FUNGI FROM COSTA RICA AND PANAMA

WITH EIGHTEEN PLATES AND A MAP IN THE TEXT

BY

FRANK LINCOLN STEVENS

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MAP 1 1928

UNIVERSITY OF ILLINOIS

Contribution from the Botanical Laboratories of the University of Illinois
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BASIDIOMYCETES

EXOBASIDIales

Microstoma Niessl

Agaricales

Polyporaceae

Polyergus Mich.

Fungi Imperfecti

Sphaeropsidales

Hyalosporae

Phylosticta Pers.

Macrophoma (Sacc.) Berl. and Vogl.

Phaeodidymae

Botryodiplodia Sacc

Hyalodidymae

Darluca Cast.

Scolecosporae

Septoria Fr.

Melanconiales

Colletotrichum Corda.

Montiales

Montiaceae

Oidium (Link) em. Sacc.

Botrytis Mich.

Ramularia Ung.

Dematiaceae

Cladosporium Link.

Helminthosporium Link.

Cercospora Fres.

Stilbaceae

Isaria Pers.

Stilbella Lindau

Tuberculariaceae

Fusarium Link.

Pucciniopsis Spog.

Scenomyces Stevens n. gen.

Index to Fungi
INTRODUCTION

The fungi reported herewith were collected by the author during a period of approximately two months spent in these countries between June 20 and August 25, 1923. The actual collecting time was short, though some 70 individual trips were taken, and the collection thus represents merely a slight sampling of the richness of these very interesting regions, a sampling to be added to the earlier reports made by Pittier,1 Hennings,2 Patouillard,3 Sydow,4 Bommer and Rousseau,5 and Spegazzini.6

The localities found to be especially interesting in Costa Rica are the primitive high forests near Cartago, and at La Palma, the old pass above San José; the rich jungle lying near the old railroad at Columbiana and other points, the jungle near Siquirres and the swamp jungles in the lowlands near Limon and Swamp Mouth. The high rainforest on the mountain slopes to the south of the old railroad from Siquirres to Guapiles and the jungles to the south of Siquirres hold a vast amount of very interesting material.

In Panama all may be said to be interesting. Here, as nowhere else that I know of, primitive jungle lies on all hands, only a few minutes walk from an excellent railroad, or traversed by a fine automobile road, and one may sleep and dine at comfortable hotels and spend many hours daily in primitive jungle of great richness and diversity.

The summer’s collections comprise something over a thousand numbers, of which only a portion are reported herewith, the Meliolas, Microthyriaceae, rusts and many of the Ascomycetes, and many of the Fungi Imperfecti being reserved for a later paper.

As is true in most tropical collecting, the Meliolas and other Perisporiales, the Microthyriaceae, the Dothideales are especially abundant; the Phylllostictas, Septorias, Cercosporas and many other genera so common in the temperate regions, though present, are relatively rare. The smuts also are sparsely represented.

1 Pittier, H., Fungi costaricensis I. Hedw., 41: (101), 1902.
2 Hennings, P., Einige neue Pilze aus Costarica und Paraguay. Hedw., 43: 147, 1904.
The slides, notes, original drawings and specimens on which these studies are based are deposited in the herbarium of the University of Illinois and duplicate specimens may be found in the New York Botanical Garden. The photographs reproduced in the plates were made by A. G. Eldridge; the line drawings by L. R. Tehon.

The following is a list of the field numbers with places and dates of collection.

**Costa Rica**

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It is a pleasure to acknowledge the kind cooperation received from many friends in both countries and in especial to mention the many courtesies of the United Fruit Company in Costa Rica; from Mr. G. V. Long, Mr. F. N. Cox, British Consul of San José, Sr. Francisco J. Peralta, Don Oton Jimenez of San José; and Mr. C. H. Lankester of Cartago.

In Panama I was given every assistance and encouragement possible by His Excellency, Colonel J. J. Morrow, Governor of the Panama Canal.
Zone, and much valuable advice and assistance by Mr. Powell of Ancon. I am indebted also to the Graduate School of the University of Illinois for financial aid. I am indebted to W. R. Maxon, Mr. P. C. Standley, S. F. Blake and Mrs. Agnes Chase for many host determinations.
PHYCOMYCETES
CHYTRIDIALES
SYNCHYTRIUM DE BARY AND WOR.

1. SYNCHYTRIUM BOERHAAVIAE STEVENS n. sp.

[Figures 1-2]

No mycelium. Resting spore globular to oval, 25 to 90μ in diameter, double walled, inner wall hyaline, thick (7μ), uniform; outer wall straw colored to yellowish brown, fragile, very thin. Interior in young stages filled with vacuolate protoplasm. Sporangial sori few, thin walled, straw yellow, 90 to 110μ in diameter. Sporangia subglobose or oval, about 25 to 28μ in diameter, bearing numerous zoospores. Living zoospores not seen.

On *Boerhaavia erecta*.7

Costa Rica; El Roble, Sept. 25, 1923, 621.

The great variability in size of the resting spores is quite remarkable. It appears as though the small ones are fully mature since their two walls seem to be as well developed as in the larger ones. Some of the resting spores appear to contain differentiated zoospores but the evidence was not decisive.

2. SYNCHYTRIUM DECIPIENS Farl.


On *Vigna vexillata*.


PERONOSPORALES

ALBUGO (Pers.) S. F. Gray


3. ALBUGO BLITI (Biv.) Kuntze.


On *Amaranthus* sp.


On *Iresine acicularis*.


7 Det. Standley.
Wilson does not list Iresine as a host of Albago. Conidia only were found; no oospores present.

4. **Albago ipomoeae-panduranae** (Schwein.) Swing.


   On *Ipomoea* sps.

   Panama: France Field, Aug. 24, 1923, 1325.

   Costa Rica: San José, June 20, 1923, 2; June 21, 1923, 19; Escasu, June 29, 1923, 156; San Pedro, July 4, 1923, 209; Peralta, July 11, 1923, 332, July 13, 1923, 461; El Roble, July 25, 1923, 630; San Vincente del Coronado, June 30, 1923, 175.

5. **Albago platensis** (Speg.) Swing.

   Jour. Myc., 7:113, 1892.

   On *Boerhaavia erecta*.

   Panama: Frijoles, Aug. 20, 1923, 1207.


   On *Boerhaavia caribaca*.

   Panama: Gamboa, Aug. 16, 1923, 1075.

**Plasmopara** Schroet.


6. **Plasmopara** Halstedii Berl. and de Toni


   On *Bidens* sp.

   Costa Rica: Desamparados, June 27, 1923, 137; San José, June 20, 1923, 5.

   On *Erechtites hieracifolia*.


**ASCOMYCETES**

**PEZIZALES**

**Tryblidiella** Sacc.


   *Tryblidiium rufulum* (Spreng.) Ell. and Everh. N. Am. Pyreno., 690, 1892.


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9 Det. Blake.
On Citrus aurantium (orange).
Costa Rica: Columbiana, July 20, 1923, 498.

**HYSTERIALES**

**ACROSPERMUM** Tode
Fungi Mecklenburgensis selecti, Luneburgi, 1790.

8. **ACROSPERMUM FOLICOLUM** Berk.
North American Fungi, no. 1000, Grevillea, 4:161, 1876.

[Figures 3, 96, 97]

On Anthurium boltonianum.\(^\text{10}\)
Costa Rica: Sabario, Aug. 8, 807.
This fungus appears to be in every detail like the specimen of Ellis and Everhart, North Amer. Fungi, no. 2629 on decaying leaves of Ulmus as well as like no. 2149 on fallen leaves of Concord grape, but in all three specimens the longitudinal opening is not apparent. There is a possibility that this species should be referred to the Hypochreales, possibly to Ophionectria, rather than to its position as given here in the Hysteriales.

**LOPHODERMiUM** Chev.
Par. I. 436, De Not. Pir. Ist. 49.

9. **LOPHODERMiUM ARUNDINACEUM** (Schr.) Chev.
Flor. par. I. 435.
On Andropogon bicornis.\(^\text{11}\)
Costa Rica: Peralta, July 13, 1923, 463.

**MYRIANGIALES**

**MYRIANGINELLA** Stevens and Weedon
Mycol., 15:197, 1923.

10. **MYRIANGINELLA COSTARICENSES** Stevens n. sp.

[Figures 4, 5]
Spot pale, subcircular, indefinite, surrounding the stromata, showing from both leaf surfaces. Stromata solitary, hypophyllous, raised above the leaf surface, brown to black, fastened by a central brown foot about 140\(\mu\) wide which extends a short distance into the mesophyll and also occupies the epidermal cells. Stroma brown, without definite boundary, 460 to

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\(^{10}\) Det. Standley.
\(^{11}\) Det. Chase.
620μ in diameter, up to 310μ deep. Asci solitary, 8-spored, inordinate, 83 to 93 x 25μ. Paraphyses matted densely, above forming a brown epithecium. Spores hyaline, muriform, 5 to 6 cross or oblique walls, 25 to 32 x 7 to 9μ, obtuse.

On Miconia sp.
Costa Rica: Siquirres, July 31, 1923, 698.

