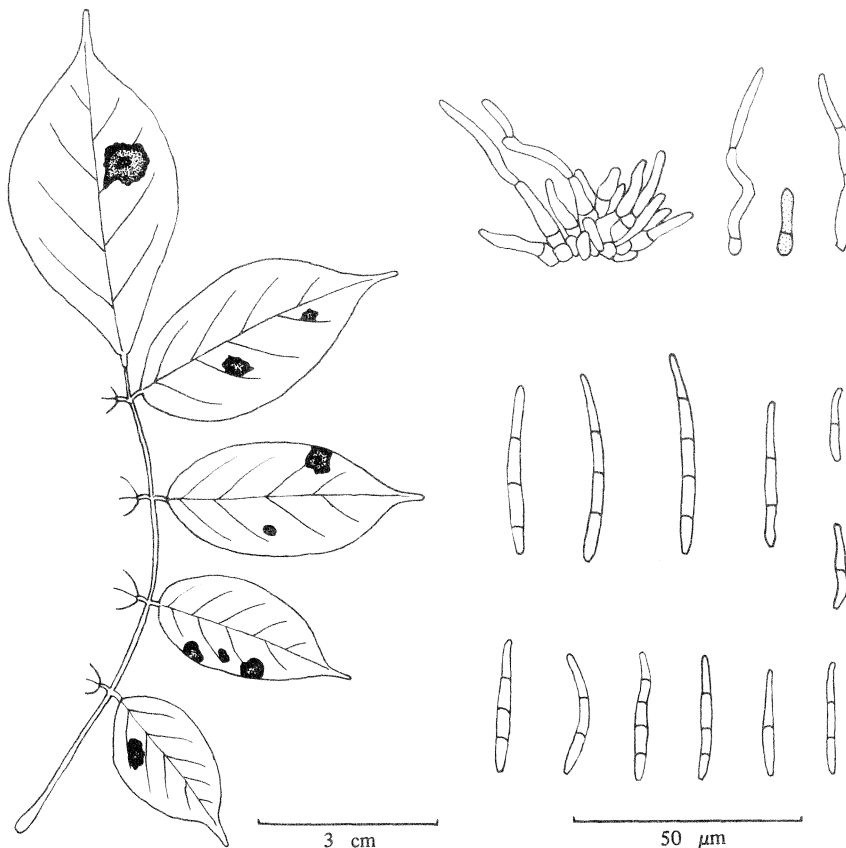


Fig. 49. *Cercospora wisteriae* Muller et Chupp on *Wisteria floribunda*. No. C 122.

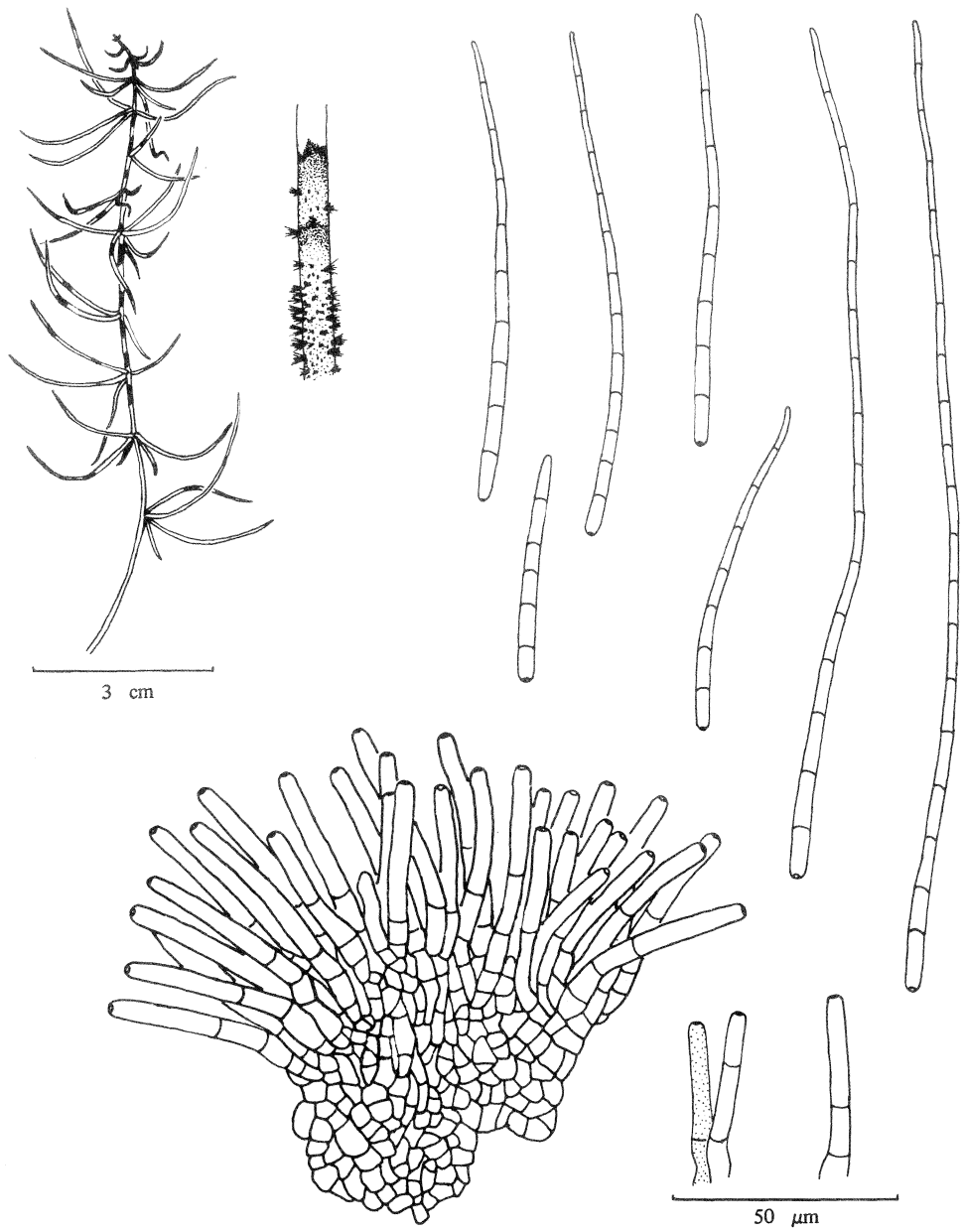


Fig. 50. *Cercospora asparagi* Saccardo on *Asparagus officinalis*. No. C 127.

LILIACEAE

49) *Cercospora asparagi* Saccardo, *Michelia* 1 : 88. 1878.

Syn. *Cercospora caulicola* Winter, *Jour. Mycol.* 1 : 125. 1885.

Lesions reddish brown on needle leaves and stems, at first elliptic with dull brown centers, 1-4 mm in size, later enlarging to big zonate blotches; stromata well developed, at first globular, 40 μm in diameter, later larger and irregular in shape; fascicles very dense; conidiophores pale olivaceous brown, uniformly colored, uniformly wide, tip truncate, sparingly septate, not branched, not geniculate, spore scars distinct and medium in size, 3.5-5.5 \times 32-68

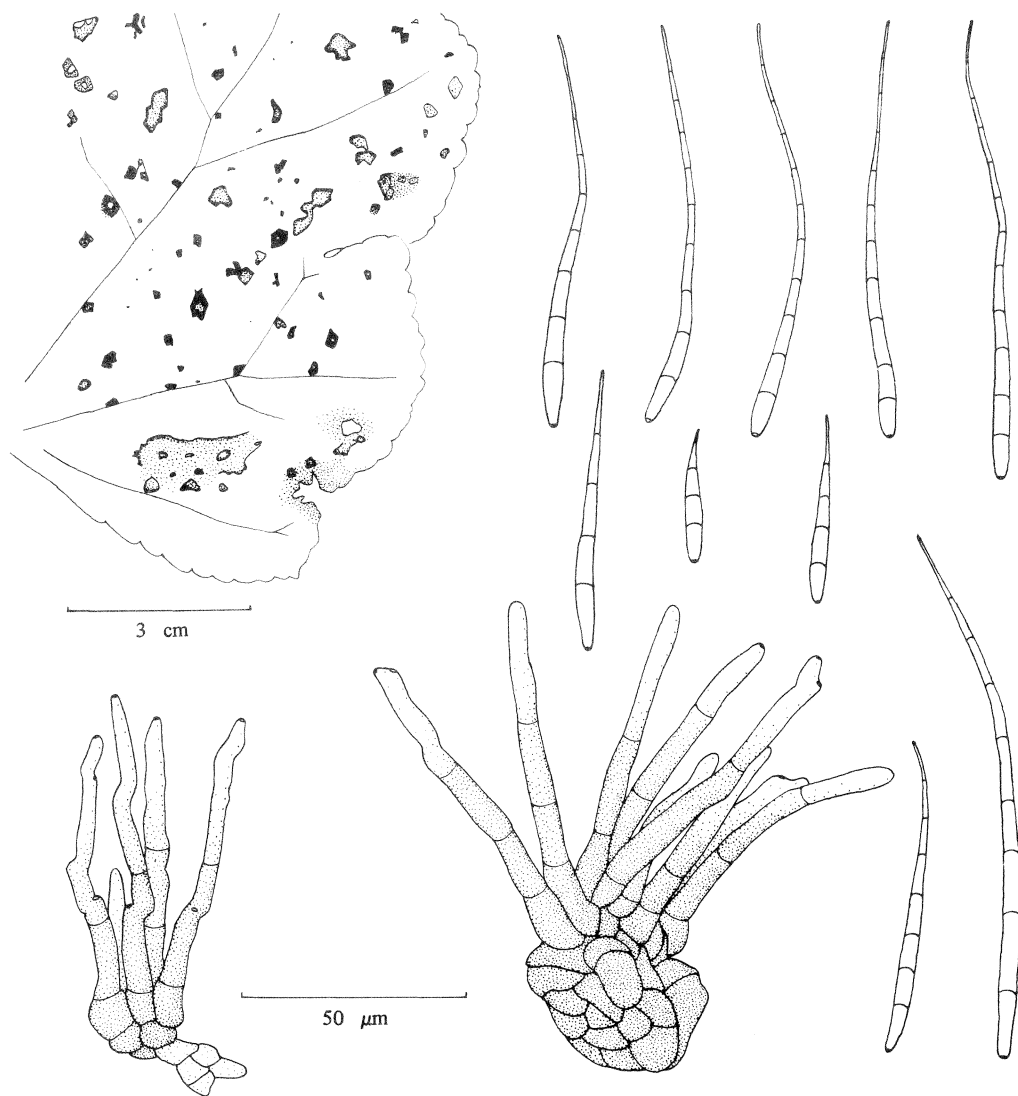


Fig. 51. *Cercospora althaeina* Saccardo on *Althaea rosea*. No. C 175.

μm ; conidia hyaline to subhyaline, acicular, indistinctly multiseptate, scars distinct, base truncate, tip obtuse to subacute, straight to mildly curved, $3.5\text{-}4 \times 52\text{-}256 \mu\text{m}$ (Fig. 50).

Hab. on *Asparagus officinalis*, at ESALQ, Piracicaba, S. P., 27 May 1975, No. C 127.

MALVACEAE

50) ***Cercospora althaeina*** Saccardo, *Michelia* 1 : 269. 1878.

Leaf spots amphigenous, irregular in shape, reddish brown with darker margins, sometimes with dull gray centers, 0.5-5 mm in size, often coalescing to form large fragile blotches, peripheral

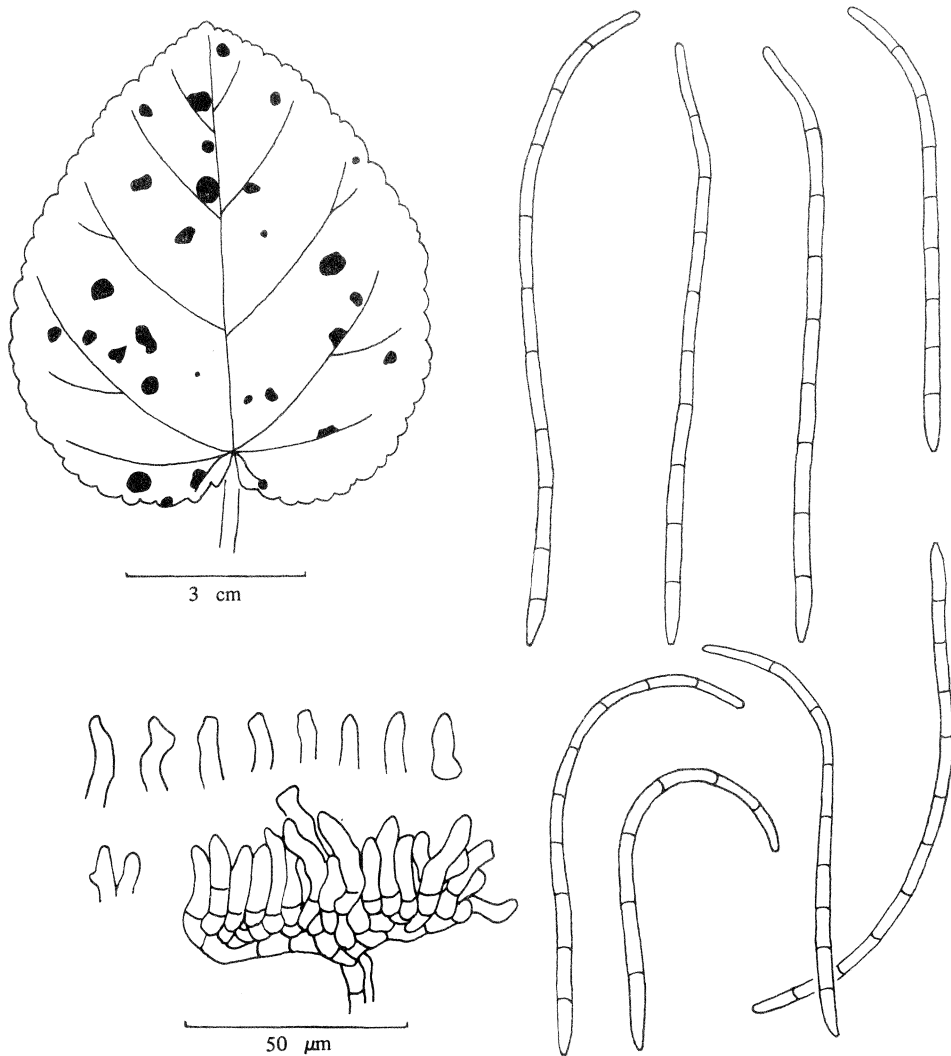


Fig. 52. *Cercospora sidae* (P. Henn.) Marchal et Steyaert on *Sida cordifolia*. No. C 106.

areas often greenish yellow; fruiting amphigenous, more abundant on upper surface; stromata a few brown cells to 40 μm in diameter, globular, brown; fascicles single stalk to dense, usually denser on upper surface; conidiophores medium brown, paler and attenuated toward tip, sometimes uniformly wide, tip truncate to subtruncate and very pale olivaceous, uni- to multiseptate, spore scars medium to small in size, straight to geniculate, often branched, 4-6 \times 44-120 μm ; conidia hyaline, acicular, straight to mildly curved, obconically truncate to truncate, tip acute, indistinctly multiseptate, scars medium to small in size, 2.5-4 \times 32-152 μm (Fig. 51).

Hab. on *Althaea rosea*, at ESALQ, Piracicaba, S. P., 3 December 1975, No. C 175.

- 51) ***Cercospora sidae*** (P. Henn.) Marchal et Steyaert, Monograph F. G. *Cercospora* : 376. 1953.
Syn. *Cercospora sidae* (P. Henn.) Petrak, Ann. Mycol. 30 : 334. 1932.

Leaf spots amphigenous, circular to subcircular, dark reddish brown to grayish brown with dark brown margins, sometimes indistinctly zonate, 0.5-8 mm in diameter, often peripheral areas widely yellowish green, lower surface paler; primary lesions dark brown dots; fruiting epiphyllous; stromata subglobular, brown, 20-60 μm in diameter; fascicles mostly dense; conidiophores pale olivaceous brown, brown in mass, uniformly colored, short, mostly straight, sometimes swollen at some points, attenuated toward bluntly rounded tip, not septate, not geniculate, not branched, spore scars indistinct and small in size, 4-6 \times 8-24 μm ; conidia olivaceous, narrowly cylindrical, straight to curved, base obconic to obconically truncate, tip round, indistinctly uni- to multiseptate, 3.5-5 \times 24-100 μm (Fig. 52).

Hab. on *Sida cordifolia*, *S.* sp., at Fazenda Santa Maria, Novo Horizonte, S. P., 16 August 1974, No. C 49; at Vila Paraiso, Botucatu, S. P., 21 February 1975, No. C 106.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora sidae* (Marchal et Steyaert) Deighton.

MORACEAE

- 52) ***Cercospora morina*** Chupp, Monograph F. G. *Cercospora* : 400. 1953.

Leaf spots contaminated with *Septoria* angular, dark reddish brown, margins dark brown, 1-10 mm in size; fruiting amphigenous; stromata lacking to globular up to 40 μm in size, brown; fascicles 2 stalks to dense; conidiophores sooty olivaceous brown, slightly paler toward tip, geniculate, multiseptate, irregular in width, tip truncate, spore scars distinct, not branched, 4-6 \times 20-80 μm ; conidia hyaline, acicular, base truncate, tip acute to subacute, indistinctly multiseptate, straight to mildly curved, scars large and distinct, 3-4 \times 32-108 μm (Fig. 53).

Hab. on *Morus alba*, at São Pedro, S. P., 17 May 1975, collected by Yodiro Masuda, No. C 121.

MUSACEAE

- 53) ***Cercospora musae*** Zimmermann, Centralbl. f. Bakt. II 8 : 219. 1902.

Leaf spots elliptic, sometimes linear, dark brown with and without dull gray centers, 0.1-5 \times 3-20 mm in size, mostly 2-3 \times 5-10 mm, peripheral areas yellow, later developing to large blotches; fruiting amphigenous; stromata globular, dark brown, 32-48 μm in diameter; fascicles dense; conidiophores olivaceous brown, uniformly colored, short, straight, not geniculate, not branched, tip round, spore scars invisible, 3.5-5 \times 10-20 μm ; conidia olivaceous, cylindrical to narrowly obclavato-cylindrical, base obconic, tip round to obtuse, straight to mildly curved, indistinctly 1-5 septate, 3.5-4 \times 20-72 μm (Fig. 54).

Hab. on *Musa sapientum*, at Guaira Paraná, 26 December 1974, No. C 80; at ESALQ, Piracicaba, S. P., 23 July 1974, No. C 9; at Estação Experimental de Presidente Medici de

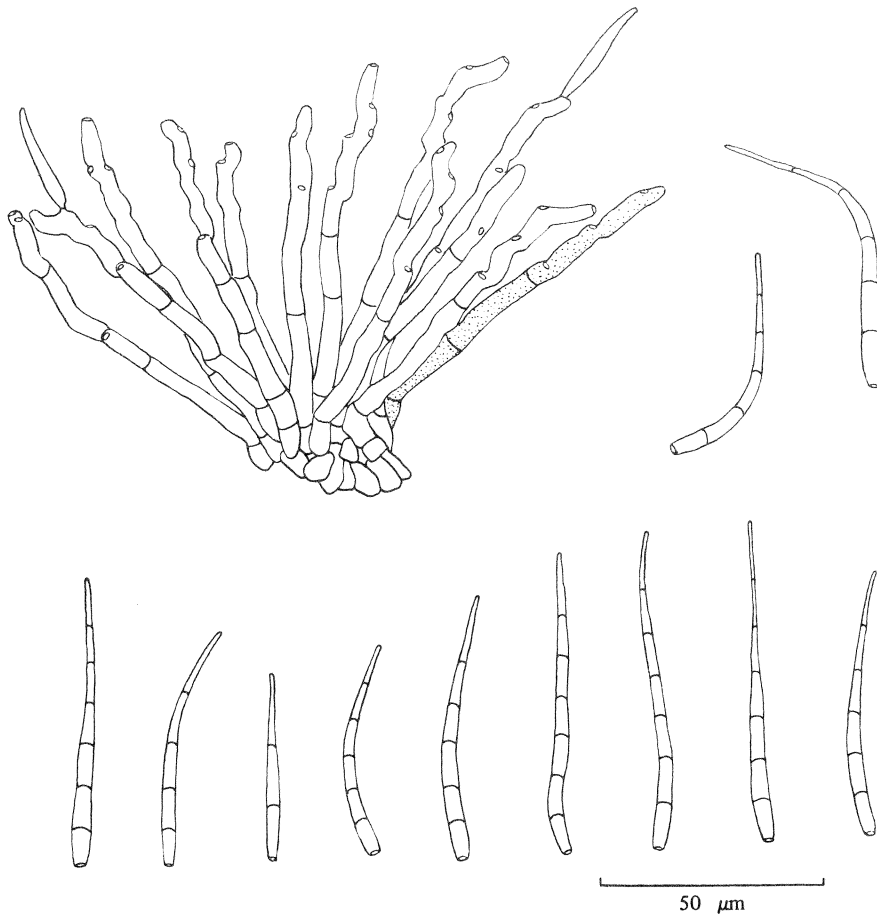


Fig. 53. *Cercospora morina* Chupp on *Morus alba*. No. C 121.

FCMBB, Botucatu, S. P., 10 December 1975, No. C 166; at Piranema, Itaguai, Rio de Janeiro, 19 October 1974, No. C 62.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora musae* (Zimm.) Deighton.

MYRTACEAE

54) *Cercospora eucalypti* Cooke et Masee, Grevillea 18 : 7. 1889.

Leaf spots irregular in shape, dark red, margins black, central parts dark gray and slightly sunken, higher than healthy parts as a whole, 0.5-6 mm in size; primary lesions red dots; peripheral areas slightly yellowish green; fruiting amphigenous; stromata lacking; non-fasciculate, fascicle-like structures with 1-10 stalks were sometimes observed at stomata; conidiophores borne directly from procumbent hyphae, pale to medium olivaceous brown, paler toward tip, 0-2 septate, irregular in width, spore scars medium in size, often branched, 2.5-4 × 12-40 μm; conidia hyaline to pale olivaceous, linear, curved, base obconic to subtruncate, tip subacute,

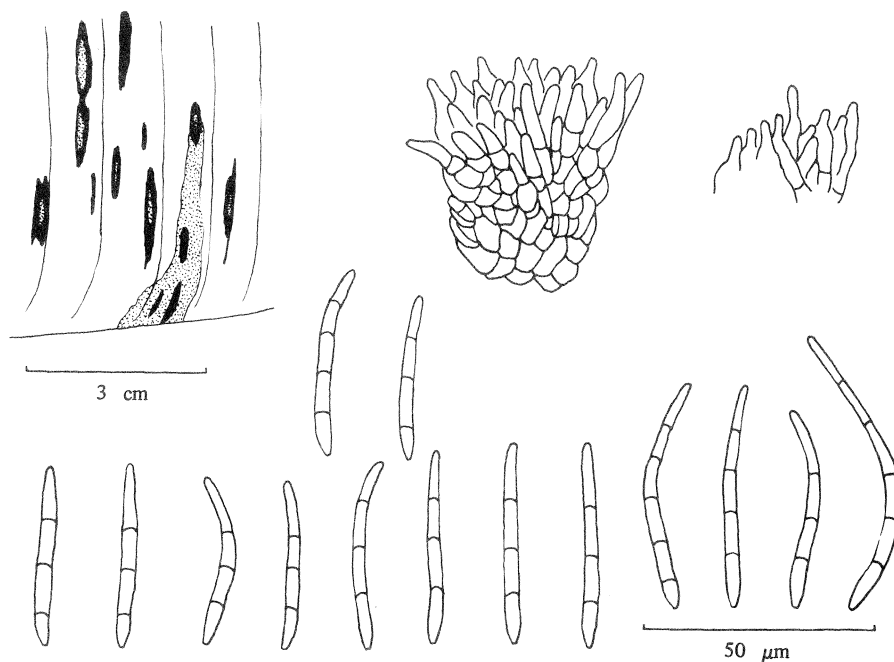


Fig. 54. *Cercospora musae* Zimmermann on *Musa sapientum*. No. C 80.

indistinctly 2-5 septate, scars indistinct, $1.5-2.5 \times 12-120 \mu\text{m}$ (Fig. 55).

Hab. on *Eucalyptus* sp., at Santa Fé, Piracicaba, S. P., 21 January 1975, No. C 89.

55) *Cercospora myrticola* Spegazzini, Anal. Soc. Sci. Argentine 16 : 167. 1883.

Leaf spots amphigenous, circular to irregular in shape, 2-5 mm in size, often large blotches at leaf edges up to $5-6 \times 15-20$ mm in size, reddish brown with dark brown margins, lower surface paler; fruiting chiefly epiphyllous; stromata globular, pale brown, $16-104 \mu\text{m}$ in diameter; fascicles mostly dense; conidiophores pale olivaceous, uniformly colored, uniformly wide, sometimes attenuated, tip conic to obconic, often round, not geniculate, not branched, indistinctly sparsely septate, spore scars small in size, $2.5-3.5 \times 12-40 \mu\text{m}$; conidia pale olivaceous, obclavato-cylindric, straight to mildly curved, base obconically truncate to obconic and sometimes concave, tip mostly obtuse and sometimes subacute or round, indistinctly 1-8 septate, $2.5-4 \times 20-88 \mu\text{m}$ (Fig. 56).

Hab. on *Myrciaria cauliflora*, at Fazenda Santa Maria, Novo Horizonte, S. P., 16 August 1974, No. C 53.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora myrticola* (Speg.) Deighton.

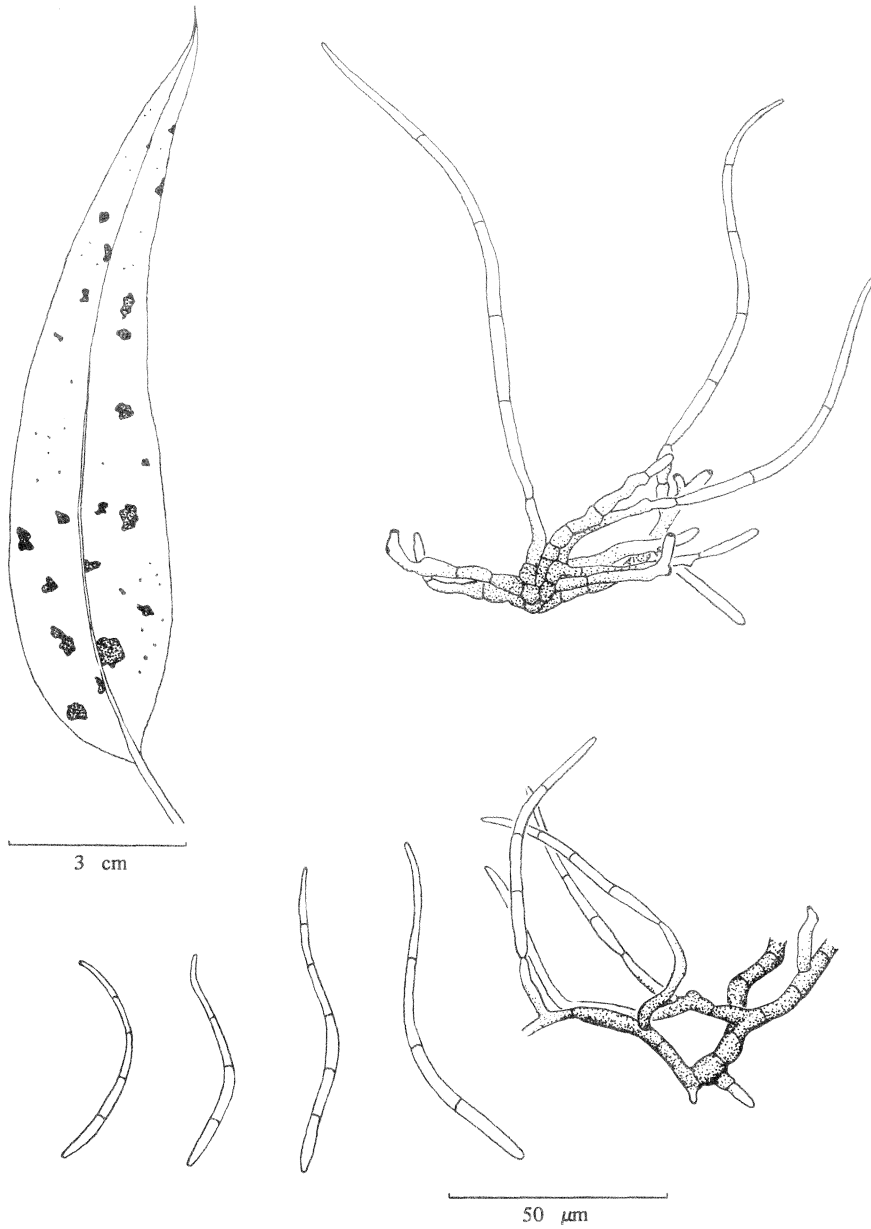


Fig. 55. *Cercospora eucalypti* Cooke et Massee on *Eucalyptus* sp. No. C 89.

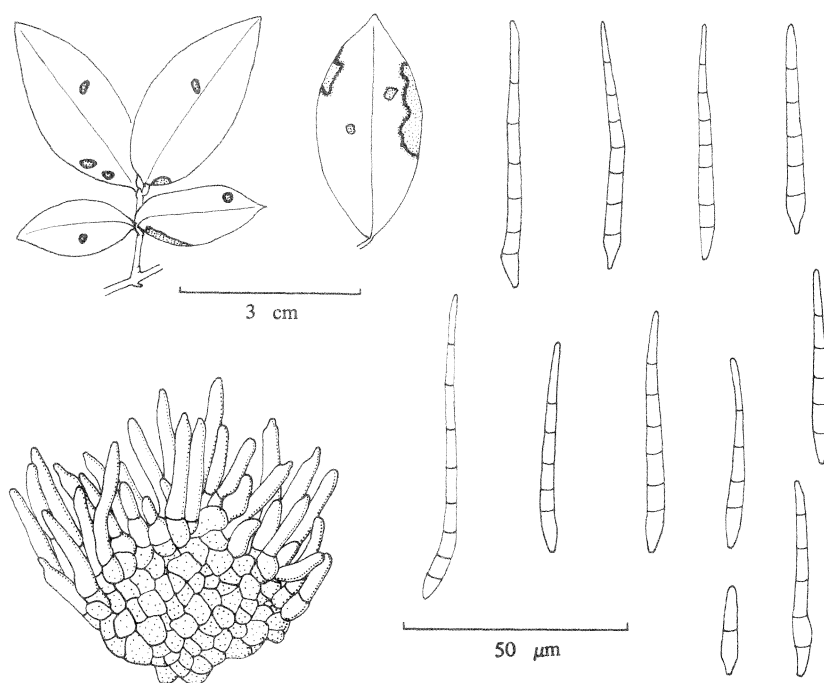


Fig. 56. *Cercospora myrticola* Spegazzini on *Myrciaria cauliflora*. No. C 53.

56) ***Cercospora sawadae*** Yamamoto, Jour. Soc. Trop. Agr. Formosa 6 : 607. 1934.

Leaf spots chiefly hypophyllous, dark reddish brown, irregular in shape, 0.5-2 mm in size, later coalescing to form larger lesions, leaf spots on upper surface reddish brown color darker than that of spots on lower surface, irregular in shape, usually 0.5-1 mm in size; fruiting hypophyllous, effuse; stromata lacking; non-fasciculate or sometimes fascicle-like structures at stomata; conidiophores borne from procumbent hyphae, pale olivaceous, uniformly colored, short ones almost uniformly wide, long ones attenuated toward tip, straight to geniculate, sometimes branched, sparingly septate, tip round to obconic, spore scars indistinct and minute, old ones pale fuliginous and apical parts paler, $2.5-4 \times 8-60 \mu\text{m}$, sometimes $80 \mu\text{m}$ or longer; conidia olivaceous, obclavato-cylindric to linear, base obconic to obconically truncate, tip obtuse and sometimes round, straight to mildly curved, 1-9 septate, sometimes catenulate $1.5-3.5 \times 20-118 \mu\text{m}$ (Fig. 57).

Hab. on *Psidium guajava*, at ESALQ, Piracicaba, S. P., 9 October 1974, No. C 55.

PEDALIACEAE

57) ***Cercospora sesami*** Zimmermann, Ber. Land. Forst. Deut. Ostaf. 2 : 28. 1904.

The fungus was obtained by keeping sesame seeds in moist chamber for two days; stromata lacking; fascicles one to a few stalks; conidiophores medium to dark brown, paler and narrower toward tip, multiseptate, tip truncate, not geniculate, not branched, straight to sinuous, spore

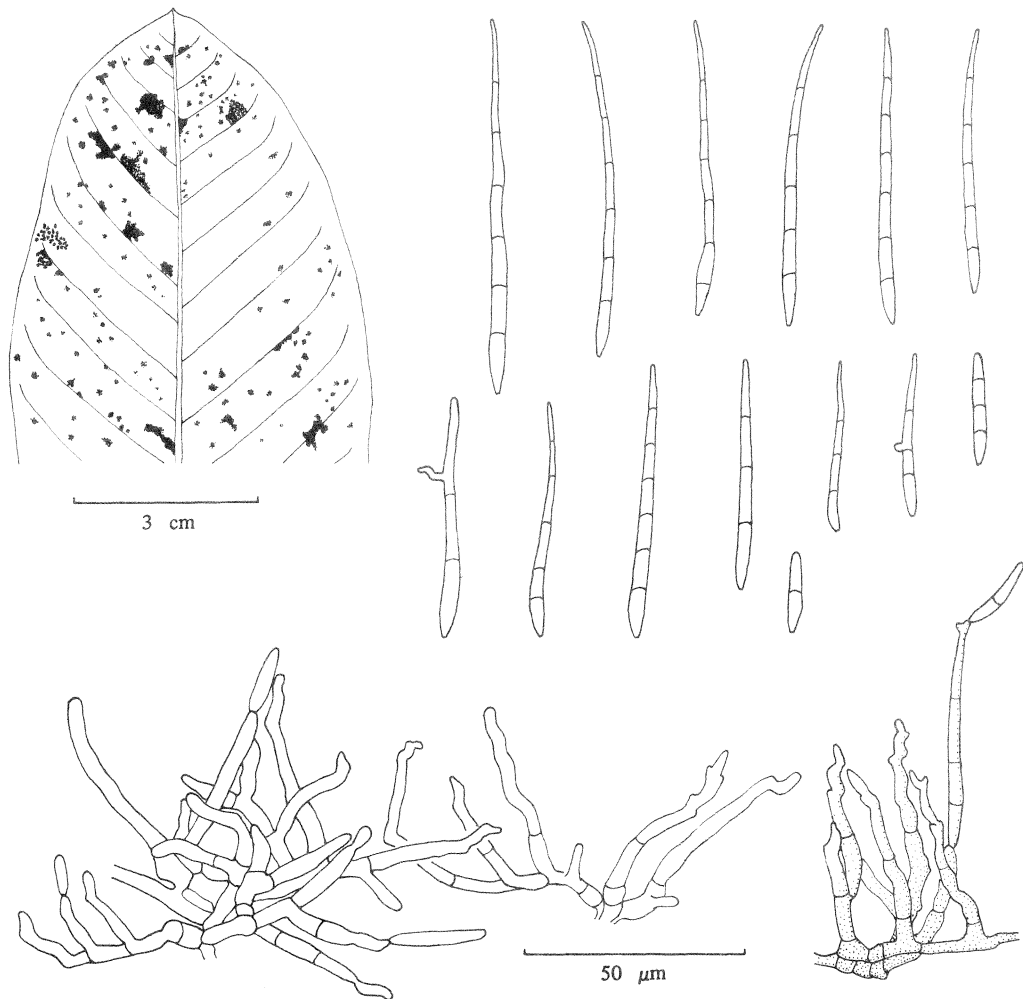


Fig. 57. *Cercospora sawadae* Yamamoto on *Psidium guajava*. No. C 55.

scars distinct and medium in size, $3.5-5 \times 148-232 \mu\text{m}$; conidia acicular, hyaline, base truncate, tip subacute, straight to curved, indistinctly multiseptate, scars distinct and medium in size, $2.5-4 \times 164-348 \mu\text{m}$ (Fig. 58).

Hab. on *Sesamum indicum*, on seeds collected at Fazenda Experimental de São Manuel de FCMBB, São Manuel, S. P., in 1974 by Chukichi Kurosawa, 9 December 1975, No. C 159.

PUNICACEAE

58) *Cercospora punicae* P. Hennings, Bot. Jahrb. von Engler 37 : 165. 1906.

Leaf spots amphigenous, circular, 0.5-3 mm in diameter, later irregular in shape and up to 6 mm in size, dark reddish brown to almost black, margins black, peripheral narrow

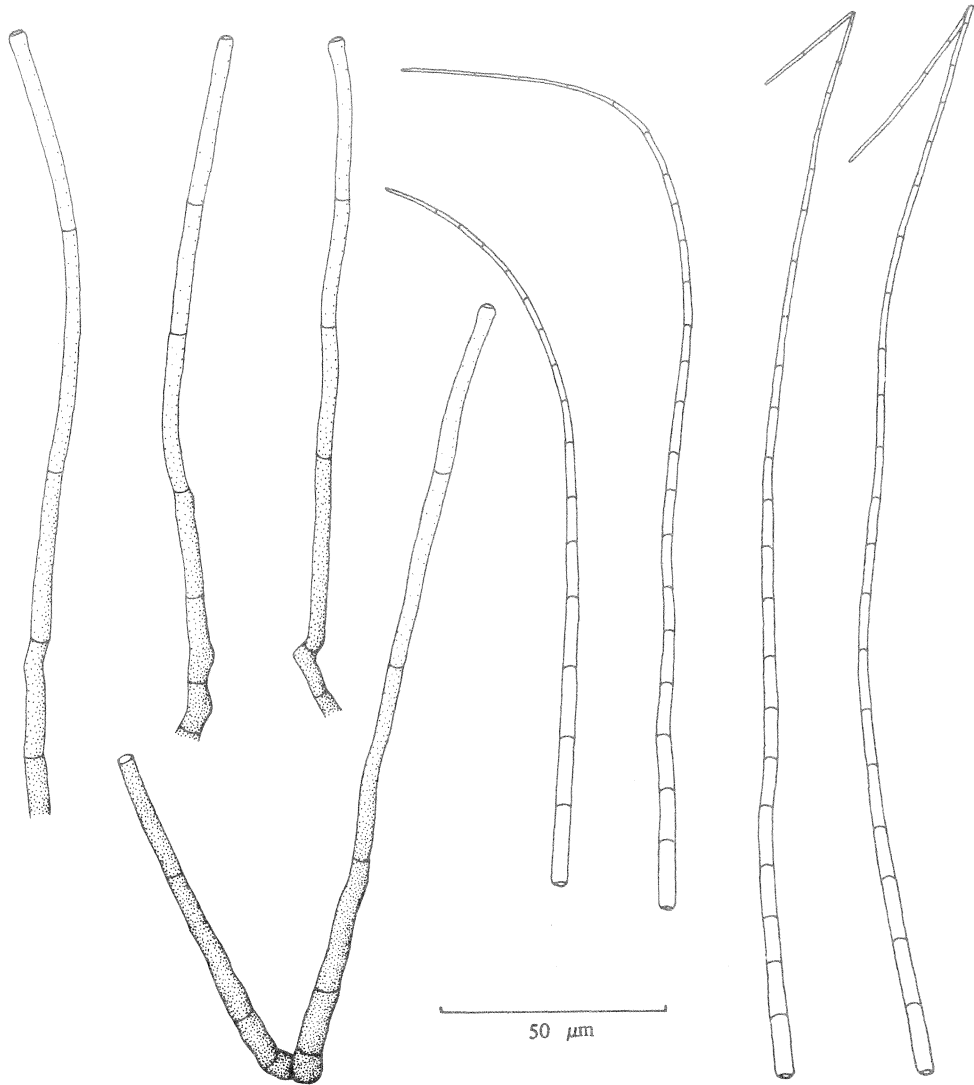


Fig. 58. *Cercospora sesami* Zimmermann on *Sesamum indicum*. No. C 159.

areas orange red and about 0.5 mm in width; fruiting amphigenous; stromata on upper surface globular, brown, 28-80 μm in diameter; stromata on lower surface lacking to minute, olivaceous brown when present; fascicles on upper surface mostly dense, fascicles on lower surface lacking or 2-20 stalks; conidiophores very pale to pale olivaceous, uniformly colored, straight to sinuous, tip obconic, spore scars minute and indistinct, sparingly septate, not branched, mostly not geniculate, 2-3.5 \times 12-40 μm , sometimes on lower surface borne from procumbent hyphae; conidia pale olivaceous, narrowly obclavato-cylindric, straight to curved, base obconic, tip round to obtuse, indistinctly uni- to multiseptate, 2-3.5 \times 20-84 μm (Fig. 59).

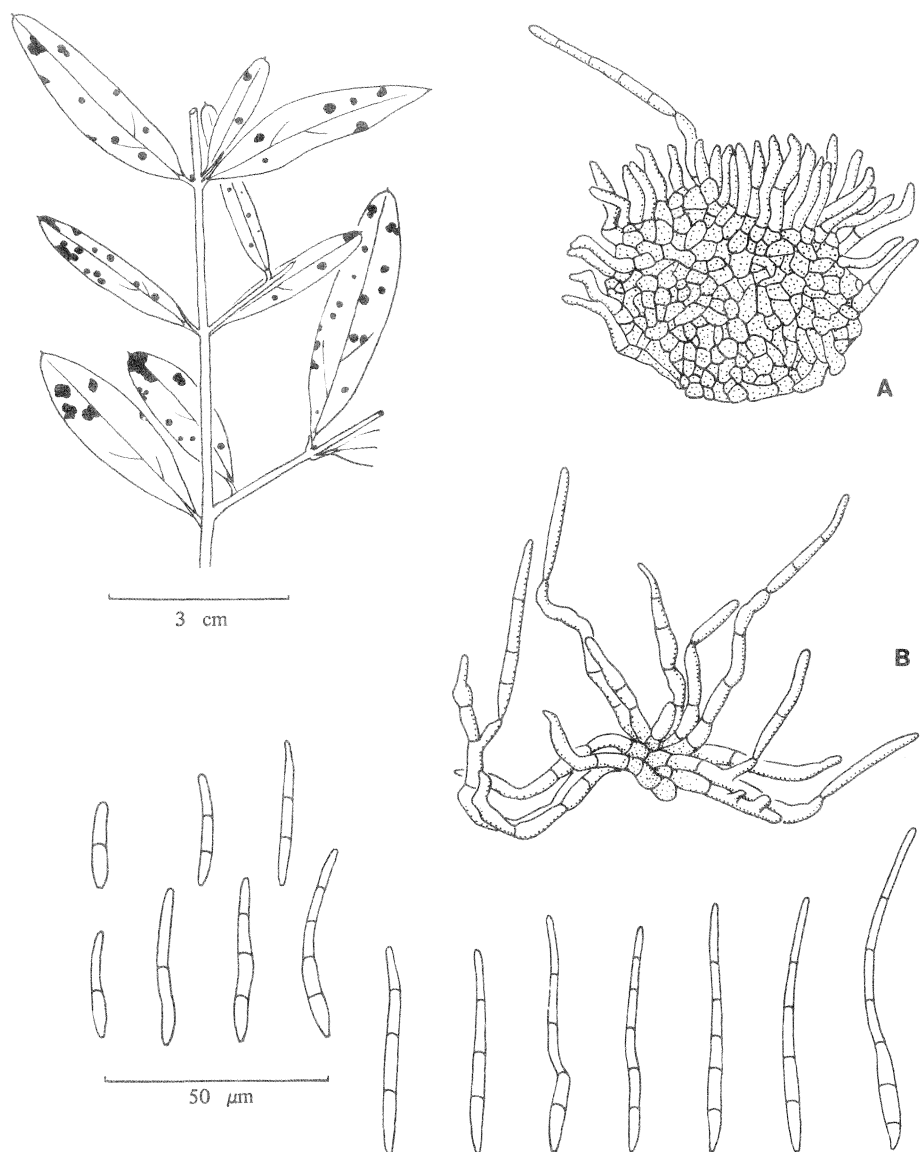


Fig. 59. *Cercospora punicae* P. Hennings on *Punica granatum*. No. C 35.
 A : Stroma and conidiophores on upper surface of lesion. B : Stroma and conidiophores on lower surface.

Hab. on *Punica granatum*, at Fazenda Citra, Limeira, S. P., 5 August 1974, No. C 35; between Campinas and Viracopos, Campinas, S. P., 8 December 1974, No. C 73.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora punicae* (P. Henn.) Deighton.

ROSACEAE

59) *Cercospora cydoniae* Ellis et Everhart, Jour. Mycol. 8 : 72. 1902.

Syn. *Cercospora cydoniae* Rangel, Bol. Agr. S. Paulo Ser. 16 : 322. 1915.

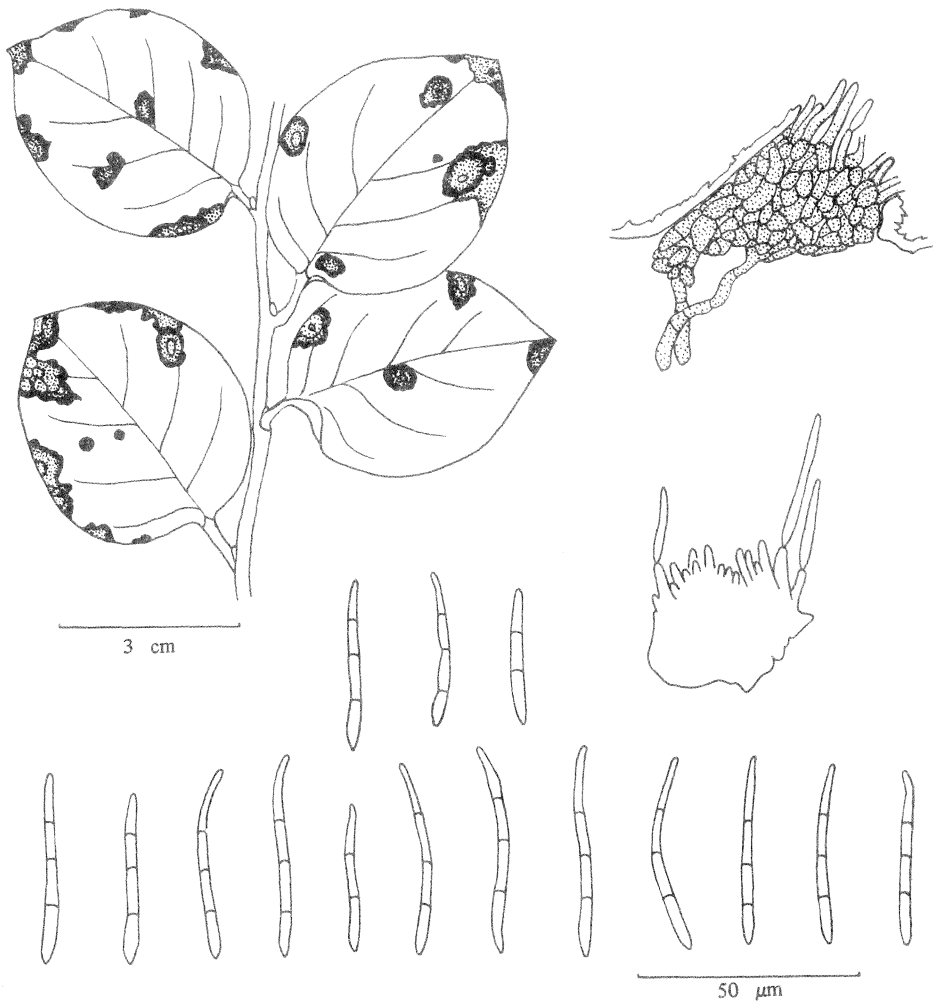


Fig. 60. *Cercospora cydoniae* Ellis et Everhart on *Cydonia oblonga*. No. C 111.

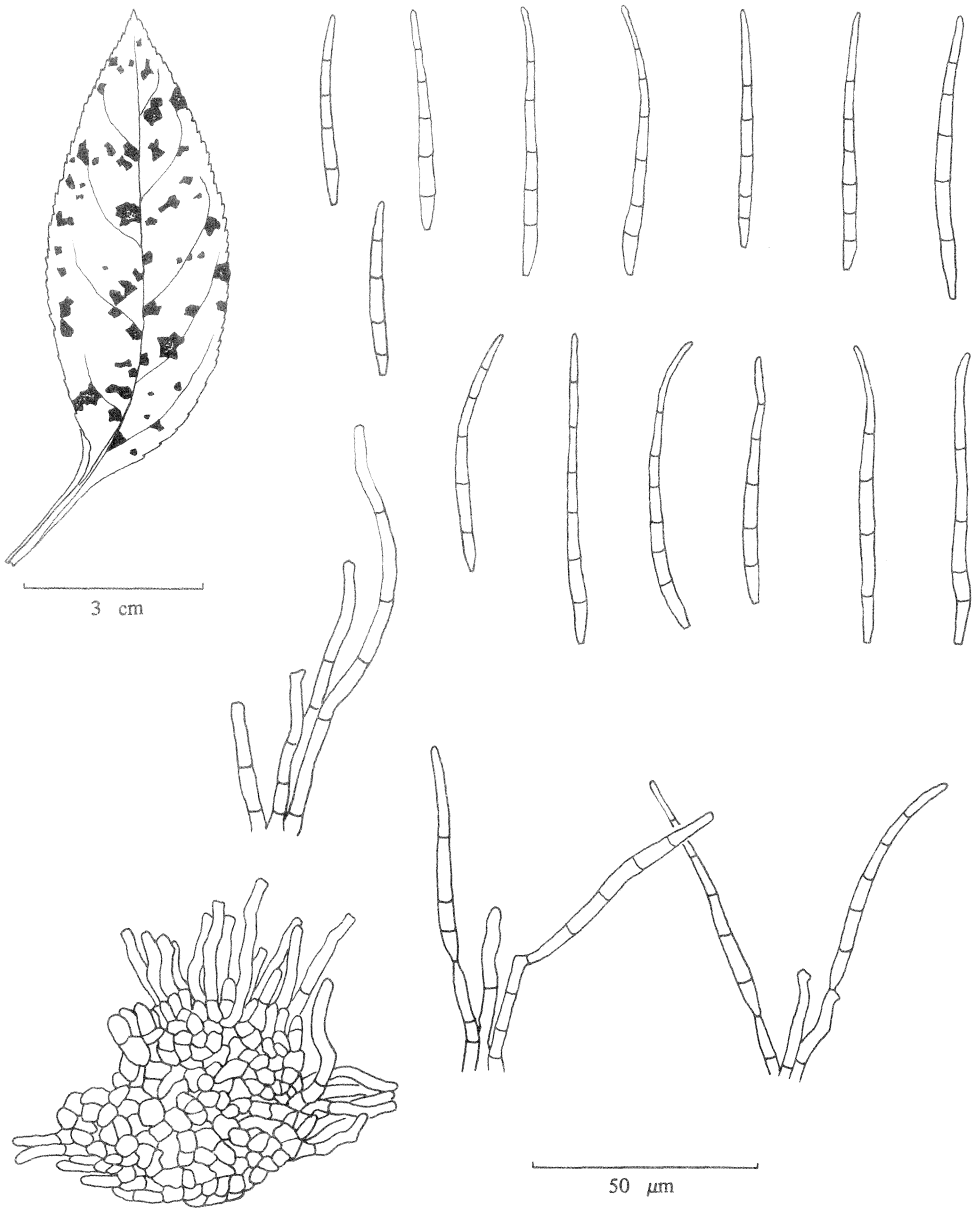


Fig. 61. *Cercospora cydoniae* Ellis et Everhart on *Chaenomeles lagenaria*. No. C 91.