Thus fungus is quite similar to Myrianginella tapirae in its superficial parts but differs essentially in the foot and hypostroma as well as in spore size and septation; it differs from Myriangina in the generic characters, also in spore shape and septation.

**Perisporiales**

**Perisporiaceae**

Key to genera included herein

Subcuticular stroma present .................. Pseudoparodiella p. 14
Subcuticular stroma not present—Perithecia and mycelium superficial, nonhyphopodiate
Spores filiform ............................. Tonduzia p. 16
Spores not filiform

Setae present
Spores hyaline, 2-celled
Asci a paraphysate .......................... Dimeriella p. 16
Asci paraphysate ........................... Chaetostigme p. 17
Spores hyaline, 3-celled ...................... Dimerielopsis p. 17
Spores brown, 4-celled ..................... Hyalomeliolina p. 18

Setae absent or atypical, perithecium smooth
Spores colorless, 2-celled
Peritheciun dark ............................ Dimerina p. 19
Spores brown, 2-celled
Perithecia red .............................. Parodiopsis p. 19
Perithecia dark ........................... Parodiella p. 19
Spores brown, 3-celled ................... Perisporina p. 19
Spores brown, 4-celled ................... Perisporium p. 20

**Pseudoparodiella** Stevens n. gen.

Fungus Perisporiaceous, asci paraphysate, no external mycelium, stroma subcuticular, conidiiferous. Perithecia free, globose, borne on a subcuticular stroma, setose. Asci 8-spored, spores 2-celled, hyaline.

11. **Pseudoparodiella vernoniae** Stevens n. sp.

[Figures 6–15, 98]

Spots circular or irregular, indefinite, 0.5 to 1 cm. in diameter, visible from both leaf surfaces as dead or bleached tissue. Surface covered, above
or below, or both, with black conidia. No external mycelium. Stroma subcuticular, thin, about 3 to 9μ, usually one, sometimes 2 to 3 cells in thickness, erumpent through the cuticle. Perithecia globose, about 90μ in diameter, attached to the stroma by a base about 30μ broad, 15μ high, bearing setae, about 13 on each perithecium. Setae obscurely septate, brown at base, pale toward tip, obtuse, 21 to 126 x 7 to 8μ. Asci 8-spored, oblong, short stalked, 52 to 70 x 17μ, spores inordinate. Paraphyses filiform. Spores 17 x 3μ, hyaline, 1-septate, not constricted, thicker at the middle, tapering toward each end. Conidiophores short, 3 x 7μ, (or longer, 18μ) arranged in a compact, low tubercle, dark on distal end, less dark on proximal end. Conidia ovoid or elliptical, dark, catenulate, in rows up to five or more, usually continuous and about 11 x 7.5μ, occasionally larger, 11 x 18μ, and 1-septate.

On Vernonia canescens.12


The general aspect of this fungus to the naked eye is that of Parodiella or related genera (Fig. 98) but cellodin or scrape mounts give only large quantities of the catenulate conidia (Fig. 12) which give the appearance of a dematoid mycelium (Fig. 14). Microtome sections reveal a subcuticular, hyaline, or nearly hyaline, mycelium one cell in thickness. (Fig. 13.) Views from the surface show this subcuticular mycelium to be arranged in bands composed of several, usually 1 to 6, parallel mycelial threads (Figs. 6, 8, 11) which do not appear to extend for any considerable distance. At very frequent intervals on this subcuticular thallus the cells elongate vertically producing a very low tubercle, usually only 5 to 8 cells in diameter and about 7μ high, which is conidia-bearing (Fig. 13). Often also the tubercle becomes somewhat higher, 18μ, by elongation of its component conidiophores (Fig. 13). The conidia in short chains are shown in Fig. 14. The 1-septate conidia are comparatively rare and may occur anywhere in a chain, either terminal or intercalary. The perithecia are borne on low tubercles quite like those that bear the conidia.

The perithecium, without ostiole, appears Perisporiaceous. The subcuticular stroma in section is of distinctly Dothideaceae aspect, but relationship with the Dothids is not borne out by any other characters, and indeed is denied by the free superficial perithecia. The subcuticular, thin stroma, composed of bands of parallel mycelium (Figs. 6, 8, 11) reminds one strongly of the subcuticular mycelium of Actinonema rosea, also to some extent of Fusicladium. In the Perisporiaceae as given by Lindau13 this fungus would fall close to Parodiella. In the key of Theissen and Sydow14 it would fall close to Alina but is quite distinct from it in

12 Det. Standley.
being without hairs, in the color of the spores, in the nature of the sub-epidermal subiculum and its conidia. Parodiella is excluded from the Perisporiaceae by Theissen and Sydow as belonging to the Pseudosphaeriaceae which are characterized by locules with solitary asci, or by asci separated by a pseudoparenchyma. Our fungus does not possess this character but does have the asci separated by paraphyses. Arnaud sets up the tribe Parodiellinees, in the family Parodiellinacees, characterized by a unilocular stroma and by the absence of external mycelium. In this family our species is most nearly related to Parodiellina P. Henn. The differences from this are however very marked, particularly in the thin subcuticular stroma.

The subcuticular stroma, reminding one strongly of the Trabutineae, but bearing conidia profusely; the resemblance to Actinonema when viewed from above; the general aspect of Parodiella and its kin; the Perisporiaceous perithecium all present a series of anomalous characters which render it difficult to assign to this fungus a definite position in present systems of classification.

Tonduzia Stevens n. gen.

Perisporiaceous, superficial, non-hyphopodi ate, perithecium and mycelium non-setose. Spores filiform; no paraphyses. Named in honor of Sr. Adolfo Tonduz.

12. Tonduzia Psychotriae Stevens n. sp.

[Figures 16, 17a, 17b]

Fungus superficial, hypophyllous, black, colonies subcircular, about 1 cm. in diameter. Mycelium brown, non-hyphopodi ate, smooth. Perithecia up to 140 μ in diameter, subglobose, black, rough. Asci linear, cylindrical, obtuse, 47 to 72 x 7 μ, short stipitate, aphanophysate. Spores filiform, hyaline, 46 to 65 x 1.7 μ, obtuse, several septate, guttulate.

On Psychotria brachiata.

Costa Rica: Columbiana, July 19, 1923, 570.

This fungus is clearly Perisporiaceous and is remarkable chiefly for its filiform spores, which are exceedingly rare in this family.

Dimeriella Speg.

Fungi aliquot Paulistani, in Revista del Museo de La Plata, 15:1908.


On Olyra latifolia.


Panama: Alehjuela, August 18, 1923, 1121.

CHAETOSTIGME Syd.


14. CHAETOSTIGME CORDIAE (P. Henn.) n. comb.

[Figure 18]

The genus Chaetostigme described as above cited appears to be valid and desirable to receive the paraphysate forms previously placed in the genus Dimeriella Speg., though Theissen and Sydow do not recognize this genus in their Synoptische Tafeln.


On Cordia interrupta.18
Costa Rica: Port Limon, August 11, 1923, 901, 902.
On Cordia corymbosa.15
Costa Rica: Peralta, July 11, 1923, 316, 324.
On Cordia sp.

This species was selected by Theissen and Sydow to be the type of the genus Dimeriella Speg., a procedure which if followed would make Dimeriella paraphysate, since *D. cordiae* is paraphysate. However, since Spegazzini describes *Dimeriella hirtula*, and that species alone, in connection with his generic description,19 *D. hirtula* and not *D. cordiae* is the type of the genus Dimeriella; and since *D. hirtula* is a paraphysate the genus Dimeriella is a paraphysate. *Dimerosporium cordiae* P. Henn. therefore becomes *C. cordiae* as indicated above.

15. CHAETOSTIGME ERIGERONICOLA (Stev.) n. comb.20


On Erigeron sp.
Costa Rica: Peralta, July 13, 1923, 448; Los Mercedes, July 17, 1923, 488.

DIMERIELLOPSIS Stevens n. gen.

Fungus superficial; mycelium not dematioid, not gelatinous, non-hyphopodiate. Perithecia setose, spores 3-celled, hyaline.

17 Det. Standley.
18 Det. Standley.
19 Fung. aliquot Paulistiani p. 12 in Revista del Museo de La Plata, 15, 1908.
20 This, according to Sydow (Ann. Mycol., 24:335, 1920), is of the Pseudosphaeriaceae and he regards it as belonging to the genus Lasiostemma.
16. **Dimeriellopsis costaricensis** Stevens n. sp.  

[Figures 19, 99]

Mycelium superficial, straw colored, very thin (1\(\mu\)), not dematioid nor gelatinous. Perithecia superficial, dark brown, globose, 90 to 150\(\mu\) in diameter, without ostiole, or ostiole atypical, bearing numerous setae (70 \(\mu\)), long (up to 460\(\mu\)), 5\(\mu\) thick at base, translucent, straw-colored. Asci 8-spored, inordinate. Spores hyaline, fusiform, 2-septate, 21 to 32 x 6 to 7\(\mu\).

On *Canavalia* sp.\(^{21}\)

Costa Rica: Swamp Mouth, August 8, 1923, 783.