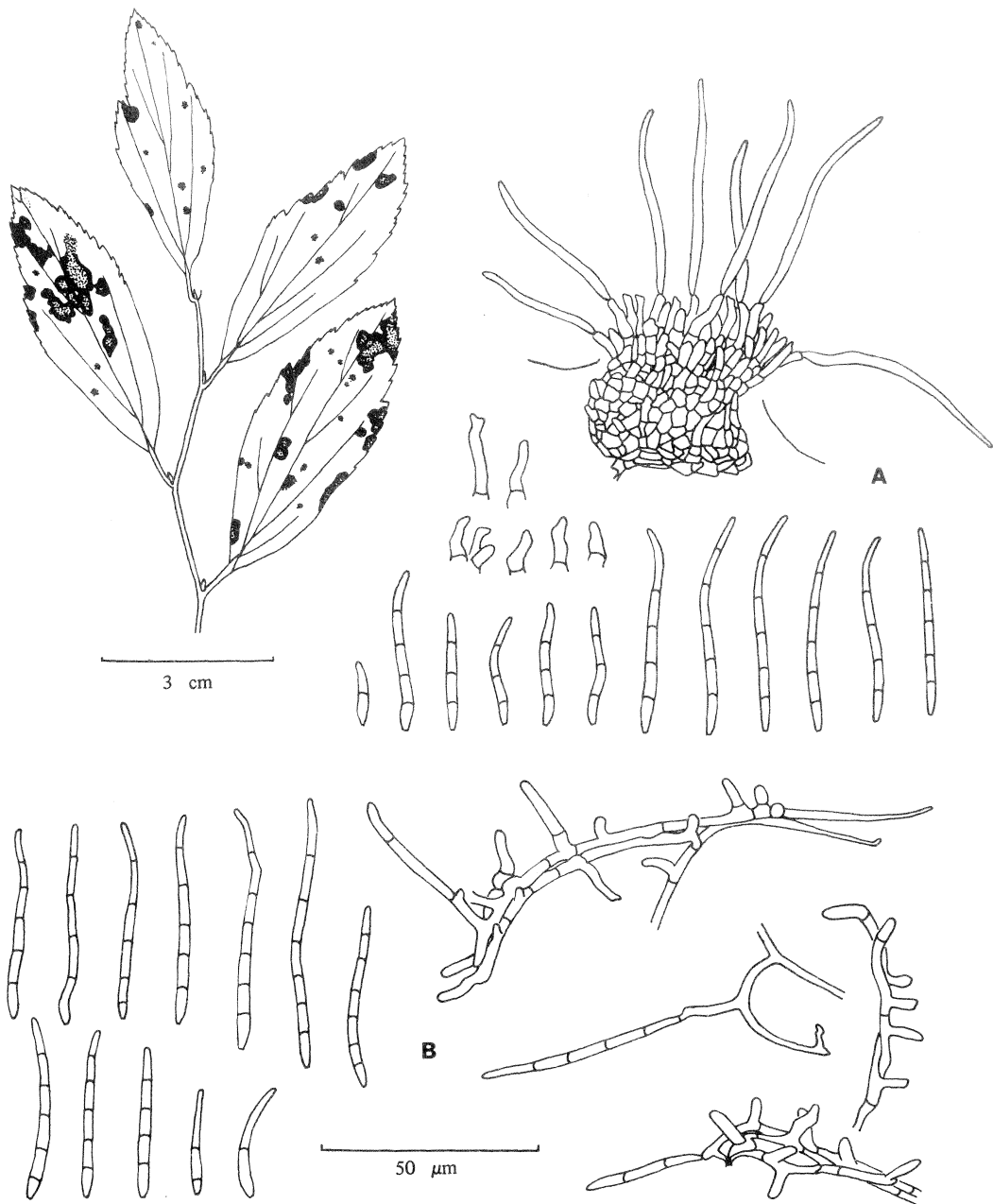


Fig. 62. *Cercospora spiraeicola* Muller et Chupp (A) on upper surface and *C. laxipes* J. J. Davis (B) on lower surface of lesions of *Spiraea hipericifolia*. No. C 138.

On *Cydonia oblonga* : leaf spots amphigenous, circular to irregular, often zonate, dark reddish brown, mostly darker toward margins, central parts brownish gray, often with black dots, lower surface dull reddish brown and indistinctly zonate, 1-10 mm in diameter, later coalescing to form large lesions; fruiting chiefly epiphyllous; fascicles dense; stromata subcircular, brown, 28-40 μm in diameter; conidiophores olivaceous brown, paler toward tip, septa invisible, tip obconic, not branched, straight, not geniculate, 1.5-2.5 \times 4-20 μm ; conidia almost hyaline, obclavate to cylindric, base obconic, tip round to obtuse, indistinctly 3-5 septate, mildly curved, 3-3.5 \times 32-52 μm (Fig. 60).

On *Chaenomeles lagenaria* : leaf spots angular to irregular, vein-limited, 0.5-10 mm in size, reddish brown on upper surface, central parts sometimes brownish gray, dull reddish brown on lower surface; fruiting chiefly epiphyllous; stromata globular, 32-80 μm in diameter; fascicles dense; conidiophores pale olivaceous brown, uniformly colored, indistinctly 1-6 septate, spore scars almost invisible, tip obconic, 2-3.5 \times 16-72 μm ; conidia olivaceous, linear to obclavato-cylindric, mildly curved, indistinctly 3-9 septate, base obconic, tip round, 3-4 \times 36-88 μm (Fig. 61).

Hab. on *Cydonia oblonga*, *Chaenomeles lagenaria*, at ESALQ, Piracicaba, S. P., 1 March 1975, No. C 111; at Avenida São João 667, Piracicaba, S. P., 22 January 1975 & 14 February 1975, No. C 91.

60) ***Cercospora laxipes*** J. J. Davis, Trans. Wisc. Acad. Sci. 30 : 11. 1937.

Leaf spots amphigenous, more distinct on upper surface, circular to irregular, reddish brown, margins dark brown, central parts sometimes dull grayish brown, 1-8 mm in size, primary lesions dark brown and effuse; fruiting hypophyllous; stromata lacking; conidiophores non-fasciculate, borne from procumbent hyphae, pale olivaceous, uniformly colored, tip round to obconic, branched, sparingly septate, 2.5-4 \times 8-44 μm ; conidia olivaceous, obclavato-cylindric, straight to mildly curved, base obconic, tip round to obtuse, indistinctly multiseptate, 2.5-3.5 \times 32-76 μm (Fig. 62).

Hab. on *Spiraea hipericifolia*, at ESALQ, Piracicaba, S. P., 11 June 1975, No. C 138; at ESALQ, Piracicaba, S. P., 28 July 1974, No. C 17; at Caucaia do Alto, Cotia, S. P., 8 June 1975, No. C 136.

Note : Upper surfaces of lesions of all the specimens above were always infected by *Cercospora spiraeicola* Muller et Chupp as mentioned later. Characters of conidia and conidiophores of both species were quite similar. Remarkable differences were observed in the case of stromata and fascicles. Both species were reported from different countries and on different host plants. In São Paulo State, both fungus species, *C. spiraeicola* and *C. laxipes*, were always found in association on *Spiraea hipericifolia*, but separately on upper and lower surface of leaves. Such findings suggest the need for carrying out a cross inoculation test.

61) ***Cercospora mali*** Ellis et Everhart, Jour. Mycol. 4 : 116. 1888.

Syn. *Cercospora minima* Tracy et Earle, Bul. Torrey Bot. Club 23 : 206. 1896.

Leaf spots amphigenous, angular, vein-limited, 1-5 mm in size, reddish brown on upper surface, dull brown on lower surface, sometimes zonate, central parts sometimes paler; fruiting epiphyllous; stromata globular, dark brown, 16-36 μm in diameter; fascicles very dense; conidiophores short, pale olivaceous brown, uniformly colored, tip round to obconic, not geniculate, not branched, not septate, spore scars indistinct, 2.5-3.5 \times 8-24 μm ; conidia pale olivaceous, cylindric, straight to mildly curved, base obconic, tip subacute, indistinctly 2-5

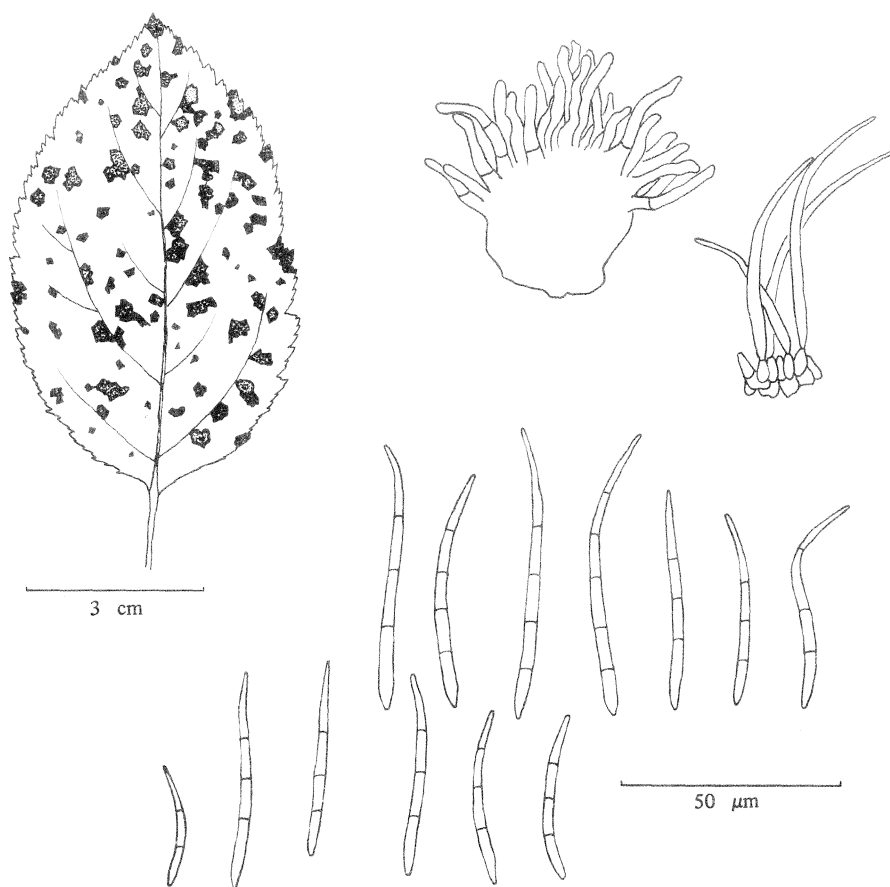


Fig. 63. *Cercospora mali* Ellis et Everhart on *Malus pumila* var. *domestica*. No. C 88.

septate, $2-3.5 \times 36-60 \mu\text{m}$ (Fig. 63).

Hab. on *Malus pumila* var. *domestica*, *Pyrus communis*, at Santa Fé, Piracicaba, S. P., 21 January 1975, No. C 88; at ESALQ, Piracicaba, S. P., 22 July 1974, No. C 6; at Ponta Alta, Itapetininga, S. P., 14 August 1974, No. C 52; at Ponta Alta, Itapetininga, S. P., 14 August 1974, No. C 51; at Estação Experimental de Presidente Medici de FCMBB, Botucatu, S. P., 10 December 1975, No. C 163.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora mali* (Ell. et Ev.) Deighton.

62) ***Cercospora prunicola*** Ellis et Everhart, Jour. Mycol. 3 : 17. 1887.

Leaf spots contaminated with rust fungus circular, brown, easily detached from healthy parts, making holes, 2-4 mm in diameter; fruiting epiphyllous; stromata globular, brown, about

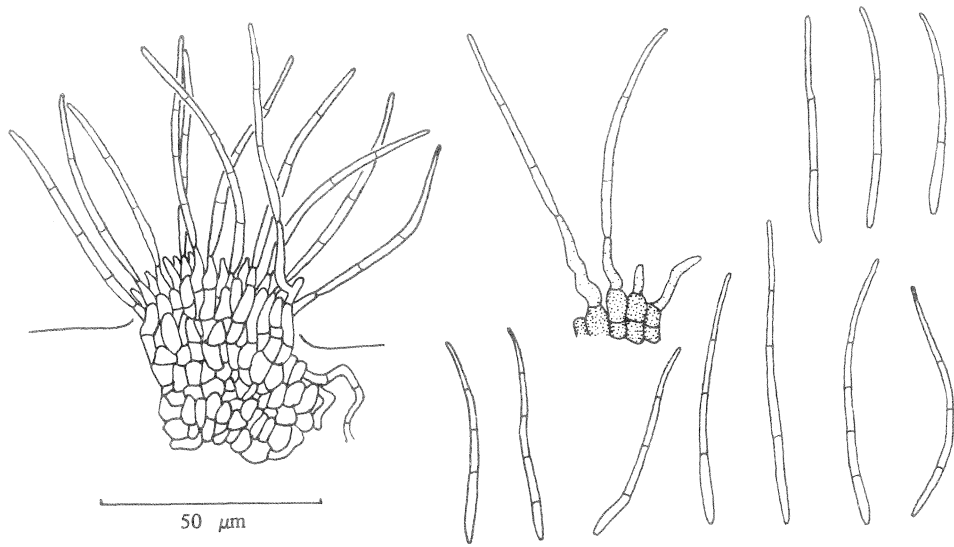


Fig. 64. *Cercospora prunicola* Ellis et Everhart on *Persica vulgaris*. No. C 114.

40 μm in diameter; fascicles very dense; conidiophores pale olivaceous, uniformly colored, tip obconic to round, 0-1 septate, 1.5-2.5 \times 8-20 μm ; conidia almost hyaline, linear, curved, base obconic, tip subacute to obtuse, indistinctly 2-4 septate, scars indistinct, 1.5-2.5 \times 36-72 μm (Fig. 64).

Hab. on *Persica vulgaris*, at Ponta Alta, Itapetininga, S. P., 8 March 1975, No. C 114; at Santa Fé, Piracicaba, S. P., 21 January 1975, No. C 90.

63) ***Cercospora rosicola*** Passerini, Just's Bot. Jahresber. 3 : 276. 1877.

Sometimes misspelled as *Cercospora rosaecola* Passerini.

Leaf spots circular, dark brownish purple, central parts often dark reddish brown, margins poorly defined, not vein-limited, 0.5-5 mm in diameter, lower surface paler and a little smaller; fruiting amphigenous, abundant on upper surface; stromata minute to a few brown cells; fascicles 2-13 stalks; conidiophores pale to medium brown, paler and slightly attenuated toward tip, straight to sinuous, mostly geniculate, rarely branched, indistinctly sparsely septate, spore scars indistinct and small, tip obconically round, 3.5-4 \times 24-80 μm ; conidia pale sooty olivaceous, obclavate to obclavato-cylindric, base obconically truncate, tip round to obtuse, straight to mildly curved, indistinctly 1-4 septate, mostly 2-3, scars small and indistinct, 4-5 \times 18-56 μm (Fig. 65).

Hab. on *Rosa* sp., at Fazenda Experimental de São Manuel de FCMBB, São Manuel, S. P., 8 December 1975, No. C 156.

64) ***Cercospora spiraeicola*** Muller et Chupp, Ceiba 1 : 177. 1950.

Symptoms were described above in the section on *Cercospora laxipes*. Fruiting epiphyllous, very rarely amphigenous; stromata globular, 20-60 μm in diameter; fascicles very dense; conidiophores olivaceous, uniformly colored, tip round to obconic, sometimes mildly geniculate, sparingly septate, not branched, sometimes irregular in width, spore scars indistinct, 2.5-3.5 \times

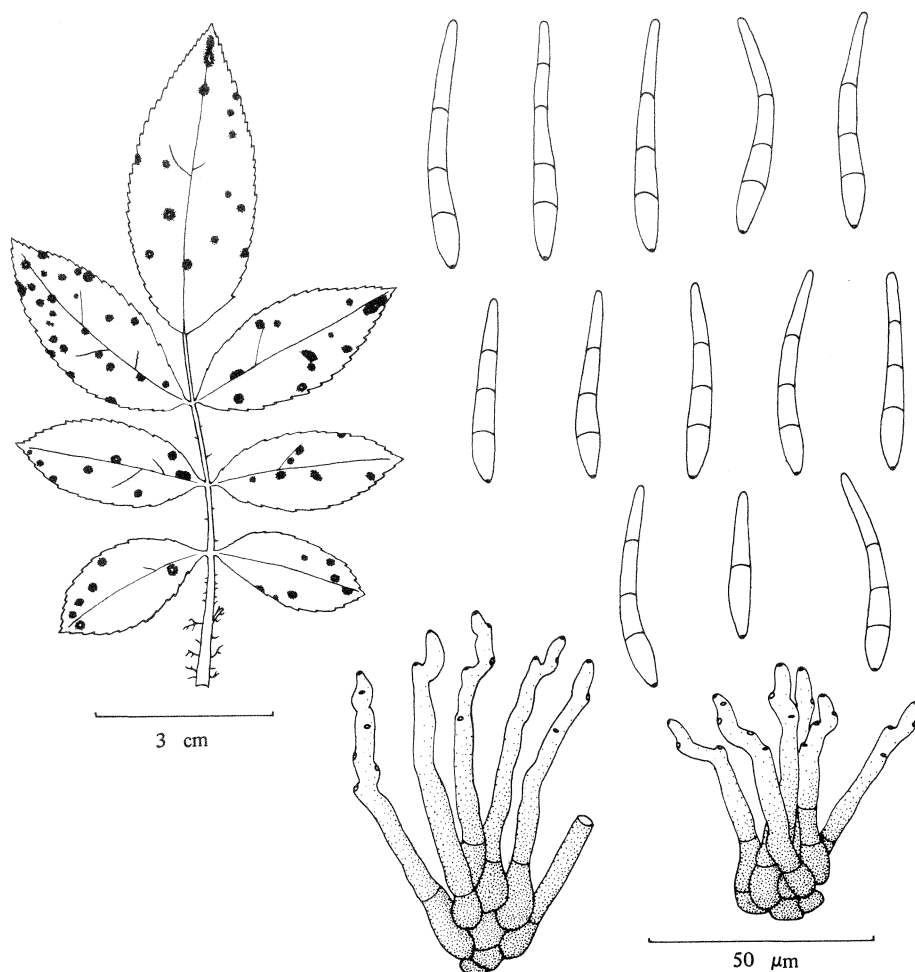


Fig. 65. *Cercospora rosicola* Passerini on *Rosa* sp. No. C 156.

12-40 μm ; conidia olivaceous, obclavato-cylindric, base obconic, tip round to obtuse, straight to mildly curved, scars mostly indistinct, indistinctly uni- to multiseptate, 2.5-3.5 \times 16-64 μm (Fig. 62).

Hab. on *Spiraea hypericifolia*; the specimens are the same as those described in the section on *C. laxipes*.

Note : Lower surfaces of all the specimens were infected by *C. laxipes*. See "Note" of *C. laxipes*.

RUBIACEAE

65) *Cercospora coffeicola* Berkeley et Cooke, Grevillea 9 : 99. 1881.

Syn. *Cercospora coffeae* Zimmermann, Ber. Land. Forst. Deut. Ostaf. 2 : 35. 1904.

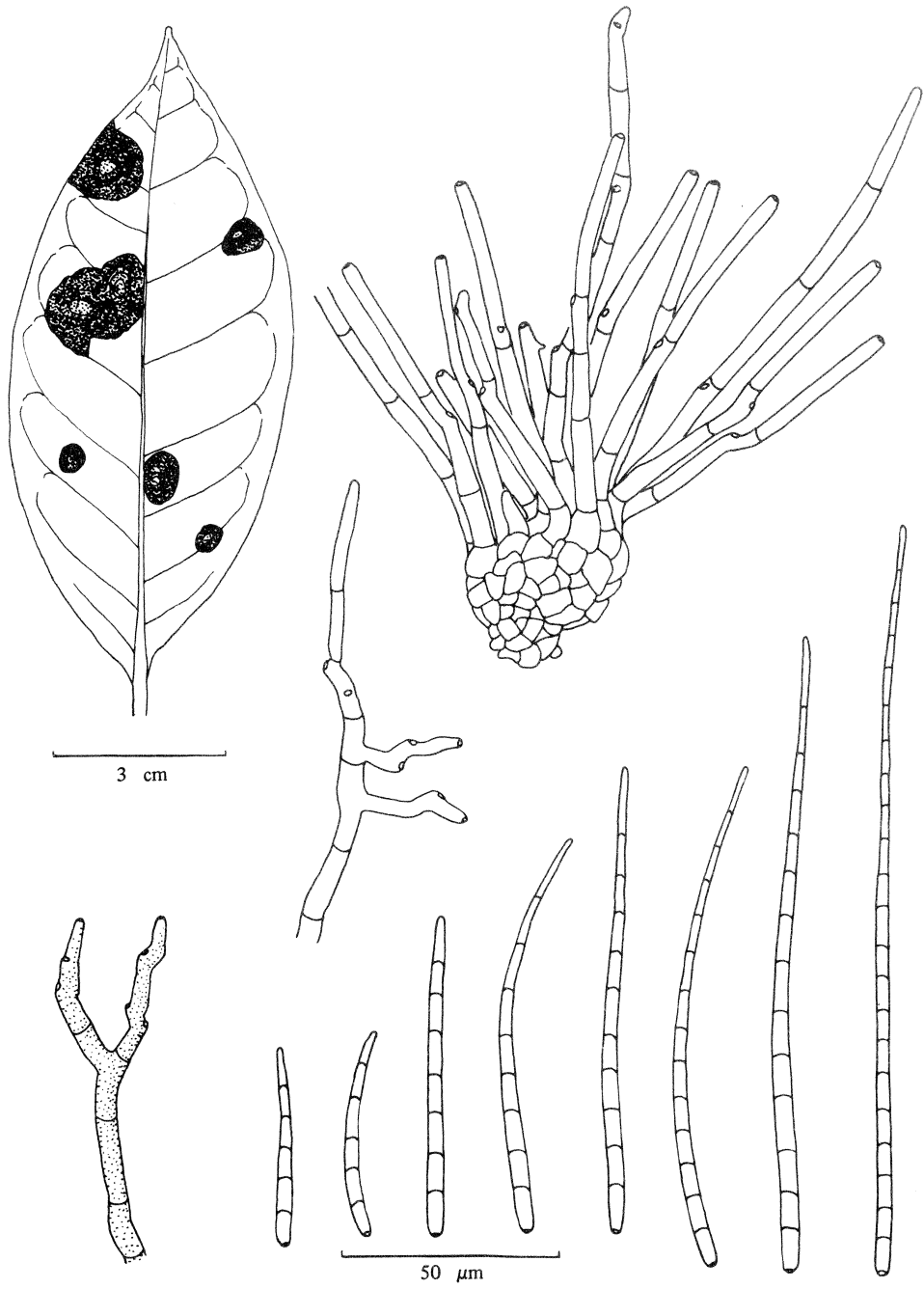


Fig. 66. *Cercospora coffeicola* Berkeley et Cooke on *Coffea arabica*. No. C 2.

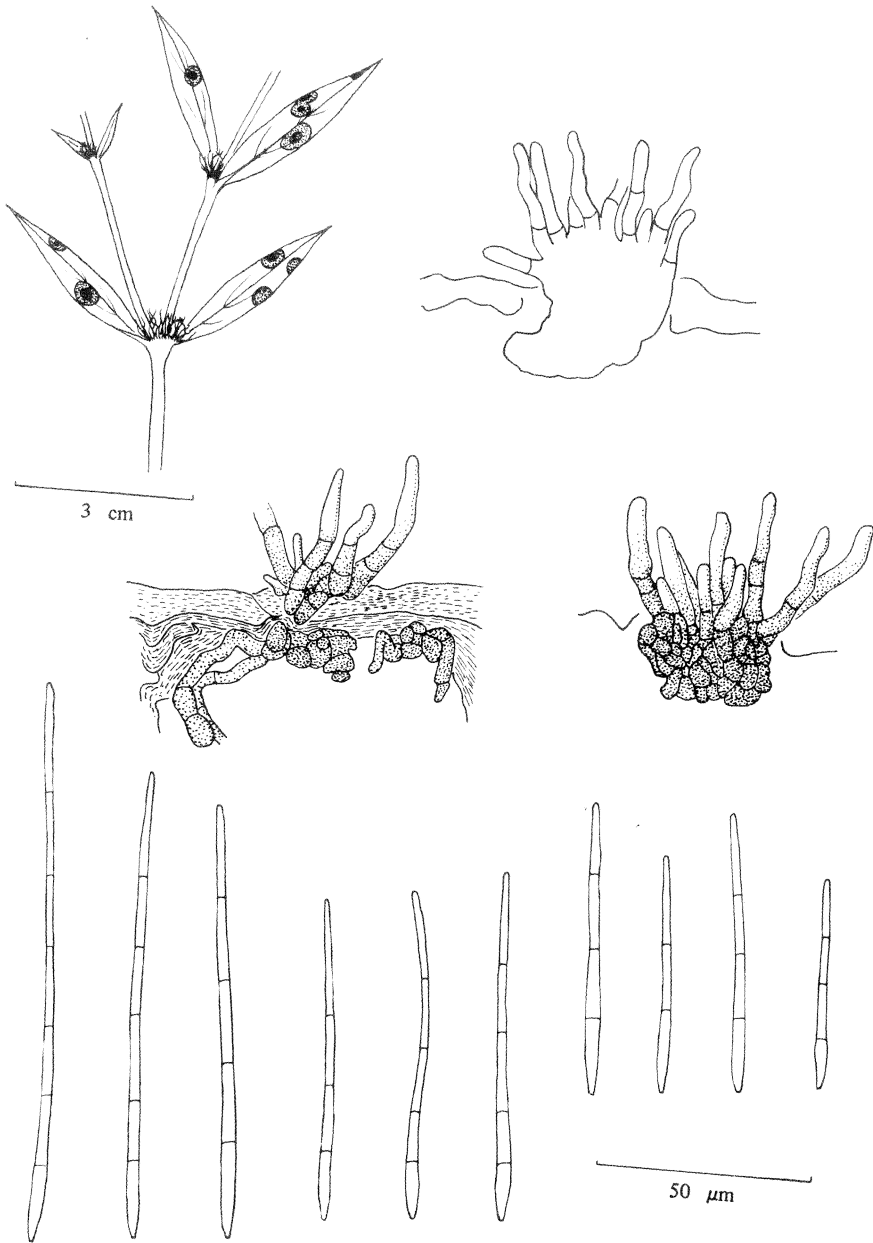


Fig. 67. *Cercospora diodiae* Cooke on *Diodia saponariifolia*. No. C 95.