This fungus is clearly Perisporiaceous and is distinguished from *Dimeriella* in the key of Theissen and Sydow by spore septation. It also differs very strikingly from that genus in the character of its perithecial setae. (Fig. 99.)

Numerous septate conidiophores, 100 to 200\(\mu\) x 3.5\(\mu\), bearing oblong, straw-colored, septate conidia (55 x 3.5\(\mu\) or shorter) occur on many of the colonies. These conidiophores may represent a parasite on the other fungus or they may be genetically connected with it. The perithecial setae arise as outgrowths of single perithecial wall cells.

**Hyalomeliolina** Stevens


17. **Hyalomeliolina costaricensis** Stevens n. sp.

Colonies superficial, black, circular, 3 to 10 mm. in diameter, hypophylous. Mycelium black, smooth, non-hyphopodiate, uniform in diameter, 4\(\mu\), slightly crooked, very sparsely branched. Perithecia numerous, not enveloped in mycelium, globose, black, 150–262\(\mu\) in diameter, slightly rough, bearing many black, simple, septate setae, about 4\(\mu\) in diameter, 300 to 800\(\mu\) in length, mycelium-like. Asci persistent, 150 x 40\(\mu\), usually 8-spored, stipitate, ovate, thick-walled. Spores inordinate, elliptical-fusoid, dark, 47 to 54 x 17 to 18\(\mu\), unequally 3-septate, constricted at the central septum. Two end cells very small and hyaline; central cells brown.

On *Tetracera volubilis*\(^{22}\)

Costa Rica: Siquirres, July 31, 1923, 668 (type).

This fungus is clearly cogeneric with *Hyalomeliolina guianensis* Stevens\(^{23}\) but differs from it in that the perithecia are not buried in mycelium but are in very sparse mycelium. The mycelium is not ropy as in the other species. The asci and spores are also somewhat larger. These two species

\(^{21}\) Det. Standley.

\(^{22}\) Det. Standley.

are sufficiently different from Meliolina to warrant making for them a separate genus.

Dimerina Theissen

18. Dimerina dodonaeae Stevens n. sp.
[Figures 20, 100]

Fungus superficial, hypophyllous. Perithecia globose, about 45 μ in diameter, smooth, yellow to black, very numerous in groups. Asci 8-spored, globose to ovate or clavate, 22 to 30 x 11 to 14 μ. Paraphyses none. Spores hyaline, oblong, 14 to 3 μ, 1-septate, rarely 2-septate.

On Dodonaea viscosa 24
Costa Rica: Swamp Mouth, August 8, 1923, 780.

Of the sixteen species given by Theissen only three agree reasonably in spore and perithecium size with ours, viz. D. galacis (E. & E.) Th., D. negeriana (P. Herr.) Th., and D. minutissimum (V. Höhn) Th. The first of these disagrees in the possession of yellow spores; the second in spore shape and widely distinct host; the third in location on leaf, shape of perithecium and spores.

Parodiopsis Maub.

19. Parodiopsis ingarum (P. Herr.) Arn.
On Inga sp.
Panama: Chagres River 2-3 mi. from mouth, August 23, 1923, 1275.

Parodiella Speg.

20. Parodiella perisporioides (Berk. and Curt.) Speg.
Fungi Arg. Pug., 1, 178, 1880. 25
On Stylosanthes sp.

Perisporina P. Herr.
Hedw., 43: 357, 1904.

21. Perisporina dentritica Stevens n. sp.
[Figures 21–23]
Spot subcircular, pale, indefinite, 2 to 5 cm. in diameter, visible from both leaf surfaces, mycelium hypophyllous, straw colored, cells long,

24 Det. Standley.
25 This is regarded by Sydow as Hypoplegma viridescens (Rehm) Th. & Syd.
cylindrical, minutely echinulate. Perithecia globose, superficial, black, slightly rough by conical prominences about 7μ high, 155 to 215μ in diameter, non-ostiolate. Asci 145 x 44μ, ovate, thick walled, thickened at apex. Paraphyses none. Spores 61 x 14μ, oblong, tapering from the middle, 3-septate, hyaline, rounded at apex, truncate at base. Mycelial setae dendritically, intricately branched.

On *Inga* sp.

Costa Rica: Experiencia Farm, July 18, 1923, 517.

This fungus in its superficial mycelium and perithecia has the habit of a Parodiopsis, but is striking for the large diseased spot that it produces, also for its tan colored mycelium merging to hyaline in the outer, younger parts of the colony. The setae arise directly from the echinulate mycelial cells. They may be absent from large portions of a colony or present in great abundance, especially in the older portions. I venture to place this fungus in this genus, though the only spores seen were hyaline, due to its obvious, close relationship to *P. manaosensis*.

Several other species of fungi were present in abundance in the colonies, evidently parasitic upon the Perisporina.

**Perisporium** Fr.


**22. Perisporium bromeliae** Stev.


On *Bromelia pinguin*.


**Capnodiaceae**

**Ceratochaetopsis** Stevens and Weedon n. gen.

Capnodiaceous, perithecioglobose, sessile, mycelium and perithecium superficial, gelatinous, mycelium without setae, perithecium setose, spores 2-celled, hyaline.

**23. Ceratochaetopsis costaricensis** Stevens and Weedon n. sp.

Mycelium epiphyllous, superficial, yellow, translucent, not beaded, very thin, gelatinous, forming a loose network. Perithecia globose, solitary, 98 to 138μ in diameter, yellow to brown, darker than the mycelium. Perithecial setae 42 to 91 x 7 to 10μ, curved, pale yellowish green when young, brown when old, slightly pointed to rounded at tip, usually 8 to 12 in number. Asci 21 to 38 x 7 to 10μ, 8-spored. Spores 14 to 21 x 2.4 to 3μ, 1-septate, hyaline, many guttulate, fusiform, sometimes slightly curved, ends rounded.

On *Myrcia costaricensis*26

Costa Rica: La Palma, July 8, 1923, 908.

26 Det. Standley.
This fungus is clearly Perisporiaceous and falls, according to the key of Theissen and Sydow, next to the genus Ceratochaete from which it differs in the possession of no mycelial setae. It is found as barely visible reddish or yellowish groups of perithecia on the surface of the host leaves.

**HYPOCREALES**

**Balansia** Spec.


24. **Balansia discoidea** P. Henn.\(^2\)

Hedw., 39:(77), 1900.

On *Panicum haenkeanum*\(^2\)

Costa Rica: Siquirres, July 31, 1923, 694.

**Dothichloe** Atkinson


25. **Dothichloe atramentosa** (B. & C.) Atk.\(^2\)

Jour. Myc., 11:259, 1905.


_Hyopcrella_ atramentosa_ Sacc., Mich., 1, 323, 1878.

On *Sporobolus berteroanus*\(^2\)

Costa Rica: San José, June 20, 10, June 21, 17, June 24, 111; Desamparados, June 27, 151; Escasa, June 29, 157.

**Sphaerostilbe** Tul.

Carpol., 3:103.

26. **Sphaerostilbe coccophila** Tul.\(^3\)

Carpol., 3:105.

On *Citrus aurantium*, Orange.

Costa Rica: Columbiana, 500.

**Dothideales**

Key to genera included herein

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\(^2\) Det. W. W. Diehl.

\(^3\) Det. Mrs. Agnes Chase.

\(^4\) Determined by W. W. Diehl.

\(^5\) Host determined by Mrs. Agnes Chase.

\(^6\) Det. Seaver.
Stroma not radial
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Spores equally 2-celled, hyaline, paraphysate ................Euryachora p. 31
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POLYSTOMELLACEAE
Coccocia Sacc.

Syll. Fung., 8:738, 1889.

27. Coccocia Palmae Stevens n. sp.

[Figure 24]

Fungus chiefly epiphyllous, black, 1 to 3 mm. across, opposite side of leaf usually showing a discolored spot, sometimes with stromata on both leaf surfaces. Superficial stromata radiate, bearing several linear perithecia that are very irregularly, concentrically arranged. Hypostroma extending deep into the mesophyll, attached to the superficial parts at several points. Locules globose or somewhat flattened, 150 to 170 x 60 to 80μ. Asci 8-spored. Paraphyses filiform. Spores dark, equally 2-celled, oblong, constricted, 14 x 3μ.

On palm.

Costa Rica: Peralta, July 13, 1923, 432.

The loculiferous stroma occurs either as the superficial stroma or on the erumpent stroma. The circular arrangement of the perithecia is so irregular that the suggestion of this as a character is questionable.

This fungus is of special interest as a form showing the characters of the Microthyriaceae in the radiations of the superficial stroma, and of the Dothideales in possessing globose locules in a stroma.

Polystomella Speg.