Leaf spots amphigenous, circular, not vein-limited, 1-20 mm in diameter, reddish brown, central parts hazy gray, distinctly zonate, peripheral areas of upper surface yellowish green, those of lower surface paler yellowish to reddish green; fruiting amphigenous; stromata minute, olivaceous brown to brown, globular, 20-40 μm in diameter; fascicles 5 stalks to dense; conidiophores pale olivaceous to medium brown, sometimes paler and narrower toward almost hyaline tip, multiseptate, tip truncate, straight to geniculate, often branched, spore scars distinct

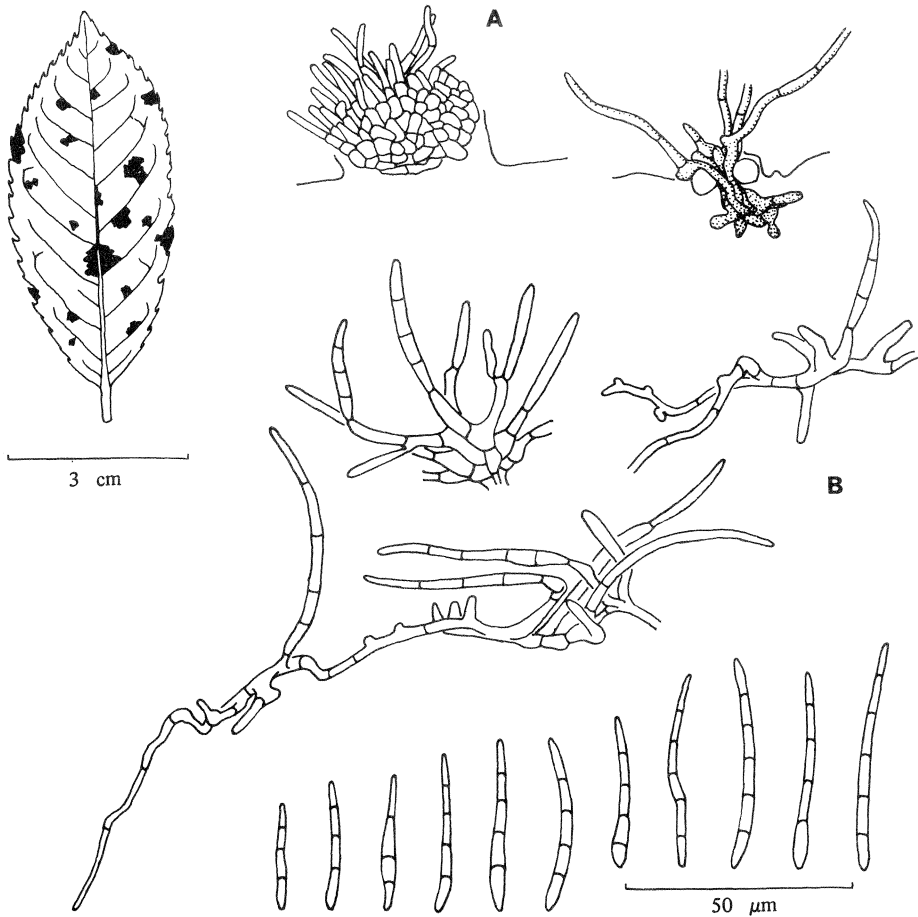


Fig. 68. *Cercospora salicina* Ellis et Everhart on *Salix* sp. No. C 149.
 A : Stroma and conidiophores on upper surface of lesions.
 B : Procumbent-hypha-like structures on lower surface.

and medium in size, $3.5.5 \times 32-188 \mu\text{m}$; conidia hyaline, acicular to obclavato-cylindric, straight to mildly curved, base truncate, tip obtuse to subobtuse, indistinctly multiseptate, $3.4 \times 40-176 \mu\text{m}$ (Fig. 66).

Hab. on *Coffea arabica*, at Fazenda Nomura, Bandeirantes, Paraná, 2 July 1974, No. C 2.

66) ***Cercospora diodiae*** Cooke, Grevillea 7 : 34. 1878.

Leaf spots circular, brown, central parts grayish brown with black dots, not vein-limited, lower surface dull brown, 3-5 mm in diameter; fruiting chiefly epiphyllous; stromata globular to irregular, brown, 20-40 μm in size; fascicles dense; conidiophores dark brown, paler toward tip, pale olivaceous when young, mostly straight to sinuous, tip obconic to subtruncate, 0-3 septate, not branched, not geniculate, spore scars invisible, $3.4 \times 20-60 \mu\text{m}$; conidia hyaline to pale olivaceous, narrowly obclavato-cylindric to linear, straight to slightly curved, indistinctly 3-7 septate, base obconic, tip subacute to obtuse, $2.5-3.5 \times 52-116 \mu\text{m}$ (Fig. 67).

Hab. on *Diodia saponariifolia*, at Vila de Dr. Galli, Tanquan, Anhembi, S. P., 1 February 1975, No. C 95.

SALICACEAE

67) ***Cercospora salicina*** Ellis et Everhart, Jour. Mycol. 3 : 19. 1887.

Leaf spots amphigenous, angular, vein-limited, 1-8 mm in size, dark reddish brown, lower surface paler in color; fruiting amphigenous; stromata minute to 72 μm in diameter, distinct on upper surface, mostly minute on lower surface, globular, pale olivaceous brown, sometimes brown on upper surface; fascicles mostly dense to very dense on upper surface, single to dense on lower surface; conidiophores pale olivaceous, uniformly colored, tip obconic, not geniculate, spore scars invisible, mostly not septate, $2.3.5 \times 8-28 \mu\text{m}$, longer conidiophores up to 48 μm when conidia present, very short in stromata on upper surface, often branched and developing to procumbent-hypha-like structures on lower surface; conidia pale olivaceous, obclavato-cylindric to linear, sometimes cylindrical, tip obtuse to round, indistinctly 2-6 septate, scars indistinct, $1.5-3.5 \times 24-64 \mu\text{m}$ (Fig. 68).

Hab. on *Salix* sp., at Avenida Brasil 1456, Campinas, S. P., 29 June 1975, No. C 149.

Note : Viégas reported *C. salicina* on *Salix* sp. in 1945. However, this fungus is considered to belong to *C. salicis*. See "Note" of *C. salicis*. Deighton (1976) transferred the fungus to the species *Pseudocercospora salicina* (Ell. et Ev.) Deighton.

68) ***Cercospora salicis*** Chupp et Greene, Amer. Midland Naturalist 41 : 757. 1949.

Leaf spots angular, dark reddish brown, central parts sometimes light brown, 0.5-3 mm in size, usually smaller than 2 mm, lower surface grayish reddish brown; fruiting chiefly hypophyllous; stromata lacking to minute; fascicles a few stalks to dense; conidiophores olivaceous, uniformly colored, straight to geniculate, tip conic to obconic, narrower toward tip, indistinctly sparsely septate, not branched, $2.4 \times 12-36 \mu\text{m}$; conidia olivaceous, cylindrical to obclavato-cylindric, straight to mildly curved, indistinctly multiseptate, base subtruncate, tip round to obtuse, rarely catenulate, scars distinct, $3.4 \times 28-92 \mu\text{m}$ (Fig. 69).

Hab. on *Salix babylonica*, at Avenida Brazil 1456, Campinas, S. P., 11 August 1974, No. C 44; at Caucaia do Alto, Cotia, S. P., 8 June 1975, No. C 134.

Note : Before *C. salicis* was described in 1949, Viégas reported *C. salicina* on *Salix* sp. in Brazil in 1945. Viégas' fungus is identical to *C. salicis*, and the host plant, *Salix* sp., seems to be also *S. babylonica*, according to Viégas' description and drawings. See also "Note" of *C. salicina*.

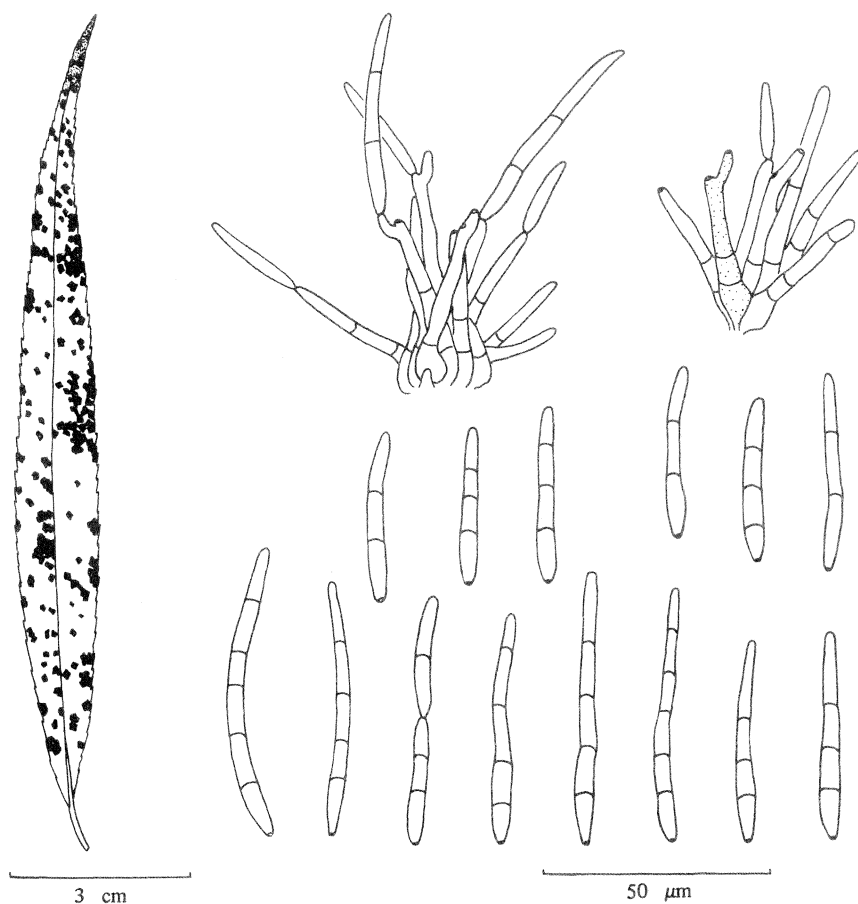


Fig. 69. *Cercospora salicis* Chupp et Greene on *Salix babylonica*. No. C 134.

SAXIFRAGACEAE

69) *Cercospora hydrangeae* Ellis et Everhart, Jour. Mycol. 8 : 71. 1902.

Leaf spots amphigenous, circular to angular, reddish brown, margins almost black, central parts paler, 1-5 mm in size, later coalescing to form large lesions, primary leaf spots epiphyllous; fruiting chiefly epiphyllous; stromata minute to a few brown cells; fascicles 2-11 stalks; conidiophores dark to pale brown, paler and narrower toward tip, straight to abruptly geniculate, tip almost hyaline and truncate, distinctly multiseptate, rarely branched, spore scars medium in size, 4-6 × 40-480 µm; conidia hyaline, acicular, straight to mildly curved, indistinctly multiseptate, base truncate, tip acute and obtuse when short, 2-4 × 36-400 µm (Fig. 70).

Hab. on *Hydrangea hortensia*, at ESALQ, Piracicaba, S. P., 16 July 1974, No. C 4.

Note : The following fungus *Cercospora* was observed on the specimen: Fruiting amphigenous; stromata minute, less than 30 µm, pale olivaceous brown; fascicles a few stalks to dense; conidiophores pale olivaceous, uniformly colored, straight to geniculate, not branched,

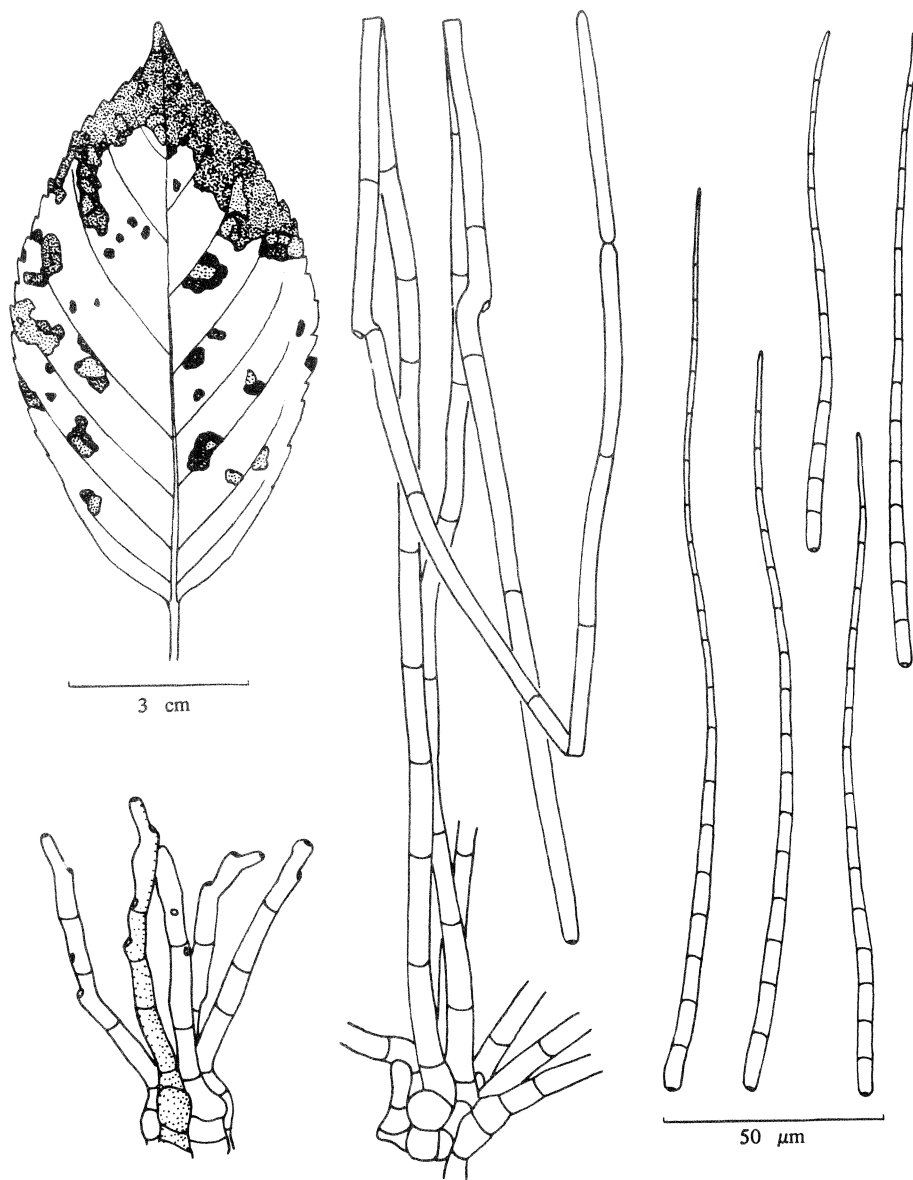


Fig. 70. *Cercospora hydrangeae* Ellis et Everhart on *Hydrangea hortensia*. No. C 4.

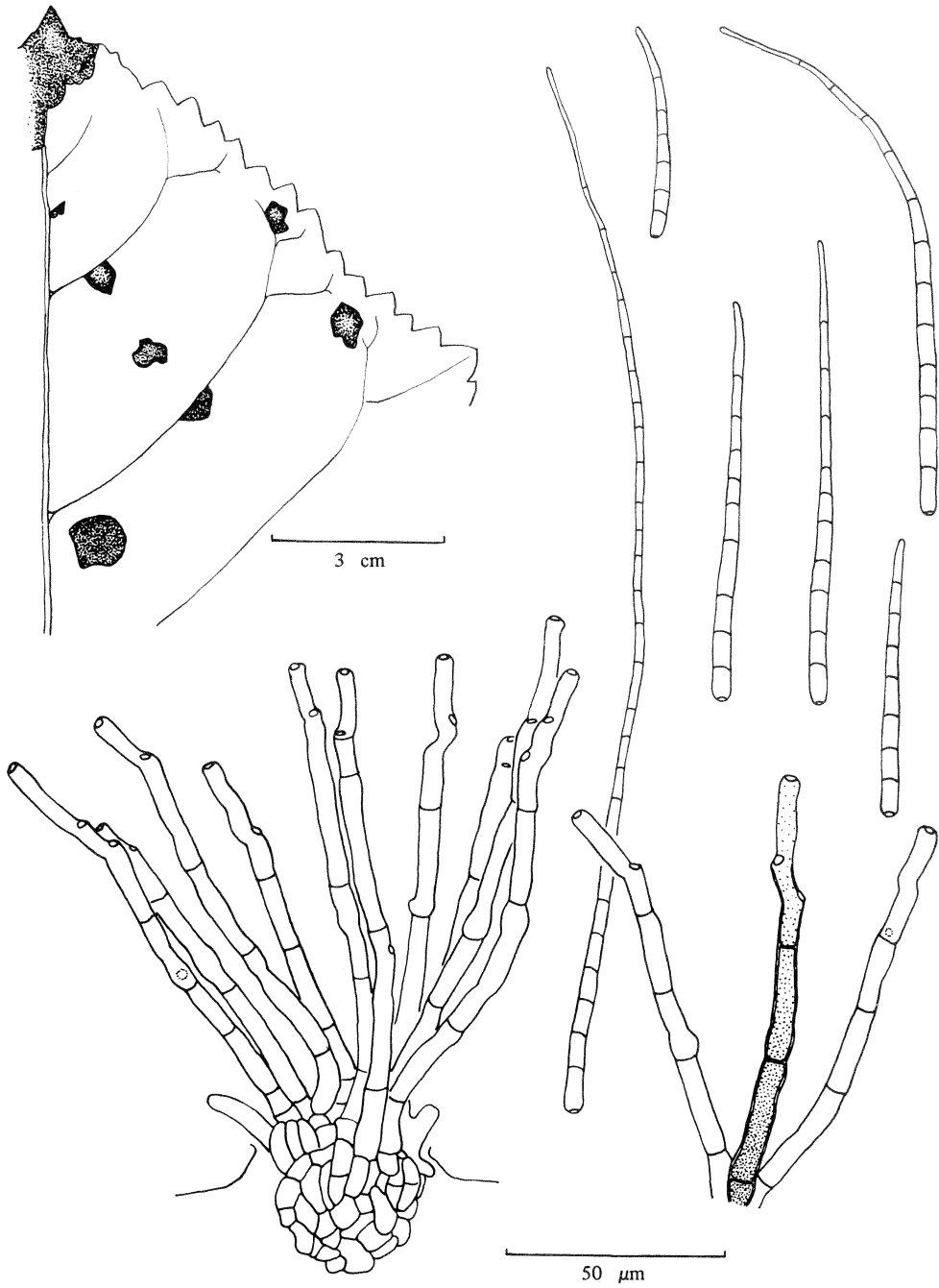


Fig. 71. *Cercospora paulowniae* Hori on *Paulownia* sp. No. C 97.

spore scars indistinct, $1.5-2.5 \times 12-52 \mu\text{m}$; conidia pale olivaceous, obclavato-cylindric to linear, base narrowly obconic, tip subacute, straight to slightly curved, distinctly multiseptate, usually 7-10 septate, scars indistinct, $2.5-3.5 \times 64-92 \mu\text{m}$.

SCROPHULARIACEAE

70) *Cercospora paulowniae* Hori, Jour. Plant. Prot. 2 : 79. 1915.

Leaf spots irregular to circular, brown, central parts sometimes brownish gray, peripheral areas hazy yellowish green, slightly sunken, 2-15 mm in size; fruiting amphigenous; stromata globular, brown, 20-32 μm in diameter; fascicles less than 13 stalks; conidiophores dull brown, paler and narrower toward tip, straight to sinuous, often geniculate, not branched, distinctly multiseptate, spore scars distinct and medium in size, $3-4 \times 24-128 \mu\text{m}$; conidia hyaline, acicular, straight to mildly curved, base truncate, tip acute, indistinctly multiseptate, scars distinct and medium in size, $3.5-4 \times 80-308 \mu\text{m}$ (Fig. 71).

Hab. on *Paulownia* sp., at ESALQ, Piracicaba, S. P., 4 February 1975, No. C 97.

Note : The present fungus showed acicular conidia and globular stromata. These features are different from those of *C. paulowniae*. The writers, however, keep the present fungus under the name of *C. paulowniae* at present.

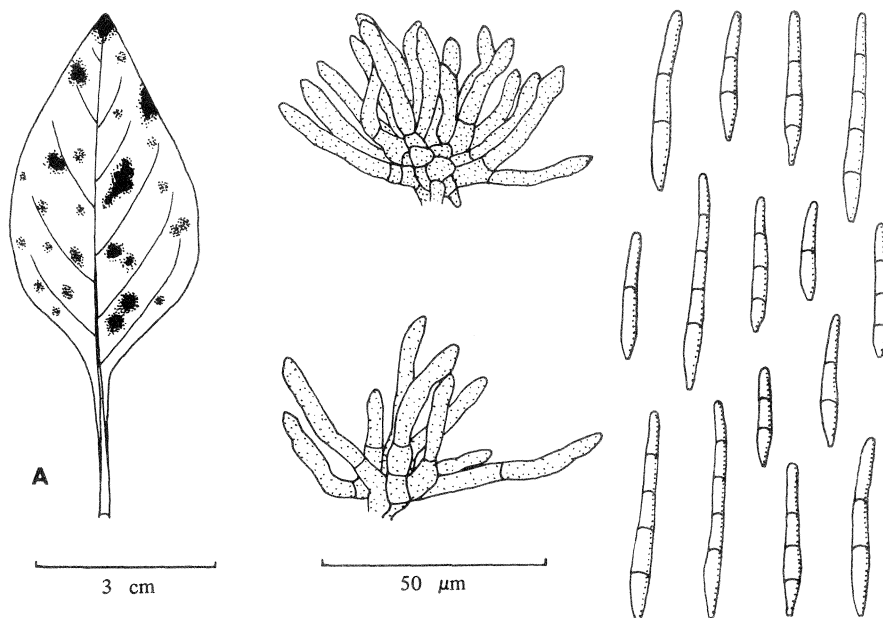


Fig. 72. *Cercospora atromarginalis* Atkinson on *Solanum nigrum*. No. C 36.
A : Lesions on lower leaf surface.

SOLANACEAE

71) *Cercospora atromarginalis* Atkinson, Jour. Elisha Mitchell Sci. Soc. 8 : 59. 1892.

Syn. *Cercospora rigospora* Atkinson, Jour. Elisha Mitchell Sci. Soc. 8 : 65. 1892.

Syn. *Cercospora tosensis* P. Hennings, Bot. Jahrb. von Engler 34 : 605. 1905.

Leaf spots amphigenous, effuse, yellow to greenish yellow, circular, 2-6 mm in diameter; old lesions coalescing to form larger ones, central parts necrotic and irregular in shape; fruiting hypophyllous, also amphigenous on necrotic parts; stromata lacking; fascicles a few stalks to dense; conidiophores olivaceous brown, uniformly colored, irregular in width, straight to sinuous, sparingly septate, often branched, not geniculate, spore scars minute and indistinct, tip obconic, $3-4.5 \times 20-52 \mu\text{m}$; conidia pale olivaceous, cylindric to obclavato-cylindric, straight to mildly curved, base obconic and sometimes concave, tip round, uni- to multiseptate, $2.5-4 \times 16-56 \mu\text{m}$ (Fig. 72).

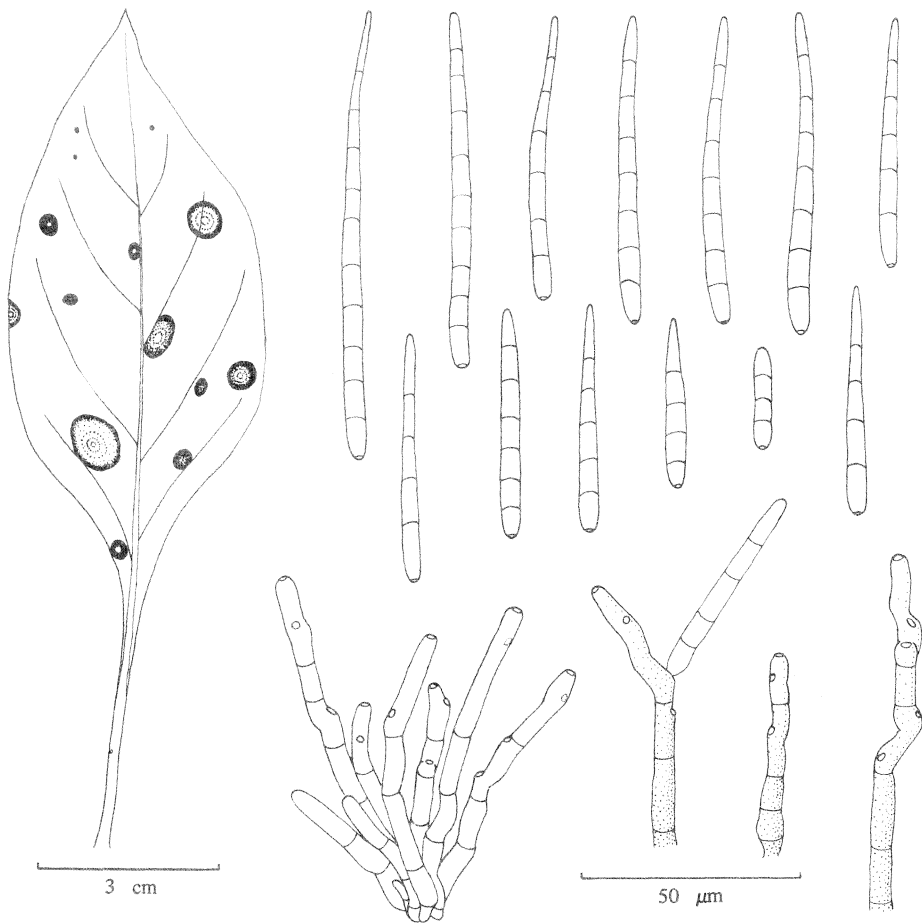


Fig. 73. *Cercospora capsici* Heald et Wolf on *Capsicum frutescens*. No. C 10.

Hab. on *Solanum nigrum*, at ESALQ, Piracicaba, S. P., 6 August 1974, No. C 36.

Note : Synonym *Cercospora rigospora* was mistakenly used for the present fungus and also for *Phaeoramularia capsicicola*. See "Note" of *Ph. capsicicola*. Deighton (1976) transferred the fungus to the species *Pseudocercospora atromarginalis* (Atk.) Deighton.

72) ***Cercospora capsici*** Heald et Wolf, Mycologia 3 : 15. 1911.

Leaf spots amphigenous, circular, 0.5-8 mm in diameter, dark sooty brown, margins often almost black, central parts hazy gray, mostly zonate; fruiting amphigenous; stromata a few brown cells; fascicles 5-20 stalks; conidiophores pale olivaceous brown to medium brown, paler and narrower toward tip, distinctly multiseptate, straight to mildly geniculate, tip truncate to subtruncate, spore scars distinct, medium to small in size, not branched, 3-6 × 32-120 μm; conidia hyaline, acicular to obclavato-cylindric, almost cylindric when short, base truncate to long obconically truncate, tip subacute to obtuse, almost round when short, straight to mildly curved, indistinctly multiseptate, spore scars distinct and medium to small in size, 3-5 × 20-112 μm (Fig. 73).

Hab. on *Capsicum frutescens*, at ESALQ, Piracicaba, S. P., 24 July 1974, No. C 10.

73) ***Phaeoramularia capsicicola*** (Vassiljevsky) Deighton, More Dematiaceous Hyphomycetes : 323. 1976.

Syn. *Cercospora unamunoi* Castellani, Riv. Agr. Subtrop. Trop. 42 : 20. 1948.

Leaf spots effuse, yellow, circular, margins poorly delineated, limited by large vein, 1-6 mm in diameter, on lower surface hazy grayish brown with poorly defined margins; fruiting hypophyllous, effuse; stromata lacking; stromata-like structures a few pale olivaceous cells under leaf stomata; fascicles dense; conidiophores pale to medium olivaceous brown, medium brown in mass, uniformly colored, often swollen at some points, tip obconic, often branched, sinuous, mildly geniculate, indistinctly multiseptate, spore scars small to minute, 4-5 × 40-80 μm; conidia very pale olivaceous, cylindric, sometimes attenuated toward tip, base obconically truncate to obconic, tip round, straight to mildly curved, often catenulate, indistinctly 0-6 septate, scars small, 3-5 × 16-168 μm, mostly 40-50 μm (Fig. 74).