F. Guaran. 2:51, No. 137, 1888.

28. Polystomella Costaricensis Stevens n. sp.

[Figures 25, 26, 101, 102]

Stromata superficial, amphigenous, 230 to 245μ thick, 1000 to 1600μ broad, circular, edge rising abruptly from the leaf surface. Surface when young marked by concentric furrows, when older also by radial fissures; color dull black. Stroma bordered on sides and top by a black rind about 15μ thick, composed of pseudoparenchyma. Context of pale thin-walled pseudoparenchyma which further toward the center becomes hyaline and gelatinous, filamentous. Hypostroma consisting of thick, dark mycelium filling certain of the epidermal cells. Locules numerous, ovate, about 90 to 110μ wide, 150 to 170μ deep, without definite boundary. Interlocular tissue composed of gelatinous filaments much resembling the paraphyses. Asci numerous, 8-spored, cylindrical, with a long, crooked stipe, 100 x 18μ or larger. Spores oblong, hyaline, 2-celled, slightly constricted, obtuse, 18 to 19 x 5 to 7μ. Paraphyses filiform, gelatinous. Conidial cavities oval to cylindrical or irregular, sometimes reaching from the base to the top of a stroma occur. Conidia very minute, about 1μ in diameter, oval, hyaline, continuous, borne on the tips of filiform conidiophores.
On *Struthanthus* sp.

Costa Rica: El Alto, July 6, 1923, 255 (type); Cartago, June 23, 1923, 97.

The covering layer is radiate, though on account of the dense color and hardness it is only with difficulty that this character is observable. Fragmentation of the covering layer occurs at the apices of the locules affording means of spore escape without the development of actual ostioles. The stroma is not anchored to the epidermal cells throughout its base but often only near the edge, leaving the central part without attachment.

This fungus agrees well with Polystomella as described. Prominent characters are the surface markings of the stromata, concentric and radial cracking and the peculiar gelatinous hyphal structure between the locules. The surface view shows distinct radiation, so characteristic of the Microthriaceae while the stroma in vertical section, near its edge, is distinctly dothideoid, as are also the locules, in that they are without definite walls. The interlocular context differs markedly from the Dothideales. Showing affinities with both the Dothideales and the Microthyriaceae, yet differences from each of them the fungus is of special interest.

The present species differs from *P. crassa* in the shape of the stroma, location of the conidial locules; from *P. pulcherrima* because the asci are larger, also because there is great difference in the mode of occupation of the epidermis (c.f. Fig. 26 with T. VI Fig. II Ann. Myc., 12); from *P. salvadoreae* in shape of locules; from *P. granulosa* in character of hypostroma; from *P. pulchella* in shape of stromata and size of spore; conidial loculi are mentioned in connection with *P. crassa* (Rehm) Theiss. but no description of the conidia is given. The cells described as conidia nere are very small and perhaps functionless.

**Rheumatopeltis** Stevens n. gen.

Plant body composed of a superficial, strap-shaped mycelial thallus bearing locules in dothideoid stromata. Asci 8-spored, paraphysate, spores falcate, continuous, fuscous. Name from ῥέωμα stream.

29. **Rheumatopeltis querci** Stevens n. sp.

[Figures 27–31, 103, 104]

Superficial thallus epiphyllous, strap-shaped, composed of parallel threads, radiating at the ends and somewhat at the sides of the bands. Stromata dothideoid. Locules 185 to 215μ broad, 80μ deep, usually solitary in each loculiferous region of the stroma, ostiolate. Asci 8-spored, ovate, thin walled, 47 x 14 to 18μ, basally borne. Paraphyses filiform, gelatinous, crooked, long, slender, many. Spores 1-celled, fuscous when mature, straight, or falcate, acute at each end, 18 to 29 x 3 to 4μ.
On Quercus eugeniifolia.22
Costa Rica: Cartago, June 23, 1923, 68.

The thallus is composed of anastomosing, strap-shaped bands, each about 150μ broad, the whole colony occupying an area a centimeter or more in diameter. In section the straps are seen to be superficial and several (3 to 4) cells in thickness. At frequent intervals the thallus develops into thickened regions which are genuine stromata of typical dothideoid structure (Fig. 28). The epidermal cells below the thallus are usually filled with mycelium. The floor of the locule is thin, dark, and in structure generally like the extra-loculiferous bands.

This fungus, in the structure of the stroma, is strictly Dothideaceous and possessing a radiating superficial mycelium would appear to fall within the Polystomellaceae. The strap-shaped bands of the thallus remind one strikingly of the Trichopeltaceae but the cell structure is quite different from that found in that family, in that cell plates, one cell in thickness, are not formed but the thallus is clearly mycelial in character though assuming the form of bands. The fungus as regards the characters given in the keys appears to fall nearest to Ellisiodothis from which it is separated by its fuscous spores. Its thallus body is however very distinct from that fungus.

**DOTHIDEACEAE**

**COCCOIDEAE**

**SCHWEINITZIELLA** Speg.

F. Guaran., 2: no. 119, 1888.

30. **SCHWEINITZIELLA PALMIGENA** Stevens n. sp.

[Figures 32, 33]

Spot small, consisting only of a very narrow, yellowish, translucent zone surrounding the stromata, subglobose, visible from below also as darkened areas. Stromata black, superficial, rough, small, (1 mm. in diameter, about 0.2 to 0.6 mm. high), epiphyllous, centrally fastened to the leaf by a foot that is of pseudo-palisade structure. Hypostroma completely occupying the epidermal cells with a dark mycelium, eventually similarly occupying all cells below the stroma. Stroma bordered by a dark rind, 18 to 36μ thick. Interior of stroma hyaline, cells thin-walled, gelatinous. Locules in young stromata regularly disposed midway between the cortex and foot, in old stromata irregularly arranged, globose, subglobose, flattened or irregular, 77 to 185μ in diameter, bounded by a thin wall of very slightly darkened cells. Ostioles well developed. Asci clavate, 43 to 61 x 7 to 11μ, short stipitate, 8-spored. Spores hyaline, slender, crescent-

22 Det. Wm. Trelease.
shaped, acute at each end, continuous, 36 to 47 x 3μ. Paraphyses filiform, very thin, gelatinous.

On *Chamaedorea* sp.22

Costa Rica: Peralta, July 13, 1923, 417, accompanied also by *Coccostromopsis palmigena*.

The stroma structure here is exceptionally interesting. The foot of the stroma shows a faint, barely perceptible, palisade arrangement. As the central region of the stroma is approached the palisade arrangement is lost and the cells become more and more pale and more gelatinous.

This fungus is clearly related to the Dothideales as is evidenced by its general aspect, the character of the hypostroma and the central fastening of the stromata to the leaf and particularly the evident, though not too-well marked prosenchymatic, palisade cell arrangement in the stipe of the stroma. It differs from the typical Dothid in that there is a faint wall within the stroma and surrounding the locules. This wall is however no more pronounced than is that found in many Dothids. A second point of deviation from the Dothids is in the cell structure of the stroma, a large portion of the more central region of the stroma being composed of hyaline, gelatinous, tangled filaments such as I have seen in no other Dothid and which have lost all semblance of palisade arrangement. This makes this species stand out as quite exceptional. It clearly belongs to the Coccoideae of the Dothideaceae, close to Schweinitziella and Coccostroma. From the latter of these it is excluded by the possession of paraphyses. The stroma type is clearly very different from that of Schweinitziella and probably warrants placing it in a new genus but I am at present reporting it under the above name.

The central fastening of the epistroma by a cylindrical foot reminds one strongly of the structure found in *Bagnisiopsis* and in the Coccoideae, but the foot differs from those usually seen in that it is pale, brown to hyaline, in portions and that it is not of characteristic dothideoid structure. While it gives suggestions of palisade arrangement in places it also is very irregularly organized elsewhere. It clearly belongs in the Dothideaceae either in the Coccoideae or the Dothideae of which it shows closer kinship with the former. In neither of these groups are genera with filiform spores.

**Scolecococoidea** Stevens n. gen.

Fungus of the Coccoideae, stroma loculiferous throughout, spores filiform.

31. **Scolecococoidea costaricensis** Stevens n. sp.

[Figure 34]

Spot none or merely consisting of a slight yellowing of the leaves around the stromata. Stroma hypophyllous, punctiform (0.5 mm.), black, showing

22 Det. O. F. Cook.
on the surface contours of numerous (30 to 40) perithecia, centrally fastened. Hypostoma consisting of a foot about 180μ in diameter extending about half way through the leaf (125μ), pale or brown, slightly dothideoid in character. Epistroma about 600 to 800μ in diameter, locules at one level, separated by a thin, pale to yellow, boundary. Locules subglobose, about 150μ in diameter. Asci 8-spored, long, slender, 108 to 144 x 2μ. Paraphyses filiform. Spores filiform, extremely thin, 80 x 0.7μ.

On Miconia sp.


Coccostromopsis Plunkett

III. Biol. Monog. 8:10, 1923.

32. Coccostromopsis palmigena Plunkett


On Chamaedorea sp.34


Dothideae

Bagnisopsis Theiss. and Syd.


33. Bagnisopsis peribebuyensis (Speg.) Theiss. and Syd.

On one of the Melastomataceae.

Costa Rica: Peralta, July 12, 1923, 379; La Palma, July 8, 1923, 277.

On Miconia sp.