Hab. on *Capsicum frutescens*, at ESALQ, Piracicaba, S. P., 12 December 1974, No. C 77.

Note : *C. rigospora* which is a synonym of *C. atromarginalis* was mistakenly used in the case of the present fungus. Besides their morphological differences, *Ph. capsicicola* is infectious to *Capsicum* spp. and *C. atromarginalis* is infectious to *Solanum nigrum*.

74) ***Cercospora nicotianae*** Ellis et Everhart, Proc. Acad. Sci. Phila. 45 : 170. 1893.

Leaf spots amphigenous, circular to subcircular, reddish brown, margins darker, often indistinctly zonate, central parts sometimes dull brownish gray, 1-20 mm in diameter, usually smaller than 10 mm; fruiting amphigenous; stromata a few brown cells; fascicles 1-12 stalks; conidiophores pale to medium brown, paler toward tip, often irregular in width, tip almost hyaline and truncate, often narrower toward apex, sometimes geniculate, very rarely branched, spore scars medium in size, indistinctly multiseptate, 3.5-6.5 × 24-128 μm; conidia hyaline, acicular, straight to mildly curved, base truncate, tip subacute to acute, indistinctly multiseptate, 2.5-4 × 36-264 μm (Fig. 75).

Hab. on *Nicotiana tabacum*, at ESALQ, Piracicaba, S. P., 20 June 1975, No. C 143; between Ituberá and Salvador, Bahia, 20 November 1975, No. C 173.

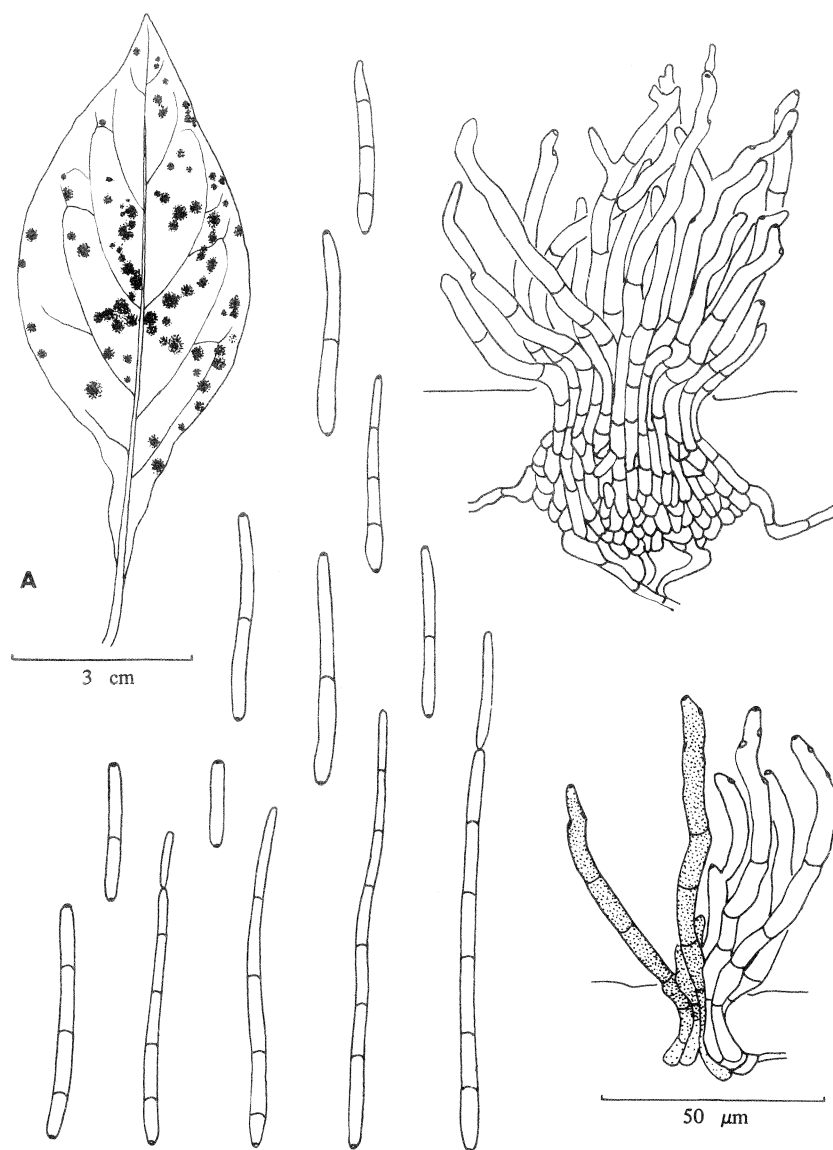


Fig. 74. *Phaeoramularia capsicola* (Vassiljevsky) Deighton,
 Syn. *Cercospora unamunoi* Castellani, on *Capsicum frutescens*. No. C 77
 A : Lesions on lower leaf surface.

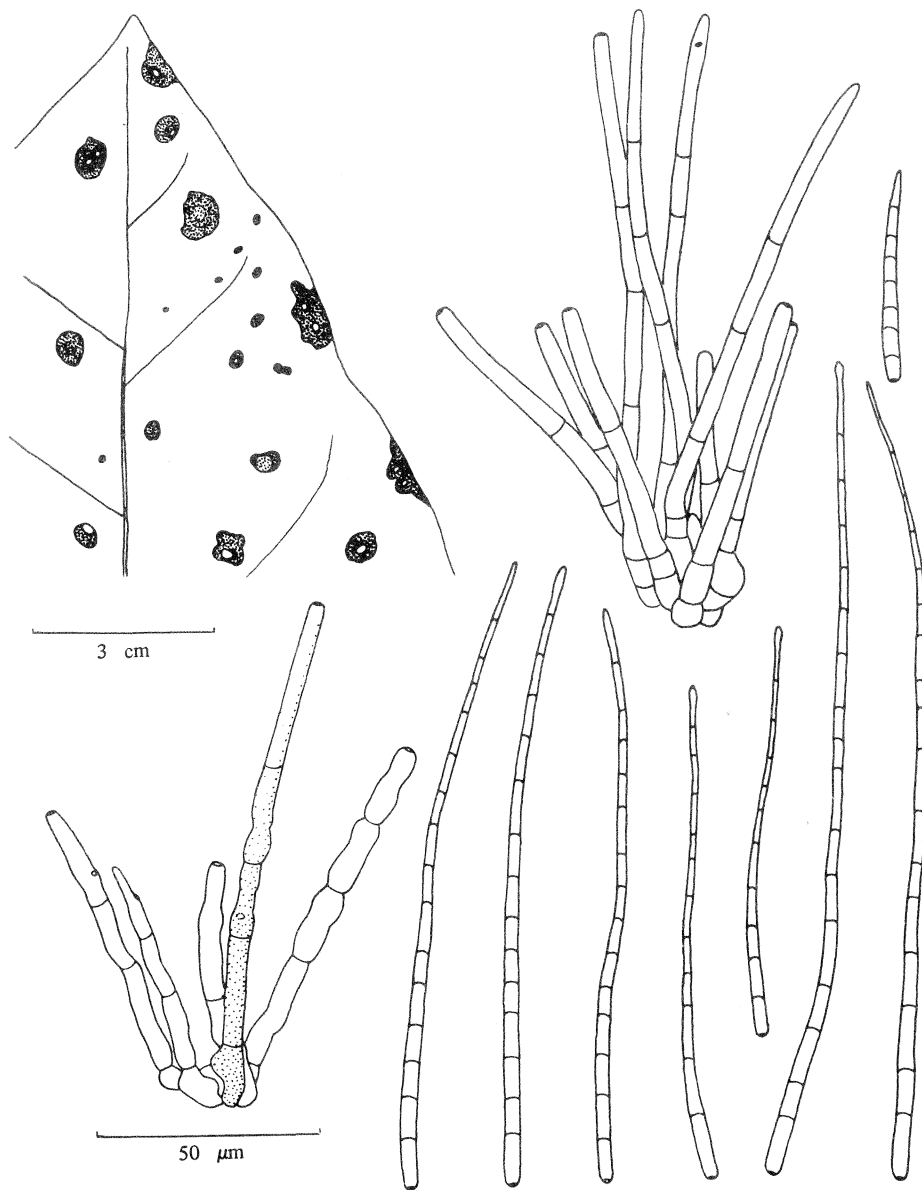


Fig. 75. *Cercospora nicotianae* Ellis et Everhart on *Nicotiana tabacum*. No. C 143.

THEACEAE

75) *Cercoseptoria theae* (Cav.) Curzi, Boll. Staz. Patol. Veg. Roma, Ser. 2, 9 : 385. 1929.

Syn. *Cercospora theae* (Cavara) Breda de Haan, L'Inst. Bot. Buitenzorg Bul. 6 : 11. 1900.

Leaf spots amphigenous, circular, numerous, 0.5-3 mm in diameter, mostly 1 mm, brown to dull white, margins sooty brown; primary lesions small black dots; fruiting chiefly epiphyllous; stromata globular, brown, 16-60 μm in diameter, smaller on lower surface; fascicles dense; conidiophores pale olivaceous, mostly very short, straight to curved, not geniculate, not septate, uniformly colored, attenuated toward tip, spore scars invisible, tip obconic to round, 2-2.5 \times 8-24 μm , rarely 40 μm ; conidia pale olivaceous, linear, mostly curved, base conic, tip subacute, indistinctly 2-7 septate, scars indistinct, 2.5-3 \times 44-96 μm , mostly 50-80 μm (Fig. 76).

Hab. on *Thea assamica*, at Registro, S. P., 16 November 1974, No. C 68.

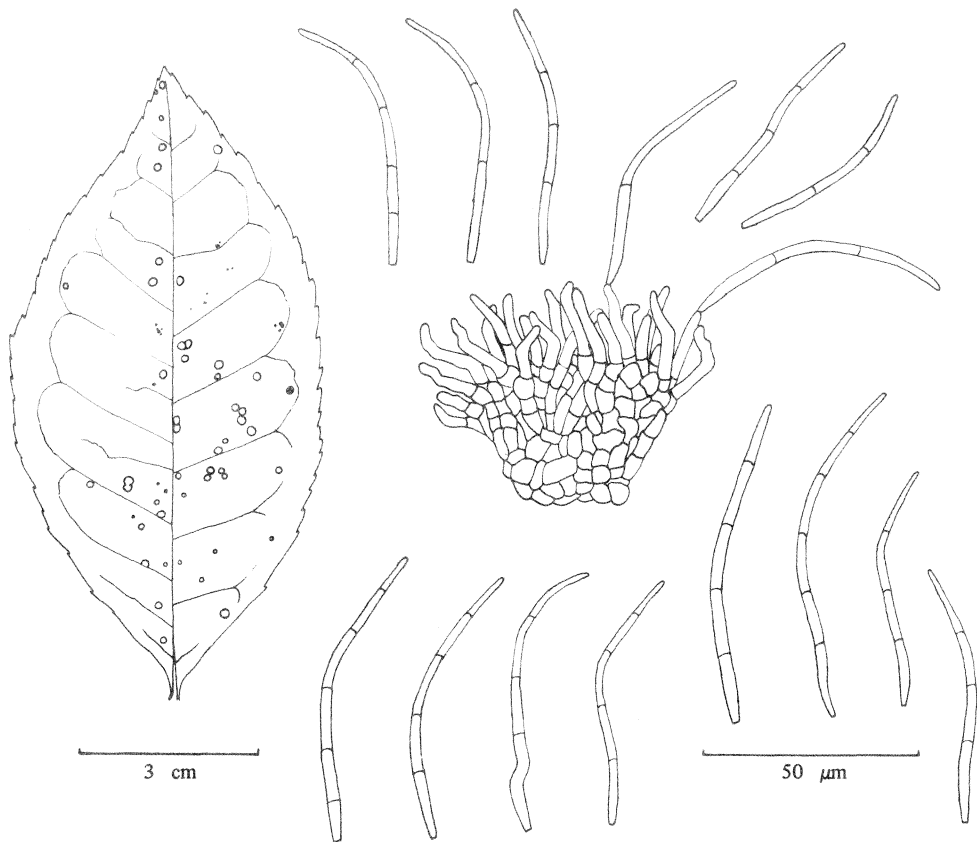


Fig. 76. *Cercoseptoria theae* (Cav.) Curzi,
Syn. *Cercospora theae* (Cavara) Breda de Haan, on *Thea assamica*. No. C 68.

TILIACEAE

76) *Cercospora triumfettae* Sydow, Ann. Mycol. 28 : 218. 1930.

Leaf spots amphigenous, angular to irregular in shape, 0.5-10 mm in size, later coalescing to form large blotches sometimes exceeding 30 mm, dark reddish brown, central parts sometimes slightly paler, often causing necrosis, peripheral areas greenish yellow, primary lesions greenish yellow and effuse; fruiting amphigenous; stromata lacking; fascicles apparently dense with procumbent hyphae or non-fasciculate; procumbent hyphae with conidiophores and conidia

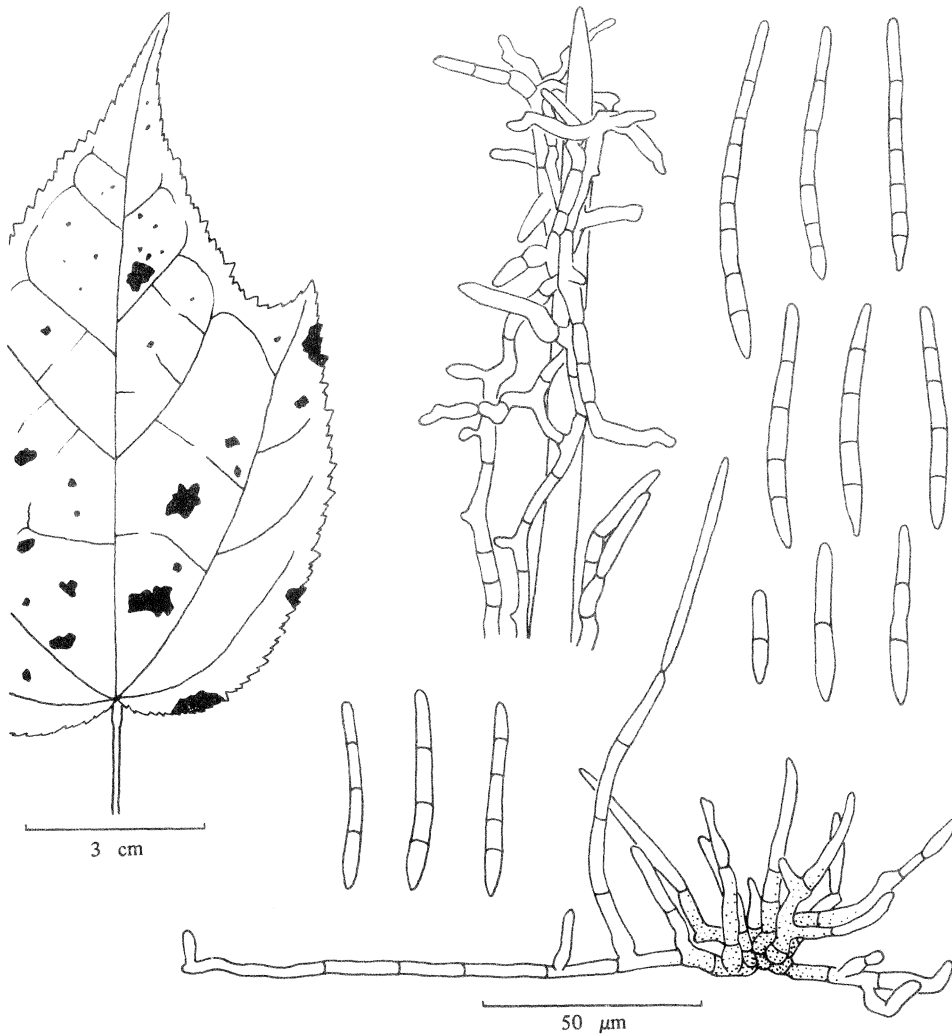


Fig. 77. *Cercospora triumfettae* Sydow on *Triumfetta semitriloba*. No. C 150.

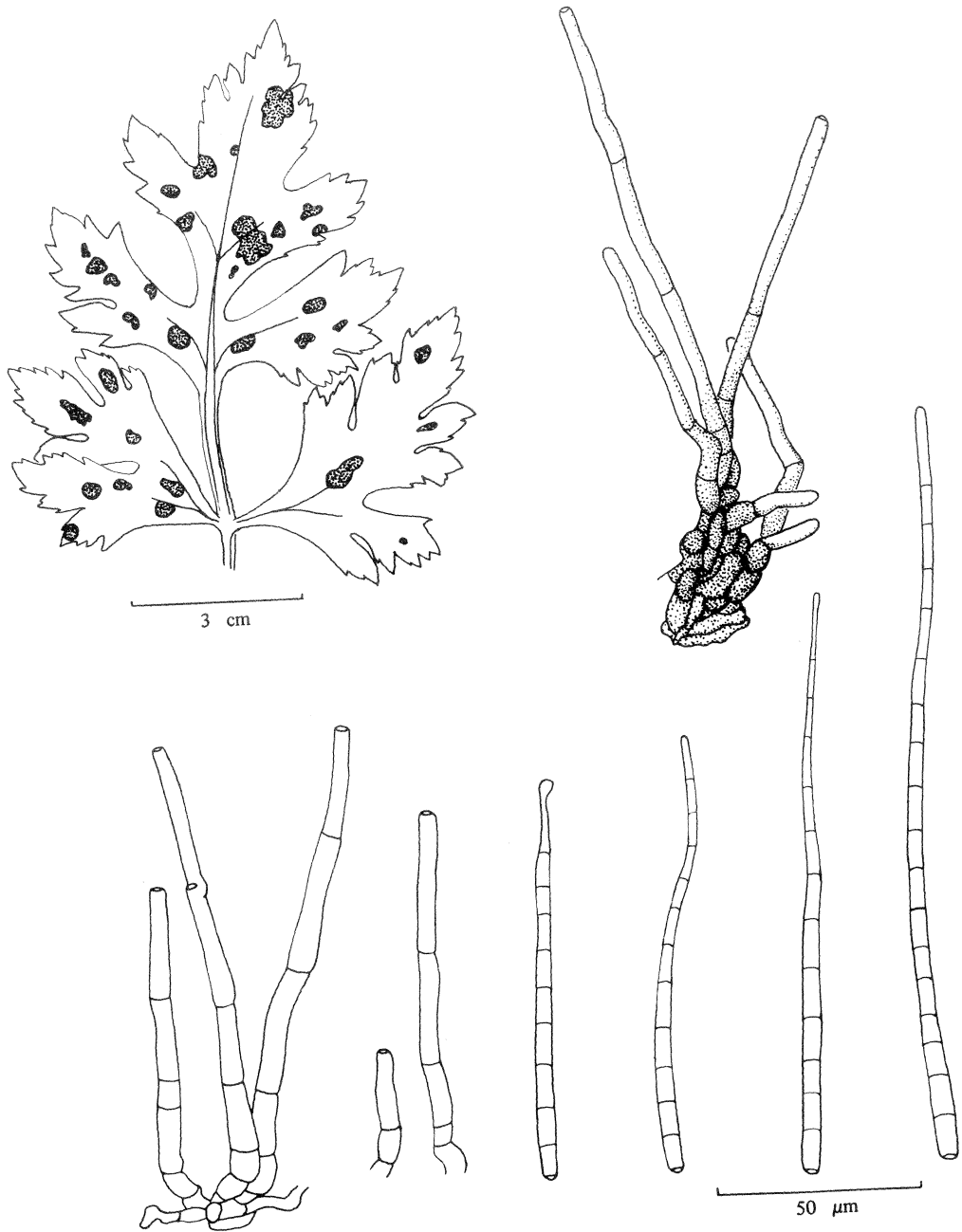


Fig. 78. *Cercospora apii* Fresenius on *Apium graveolens*. No. C 105.

climbing leaf hairs on lower surface, sometimes detached to become structures appearing like bundles of aerial hyphae; conidiophores olivaceous brown, paler toward almost hyaline tip, irregular in width, long ones distinctly septate, tip round to obconic, spore scars invisible, often branched, not straight, $2.5-4 \times 20-60 \mu\text{m}$; conidia olivaceous, cylindrical to obclavato-cylindric, sometimes constricted at septa, straight to mildly curved, distinctly 1-9 septate, mostly 2-4 septate, base obconic, sometimes concave, tip round, $2.5-4 \times 20-80 \mu\text{m}$ (Fig. 77).

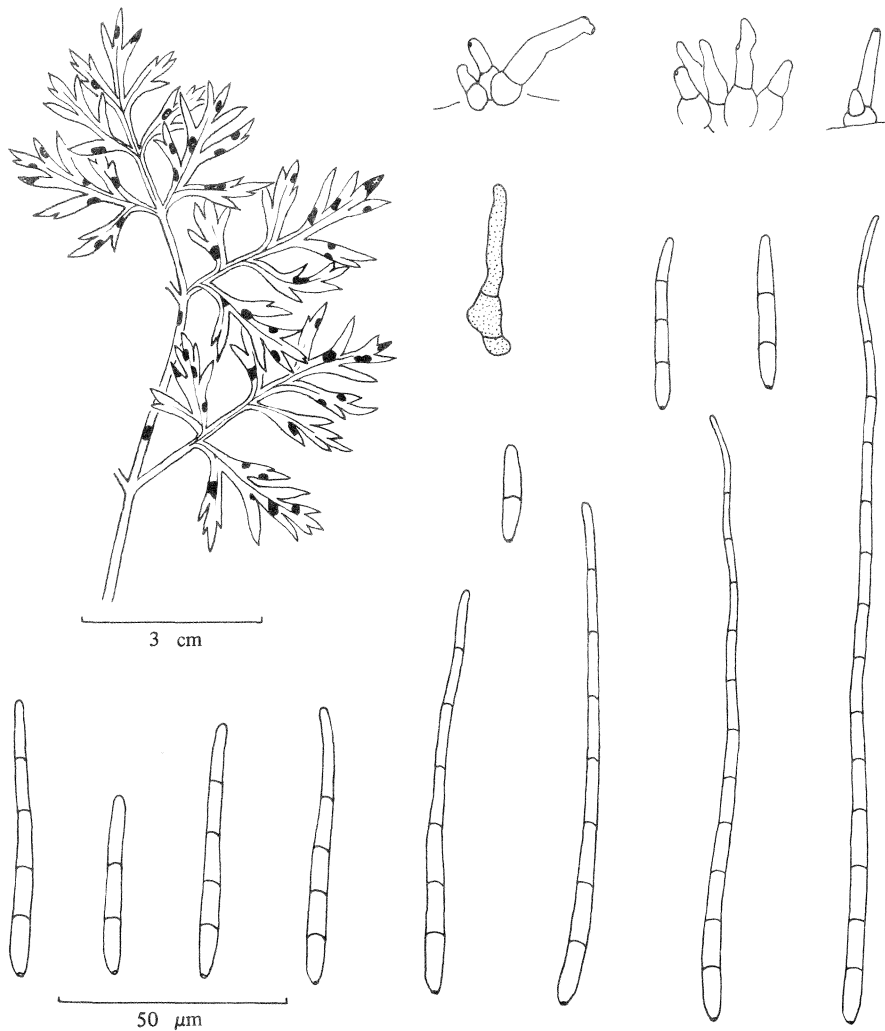


Fig. 79. *Cercospora carotae* (Passerini) Solheim on *Daucus carota*. No. C 124.

Hab. on *Triumfetta semitriloba*, at Itapetininga, S. P., 2 July 1975, No. C 150.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora triumfettae* (H. Syd.) Deighton. The following fungus *Cercospora* was observed. Fruiting amphigenous; stromata lacking; fascicles 1-6 stalks; conidiophores medium brown, paler and narrower toward tip, distinctly multiseptate, straight to geniculate, tip truncate, spore scars medium in size and distinct, $3.5-4.5 \times 28-136 \mu\text{m}$; conidia acicular, straight to mildly curved, base truncate, tip acute to subacute, indistinctly multiseptate, scars distinct, $2-4 \times 44-264 \mu\text{m}$.

UMBELLIFERAE

77) ***Cercospora apii*** Fresenius, Beitr. Mykol. 3 : 91. 1863.

Leaf spots amphigenous, brown, circular to irregular, sometimes vein-limited, 1-5 mm in size, later coalescing to form larger blotches; fruiting amphigenous; stromata lacking or minute, brown; fascicles 1-10 stalks; conidiophores olivaceous brown, olivaceous when young, paler and attenuated toward tip, straight or geniculate, rarely branched, 1-5 septate, tip truncate, $4-7 \times 20-128 \mu\text{m}$; conidia hyaline, acicular, straight to mildly curved, base truncate, tip subacute to obtuse, indistinctly multiseptate, $4-6 \times 64-180 \mu\text{m}$ (Fig. 78).

Hab. on *Apium graveolens*, at local market, Piracicaba, S. P., 13 February 1975, No. C 105; at Mogi das Cruzes, S. P., 29 November 1974, No. C 70.

78) ***Cercospora carotae*** (Passerini) Solheim, Bio. Monographs 12 : 43. 1929.

Leaf spots amphigenous, circular to angular, vein-limited, 0.5-3 mm, mostly 1 mm in size, brown, margins dark brown; fruiting amphigenous; stromata lacking; fascicles 1 to 9 stalks; conidiophores pale olivaceous, uniformly colored, attenuated toward tip, basal cells usually bulbous, not septate, not branched, not geniculate, spore scars very small in size, $2-4 \times 8-32 \mu\text{m}$; conidia pale olivaceous, long obclavato-cylindric, base obconic, tip round to subacute, indistinctly uni- to multiseptate, straight to mildly curved, $2.5-4 \times 24-184 \mu\text{m}$ (Fig. 79).

Hab. on *Daucus carota*, in Pernambuco State, April 1975, collected by Cyro Paulino da Costa, No. C 124.

79) ***Cercospora petroselinicola*** Hino et Tokeshi n. sp.

Maculae amphigenae, orbiculares vel irregulares, rufo-brunneae, 0.5-2 mm. diam.; caespituli praecipue hypophylli; stromata minuta, globosa, pallide vel modice olivaceo-brunnea, usque ad $40 \mu\text{m}$ diametris; conidiophora 1-25 fasciculata, primo subhyalina, deinde pallide olivaceo-brunnea, sursum pallidiora et vix vel non attenuata, recta, aliquando geniculata, simplicia, ad apicem truncata, 0-2 septata, $3.5-6 \times 20-48 \mu\text{m}$; conidia hyalina vel pallidissime olivacea, anguste obclavata vel obclavato-cylindracea, fere recta, obscure 2 vel multiseptata, ad basim subtruncata, ad apicem obtusa vel subacuta, $3.5-6 \times 28-161 \mu\text{m}$.

Hab. in foliis vivis *Petroselinii hortensis*; Piracicaba, São Paulo, Brasil; 20 Junius 1975; No. C 151.

Leaf spots amphigenous, circular to irregular in shape, vein-limited, reddish brown, central parts paler, sunken, 0.5-2 mm in diameter, old spots fragile; fruiting chiefly hypophyllous; stromata globular, pale to medium olivaceous brown, smaller than $40 \mu\text{m}$; fascicles 1-25 stalks; conidiophores pale olivaceous brown, very pale when young, paler toward tip, uniformly wide, or slightly narrower toward tip, mostly straight, sometimes geniculate, not branched, tip truncate, basal cells often bulbous, 0-2 septate, $3.5-6 \times 20-48 \mu\text{m}$; conidia hyaline to very pale olivaceous, obclavato-cylindric to acicular, straight to slightly curved, indistinctly bi- to multiseptate, base obconically truncate, tip obtuse to subacute, $3.5-6 \times 28-161 \mu\text{m}$ (Fig. 80).

Hab. on *Petroselinum hortense*, at ESALQ, Piracicaba, S. P., 20 June 1975, No. C 151; at ESALQ, Piracicaba, S. P., 31 July 1974, No. C 25.

Type : No. C 151; kept at Departamento de Fitopatologia, ESALQ, Piracicaba, S. P., Brazil. A part of the specimen is deposited at the Herbarium of Commonwealth Mycological Institute, England.

Note : Viégas reported *Cercospora apii* Fresenius var. *petroselini* Saccardo on *Petroselinum hortense* in 1945. The fungus described here is identical to Viégas' fungus. *C. apii* var. *petroselini* which is a synonym of *C. petroselini* belongs to *Didymaria* according to Chupp (1953) and to *Cercosporidium punctum* according to Deighton (1967). The fungus described here certainly belongs to *Cercospora* and not to *Didymaria* nor to *Cercosporidium*.

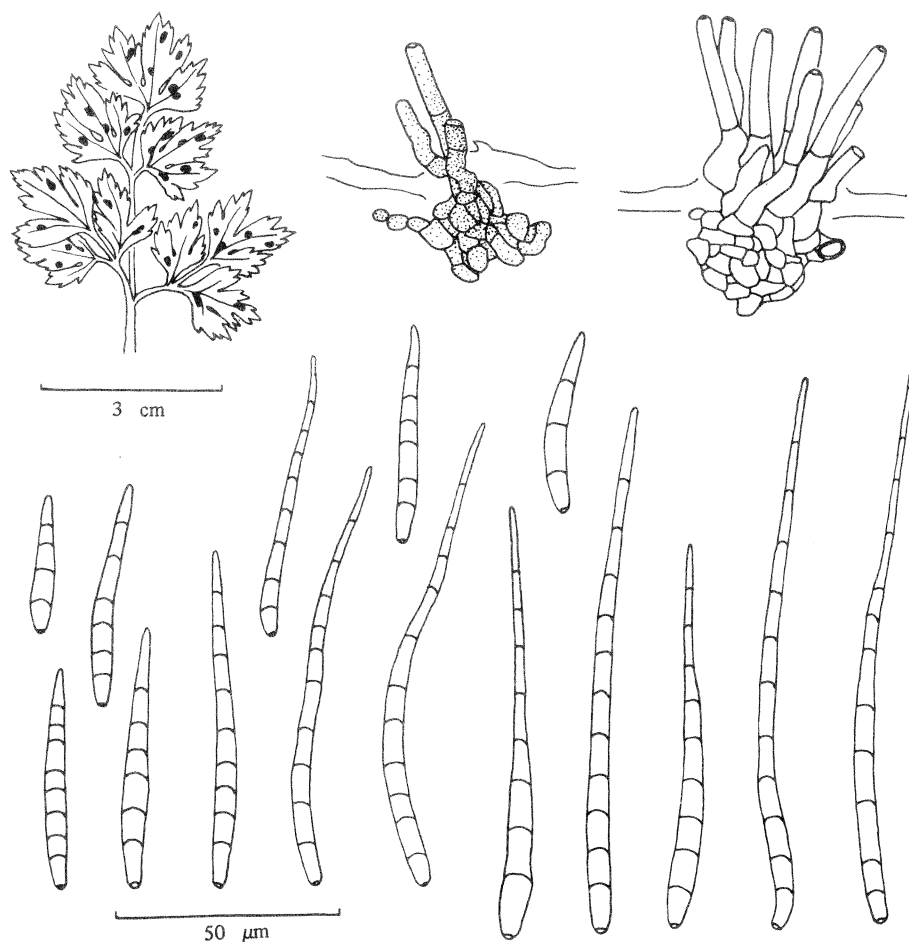


Fig. 80. *Cercospora petroselinicola* Hino et Tokeshi n. sp. on *Petroselinum hortense*. No. C 25.

VERBENACEAE

80) *Cercospora formosana* Yamamoto, Jour. Soc. Trop. Agr. 6 : 600. 1934.

Leaf spots angular, seldom circular, vein-limited, dark reddish brown, very seldom with small grayish brown centers, 0.5-3 mm in size, lower surface paler; fruiting hypophyllous; stromata lacking; conidiophores non-fasciculate, borne from procumbent hyphae, pale olivaceous, uniformly colored, sometimes slightly geniculate, often branched, indistinctly sparsely septate, mostly undulate, tip obconic to round, irregular in width, spore scars invisible, $3-4 \times 5-60 \mu\text{m}$; conidia pale olivaceous, obclavato-cylindric, straight to mildly curved, base obconic, tip round to obtuse, indistinctly 1-5 septate, scars invisible, $2.5-3.5 \times 20-88 \mu\text{m}$ (Fig. 81).

Hab. on *Lantana camara*, at Km 199, Rodovia SP 127, Itapetininga, S. P., 14 August

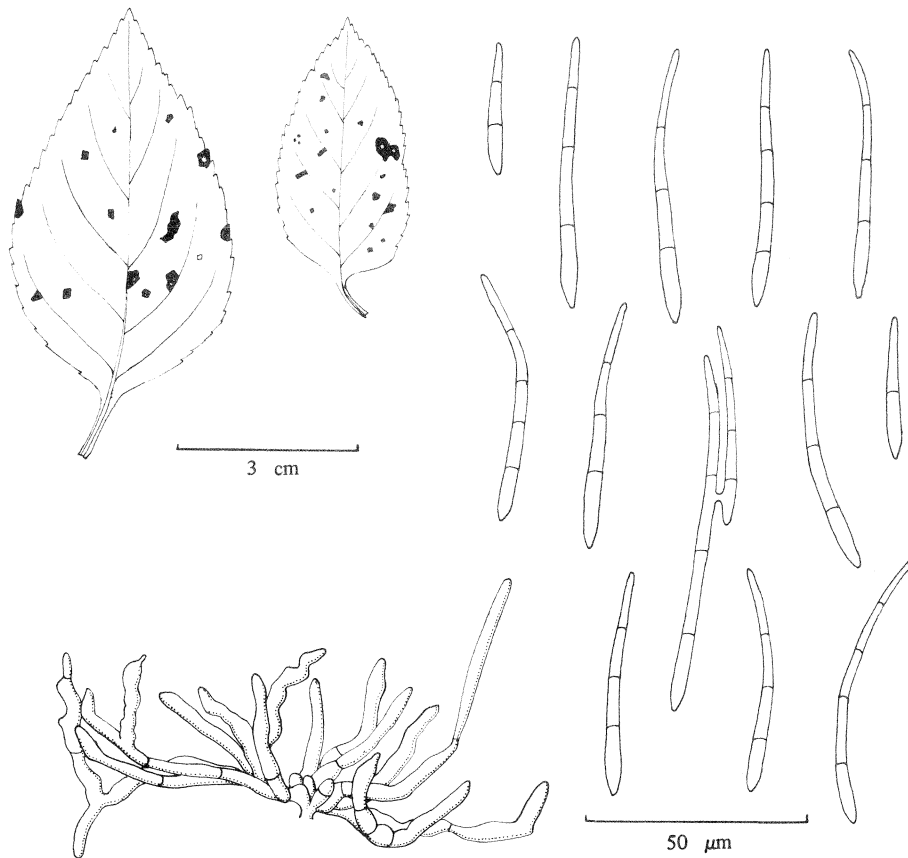


Fig. 81. *Cercospora formosana* Yamamoto on *Lantana camara*. No. C 48.

1974, No. C 48.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora formosana* (Yamam.) Deighton.

81) *Cercospora guianensis* Stevens et Solheim, Mycologia 23 : 375. 1931.

Leaf spots at first effuse and yellow, later dark brown, lower surface paler, angular, vein-limited, 0.5-5 mm in size, peripheral areas yellow to orange-yellow; fruiting chiefly epiphyllous; stromata globular, brown, 15-50 μm ; fascicles dense, sometimes less than 10 stalks; conidiophores pale olivaceous to pale sooty olivaceous, uniformly colored, irregular in width, straight to undulate, sometimes mildly geniculate, not branched, sparingly 1-2 septate, 3.5-4 \times 7.5-34 μm ; conidia pale olivaceous, narrowly obclavato-cylindric, mostly mildly curved, base obconic, tip round to subacute, multiseptate, scars invisible, 3-4 \times 21-97 μm , mostly 65-90 μm in length (Fig. 82).

Hab. on *Lantana camara*, at Ubatuba, S. P., 4 January 1976, No. C 181.

Note : Deighton (1976) transferred the fungus to the species *Pseudocercospora guianensis* (Stev. et Solh.) Deighton.

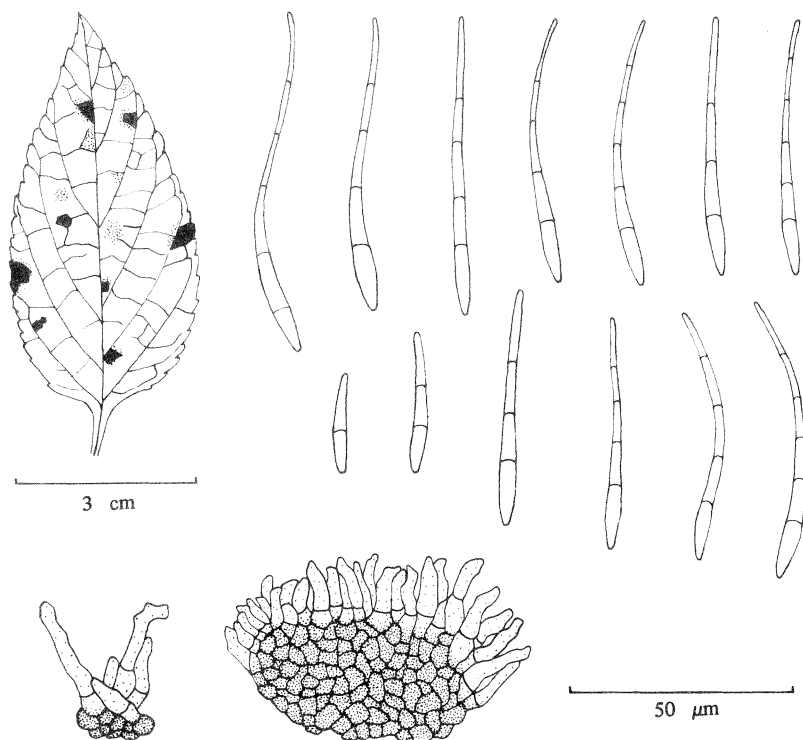


Fig. 82. *Cercospora guianensis* Stevens et Solheim on *Lantana Camara*. No. C 181.

III List of *Cercosporae* distributed in Brazil

The fungi reported under the name of *Cercospora* which are distributed in Brazil were listed in alphabetical order according to each host family. Synonyms were limited only to those used in Brazil. Asterisks(*) indicate the species which were examined in the present report.

Acanthaceae

- 1) *Cercospora bakeri* Sydow ; on Acanthaceae ; Muller & Chupp 1934

Note : This species is infectious only to *Clerodendron fragans*, Verbenaceae (Chupp 1953).

Aizoaceae

- 2) *Cercospora tetragoniae* (Speg.) Chupp ; on *Tetragonia expansa* ; Viégas 1945a, (*)

Amaranthaceae

- 3) *Cercospora brachiata* Ellis et Everhart ; on *Amaranthus* sp. ; Viégas 1945a

- 4) *Cercospora celosiae* Sydow ; on *Celosia argentea* var. *crispata* ; Viégas 1945a, (*)

- 5) *Cercospora gomphrenicola* Spegazzini (*Phaeoramularia gomphrenicola* (Speg.) Muntañola) ; on *Gomphrena glauca* (*Pfaffia glauca*), *G. iresinoides* (*P. iresinoides*) ; Chupp 1953

- 6) *Cercospora pfaffiae* Chupp ; on *Pfaffia sericea* ; Chupp 1953

- 7) *Cercospora* sp. ; on *Amaranthus* sp. ; Cruz et al. 1964

Amaryllidaceae

- 8) *Cercospora fourcroyae* Obregon-Botero ; on *Fourcroya gigantea* (*Furcraea gigantea*) ; Chupp 1953

Anacardiaceae

- 9) *Cercospora anacardii* Muller et Chupp ; on *Anacardium occidentale* ; Muller & Chupp 1934, Cruz et al. 1964

- 10) *Cercospora mangiferae* Koorders (*Stigmina mangiferae* (Koorders) M. B. Ellis) ; on *Mangifera indica* ; Hino & Tokeshi 1976c, (*)

- 11) *Cercospora verniciferae* Chupp et Viégas ; on *Rhus vernicifera* ; Viégas 1945a

Anonaceae

- 12) *Cercospora anonaceae* P. Hennings ; on *Anona reticulata* ; Hennings 1909a, Muller & Chupp 1934

- 13) *Cercospora anonae* Muller et Chupp ; on *Anona squamosa*, *Rollinia sylvestre* ; Muller & Chupp 1934, 1936

- 14) *Cercospora oblecta* Sydow ; on *Anona* sp. ; (*)

- 15) *Cercospora xylopiiae* Viégas et Chupp ; on *Xylopia grandiflora* ; Viégas 1945a

Apocynaceae

- 16) *Cercospora plumerifolii* Batista et Peres ; on *Plumeria obovata* ; Batista et al. 1960

Aquifoliaceae

- 17) *Cercospora ilicicola* Maublanc ; on *Ilex paraguensis* ; Maublanc & Rangel 1915

Araceae

- 18) *Cercospora caladicola* (P. Henn.) Chupp ; Syn. *Cercospora caladii* P. Hennings ; on *Caladium* sp. ; Hennings 1909a

- 19) *Cercospora montrichardiae* P. Hennings ; on *Montrichardia arborescens* (*M. aculeatum*) ; Hennings 1909b

Aristolochiaceae

- 20) *Cercospora serpentaria* Ellis et Everhart ; on *Aristolochia serpentaria*, *A. bilobata*, *A.* sp. ;

Chupp 1953

Asclepiadaceae

- 21) *Cercospora asclepidicola* (P. Henn.) Chupp ; Syn. *Cercospora asclepiadis* P. Hennings ; on *Asclepias* sp. ; Hennings 1902b
 22) *Cercospora calotropidis* Ellis et Everhart ; on *Calotropis gigantea* ; Batista et al. 1960

Balsaminaceae

- 23) *Cercospora campi-silii* Spegazzini ; Syn. *Cercospora impatientis* Baumler ; on *Impatiens balsamina* ; Muller & Chupp 1934, Muller 1935
 24) *Cercospora fukushiana* (Matsuura) Yamamoto ; on *Impatiens balsamina* ; (*)

Berberidaceae

- 25) *Cercospora caulophylli* Peck ; on *Caulophyllum thalictroides* ; Chupp 1953

Bignoniaceae

- 26) *Cercospora adenocalymmae* Muller et Chupp ; on *Adenocalymma bullatum* ; Muller & Chupp 1934
 27) *Cercospora arrabidaeae* Chupp et Viégas ; on *Arrabidaea platyphylla* ; Viégas 1945a
 28) *Cercospora cybistacis* P. Hennings ; on *Cybistax antisiphilitica* ; Hennings 1909a
 29) *Cercospora polymera* Sydow ; on *Cremastus sceptrum (Bignonia sceptrum)* ; Sydow 1930
 30) *Cercospora pyrostegiae* Viégas ; on *Pyrostegia venusta* ; Viégas 1945a, (*)
 31) *Cercospora tecomae* Chupp et Viégas ; on *Tecoma* sp. ; Viégas 1945a
 32) *Cercospora zeyrae* P. Hennings ; on *Zeyra montana* ; Hennings 1909a

Bixaceae

- 33) *Cercospora bixae* Allescher et Noack ; on *Bixa orellana* ; Noack 1898, Viégas 1945a

Bombacaceae

- 34) *Cercospora ceibae* Chupp et Viégas ; on *Ceiba pentandra* ; Viégas 1945a

Boraginaceae

- 35) *Cercospora agnostoica* Spegazzini ; on *Symphytum asperrimum, Borago officinale* ; Spegazzini 1908

Campanulaceae

- 36) *Cercospora lobeliae* Kellerman et Swingle ; on *Lobelia* sp. ; Muller & Chupp 1934, Muller 1935
 37) *Cercospora siphocampyli* Chupp et Viégas ; on *Siphocampylus cinerascens* ; Viégas 1944

Capparidaceae

- 38) *Cercospora capparidicola* Hansford et Thirumalachar ; on *Crataeva tapia* ; Batista et al. 1960

Caricaceae

- 39) *Cercospora mamaonis* Viégas et Chupp ; Syn. *Cercospora papayae* Viégas et Chupp ; on *Carica papaya* ; Viégas 1945a, Chupp 1953, (*)

Caryophyllaceae

- 40) *Cercospora dianthi* Muller et Chupp ; on *Dianthus* sp. ; Muller & Chupp 1936

Chenopodiaceae

- 41) *Cercospora beticola* Saccardo ; Syn. *Cercospora anthelmintica* Atkinson ; on *Beta vulgaris, B. vulgaris* var. *cycla, Spinacea oleracea, Chenopodium ambrosioides* ; Puttemans 1906, Bitancourt 1934, Muller & Chupp 1934, Arruda 1938, Viégas 1945a, (*)
 42) *Cercospora dubia* (Riess) Winter ; on *Chenopodium album* ; Viégas 1945a

Combretaceae

- 43) *Cercospora catappae* P. Hennings ; on *Terminalia catappa* ; Muller & Chupp 1934
 44) *Cercospora geraiensis* Chupp ; on *Terminalia catappa* ; Chupp 1953

Compositae

- 45) *Cercospora bidentis* Tharp ; on *Bidentis pilosa*, *B. sp.* ; Muller & Chupp 1934, Viégas 1945a, (*)
- 46) *Cercospora calendulae* Saccardo ; on *Calendula officinalis* ; Muller & Chupp 1934, Muller 1935, (*)
- 47) *Cercospora chrysanthemi* Heald et Wolf ; Syn. *Cercospora chrysanthemi* Puttemans ; on *Chrysanthemum indicum*, *C. sp.*, *Callistephus chinensis* ; Puttemans 1912, (*)
- 48) *Cercospora consimilis* Sydow ; on *Vernonia crotonoides* ; Muller & Chupp 1934
- 49) *Cercospora elephantopi* Ellis et Everhart ; on *Elephantopus scaber*, *Eremanthus scapigerus* ; Muller & Chupp 1934, Viégas 1945c
- 50) *Cercospora gerberae* Chupp et Viégas ; on *Gerbera jamesonii* ; Viégas 1945a, (*)
- 51) *Cercospora gnaphaliacea* Cooke ; on *Gnaphalium sp.* ; Chupp 1953
- 52) *Cercospora grandissima* Rangel ; on *Dahlia variabilis*, *D. scolymus*, *D. sp.* ; Maublanc & Rangel 1915, Muller & Chupp 1934, Muller 1935, Viégas 1945a, (*)
- 53) *Cercospora helianthicola* Chupp et Viégas ; on *Helianthus annuus*, *H. sp.* ; Viégas 1945a, (*)
- 54) *Cercospora helichrysi* Chupp ; on *Helichrysum orientale* ; Chupp 1953
- 55) *Cercospora longissima* (Trav.) Saccardo ; on *Lactuca sativa* ; Sacca 1917, Muller & Chupp 1934, Viégas 1945a
- 56) *Cercospora stomatica* Ellis et Davis ; on *Solidago sp.* ; Muller & Chupp 1936
- 57) *Cercospora tageticola* Ellis et Everhart ; on *Tagetes sp.* ; (*)
- 58) *Cercospora vernoniae* Ellis et Kellerman ; on *Vernonia scorpioides* ; (*)
- 59) *Cercospora viegasii* Chupp ; on *Mikania hirsutissima* ; Viégas 1945a
- 60) *Cercospora wulfiae* Muller et Chupp ; on *Wulfia stenoglossa* ; Muller & Chupp 1936
- 61) *Cercospora zinniae* Ellis et Martin ; Syn. *Cercospora atricincta* Heald et Wolf ; on *Zinnia elegans*, *Z. sp.* ; Muller & Chupp 1934, Muller 1935, Silveira 1942, (*)
- 62) *Cercospora sp.* ; on *Lactuca sativa* ; Galli et al. 1968
- 63) *Cercospora sp.* ; on *Cynara scolymus* ; Cruz et al. 1964
- Convolvulaceae
- 64) *Cercospora cordobensis* Spegazzini ; on *Ipomoea batatas* ; Muller & Chupp 1953
- 65) *Cercospora evolvuli* Chupp ; on *Evolvulus sp.* ; Chupp 1953
- 66) *Cercospora ipomoeae* Winter ; on *Ipomoea batatas*, *I. longicuspis*, *I. sp.* ; Viégas 1945a, (*)
- 67) *Cercospora timorensis* Cooke ; on *Ipomoea batatas* ; (*)
- Cruciferae
- 68) *Cercospora brassicicola* P. Hennings ; Syn. *Cercospora bloxami* (Berk. et Br.) Young, *Cercospora brassicae-campestris* Rangel ; on *Brassica nigra*, *B. pekinensis*, *B. campestris*, *Raphanus sativus* ; Rangel 1916, Muller & Chupp 1934, 1936, Viégas 1945a
- 69) *Cercospora cheiranthi* Saccardo ; on *Cheiranthus cheirus* ; Muller & Chupp 1936
- 70) *Cercospora cruciferarum* Ellis et Everhart ; on *Raphanus sativus* ; Hennings 1902a, (*)
- 71) *Cercospora nasturtii* Passerini ; on *Nasturtium officinale*, *N. sp.* ; Muller & Chupp 1936, Viégas 1945a, (*)
- Cucurbitaceae
- 72) *Cercospora cayaponiae* Stevens & Solheim (*Mycovellosiella cucurbiticola* (Speg.) Deighton) ; on Cucurbitaceae ; Muller & Chupp 1934
- 73) *Cercospora citrullina* Cooke ; on *Citrullus vulgaris*, *Cucumis melo*, *Cucurbita*, *maxima*, *Luffa cylindrica*, *L. sp.*, *Momordica charantia*, *Sechium edule*, Cucurbitaceae ; Muller & Chupp 1934, 1936, Viégas 1945a, Batista et al. 1960, Galli et al. 1968, (*)
- 74) *Cercospora cucurbiticola* P. Hennings (*Phaeoramularia cucurbiticola* (P. Henn.) Deighton) ; on *Cucurbita sp.* ; Hennings 1904a

75) *Cercospora cyclantherae* Chupp et Muller ; on *Cyclanthera* sp. ; Viégas 1945a

76) *Cercospora echinocystis* Ellis et Martin ; on *Anguria* ; Muller & Chupp 1934

Note : "*Anguria*" perhaps belongs to *Cucumis* sp. or related genus.