Panama: Gamboa, Aug. 16, 1923, 1072 and 1096; Gatun, Aug. 24, 1923; France Field, Aug. 24, 1923, 1326; Chagres mouth Aug. 23, 1923, 1317.


Hyperus Stevens n. gen.

Stromata hypophyllous, erumpent; hypostroma permeating the mesophyll. Perithecia dark walled, immersed in the stroma, ostiolate and beaked. Asci 8-spored; spores cylindrical, hyaline, continuous. Genus name from υπεροδόμε, pestle.

34. Hyperus costaricensis Stevens n. sp.

[Figures 35–40, 105]

Hyposotrom extenive in the mesophyll. Stromata erumpent, brown to yellow, rising 150 to 230μ above the leaf surface, 80 to 230μ thick, usually thicker above than at the base. Locules globose or elongate, up

34 Det. O. F. Cook.
to 290\(\mu\) in diameter, bounded by a definite, dark wall about 30\(\mu\) thick. Ostiole in a beak 150 to 200 x 46 to 60\(\mu\). Asci numerous, very small, 22 x 5.5\(\mu\). Spores short, cylindrical, hyaline, continuous, 5.5 x 1.5\(\mu\).

Conidial locules borne in stromata similar to those of the ascigerous locules but smaller. Locules subglobose up to 180\(\mu\) in diameter, locular wall less dark and definite than that of the ascigerous locules. Conidia straight, simple, about 25 x 3\(\mu\). Conidia short, oblong, continuous, 3.5 to 7\(\mu\).

On unknown dicotyledonous plant.

Costa Rica: Experiencia Farm, July 18, 1923, 525.

When dry, the perithecia under the low power of the microscope appear like cups with a rod sticking upright in their centers. (Fig. 105.) This appearance is due to the infolding of the tops of the perithecia in drying.

This fungus combines the characters of both the Dothideales and the Sphaeriales. The prominent rostrum allies it with the Sphaeriales and perhaps most closely with the Coryneliaceae, though it does not appear really to belong in that family. The stroma is distinctly Dothideaceous in character, closely resembling the Dothideales (Figs. 37, 38). The very peculiar condition is frequently seen of isolated masses of stroma upon a peritheciun. These may occur upon the top (Fig. 38) or elsewhere. They suggest that in earlier stages the peritheciun is quite imbedded in a stroma and that as the stroma ages it flakes off leaving these remnants.

**Dothidina** Theissen and Sydow


35. **Dothidina costaricensis** Stevens n. sp.

[Figures 41-43]

Spot indefinite, yellow, long and narrow, often occupying the whole length of a leaf segment. Stromata about 1 mm. in diameter, black, amphiogenous but more common above, very numerous, usually distinct, sometimes coalescing. At first subepidermal, later erumpent, the apex only emerging. Structure dothideoid. Locules usually solitary, globose, about 370\(\mu\) broad, 215 to 310\(\mu\) deep. Asci cylindrical, 8-spored, 150 x 14\(\mu\). Paraphyses filiform, crooked. Spores at first hyaline, later brown, oval, 14 to 18 x 9\(\mu\), usually uniseriate, occasionally inordinate.

On Palm (*Astrocaryum, Acrocomia* or *Bactria*)


This fungus clearly belongs to the Dothideales in the Dothideaceae rather than to the Scirrhiineae in the Phyllachoraceae, though it indicates a transition form between these two families, in that the stroma has not the truly palisade character of the former family but is composed of cells more elliptical than rectangular. It also tends toward the latter family in that the emergence of the stroma above the epidermis is very slight, only the apex of the stroma protruding.
The species is quite distinct in several ways, notably so in the spore shape and size, from D. palmicola (Speg.) Theiss. and Syd. A very peculiar condition was observed in the asci which at maturity fall into eight segments, each of which contains one spore. (Fig. 43.) Before falling apart thus the ascus can be seen to be divided by septa, either transverse or oblique as need be to separate the spores from each other. Study of the asci of D. palmicola shows that in this species also the ascus falls into single-spored segments though asci with septa were not seen. De Bary\(^{35}\) cites in the ascomycetes cases where the wall of the ascus forms a septum between each pair of spores though in the cases cited by him the spores fill the separated segments while in my species the spores do not do so. A similar condition of the asci is found also in Othiella (see page 46).

ACHORELLA Theissen and Sydow


36. ACHORELLA ATTALEAE Stevens n. sp.

Spot dead, 2 to 10 x 1 to 3 mm. oval to linear, black, yellow-bordered, hypophyllous, visible above as a yellowed discoloration. Stromata at first poorly developed, subepidermal, later erumpent, basal portion below the epidermis dothideoid, superficial part usually consisting of a unilocular, globose protuberance about 300\(\mu\) in diameter; rough walled; ten or more on one spot. Locule globose, about 340\(\mu\) in diameter. Base of the protuberance surrounded by a superficial crooked, nonhyphopodiate mycelium.

Asci 80 x 11\(\mu\), 8-spored. Paraphyses filiform, slender, crooked, numerous; spores, yellow, 16 x 3.5\(\mu\), obtuse, cylindrical, 1-septate, slightly constricted. Small pycnidial cavities about 100 to 150\(\mu\), frequently occur on the loculiferous stroma.

On Attalea cohune.\(^{36}\)

Panama: Gamboa, Aug. 16, 1923, 1079.

This fungus is distinctly parasitic, causing well defined diseased spots. The growth of superficial mycelium as well as the free perithecioid-like protuberances gives to this fungus both the characters of the Dothids and of the Perisporiaceae though its closest relation is with the former. This species differs essentially from A. ametableta (Rehm.) Theiss. and Syd. from Brazil on Baccharis stems in the smaller stromata, smaller locules, in the shape of the spores and particularly in that the perithecial protuberances are often free on the stroma, not immersed in it as is the case in A. ametableta.

\(^{35}\) Comp. Morph. and Biol. of the Fungi Mycetozoa and Bacteria, Trans. by Garnsey, 1887:96.

\(^{36}\) Det. by P. C. Standley.
37. **Achorella costaricensis** Stevens n. sp.  
[Figures 44, 45]

Spot none. Stromata epiphyllous, black, 1 to 2 mm. in diameter, much raised above the leaf surface, bearing numerous (10 to 30), globose perithecia on the stroma surface. Stroma centrally fastened, foot dothideoid. Locules globose, about 150μ in diameter. Asci 8-spored, conglobate. Spores brown, oblong, 1-septate, 21 to 25 x 10μ. Paraphyses many, crooked, filiform, gelatinous. Conidial locules irregular in shape, conidia very minute, bacteria-like.

On *Mikania* sp.
Costa Rica: Cartago, Leg. Lancaster, July 24, 1923, 646 (type); Cartago, June 23, 1923, 57.

The hypostroma is quite remarkable in that it is made up of a coarse mycelium, hyaline when young but dark when old, that appears to be strictly if not entirely intercellular in character. The leaf, in the occupied region, is deformed to nearly three times its normal thickness. The stromata develop first in the mesophyll but soon become erumpent. This fungus rather closely resembles *A. guianensis* on the same genus of host, from British Guiana, but is distinguished from it by the difference in the shape, size and constriction of the spores.

**PHYLLACHORACEAE**

**TRABUTIINEAE**

**Trabutia** Sacc. and Roum. emend Theiss. and Syd.  

38. **Trabutia xylosmae** Stevens n. sp.  
[Figures 46, 106]

Stromata subcuticular, strictly epiphyllous, showing only from above, black, shining, raised, circular to irregular in shape, varying from minute (½ mm.) to 5 mm. in diameter. Thickly scattered over the leaf. Epidermal clypeus dense, black. Subepidermal stroma more loose. Ascigerous locules about 260 to 500μ wide, 110 to 370μ deep, several in a stroma. Paraphyses filiform, crooked. Asci 8-spored, 144 x 18μ. Spores 1-celled, globose when young, globose to oval when mature, 9μ in diameter to 9 x 11 to 16μ, usually uniseriate. Conidia filiform, about 18μ long, in cavities about 180μ wide or by coalescence much wider, and 70μ deep, borne on filiform conidiphores.

On *Xylosma salzmannii*.  
Costa Rica: El Alto, July 6, 1923, 243 (type); Cartago, July 2, 1923, 186.

38 Det. Standley.
On *Myroxylon ellipticum*. 39
Costa Rica: La Palma, July 8, 1923, 276.

HYPOSTIGMA Sydow

39. HYPOSTIGMA POLYADELPHA Sydow
On *Buettneria aculeata*. 40

The fungus is quite unique in that the hyaline mycelium extends from stroma to stroma under the cuticle, usually one layer thick (Fig. 47), sometimes two layers (Fig. 47). Frequently it also extends downward between the epidermal cells (Fig. 52) and penetrates these cells, developing within rather extensive haustoria. The loculiferous mycelium always turns dark at the base of the locule; is flat and one cell thick, composed of cells that are approximately isodiametric. (Figs. 49, 51.) Over this floor is the arched covering (Fig. 50) which is also of isodiametric cells considerably darker than those of the base. The base extends outward at the margin in irregular projections, 3 to 7μ long, but neither the base or the covering in any of its parts gives any indication of radiate structure. In age the whole covering of the locule breaks away leaving only the floor with a margin showing the attachment of the covering (Fig. 51). The position of this fungus is somewhat doubtful. In general character it resembles the Trabutineae, near Trabutiella, but the stroma is so slightly developed that it is questionable whether any stroma should be recognized. The subcuticular development as well as the general appearance also suggest the Stigmataceae, but this fungus lacks entirely the radiate structure requisite to membership in that family. It is placed by Sydow in the Sphaeriaceae.