Cyperaceae

77) *Cercospora glauciana* Viégas ; on *Bulbostylis major* ; Viégas 1945a

78) *Cercospora ugandensis* Hansford ; on *Cyperus* sp. ; (*)

Dilleniaceae

79) *Cercospora davillae* Muller et Chupp ; on *Davilla rugosa* ; Muller & Chupp 1934

Dioscoreaceae

80) *Cercospora carbonacea* Miles ; on *Dioscorea batatas* ; Bitancourt 1937

81) *Cercospora dioscoreae* Ellis et Martin (*Phaeoramularia dioscoreae* (Ellis et Martin) Deighton); on *Dioscorea* sp. ; Viégas 1945a

82) *Cercospora pachyderma* H. et P. Sydow ; on *Dioscorea alata* ; Muller & Chupp 1936

83) *Cercospora ubi* Raciborski ; Syn. *Cercospora brasiliensis* Avena-Sacca ; on *Dioscorea alata*, *D. bulbifera* ; Sacca 1917, Chupp 1953

84) *Cercospora* sp. ; on *Dioscorea batatas* ; Bitancourt et al. 1935

Dipsacaceae

85) *Cercospora elongata* Peck ; Syn. *Cercospora scabiosaecola* Rangel ; on *Scabiosa atropurpurea*; Maublanc & Rangel 1915

Ebenaceae

86) *Cercospora fuliginosa* Ellis et Kellerman ; Syn. *Cercospora diospyri* Viégas ; on *Disopyros hispida* ; Viégas 1945a

87) *Cercospora kaki* Ellis et Everhart ; on *Diospyros kaki*, *D. hispida* ; Viégas 1944, Namekata & Tokeshi 1964, (*)

88) *Cercospora* sp. ; on *Diospyros kaki* ; Cruz et al. 1964

Euphorbiaceae

89) *Cercospora acalyphae* Peck ; on *Acalypha rubra*, *A. marvorata* ; Muller & Chupp 1934, Muller 1935, (*)

90) *Cercospora aleuritidis* Miyake ; on *Aleurites fordii* ; Muller & Chupp 1936, Silveira 1942, Viégas 1945a

91) *Cercospora caribaea* Chupp et Ciferri (*Phaeoramularia manihotis* (Stev. et Solh.) M. B. Ellis) ; on *Manihot utilissima* ; Muller & Chupp 1934, Viégas 1941, 1945a, Galli et al. 1968

92) *Cercospora crotonophila* Spegazzini ; on *Croton* sp. ; Viégas 1945a

93) *Cercospora euphorbiaecola* Atkinson ; on Euphorbiaceae ; Muller & Chupp 1934

94) *Cercospora euphorbiae-pubescentis* Unamuno ; on *Euphorbia pubescens* ; Chupp 1953

95) *Cercospora henningsii* Allescher (*Cercosporidium henningsii* (Allesch.) Deighton) ; on *Manihot utilissima*, *M. glaziovii*, *M. piauhyensis*, *M.* sp. ; Muller & Chupp 1934, Viégas 1941, 1945a, Batista et al. 1960, Cruz et al. 1964, Galli et al. 1968, (*)

96) *Cercospora heveae* Vincens ; on *Hevea brasiliensis* ; Chupp 1953

97) *Cercospora hieronymae* Chupp ; on *Hieronyma laxifolia* ; Chupp 1953

98) *Cercospora hurae* Stevens ; on *Hura crepitans* ; Muller & Chupp 1934

99) *Cercospora huricola* Chupp ; on *Hura crepitans* ; Chupp 1953

100) *Cercospora manaosensis* P. Hennings ; on *Croton* sp. ; Hennings 1904b

101) *Cercospora manihobae* Viégas ; on *Manihot utilissima* ; Viégas 1945a

102) *Cercospora phyllanthi* Chupp ; on *Phyllanthus* sp. ; Viégas 1945a

103) *Cercospora pulcherrimae* Tharp ; on *Euphorbia (Poinsettia)* sp., *P. pulcherrima* ; Muller

- & Chupp 1934, Muller 1935, (*)
- 104) *Cercospora ricinella* Saccardo et Berlese ; on *Ricinus communis* ; Puttemans 1906, Spegazzini 1908, Muller & Chupp 1934, Gonçalves 1938b, Viégas 1945a, Batista et al. 1960, Galli et al. 1968, (*)
- 105) *Cercospora rubida* Muller et Chupp ; on *Croton floribundus*, Euphorbiaceae ; Muller & Chupp 1934, Viégas 1945a
- 106) *Cercospora vicosae* Muller et Chupp ; on *Manihot* sp. ; Muller & Chupp 1934, Viégas 1945a
- 107) *Cercospora* sp. ; on *Ricinus communis* ; Cruz et al. 1964
- Fagaceae
- 108) *Cercospora castaneae* Muller et Chupp ; on *Castanea sativa*, *C. crenata*, *C.* sp. ; Muller & Chupp 1936, Viégas 1945a, (*)
- 109) *Cercospora juglandis* Kellerman et Swingle ; on Fagaceae ; Muller & Chupp 1934
Note : The fungus is infectious to *Juglans*, Juglandaceae.
- Flacourtiaceae
- 110) *Cercospora caloncobae* Viégas ; on *Caloncoba echinata* (*Oncoba echinata*) ; Viégas 1947a
- Gesneriaceae
- 111) *Cercospora gloxiniae* Chupp ; on *Gloxinia maculata* ; Chupp 1953
- Gramineae
- 112) *Cercospora atrofiliiformis* Yen, Lo et Chi ; on *Saccharum* spp. ; Galli et al. 1968
Note : The species was described in the textbook for students as a sugarcane disease, but is not considered to be distributed in Brazil.
- 113) *Cercospora fusimaculans* Atkinson ; on *Ichnanthus* sp., *Panicum maximum*, *P.* sp., *Trichachne insularis* ; Muller & Chupp 1936, (*)
- 114) *Cercospora koepkei* Krüger ; Syn. *Cercospora longipes* Butler ; on *Saccharum officinarum*, *S.* spp. ; Muller & Chupp 1934, Bitancourt 1934, 1940a, Arruda 1941, 1943, 1946, Galli et al. 1968, (*)
- 115) *Cercospora oryzae* Miyake ; on *Oryza sativa* ; Muller & Chupp 1934, Muller 1936, Mello et al. 1962, Cruz et al. 1964, Galli et al. 1968, (*)
- 116) *Cercospora setariae* Atkinson ; on *Stenotaphrum secundatum*, *Setaria poiretiana* ; Muller & Chupp 1934, (*)
- 117) *Cercospora sorghi* Ellis et Everhart ; on *Zea mays* ; Muller & Chupp 1936
- 118) *Cercospora vaginae* Krüger ; on *Saccharum officinarum*, *S.* spp. ; Bitancourt 1940a, Viégas 1944, Galli et al. 1968, (*)
- 119) *Cercospora zaeae-mydis* Tehon et Daniels ; on *Zea mays* ; Muller & Chupp 1936, Viégas 1945a
- 120) *Cercospora* sp. ; on *Oryza sativa* ; Viégas 1945a
Note : The fungus is identical to *Cercospora oryzae*, according to the description and drawings of Viégas.
- Iridaceae
- 121) *Cercospora iridis* Chupp ; on *Iris* sp. ; Chupp 1953
- Juglandaceae
- 122) *Cercospora forsteriana* Chupp et Viégas ; on *Juglans regia* ; Viégas 1945a
- 123) *Cercospora fusca* (Heald et Wolf) Rand (*Sirosporium diffusum* (Heald et Wolf) Deighton) ; on *Carya illinoensis* ; Bitancourt 1940b, Cruz et al. 1964, (*)
- 124) *Cercospora juglandis* Kellerman et Swingle ; on Fagaceae, *Juglans nigra* ; Muller & Chupp 1934, Chupp 1953
Note : See "Note" of *C. juglandis* in Fagaceae.

Labiatae

- 125) *Cercospora coleicola* Chupp et Muller ; on *Coleus* sp. ; Chupp 1953
 126) *Cercospora hyptidis* Spegazzini ; on *Hyptis* sp. ; Muller & Chupp 1936
 127) *Cercospora labiatarum* Chupp et Muller ; on Labiatae ; Chupp 1953
 128) *Cercospora leonuri* Stevens et Solheim ; on *Leonurus cardiaca*, *L. sibiricus* ; Viégas 1945a, (*)
 129) *Cercospora menthicola* Tehon et Daniels ; on *Mentha canadensis*, *M.* sp. ; (*)

Lauraceae

- 130) *Cercospora perseae* Ellis et Martin ; on *Persea americana* ; Bitancourt 1940c, Cruz et al. 1964
 Note : The fungus does not seem to belong to *Cercospora* (Chupp 1953).
 131) *Cercospora purpurea* Cooke ; on *Persea americana*, *P. drymifolia* ; Viégas 1945c, Amaral 1951, Albuquerque 1962, (*)
 132) *Cercospora* sp. ; on *Persea gratissima* ; Galli et al. 1968

Lecythidaceae

- 133) *Cercospora couratariae* Chupp ; *Couratari estrellensis* ; Chupp 1953

Leguminosae

- 134) *Cercospora aeschynomenes* Muller et Chupp ; on *Aeschynomene falcata* ; Muller & Chupp 1934
 135) *Cercospora alemquerensis* Spegazzini ; on *Acacia alemquerensis* ; Spegazzini 1922, Chupp 1953
 Note : The fungus is not considered to belong to *Cercospora* according to Chupp (1953).
 136) *Cercospora arachidicola* Hori ; on *Arachis hypogaea* ; Cruz et al. 1962, 1964, Galli et al. 1968, (*)
 137) *Cercospora austrinae* Chupp et Viégas ; on *Pueraria hirsuta*, *P.* sp. ; Viégas 1945a, (*)
 138) *Cercospora barbatimao* Viégas ; on *Stryphnodendron barbatimam* ; Viégas 1945b
 139) *Cercospora bauhiniae* H. et P. Sydow ; on *Bauhinia variegata* ; (*)
 140) *Cercospora cajani* P. Hennings (*Mycovellosiella cajani* (P. Henn.) Rangel) ; Syn. *Vellosiella cajani* (P. Henn.) Rangel ; on *Cajanus indicus* ; Hennings 1902b, Rangel 1915, 1917, Viégas 1945a, Gonçalves 1947
 141) *Cercospora canavaliae* H. et P. Sydow (*Stenella canavaliae* (H. et P. Syd.) Deighton) ; on *Canavalia ensiformis* ; Muller & Chupp 1934
 142) *Cercospora canescens* Ellis et Martin ; on *Phaseolus vulgaris*, *Canavalia gladiata*, *Crotalaria juncea*, *Dolichos lablab*, *Glycine max*, *Vigna sesquipedalis* ; Muller & Chupp 1934, Viégas 1945a, Galli et al. 1968, (*)
 Note : The fungus is not infectious to *Glycine max*, though reported by Viégas.
 143) *Cercospora caracallae* (Speg.) Chupp ; on *Phaseolus* sp., *Vigna sinensis* ; Viégas 1945a, Batista et al. 1960
 144) *Cercospora cassiae* P. Hennings (*Cercosporidium cassiae* (P. Henn.) Deighton) ; on *Cassia machantera*, *C. leptocarpa* ; Muller & Chupp 1934, 1936
 145) *Cercospora chupii* Viégas ; on *Ormosia arborea* ; Viégas 1945b
 Note : According to Chupp (1953), the fungus seems to belong to *Didymaria*.
 146) *Cercospora columnaris* Ellis et Everhart (*Phaeoisariopsis griseola* (Sacc.) Ferraris) ; Syn. *Isariopsis griseola* Saccardo ; on *Phaseolus vulgaris* ; Hennings 1902b, Muller & Chupp 1934, Viégas 1945a
 147) *Cercospora cruenta* Saccardo ; on *Canavalia ensiformis*, *Vigna sinensis*, *V. sesquipedalis* ;

- Muller & Chupp 1934, Viégas 1945a, Batista et al. 1960, (*)
- 148) *Cercospora demetroniana* Winter ; on *Crotalaria juncea* ; Muller & Chupp 1936
- 149) *Cercospora erythrinae-tomentosae* Hansford ; on *Erythrina reticulata* ; Muller & Chupp 1936
 Note : The writers failed to find the original description of *C. erythrinae-tomentosae*.
 The fungus might be identical to *C. tomentosae* Hansford.
- 150) *Cercospora erythrinicola* Tharp ; on *Erythrina velutina* ; Viégas 1945a
- 151) *Cercospora flagellifera* Atkinson ; on *Galactia striata* ; (*)
- 152) *Cercospora ingae* Oregon-Botero ; on *Inga spectabilis* ; Chupp 1953
- 153) *Cercospora instabilis* Rangel ; on *Cajanus indicus* ; Rangel 1915
- 154) *Cercospora kikuchii* Matsumoto et Tomoyasu ; on *Glycine max* ; Galli et al. 1968, (*)
- 155) *Cercospora leguminum* Chupp et Linder ; on *Crotalaria stipularis* ; Muller & Chupp 1936
- 156) *Cercospora lonchocarpi* Stevenson ; on *Lonchocarpus nicou* ; Stevenson 1946
- 157) *Cercospora mucunae* H. et P. Sydow ; on *Mucuna* sp. ; H. & P. Sydow 1903
- 158) *Cercospora munduleae* Saccardo et Sydow ; on Leguminosae (*Mundulea* sp. ?) ; Viégas 1945a
 Note : The fungus is considered to belong to *Exosporium* according to Chupp (1953).
- 159) *Cercospora occidentalis* Cooke (*Phaeoramularia occidentalis* (Cooke) Deighton) ; Syn. *Cercospora paulensis* P. Hennings ; on *Cassia occidentalis* ; Hennings 1909a, Maublanc & Rangel 1915, Viégas 1945a
- 160) *Cercospora personata* (Berk. et Curt.) Ellis et Everhart (*Cercosporidium personatum* (Berk. et Curt.) Deighton) ; Syn. *Cercospora arachidis* P. Hennings ; on *Arachis hypogaea*, *Cassia occidentalis* ; Hennings 1904b, 1909b, Puttemans 1906, Muller & Chupp 1934, Bitancourt 1935, Silveira 1942, Viégas 1945a, Cruz et al. 1964, Galli et al. 1968, (*)
 Note : Hennings (1904b) reported the fungus on *Cassia occidentalis*, but the fungus seems to be only infectious to *Arachis hypogaea*.
- 161) *Cercospora pittierii* Sydow ; on *Erythrina* sp. ; Chupp 1953
- 162) *Cercospora sojina* Hara ; on *Glycine max* ; Lehman et al. 1976
- 163) *Cercospora sphaeroidea* Spegazzini ; Syn. *Cercospora iponemensis* P. Hennings ; on *Cassia* sp. ; Hennings 1909a
- 164) *Cercospora stensvii* Young ; on *Andira* sp., *Gycine max* ; Muller & Chupp 1936, Chupp 1953
 Note : Muller & Chupp (1936) reported the fungus on *Glycine max*, but the fungus does not seem to be infectious to *Glycine max*.
- 165) *Cercospora stizolobii* H. et P. Sydow ; on *Stizolobium* sp., *Mucuna utilis*, *M. sp.* ; Muller & Chupp 1934, Viégas 1945a, (*)
- 166) *Cercospora tomentosae* Hansford ; on *Erythrina reticulata* ; Chupp 1953
 Note : See "Note" of *C. erythrinae-tomentosae*.
- 167) *Cercospora traversiana* Saccardo ; Syn. *Cercospora trigonellae* Maublanc ; on *Trigonella foenum graecum* ; Maublanc & Rangel 1915
- 168) *Cercospora vanderystii* P. Hennings ; on *Phaseolus vulgaris* ; Galli et al. 1968
 Note : It is necessary to check the specimen.
- 169) *Cercospora vataireae* P. Hennings ; on *Vatairea guianensis* (*Derris guianensis*) ; Hennings 1909b
- 170) *Cercospora wisteriae* Muller et Chupp ; on *Wisteria floribunda*, *W. sp.* ; Muller & Chupp 1936, (*)
- 171) *Cercospora* sp. ; on *Soja max* (*Glycine max*) ; Amaral 1951

- 172) *Cercospora* sp. ; on *Crotalaria vitellina* ; Puttemans 1906
 173) *Cercospora* sp. ; on *Phaseolus vulgaris* ; Puttemans 1906
 Liliaceae
 174) *Cercospora asparagi* Saccardo ; Syn. *Cercospora caulicola* Winter ; on *Asparagus officinalis* ;
 Puttemans 1906, Muller & Chupp 1934, Viégas 1945a, (*)
 175) *Cercospora cordyline* P. Hennings ; on *Cordyline dracaenoides* ; Hennings 1902a
 176) *Cercospora duddiae* Welles ; on *Allium sativum*, *A. cepa* ; Chupp 1953, Galli et al. 1968
 177) *Cercospora pallidissima* Chupp ; on *Smilax* sp. ; Chupp 1953
 178) *Cercospora pycnidioides* (Speg.) Chupp ; Syn. *Cercospora smilacina* Spegazzini ; on
Smilax sp. ; Spegazzini 1908, Chupp 1953
 179) *Cercospora smilacis* de Thuemen ; on *Smilax* sp. ; Muller & Chupp 1934, Viégas 1944
 180) *Cercospora victorialis* de Thuemen ; on *Allium sativum* ; Muller & Chupp 1936
 181) *Cercospora yuccae* Cooke ; on *Yucca gloriosa* var. *recurvifolia*, *Y. sp.* ; Viégas 1945a
 Malpighiaceae
 182) *Cercospora byrsonimatis* Maublanc ; on *Byrsonima* sp. ; Muller & Chupp 1936
 183) *Cercospora castris* Viégas ; on *Banisteria metallicolor* ; Viégas 1945a
 184) *Cercospora peixotoae* Chupp et Viegas ; on *Peixotoa macrophylla* ; Viégas 1945a
 Malvaceae
 185) *Cercospora abelmoschi* Ellis et Everhart ; Syn. *Cercospora hibisci* Tracy et Earle ; on
Hibiscus esculentus (*Abelmoschus esculentus*) ; Muller & Chupp 1934, Batista et
 al. 1960
 186) *Cercospora altheina* Saccardo ; on *Althaea rosea* ; Muller & Chupp 1936, (*)
 187) *Cercospora gossypina* Cooke ; on *Gossypium hirsutum*, *G. herbaceum* ; Puttemans 1906,
 Bitancourt 1934, 1935, Muller & Chupp 1936, Viégas 1945a, Galli et al. 1968
 188) *Cercospora hibiscina* Ellis et Everhart ; on *Hibiscus esculentus*, *H. tiliaceus* ; Muller &
 Chupp 1934, Viégas 1945a
 189) *Cercospora hyalospora* Muller et Chupp ; on *Sida* sp. ; Muller & Chupp 1934
 190) *Cercospora malachrae* Heald et Wolf ; on *Malachra* sp. ; Chupp 1953
 191) *Cercospora malayensis* Stevens et Solheim ; on *Hibiscus esculentus*, *H. sabdariffa* ; Viégas
 1945a
 192) *Cercospora malvarum* Saccardo ; on *Malva* sp. ; Muller & Chupp 1934
 193) *Cercospora micranthae* Muller & Chupp ; on *Sida micrantha*, *S. cordifolia* ; Muller &
 Chupp 1936, Viégas 1945a
 194) *Cercospora sidae* (P. Henn.) Marchal et Steyaert ; Syn. *Cercospora sidae* (P. Henn.) Petrak ;
 on *Sida cordifolia*, *S. sp.* ; Viégas 1945a, (*)
 195) *Cercospora sidaecola* Ellis et Everhart ; on *Sida spinosa* var. *angustifolia*, Malvaceae ;
 Muller & Chupp 1934, Viégas 1945a
 196) *Cercospora urenae* Viégas et Chupp ; on *Urena lobata*, *Sida cordifolia*, *Hibiscus esculentus*
 (*Abelmoschus esculentus*) ; Viégas 1945a, Batista et al. 1960
 197) *Cercospora* sp. ; on *Hibiscus rosa-sinensis* ; Cruz et al. 1964
 198) *Cercospora* sp. ; on *Hibiscus mutabilis* ; Puttemans 1906
 Marantaceae
 199) *Cercospora calathea* Viégas et Chupp ; on *Calathea* sp. ; Viégas 1945a
 Melastomataceae
 200) *Cercospora tibouchinae* Viégas et Chupp (*Cercoseptoria tibouchinae* (Viégas) Deighton) ;
 on *Tibouchina* sp. ; Viégas 1945a
 Moraceae

- 201) *Cercospora cecropiae* Muller et Chupp ; on *Cecropia* sp. ; Muller & Chupp 1934
- 202) *Cercospora moricola* Cooke ; on *Morus alba* ; Muller & Chupp 1936
- 203) *Cercospora morina* Chupp ; on *Morus alba* ; Chupp 1953, (*)
- 204) *Cercospora urostigmatis* P. Hennings ; on *Urostigma* sp. ; Hennings 1902a
- Musaceae
- 205) *Cercospora musae* Zimmermann ; on *Musa sapientum*, *M.* spp. ; Issa 1953, Cruz et al. 1964, Galli et al. 1968, (*)
- Myrsinaceae
- 206) *Cercospora stylogynis* Viégas ; on *Stylogyne ambigua* ; Viégas 1947b
- Myrtaceae
- 207) *Cercospora campinensis* Chupp et Viégas ; on Myrtaceae ; Viégas 1945a
- 208) *Cercospora epicoccoides* Cooke et Masee ; on *Eucalyptus* spp. ; Cruz et al. 1964
Note : It is necessary to check the specimen.
- 209) *Cercospora eucalypti* Cooke et Masee ; on *Eucalyptus globulus*, *E.* spp. ; Muller & Chupp 1936, Galli et al. 1968, (*)
- 210) *Cercospora eugeniae* (Rangel) Chupp ; on *Eugenia uniflora* ; Rangel 1916, Viégas 1945a
- 211) *Cercospora myrticola* Spegazzini ; on *Tibouchina mutabilis*, *Myrciaria cauliflora* ; Muller & Chupp 1934, (*)
Note : *Tibouchina mutabilis* was reported by Muller & Chupp (1934) as a host plant of the fungus. However, the fungus is not infectious to the host.
- 212) *Cercospora psidii* Rangel ; on *Psidium araca*, *Couratari estrellense* ; Maublanc & Rangel 1915, Muller & Chupp 1936
Note : The fungus is not infectious to *Couratari estrellense*, Leguminosae, though reported by Muller & Chupp (1936).
- 213) *Cercospora sawadae* Yamamoto ; on *Psidium guajava* ; Viégas 1945a, (*)
- 214) *Cercospora asteriana* Spegazzini ; on Myrtaceae ; Spegazzini 1908
- Nymphaeaceae
- 215) *Cercospora nymphaeacea* Cooke et Ellis (*Cercoseptoria nymphaeacea* (Cooke et Ell.) Deighton) ; *Nymphaea* sp. ; Viégas 1945a
- Oenotheraceae
- 216) *Cercospora fuchsiae* Muller et Chupp ; on *Fuchsia* sp. ; Viégas 1945a
- Oleaceae
- 217) *Cercospora jasminicola* Muller et Chupp ; on *Jasminum officinale*, *J. grandiflorum* ; Muller et Chupp 1936, Viégas 1945a
- 218) *Cercospora lilacis* (Desm.) Saccardo ; on *Syringa* sp. ; Muller 1935, Muller & Chupp 1936
- 219) *Cercospora puttemansii* P. Hennings ; on *Nyctanthes arbo-tristis* ; Hennings 1902a
- Oxalidaceae
- 220) *Cercospora oxalidiphila* (Speg. Ined.) Chupp et Muller ; on *Oxalis* sp. ; Chupp 1953
- 221) *Cercospora oxalidis* Muller et Chupp ; on *Oxalis* sp. ; Muller & Chupp 1934
- 222) *Cercospora* sp. ; on *Oxalis martiniana* ; Cruz et al. 1964
- 223) *Cercospora* sp. ; on *Averrhoa caranbola* ; Cruz et al. 1964
- Palmae
- 224) *Cercospora palmicola* Spegazzini ; on *Orbignya martiana* ; Ponte 1969
Note : According to Chupp (1953), the fungus is considered to be *Helminthosporium*.
- 225) *Cercospora* sp. ; on *Cocos nucifera* ; Cruz et al. 1964
- Papaveraceae
- 226) *Cercospora papavericola* (Sawada) Chupp ; Syn. *Cercospora papaveri* Muller et Chupp ;

on *Papaver* sp. ; Muller & Chupp 1936

Passifloraceae

227) *Cercospora fusco-virens* Saccardo ; on *Passiflora speciosa* ; Muller & Chupp 1936

228) *Cercospora passiflorae* Muller et Chupp ; on *Passiflora* sp. ; Muller et Chupp 1936

Pedaliaceae

229) *Cercospora sesami* Zimmermann ; on *Sesamum indicum* ; Puttemans 1906, Muller & Chupp 1936, Viégas 1945a, (*)

230) *Cercospora* sp. ; on *Sesamum indicum* ; Sacca 1918

Phytolaccaceae

231) *Cercospora trichostigmae* Stevens ; on *Villamilla octandra*, *Gallesia scorododendrum* ; Chupp 1953

Piperaceae

232) *Cercospora artanthes* P. Hennings ; on *Piper crassinervium*, *Artanthes (Piper)* sp. ; Hennings 1909a, Viégas 1945a

233) *Cercospora piperis* Patouillard ; on *Pothomorphe* sp., *Piper hydrangeifolium*, *P.* sp. ; Muller & Chupp 1934, Bitancourt 1937

Plantaginaceae

234) *Cercospora plantaginis* Saccardo ; on *Plantago* sp. ; Muller & Chupp 1934

Polygalaceae

235) *Cercospora grisea* Cooke et Ellis ; Syn. *Cercospora polygalae* P. Hennings ; on *Polygala paniculata* ; Hennings 1904a, Muller & Chupp 1936

Polygonaceae

236) *Cercospora polygonorum* Cooke ; on *Polygonum acre*, *P.* sp. ; Muller & Chupp 1934, Viégas 1945a

237) *Cercospora rhapontici* Tehon et Daniels ; on *Rheum officinale* ; Viégas 1945a

238) *Cercospora* sp. ; on *Fagopyrum esculentum* ; Puttemans 1906

Polypodiaceae

239) *Cercospora filicum* P. Hennings ; on *Nephrodium* sp. ; Hennings 1902b

Note : The species belongs to *Helminthosporium* according to Chupp (1953).