EURYACHORAFuckel

40. EURYACHORA sp. ind.
On Unknown dicotyledonous plant.
Costa Rica: La Palma, July 8, 1923, 274; El Alto, July 6, 1923, 252.

SCIRRHIINEAE
CATAcouMa Theissen and Sydow

39 Det. Maxon.
40 Det. Standley.
41. **Catacouma costaricens** Stevens n. sp.  

[Figure 108]  
Spot irregular, slightly exceeding the stroma as a pale zone, yellow below. Stroma epiphyllous, subcuticular, black, flat or slightly raised, irregular in outline, 1 to 5 mm. across, about 100μ thick, filling the epidermis with an opaque, black layer about 11 to 18μ thick. The upper portion of the palisade layer is occupied by a similar layer. The part between these two layers is more thin-walled and less dark. Ascigerous locules 42 to 56 x 70 to 141μ or 78 x 36μ, located in the central layer of the stroma. Asci 4–8 spored, 21 to 38 x 7 to 10μ. Paraphyses filiform, gelatinous. Spores 14x2 to 3μ, hyaline, continuous, fusiform. Conidial locules 42 to 56 x 70 to 141μ or 78 to 436μ, located in the central layer of the stroma. Conidia 5 to 7 x 1.2 to 1.7μ. Conidiophores rod-shaped, simple, several times the length of the conidia.  

On *Myrcia costaricenses*.41  
Costa Rica: La Palma, July 8, 1923, 287.  
This fungus differs essentially from all species of Catacouma described on the Myrtaceae. The conidial cavities are of especial interest.

42. **Catacouma zanthoxyli** Stevens n. sp.  

[Figures 53, 54, 109, 110]  
Spot subcircular, showing below as an indefinite, pale area. Stromata epiphyllous, black, punctiform, slightly raised, very many in each spot, the old ones toward the center, the younger toward the margin. Old stromata in the center of a spot are often denuded. Stromata develop in the epidermis and above the palisade. Epidermal clypeus black, about 30μ thick, up to 540μ across. Locules usually solitary, occasionally more than one, the locules then separated by dothideoid tissue, lenticular, up to 460μ wide, 215μ thick, floor hyaline. Asci basal, 8-spored. Spores hyaline, 1-celled, ovate, 14 to 15μ x 8 to 9μ, rounded at one end, pointed at the other. Paraphyses many, thin. Conidial locules also present, smaller than the ascigerous and bearing bacillar conidia.  

On *Zanthoxylon* sp.42  
Panama: Chagres, 3 miles from mouth, Aug. 23, 1923, 1200.  

**APIOSPORA** Sacc.  
Comp. gen. Pyren., 9, 1875.  

43. **APIOSPORA striola** (Pass.) Sacc.  

On Bamboo (*Chusquea pittieri*?).  
Panama: Tapia, Aug. 15, 1923, 1019.

41 Det. Standley.  
42 Det. Standley.
The spores are very variable in size and it is really difficult to say which of the three species described on bamboo is here represented. It agrees, however, well with the one above named.

**PHYLLACHORINEAE**

**Phyllachora Nits.**

44. **Phyllachora ambrosiae** (B. & C.) Sacc.

Syll. Fung., 2, 601.

[Figures 55, 56]

Spot brown, irregular, dead, definitely bordered, 0.5 to 2 cm. in diameter, bounded by a narrow yellow zone. Stromata barely visible above, but prominent below as rounded, black protuberances. Locules solitary in each stroma, but stromata occasionally contiguous, globose, 150 to 250μ in diameter, ostiolate, asci basal, lower clypeus about 25μ thick, locular wall about 11μ thick. Stroma of the mesophyll loose, brown. Asci 8-spored, 90 to 110 x 11μ. Spores uniseriate or inordinate, globose or short cylindrical, 11 to 14 x 7 to 11μ, hyaline, 1-celled. Paraphyses filiform, long, crooked.

On *Podachaenium eminens*.43

Costa Rica: Peralta, July 13, 1923, 467.

The stroma in the upper leaf surface occasionally develops to fill the region between the epidermis and the locule, thus emphasizing the Dothid relationship.

45. **Phyllachora anthephorae** Syd.


On *Anthephora hermaphrodita*.44

Costa Rica: Swamp Mouth, Aug. 8, 1923, 774.

This specimen appears to agree in all particulars with the description by Sydow drawn from the type collected in Jamaica.

46. **Phyllachora casimiroae** Stevens and King n. sp.

[Figures 57, 58, 111]

Stromata extending through the leaf. Clypei epidermal, black, irregular, confluent with stroma; on the upper surface slightly raised, shiny and frequently minutely pimpled; on lower surface prominent, lustrous, but sometimes appearing hairy because of adhering trichomes, bearing one to several broadly conical projections at the apices of which the ostioles form; diameter 3 mm. or more below, smaller above; thickness 20 to 40μ.

43 Det. Standley.
44 Det. Chase.
Ostiole about 80μ across. Locules solitary or several (1 to 12), typically oval, 520μ wide, 400μ deep, asci and paraphyses numerous and covering all of interior except near the ostiole; lined by a layer of hyaline mycelium which is covered by and structurally continuous with a dark mycelial layer. Asci nearly cylindrical, hyaline, thin walled, 4 to 8 spored (usually 8), apex somewhat truncate, 16 to 21μ x 144 to 168μ. Paraphyses filiform, up to 254μ long, hyaline. Spores one-celled, hyaline or slightly grayish, fusoid, 12 x 28μ.

On Casimiroa tetrameria.

This species of Phyllachora is unique in showing all of the generic structural characteristics, but in addition having a dark mycelial layer surrounding the hyaline mycelial layer from which the asci arise (Fig. 57). There is direct organic connection between these layers, the same mycelial strand appearing dark and dense in the one and hyaline in the other. The large size of the stroma and abundance of frail thin-walled asci are unusual.

47. Phyllachora chaetochloae Stevens
On Chaetochloa vulpiseta.45
Panama: Gamboa, Aug. 16, 1923, 1078.
On Pennisetum distachyum.46
On Paspalum fasciculatum.
Costa Rica: Sabrio, Aug. 8, 1923, 809.

48. Phyllachora chusqueae P. Henn. and Lind.
Hedw., 36:224, 1897.
On Chusquea pittieri.46
Panama: Alejuelu, Aug. 18, 1923, 1122; Juan Mina, Aug. 18, 1923, 1165.

49. Phyllachora dioclea P. Henn.
Hedw., 43:252, 1904.
On Dioclea reflexa.47

This specimen agrees well with the original description given by P. Hennings as drawn from material collected by Ule in the Amazon region. The description given by Theissen and Sydow48 differs somewhat from the original description in several details, particularly as to the size of the

45 Det. Mrs. Chase.
46 Det. Standley.
47 Det. Blake.
48 l. c.
stromata and of the spores, giving the spores as markedly larger than in the original description, (20 to 23 x 6μ as against 18 to 22 x 4 to 5μ).

50. Phyllachora engleri Speg.

On Anthurium aemulum.40
On Anthurium sp.

51. Phyllachora icacoreae Stevens n. sp.
[Figures 59, 112]
Spot none or consisting only of a slight bleaching of the tissue surrounding the stromata. Stromata, circular when mature, usually about 3 mm. in diameter; above black and shining, slightly arched; below black, dull, slightly arched. Upper and lower clypeus well developed in the epidermis, about 18 to 25μ thick, densely black. Stroma of the mesophyll poorly developed, consisting mostly of a loose network. Locular wall well defined, dense, brown, about 18μ thick. Locules subglobose, located in the mesophyll, opening epiphyllous, about 170 to 230μ in diameter. Paraphyses filiform, numerous, Asci about 90 to 100 x 7μ. Spores oval, oblong, 1-celled, hyaline, 11 x 5μ.

On Icacorea sp.50
Costa Rica: Cartago, June 23, 1923, 46 (type) 72, 89.
Three species of Phyllachora are recorded by Theissen and Sydow,52 as on the Myrsinaceae. Of these P. pitleri Theiss. and Sydow on Myrsine has much larger spores; P. siuik-lagaraik Speg. on Myrsine, has spores only somewhat thicker but is clearly set apart by its small stromata, each with few locules; P. ardisiae P. Henn. on Ardisia by the shape of the stromata.

52. Phyllachora juraeensis P. Henn. var minima Stevens n. var.
Characters as in the species except as follows: Asci 80 to 144μ long. Spores oblong, obtuse, often slightly pointed at one end, continuous, hyaline, 14 to 18 x 3.5μ.