Proteaceae

240) *Cercospora roupalae* Batista et Perez ; on *Roupala brasiliensis* ; Batista et al. 1960

Funicaceae

241) *Cercospora punicae* P. Hennings ; on *Punica granatum* ; Muller & Chupp 1934, Viégas 1945a, (*)

Ranunculaceae

242) *Cercospora aquilegiae* Kellerman et Swingle ; on *Aquilegia* sp. ; Muller & Chupp 1936

Rhamnaceae

243) *Cercospora colubrinae* Chupp et Viégas ; on *Colubrina rufa* ; Viégas 1945a

244) *Cercospora frangulina* P. Hennings ; on *Rhamnus (Frangula)* sp. ; Hennings 1909a

245) *Cercospora hoveniae* Viégas et Chupp ; on *Hovenia dulcis* ; Viégas 1945a

Rosaceae

246) *Cercospora circumscissa* Saccardo ; Syn. *Cercospora cerasella* Saccardo ; on *Prunus cerasus*, *Persica vulgaris*, *Eriobotrya japonica* ; Spegazzini 1908, Bitancourt et al. 1935, Pickel 1940, Viégas 1945a

247) *Cercospora cydoniae* Ellis et Everhart ; Syn. *Cercospora cydoniae* Rangel ; on *Cydonia vulgaris (C. oblonga)*, *Chaenomeles lagenaria* ; Maublanc & Rangel 1915, (*)

248) *Cercospora hyalina* Muller & Chupp ; on *Rosa* sp. ; Muller & Chupp 1934

- 249) *Cercospora laxipes* J. J. Davis ; on *Spiraea hipericifolia* ; (*)
- 250) *Cercospora mali* Ellis et Everhart ; Syn. *Cercospora minima* Tracy et Earle ; on *Pyrus malus* (*Malus pumila* var. *domestica*), *P. communis*, *Cydonia oblonga* ; Muller & Chupp 1934, Viégas 1945a, (*)
 Note : The fungus does not seem to be infectious to *Cydonia oblonga*, though reported by Muller & Chupp (1934) as *C. minima*.
- 251) *Cercospora prunicola* Ellis et Everhart ; on *Persica vulgaris* ; (*)
- 252) *Cercospora rosicola* Passerini ; Syn. *Cercospora rosaecola* Passerini ; on *Rosa* sp. ; Noack 1898, Bitancourt 1934, Muller & Chupp 1934, Gonçalves 1937, Viégas 1945a, (*)
- 253) *Cercospora rubi* Saccardo ; on *Rubus* sp. ; Viégas 1945a
- 254) *Cercospora spiraeicola* Muller et Chupp ; on *Spiraea hipericifolia* ; (*)
- 255) *Cercospora* sp. ; on *Prunus persica* (*Persica vulgaris*) ; Cruz et al. 1964
- 256) *Cercospora* sp. ; on *Pyrus communis* ; Cruz et al. 1964
- Rubiaceae
- 257) *Cercospora coffeicola* Berkeley et Cooke ; Syn. *Cercospora coffeae* Zimmermann ; on *Coffea arabica* ; Hennings 1902b, D'Utra 1902, 1915, Puttemans 1906, Bitancourt 1934, Muller & Chupp 1934, Viégas 1945a, Amaral 1951, Batista et al. 1960, Galli et al. 1968, (*)
- 258) *Cercospora diodiae* Cooke ; on *Diodia teres*, *Diodia saponariifolia* ; Hennings 1904b, Viégas 1945a, (*)
- 259) *Cercospora genipae* Rangel ; on *Genipa* sp. ; Rangel 1917
- 260) *Cercospora psychotriiae* Chupp et Viégas ; on *Psychotria* sp. ; Viégas 1945a
- 261) *Cercospora richardsoniae* P. Hennings ; on *Richardsonia brasiliense* ; Hennings 1902a, Muller & Chupp 1936
- 262) *Cercospora ubatubensis* Chupp et Viégas ; on *Borreria alata* ; Viégas 1945a
- Rutaceae
- 263) *Cercospora penzigii* Saccardo ; Syn. *Cercospora aurantia* Heald et Wolf ; on *Citrus* sp. ; Bitancourt 1936, Pickel 1939
- Salicaceae
- 264) *Cercospora salicina* Ellis et Everhart ; on *Salix* sp., *Populus* sp. ; Muller & Chupp 1936, Bitancourt 1937, Viégas 1945a, (*)
- 265) *Cercospora salicis* Chupp et Greene ; on *Salix bobyronica* ; (*)
- Saxifragaceae
- 266) *Cercospora hydrangeae* Ellis et Everhart ; on *Hydrangea hortensia* (*Hortensia hydrangea*), *H.* sp. ; Muller & Chupp 1934, Muller 1935, Viégas 1945a, (*)
- 267) *Cercospora* sp. ; on *Hydrangea* (*Hortensia*) sp. ; Silva 1940
- Scrophulariaceae
- 268) *Cercospora paulowniae* Hori ; on *Paulownia* sp. ; (*)
- 269) *Cercospora scrophulariae* (Moesz) Chupp ; on *Scrophularia* sp. ; Muller & Chupp 1936
- 270) *Cercospora toreniae* P. Hennings ; on *Torenia* sp. ; Hennings 1904b
- Solanaceae
- 271) *Cercospora atromarginalis* Atkinson ; Syn. *Cercospora rigospora* Atkinson, *Cercospora tosensis* P. Hennings ; on *Capsicum frutescens*, *C.* sp., *Solanum nigrum*, *S. verbascifolium*, *S.* sp. ; Muller & Chupp 1934, 1936, Bitancourt et al. 1935, Viégas 1945a, Galli et al. 1968, (*)
 Note : The fungus is infectious only to *Solanum nigrum* group and not to *Capsicum*.
- 272) *Cercospora brachyclada* Sydow ; on *Solanum* sp. ; Muller & Chupp 1936

- 273) *Cercospora capsici* Heald et Wolf ; on *Capsicum frutescens* ; Muller & Chupp 1934, Bitancourt et al. 1935, Viégas 1945a, (*)
- 274) *Cercospora incarnata* P. Hennings (*Mycovellosiella incarnata* Deighton) ; on *Solanum* sp. ; Hennings 1909a
- 275) *Cercospora melongenae* Welles ; on *Solanum melongena* ; Galli et al. 1968
- 276) *Cercospora nicotianae* Ellis et Everhart ; on *Nicotiana tabacum* ; Hennings 1902b, Sacca 1922, Bitancourt 1934, Muller & Chupp 1934, Viégas 1945a, Amaral 1951, Galli et al. 1968, (*)
- 277) *Cercospora petuniae* (Saito) Muller et Chupp ; on *Petunia* sp. ; Muller & Chupp 1936, Viégas 1945a
- 278) *Cercospora physalidis* Ellis ; on *Physalis pubescens*, *P.* sp. ; Muller & Chupp 1936, Viégas 1945a
- 279) *Cercospora solani* de Thueman ; on *Solanum nigrum* ; Muller & Chupp 1934
- 280) *Cercospora solanicola* Atkinson ; on *Solanum tuberosum* ; D'Utra 1910, Sacca 1918, 1922, Muller & Chupp 1934, Viégas 1945a
- 281) *Cercospora unamunoi* Castellani (*Phaeoramularia capsicicola* (Vassiljevsky) Deighton) ; on *Capsicum frutescens* ; (*)
 Note : The fungus was frequently mistaken as *Cercospora rigospora* which is a synonym of *Cercospora atromarginalis* Atkinson (Muller & Chupp 1934, Viégas 1945a, Amaral 1951, Galli et al. 1968).
- 282) *Cercospora venezuelae* Chupp ; on *Solanum argenteum* ; Muller & Chupp 1936
- 283) *Cercospora* sp. ; on *Capsicum annuum* ; Cruz et al. 1964
- Sterculiaceae
- 284) *Cercospora melochiae* P. Hennings ; on *Melochia melissifolia*, *Waltheria americana*, *W.* sp. ; Hennings 1904b, Muller & Chupp 1936, Batista et al. 1960
- Taxodiaceae
- 285) *Cercospora* sp. ; on *Cryptomeria japonica* ; Cruz et al. 1964
- Theaceae
- 286) *Cercospora theae* (Cavara) Breda de Haan (*Cercoseptoria theae* (Cav.) Curzi) ; on *Thea assamica* ; (*)
- Tiliaceae
- 287) *Cercospora luheae* Chupp et Viégas ; on *Luhea* sp. ; Viégas 1945a
- 288) *Cercospora triumfettae* Sydow ; on *Triumfetta semitriloba* ; Muller & Chupp 1936, (*)
- Tropaeolaceae
- 289) *Cercospora tropaeoli* Atkinson ; on *Tropaeolum* sp. ; Muller & Chupp 1936
- Umbelliferae
- 290) *Cercospora apii* Fresenius ; on *Apium graveolens* ; Muller & Chupp 1934, Cruz et al. 1964, (*)
- 291) *Cercospora apii* Fresenius var. *petroselini* Saccardo (*Cercosporidium punctum* (Lacroix) Deighton) ; on *Petroselinum hortense* ; Viégas 1945a
 Note : *C. apii* var. *petroselini* belongs to *Didymaria* according to Chupp (1953) and to *Cercosporidium punctum* according to Deighton (1967). However, Viégas' fungus shows the typical features of *Cercospora* and is identical to *Cercospora petroselinicola*.
- 292) *Cercospora carotae* (Pass.) Solheim ; on *Daucus carota* ; Muller & Chupp 1936, Galli et al. 1968, (*)
- 293) *Cercospora petroselinicola* Hino et Tokeshi ; *Petroselinum hortense* ; (*)

Note : See "Note" of *C. apii* var. *petroselini*.

294) *Cercospora* sp. ; on *Angelica archangelica* ; Puttemans 1906

Urticaceae

295) *Cercospora krugiana* Muller et Chupp ; on *Boehmeria nivea* ; Muller & Chupp 1936,
Viégas 1945a

Verbenaceae

296) *Cercospora duplicans* (P. Henn.) Chupp ; Syn. *Cercospora stachytarphetae* P. Hennings ;
on *Stachytarpheta* sp. ; Hennings 1909a

297) *Cercospora formosana* Yamamoto ; on *Lantana camara* ; (*)

298) *Cercospora guianensis* Stevens et Solheim ; on *Lantana camara* ; (*)

299) *Cercospora lantanae* Chupp (*Mycovellosiella lantanae* (Chupp) Deighton var. *lantanae*) ;
on *Lantana camara* ; Viégas 1945a

Violaceae

300) *Cercospora granuliformis* Ellis et Holway ; on *Viola odorata* ; Viégas 1945a

301) *Cercospora tandilensis* Spegazzini ; on *Hybanthus atropurpureus* ; Viégas 1945a

Vitaceae

302) *Cercospora vitis* (Lev.) Saccardo (*Pseudocercospora vitis* (Lev.) Spegazzini) ; Syn. *Isariopsis clavispora* Saccardo, *Cercospora viticola* (Ces.) Saccardo ; on *Vitis vinifera* ; Bitancourt 1934, Muller & Chupp 1934, Viégas 1945a, Gonçalves 1938a

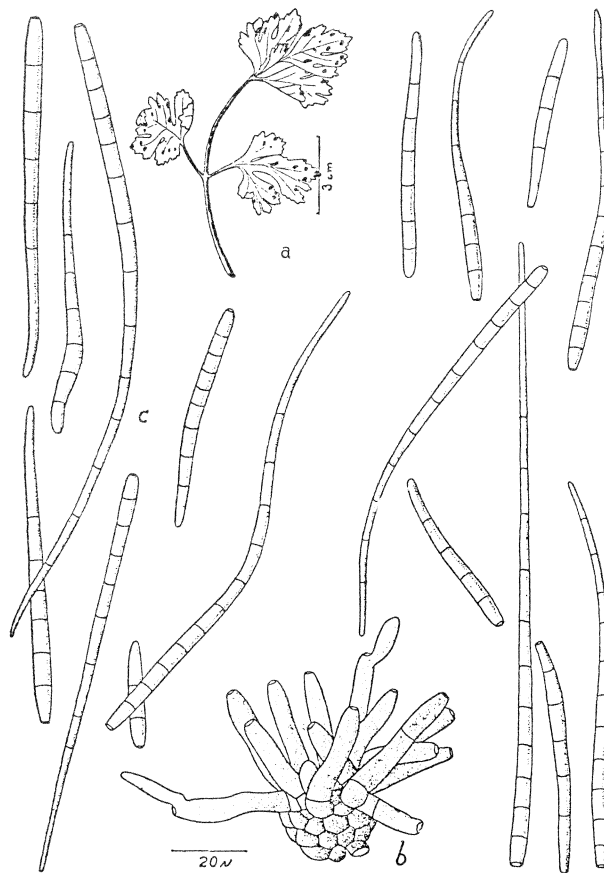
IV Discussion and Conclusion

During the period extending from February 1974 to March 1976, *Cercosporae* and related species were collected in Brazil, mainly in the State of São Paulo, and 81 species were identified among 155 specimens collected. The writers also tried to list all the species which belong to and had belonged to the genus *Cercospora* distributed in Brazil.

Among the specimens examined, *Spiraea hipericifolia* was always affected by two kinds of *Cercospora* species, *C. spiraeicola* and *C. laxipes* found on the upper and lower surface of the lesions, respectively. Although characteristics of conidia and conidiophores of both species were quite similar, those of stromata and fascicles were different. These two species were

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ESTAMPA I



Cercospora apii Fresen. var. *petroselini* Sacc.

Fig. 83. *Cercospora apii* Fresen. var. *petroselini* Sacc. on parsley drawn by Viégas (1945a).

reported separately on different host plants and in different countries. In the specimens collected in Brazil, though only in the State of São Paulo, these two fungi were always found in association but living separately on the upper and lower surface of the lesions. These observations suggest that inoculation tests should be carried out to differentiate these two species.

Cercospora species affecting parsley, *Petroselinum hortense*, was reported in Brazil by Viégas (1945a) as *C. apii* var. *petroselini* Sacc. including a description and drawings of the fungus as shown in Figure 83. *C. apii* var. *petroselini* Sacc. 1886 which is a synonym of *C. petroselini* Sacc. 1912 was labelled as *Didymaria* by Chupp (1953) and later *Cercosporidium punctum* by Deighton (1967). The conidia of *C. apii* var. *petroselini* Sacc. were cylindrical and mostly 1-2 septate as shown in Figure 84 drawn by Deighton. Description given by Saccardo (1912) was as follows: Hab. in foliis languidis *Petroselini sativi*, Romae, Febr. 1904 (D Saccardo). Aptius ut species propria habenda : conidiophoris caespitulosis, brunneis, amphigenis, saepius 1-septatis, 60-70 × 5-6, sursum distincte denticulatis pallidioribus ; conidiis tereti-fusoideis rectis curvulisve, 1-2 septatis, 36-40 × 4-5, subhyalinis ; maculis minutis subolivaceis, non marginatis.

The species reported by Viégas was quite different from *C. apii* var. *petroselini* Sacc.

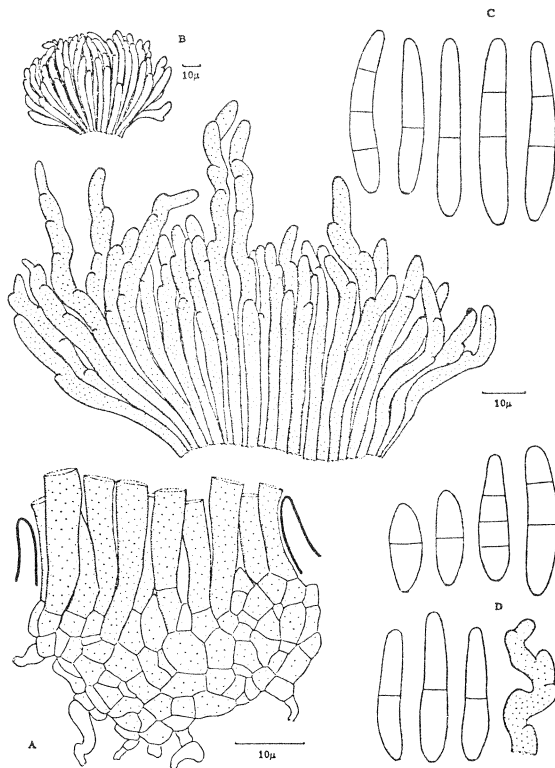


FIG. 26. *Cercosporidium punctum* on *Petroselinum*. Section through stroma, conidiophores and conidia: A, from 30635; B, from 82053; C, from 110941; D, from 104342.

Fig. 84. *Cercosporidium punctum* (Lacr.) Deighton, Syn. *Cercospora apii* Fresen. var. *petroselini* Sacc., drawn by Deighton (1967). (Courtesy of Dr. A. Johnston, Director, Commonw. Mycol. Inst., Kew, England)

mentioned above. Viégas' species perfectly showed the morphological characteristics of *Cercospora*, e.g., conidia were obclavato-cylindric to acicular and multiseptate. The species collected by the writers, as shown in Figure 80, was quite identical to Viégas' species. As it was necessary to distinguish the species from *Cercosporidium punctum* which was originally reported as *Cercospora apii* var. *petroselini* Sacc., the name of *Cercospora petroselinicola* n. sp. was proposed to designate the species of Viégas as well as that identified by the writers.

As reviewed by Deighton (1976), many researchers such as Spegazzini, Saccardo, Penzes, Solheim, Miura, Deighton, etc., have attempted to divide *Cercospora* into groups. Recently Deighton (1976) proposed to incorporate some hundreds of *Cercospora* species to *Pseudocercospora* species which was first described by Spegazzini in 1910 on the basis of *Ps. vitis* (Lev.) Sp. Since the genus description, *Pseudocercospora* species were scarcely reported for a long time. In 1965 Katsuki described 3 species and the key to *Pseudocercospora* and *Cercospora* identification. In 1971 Ellis, in his book "Dematiaceous Hyphomycetes", described the characteristics of the genus *Pseudocercospora*. The characteristics of the genus were also outlined by Deighton in 1976 with about 200 new combinations, enabling to isolate the species, mostly from *Cercospora*. The concept of *Pseudocercospora* as reviewed by the three taxonomists, Katsuki, Ellis and Deighton, varies depending on characteristics such as the thickness of the walls of conidia, the presence of stromata, the percurrent propensity of conidiogenous cells, the branching of conidiophores, the thickening of spore scars, etc. Plant pathologists tend to consider that it is preferable to wait for the conclusion of discussions among the taxonomists with regard to the concept of the genus *Pseudocercospora*.

Since the initiation of research on *Cercospora* in Brazil, more than 260 species have been reported to be distributed in Brazil. On the other hand, more than 250 species were reported to be distributed in Japan (Katsuki 1965, 1966, 1973, Katsuki & Kobayashi 1975, 1976, Yamamoto & Maeda 1960). Among these species, only 73 species were found in both countries (Hino & Tokeshi 1976a), including *Cercoseptoria Cercosporidium*, *Mycovellosiella* and *Phaeoramularia* which had been incorporated in genus *Cercospora*.

Cercospora (Chupp's concept) is host specific or host genus specific under natural conditions. It is natural that these species found in Brazil should be different from those in Japan, because host flora are different in both countries. However, it should not be overlooked that there are many kinds of host plants distributed commonly in both countries, e.g., cereals, legumes, root crops, ornamental plants, trees, weeds, etc. which were introduced by artificial means, or inadvertently into both countries.

In Table 1, some plants common to both countries were listed along with the fungus species of *Cercospora* and related genera reported. This table suggests that the fungus species common to both countries might have been introduced at the same time as the transfer of plant tissues or seeds, e.g., *C. oryzae*, *C. canescens*, *C. cruenta*, *C. arachidicola*, *C. sesami*, etc. For example, the most important among tree diseases in Japan forestry is that caused by *Cercospora sequoiae* Ellis et Everhart on *Cryptomeria japonica*. The fungus is at present considered to have been introduced from North America inadvertently, along with the introduction of seedlings or stocks of *Sequoia gigantea* around the beginning of the century when the Government quarantine system was not established (Ito, Kobayashi & Shibukawa 1967).

As shown in Table 1, there also exist many kinds of species of *Cercospora* and related genera which are found only in Brazil or in Japan even in the case of the same host plants, e.g., *C. zae-maidis* of corn was found only in Brazil and not in Japan (B) and *C. koepkei* var. *sorghii* was found only in Japan and not in Brazil (J). The same applies to *C. caracallae* (B) and *C. vanderysti* (B) of bean and cowpea, *C. zebrina* (J) of broadbean, *C. solanicola* (B)

of potato, *C. mali* (B) of apple, etc. A very interesting and quite important problem with regard to plant quarantine is that different *Cercospora* and related species have been found in both countries even on the same host plants. At present only 73 kinds of *Cercospora* and related species were proved to be distributed in both countries, and the remaining species were found only in either country, Brazil or Japan. Though further investigations might enable to uncover the hidden species which are commonly distributed in both countries, such species do not seem to be so abundant when the achievements in the field of mycology hitherto reached in both countries are taken into consideration.

Table 1. Distribution of *Cercospora* and related species on some plants common to both Brazil and Japan.

B : distributed only in Brazil, B&J : distributed both in Brazil and in Japan, J : distributed only in Japan.

Host plant	B	B&J	J	Fungus
Cereals, legumes & root crops				
Rice		1		<i>C. oryzae</i>
Corn & Sorghum	1	1	1	<i>C. zeaе-maidis</i> (B), <i>C. sorghi</i> (B&J), <i>C. koepkei</i> var. <i>sorghii</i> (J)
Italian millet		1		<i>C. setariae</i>
Soybean	1	2		<i>C. stevensii</i> (B), <i>C. kikuchii</i> (B&J), <i>C. sojae</i> (B&J)
Bean & Cowpea	2	2		<i>C. caracallae</i> (B), <i>C. vanderysti</i> (B), <i>C. canescens</i> (B&J), <i>C. cruenta</i> (B&J)
Peanut		2		<i>C. arachidicola</i> , <i>Cd. personatum</i>
Broad bean			1	<i>C. zebrina</i>
Potato	1		1	<i>C. solanicola</i> (B), <i>M. concors</i> (J)
Sweet potato	1	2		<i>C. cordobensis</i> (B), <i>C. ipomoeae</i> (B&J), <i>C. timorensis</i> (B&J)
Chinese yam	1	3	2	<i>C. carbonacea</i> (B), <i>Ph. dioscoreae</i> (B&J), <i>C. pachyderma</i> (B&J), <i>C. ubi</i> (B&J), <i>C. contraria</i> (J), <i>C. hiratsukana</i> (J)
Vegetables				
Tomato			1	<i>C. fuligena</i>
Eggplant	1		2	<i>C. melongenae</i> (B), <i>C. deightonii</i> (J), <i>C. egenula</i> (J)
Pepper	1	1		<i>Ph. capsicola</i> (B), <i>C. capsici</i> (B&J)
Watermelon, etc.		1		<i>C. citrullina</i>
Leak & Onion	2			<i>C. duddiae</i> , <i>C. victorialis</i>
Asparagus		1		<i>C. asparagi</i>
Chinese cabbage, etc.		1		<i>C. brassicicola</i>
Radish	1			<i>C. cruciferarum</i>
Water cress		1		<i>C. nasturtii</i>
Burdock			1	<i>C. arcti-ambrosiae</i>

Host plant	B	B&J	J	Fungus
Lettuce		1		<i>C. longissima</i>
Carot		1		<i>C. carotae</i>
Celery		1		<i>C. apii</i>
Parsley	1			<i>C. petroselinicola</i>
Beet & Spinach		1		<i>C. beticola</i>
New Zealand spinach		1		<i>C. tetragoniae</i>
Okra	1	2		<i>C. hibiscina</i> (B), <i>C. abelmoschi</i> (B&J), <i>C. malayensis</i> (B&J)
Fruit & nut trees				
Oranges		1		<i>C. penzigii</i>
Persimmon		1	1	<i>C. kaki</i> (B&J), <i>C. kakivora</i> (J)
Apple & Pear	1			<i>C. mali</i>
Quince		1		<i>C. cydoniae</i>
Peach		2		<i>C. circumscissa</i> , <i>C. prunicola</i>
Loquat			1	<i>C. eriobotryae</i>
Raspberry		1		<i>C. rubi</i>
Fig			2	<i>C. bolleana</i> , <i>C. ficci</i>
Pomegranate		1		<i>C. punicae</i>
Guava	1	1		<i>C. psidii</i> (B), <i>C. sawadae</i> (B&J)
Chestnut	1			<i>C. castaneae</i>
Walnut	2			<i>C. forsteriana</i> , <i>C. juglandis</i>
Pecan	1			<i>S. diffusum</i>
Jaboticaba, etc.		1		<i>C. myrticola</i>
Industrial crops				
Tobacco		1		<i>C. nicotianae</i>
Tea		1	1	<i>Cp. theae</i> (B&J), <i>C. chaae</i> (J)
Sugarcane		2	1	<i>C. koepkei</i> (B&J), <i>C. vaginae</i> (B&J), <i>C. taiwanensis</i> (J)
Sesame		1		<i>C. sesami</i>
Castor bean		1		<i>C. ricinella</i>
Mint	1			<i>C. menthicola</i>
Cotton		1		<i>C. gossypina</i>
Ramie	1		1	<i>C. krugiana</i> (B), <i>C. boehmeriae</i> (J)
Ornamental plants				
Cockscomb		1		<i>C. celosiae</i>
Globe-amaranth	1			<i>Ph. gomphrenicola</i>
Garden balsam		2	1	<i>C. campi-silii</i> (B&J), <i>C. fukushiana</i> (B&J), <i>C. nojimai</i> (J)
Begonia			1	<i>C. begoniae</i>
Dianthus		1		<i>C. dianthi</i>
Pot marigold	1			<i>C. calendulae</i>
Chrysanthemum		1		<i>C. chrysanthemi</i>
Transvaal daisy	1			<i>C. gerberae</i>
Dahlia		1		<i>C. grandissima</i>

Host plant	B	B&J	J	Fungus
Sunflower	1			<i>C. helianthicola</i>
Zinnia		1		<i>C. zinniae</i>
Tagetes	1			<i>C. tageticola</i>
Aster			1	<i>C. asteris</i>
Azalea			1	<i>Cp. handelii</i>
Croton	3			<i>C. crotonophila</i> , <i>C. rubida</i> , <i>C. manaosensis</i>
Poinsettia		1		<i>C. pulcherrimae</i>
Scarlet sage			1	<i>C. salviicola</i>
Wisteria	1			<i>C. wisteriae</i>
Sweetpea			1	<i>C. lathyrina</i>
Crapemyrtle			1	<i>C. lythracearum</i>
Hollyhock		1		<i>C. althaeina</i>
Waterlily		1		<i>Cp. nymphaeacea</i>
Lilac		1		<i>C. lilacis</i>
Poppy	1			<i>C. papavericola</i>
Rose	1	1		<i>C. hyalina</i> (B), <i>C. rosicola</i> (B&J)
Hortensia		1	2	<i>C. hydrangeae</i> (B&J), <i>C. obtegens</i> (J), <i>C. yakushimaensis</i> (J)
Petunia		1		<i>C. petuniae</i>
Lanternplant		1		<i>C. physalidis</i>
Tropaeolum	1			<i>C. tropaeoli</i>
Lantana	3			<i>M. lantanae</i> , <i>C. formosana</i> , <i>C. guianensis</i>
Trees, forage crops & weeds				
<i>Paulownia</i>		1		<i>C. paulowniae</i>
<i>Aleurites</i>		1		<i>C. aleurides</i>
<i>Eucalyptus</i>	1	1		<i>C. eucalypti</i> (B), <i>C. epicoccoides</i> (B&J)
<i>Platanus</i>			1	<i>C. platanicola</i>
<i>Salix</i>	2			<i>C. salicina</i> , <i>C. salicis</i>
<i>Populus</i>			1	<i>C. populina</i>
<i>Ilex</i>		1	1	<i>C. ilicicola</i> (B&J), <i>C. naitoi</i> (J)
<i>Melia</i>			1	<i>C. subsessilis</i>
<i>Smilax</i>	3		1	<i>C. pallidissima</i> (B), <i>C. picnidioides</i> (B), <i>C. smilacis</i> (B), <i>C. miyakei</i> (J)
<i>Panicum</i>		1		<i>C. fusimaculans</i>
<i>Pueraria</i>	1		1	<i>C. austrinae</i> (B), <i>C. pueraricola</i> (J)
<i>Crotalaria</i>	2			<i>C. demetrioniana</i> , <i>C. leguminum</i>
<i>Trifolium</i>			1	<i>C. zebrina</i>
<i>Amaranthus</i>		1		<i>C. brachiata</i>
<i>Chenopodium</i>		1		<i>C. dubia</i>
<i>Bidens</i>		1		<i>C. bidentis</i>
<i>Gnaphalium</i>		1		<i>C. gnaphaliacea</i>
<i>Cyperus</i>	1			<i>C. ugandensis</i>

Host plant	B	B&J	J	Fungus
<i>Leonurus</i>	1			<i>C. leonuri</i>
<i>Aeschynomene</i>	1			<i>C. aeschynomenes</i>
<i>Oxalis</i>	2			<i>C. oxalidiphila</i> , <i>C. oxalidis</i>
<i>Plantago</i>	1			<i>C. plantaginis</i>
<i>Solanum nigrum</i>	1	1		<i>C. solani</i> (B), <i>C. atromarginalis</i> (B&J)
<i>Artemisia</i>			1	<i>C. ferruginea</i>

C. : *Cercospora*, *Cd.* : *Cercosporidium*, *Cp.* : *Cercoseptoria*, *M.* : *Mycovellosiella*,
Ph. : *Phaeoramularia*, *S.* : *Sirosporium*

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