On Brownea sp.
Panama: Tapia, Aug. 15, 1923, 1025.
The species was originally described by Hennings54 on Brownia sp. from the Amazon and is also listed and described by Theissen and Sydow.52 These two descriptions differ somewhat as to spore and ascus measurements, but both give asci much shorter than the dimensions given above, and both give spores much larger than those given above; 20 to 26 x 5 to 6μ in Hennings; 22 to 28 x 4.5 to 5.5μ by Theissen and Sydow.

40 Det. S. F. Blake.
50 Det. Standley.
53. Phyllachora lactea Theiss. and Syd.
On Cassia sp.
Costa Rica: Columbiana, July 19, 1923, 568; Siquirres, Aug. 1, 1923, 724.

Among the fifty and more species of Phyllachora recorded on legumes there are many with punctiform, unilocular stromata, and many of these agree quite closely in spore size and in other characters.

Two species are described on Cassia. Namely P. cassiae P. Henn and P. bakeriana P. Henn. The present species differs from both of these in several ways. It does, however, appear to agree sufficiently well with the above named species to warrant reporting it under that name. My own notes on the characters shown by my specimen are as follows: spot indefinite, irregular, poorly defined, containing numerous stromata which are punctiform, unilocular, ostiolate, 170 to 215μ broad and deep. Upper clypeus consisting of a thickening and darkening of the upper part of the locular border, less broad than the perithecial diameter; basal stroma absent. Asci 97 x 18μ. Paraphyses filiform. Spores oval, 14 to 18 x 7μ, hyaline.

54. Phyllachora litsea Koord.
On Nectandra glabrescens.51
Panama: Tapia, Aug. 15, 1923, 1017.

55. Phyllachora maydis Maub.
On Zea mays.
Panama: Gamboa, Aug. 17, 1923, 1106.

56. Phyllachora meibomiae Stevens n. sp.

[Figures 60, 113]
Spot none. Stromata epiphyllous, not visible from below, black, irregular in outline, 1 to 2 mm. in diameter, showing 1 to several ostioles. Epidermal clypeus black, broadly extending, about 18 to 25μ thick, subepidermal stroma brown, dothideoid, mostly limited to the interlocular region. Locules one to few in each stroma, 170 to 246μ wide, 107 to 140μ deep, bounded by a brown wall 7 to 14μ thick. Asci borne basally, 8-spored,

51 Hedw., 43:252. 1904.
52 Theissen and Sydow l. c.
53 Det. Standley.
64 to 90 x 10 to 14μ, stipitate. Spores oblique or conglobate. Paraphyses filiform, crooked. Spores hyaline, continuous, 18 x 3.5μ.

On *Meibomia* sp.

Costa Rica: San Cecelia, Aug. 7, 1923, 756 (type) and 745.

The black epidermal clypeus with but scant stromatic development below is quite characteristic. The stromata on the two specimens, which are of two distinct species of *Meibomia*, are somewhat different in appearance but the spore characters are the same.

57. **Phyllachora octeicola** Stevens and Dalby


**Phyllachora octeicola var. costaricensis** Stevens n. var.

Though resembling *P. octeicola* somewhat in stroma and spore this variety differs markedly in that the stromata are black and shining above and distinctly raised and show the impression of the loculi, while *P. octeicola* differs in all these regards, being flat and dull above. The stromata in this variety are also less angular, more nearly circular.

On *Ocotea* sp.

Costa Rica: Paralta, July 12, 1923, 390.

58. **Phyllachora opismeni** Syd.


On *Oplismenus burmanni*.


This appears to agree completely with the description by Sydow and therefore with the specimen collected by Tonduz (no. 188) in Costa Rica.

59. **Phyllachora panamensis** Stevens n. sp.

Spot indefinite, consisting of a pale or yellowish region 3 to 4 mm. wide surrounding the stromata. Stromata numerous, scattered, somewhat irregular in shape, 1 to 1.5 mm. in diameter, visible from both sides of the leaf; above shining, black, slightly raised; below, slightly raised, dull, showing the locules clearly. Upper and lower clypeus each epidermal and about 30μ thick. Upper clypeus extending slightly beyond the locules. Stroma in the mesophyll scant, usually consisting of merely a slight, loosely woven, mass between the locules. Locules 150 to 260μ deep, 150 to 300μ wide, opening epiphyllous. Asci mainly, basal. Paraphyses filiform, numerous, crooked, asci 87 x 7μ, long, narrow. Spores uniseriate or oblique, long, oval, 14 x 6 to 7μ, thickest in the middle.

14 The original description errs in the spore measurement through the omission of a decimal point. The description should read 17x5.4 to 7μ.

15 Det. Standley.

16 Det. Chase.
On *Rourea glabra*.
Panama: Gamboa, Aug. 16, 1923, 1094; Juan Mina, Aug. 18, 1923, 1351.

60. *Phyllachora paspalicola* P. Henn.

On *Paspalum conjugatum*.
Costa Rica: Peralta, July 11, 1923, 335a; July 13, 1923, 435a; July 13, 1923, 815a.

61. *Phyllachora picramniae* Stevens n. sp.

[Figures 61, 62, 121]

Spots circular, indefinite bordered, yellow, surrounding the stromata by a zone about 3 mm. wide. Stromata circular, raised, both surfaces black and shining, about 3 mm. in diameter. Stromata in each epidermis dense and black, in the mesophyll much less dense. Locules in one row, opening epiphyllous, globose or somewhat flattened, 185 to 246 μ broad, 150 to 231 μ deep. Asci cylindrical, short stalked, 93 x 11 μ, spores oblique. Paraphyses filiform, gelatinous, numerous. Spores continuous, hyaline, 21 to 25 x 5 μ, oblong, tapering slightly from middle to each end.

On *Picramnia bonplandiana*.
Costa Rica: Aserri, June 26, 1923, 119 (type); Desamparados, June 27, 1923, 138.

Only one Phyllachora appears to be recorded on the Simarubaceae and that quite different from the one above described. *Phyllachora roureae* Syd. was described from the conidial stage only on *Rourea erecta* from the Philippines and later was excluded from the genus Phyllachora by Theissen and Sydow because of the lack of description of asci and spores. It in some respects resembles this species. Our specimens show no conidia. The present species differs markedly in spore shape and size from *P. connari* Syd. and *P. connarina* Rac. also on members of the Connaraceae.

On *Picramnia antidesma*.


The specimens on the last named host differ markedly from those on the other host as follows: The stromata are much less abundant, much smaller, and are dull rather than shining. The locules are usually much smaller, 125 to 218 μ broad, thus occupying much less space in the mesophyll. The spores on the two hosts however, measure the same. This

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57 Det. Standley.
58 Det. Standley.
61 Det. Standley.
makes an interesting case of a fungus occurring on two separate hosts and showing quite different morphology on the two. Whether this difference is due to alteration of the fungus or to differences in the host reaction is unknown. That the fungi on the two hosts are closely related, cospecific, is probable from the appearance of the spores and the general structure of a stroma.

62. Phyllachora sapindacearum Stevens n. sp.

Spots yellow to brown, dead, circular, indefinite, about 5 mm. in diameter, with one stroma at the center, visible from both sides of the leaf. Stromata about 1 mm. in diameter, black and shining above, dull black below. Clypeus, above and below, each about 30 to 45 μ thick, epidermal, densely black. Mesostroma pale, scant. Locules 60 to 140 μ deep, 120 to 340 μ wide, surrounded by a definite dark border, few in a stroma, usually one. Asci 8-spored, inordinate, 70 x 114 μ, basal. Paraphyses numerous, filiform. Spores oblong, 11 x 7 μ, continuous, hyaline.

On Serjania mexicana.

Panama: France Field, Aug. 24, 1923, 1327.

This differs essentially from P. duplex Rehm on Serjania from Brazil, also from P. subreplens Speg., and P. insueta Sydow in spore shape and size.

63. Phyllachora stevensii Sydow n. sp.

[Fig. 115]

Spot vague, indefinite, slightly discolored, 3 to 8 mm. in diameter, visible below as a slightly pale region. Stromata epiphyllous, black, shiny, punctiform, 150 to 180 μ in diameter, numerous in irregularly arranged groups. Clypeus in the epidermal cells, about 15 μ thick, dense, extending barely to the diameter of the locule. Stroma development at the base of the locule limited to a small black shield, much smaller than the superior clypeus. Locules 107 to 185 μ in diameter, 46 to 90 μ deep. Paraphyses numerous, short and thick, 0.75 to 1 μ. Asci 50 to 57 x 7 to 18 μ, 8-spored. Spores oval, hyaline to green, 8 x 5 μ. Locule 154 to 215 μ broad, 140 to 185 μ deep.

On Meibomia sp.

Panama: Gamboa, Aug. 17, 1923, 1007 (type); Gatuncillo, Aug. 18, 1923, 1150.

The type of stroma in this fungus is much like that of P. inclusa as described and figured by Theissen and Syd. (Ann. Myc., 13, Taf. 3. fig. 14), and is similar also to P. calvertia (Taf. 4 fig. 5).

In specimen No. 1150 the spores are a trifle larger and the clypeus extends somewhat further to each side of the locule. This species is much like P. ramosii, (P. Henn.) Theiss. and Syd. but differs from it in its much more highly developed stroma.
64. **Phyllachora tragiae** (Berk and Curt) Sacc.

Syll Fung. 2. 601.

On *Croton* sp.

Costa Rica: Escasu, June 29, 1923, 150.

The epidermal cells are densely crowded with dark mycelium forming the epidermal clypeus. Below this is a thick layer of somewhat less dense stroma, while between this and the palisade layer is another stromatic layer that is comparatively loose and light-colored.

The conidial locules are borne in the upper, dense, dark region of the stroma immediately below the epidermal clypeus, while the asciigerous locules are found deeper down, below the dense layer of stroma and in the more loose layer.

On *Croton gladulosus*.62

Panama: France Field, Aug. 24, 1923, 1322; Juan Diaz, Aug. 21, 1923, 1226; Tapia, Aug. 15, 1923, 1011.

The specimens on the last mentioned host differ somewhat in the shape of the locules and the stromata; but this may well be due to the difference in the host tissue.

65. **Phyllachora trophis** Stevens, n. sp.

[Figs. 63-65]

Spot small, circular, indefinite, consisting of a pale zone surrounding the stromata, visible from both sides of the leaf. Stromata solitary in each spot, about 1 mm. in diameter, black and shining above, flat or slightly raised; below dull black. Stromatic development in the upper and lower epidermis scant, usually only a few cells being filled with black mycelium. A layer of black, dense stroma about 36μ thick usually develops under each epidermis, while the mesophyll layer between these two regions is with but scant, and hyaline, mycelium. Locule in the mesophyll, flattened, about 380μ in diameter, 80 to 90μ deep, bounded by a thin, hyaline border, opening epiphyllous. Asci basal, 8-spored, 72 to 90 x 7 to 11μ. Spores oval, 9 to 12 x 7 to 8μ, 1-celled, hyaline. Paraphyses filiform, crooked.

On *Trophis racemosa*.63


This Phyllachora is remarkable chiefly for the scant epidermal stromata with black bands of subepidermal stromata, and with a hyaline region in the mesophyll between these. On the same leaves occurs a conidial stroma, Dothideaceous in character, but so different in stroma from this Phyllachora that it is difficult to regard them as being the same. With both of these stromata the leaf is enlarged to about twice its normal thickness.

The conidial stroma may be described as follows:

Upper clypeus weakly developed, limited to the epidermal cells, which are but partly filled with mycelium; lower epidermal clypeus still more

62 Det. Standley.
scant, some of the cells being devoid of mycelium. Mesophyll well packed with a brown stroma. Locule usually solitary, opening epiphyllous. Conidial locules opening epiphyllous, in the middle of the mesophyll, 40–180 μ in diameter. Conidia 1-celled, oblong, yellow, 73.5 μ. Conidiophores simple, filiform, 14 to 20 μ long, 3 μ thick.

66. **Phyllachora ulei** Wint.

Grevillea, 15:90, 1886.

On *Dioscorea* sp.

Costa Rica: Limon, Aug. 7, 1923, 772; Sabario, Aug. 8, 1923, 798; Port Limon, Aug. 10, 1923, 875.

Panama: Panama, Aug. 14, 1923, 1003; Tapia, Aug. 15, 1923, 1006; Gamboa, Aug. 16, 1923, 1083; Pedro Miguel, Aug. 16, 1923, 1101; Alehuela, Aug. 18, 1923, 1128; Gatuntillo, Aug. 18, 1923, 1144; Frijoles, Aug. 20, 1923, 1183; Panama, Aug. 21, 1923, 1216; Juan Diaz, Aug. 21, 1923, 1243.

67. **Phyllachora visiae** Stevens n. sp.

Spot yellow, irregular, about 3 to 5 mm. in diameter, border indefinite. Stroma black, irregular in outline, about 2 mm. in diameter. Spot visible only from above, stroma faintly showing below. Black epidermal clypeus present above and below, extending far beyond the locules, development in the mesophyll scant. Locules one to several in each stroma, 150 to 330 μ in diameter, 140 to 231 μ deep, border brown. Asci basal, long, cylindrical, 112 x 11 μ; spores uniseriate, oblique. Paraphyses filiform. Spores oblong, 12 to 18 x 7 μ.

On *Vismia guianensis*.<sup>63</sup>


No Phyllachora has heretofore been described on any member of the Guttiferae and the only Dothid recorded is an *Endodothella* on *Vismia* from Costa Rica.

68. **Phyllachora** sp. indet.

On unknown dicotyledonous plant.

Panama: Juan Diaz, Aug. 21, 1923, 1255. This specimen though undeterminable has been considered by Blain<sup>64</sup> on account of its interesting morphology.

**Phyllachorella** Syd.


<sup>63</sup> Det. Standley.

<sup>64</sup> Blain, W. L. Mycol. 29:1, 20. 1927.
69. Phyllachorella schistocarphae Stevens n. sp.

[Figures 66, 116]

Spots indefinite, of irregular shape, pale yellow, 1–2 cm. in diameter, visible above and below. Stromata punctiform, numerous and irregularly grouped in the spots, black above and slightly raised. Stromata limited to a very slight epidermal clypeus, with sometimes a scant stromatic development between the locale and epidermis. Ostiole well developed. Locule in the mesophyll, globular, 140 to 310μ in diameter, bounding layer about 45μ thick, hyaline, asci borne basally. Asci 8-spored, aparaphysate. Spores hyaline, irregularly oval, 1-celled, 11 to 14 x 5.5μ, somewhat thicker in the middle than at the ends.

On Schistocarpha hoffmani.65


This fungus with its thin hyaline locular wall, and well defined ostiole would doubtless by many be classified as one of the Sphaeriaceae, and placed in the genus Laestadia. It has, however, always the rudiments of an epidermal clypeus and quite often also a slight subepidermal stromatic development, which appear to me to place it with those uniloculate Phyllachoras which have but small clypei, this specimen representing an extreme reduction. The absence of paraphyses places it in Phyllachorella rather than Phyllachora.

Sphaerodothis Shear

Mycol., 1, 162, 1909.

70. Sphaerodothis circumscripta (Berk.) Theiss. and Syd.


On Sophoelesia sp.66

Costa Rica: Cartago, June 23, 1923, 41 and 60.

The material of this species is scant and spores few. While I find no dark spores and ought perhaps therefore to place the fungus in Phyllachora, still it appears to agree so well with the above named fungus that I venture to so report it. The long, narrow, pointed spores are quite characteristic, as is also the peculiarly limited stroma.

71. Sphaerodothis scleriae (Rehm) Stevens n. comb.


On Scleria melaleuca.67


On Sedge.

65 Det. Standley.
66 Det. Maxon.
67 Det. Standley.
Costa Rica: Peralta, July 12, 1923, 907.
On Scleria pterota.\(^{57}\)
Costa Rica: Port Limon, Aug. 9, 1923, 825.

The species was originally described as on “Scleria sps” from Brazil. The shape of the spores—fusiform, pointed at each end with one end slightly thicker than the other—is very characteristic; so definitely so as to leave no doubt that the present specimens are co-specific with Phyllachora scleriae. The ascospores when fully mature are brown, necessitating change in the generic name. Mature brown spores are only rarely seen. They differ slightly from the immature spores in that they are less pointed but the transition from the younger pointed shape to the older obtuse form is clearly traceable in a single locule.


On *Cenchrus viridis*.

Costa Rica: Peralta, Aug. 1, 1923, 736; Swamp Mouth, Aug. 8, 1923, 775.

Panama: Gamboa, Aug. 17, 1923, 1116.

This specimen agrees in every detail with the type specimen of *Phyllachora sphaerosperma* Winter, issued by Rabenhorst in “Fungi Europaei” no. 3062 except that occasional spores were found in ours which were distinctly brown. In both however numerous spores of a smoky gray tinge appear. Theissen and Sydow\(^{58}\) describe the spores as elliptical, 11 to 12 by 6.5 to 7\(\mu\). In both the type and in our specimen the spores are globose or subglobose, commonly 10\(\mu\) in diameter but ranging from 8 to 12\(\mu\). This agrees with Rabenhorst’s description accompanying the type specimen and with Saccardo.\(^{59}\) Saccardo also notes the dark spores and suggests Auerswaldia as the genus. The occurrence of the brown spores leads to the formation of this new combination.

**Phaeodothis** Syd.


73. *Phaeodothis costaricensis* Stevens n. sp.

[Figures 67, 68]

Spot none. Stromata scattered, strictly hypophyllous, subcircular, about 1 mm. in diameter, developed as a dense, dark clypeus, subtended by a more loose, less dark stroma reaching into the mesophyll, but rarely extending to more than half way through the leaf. Locules few in each


\(^{58}\) Saccardo, Sylloge Fungorum, 9:1027.
stroma (usually 1 to 5). Asci 8-spored, long, narrow, 90 x 7μ. Paraphyses filamentous. Spores yellow, uniseriate, oval, 10 to 11 x 3 to 4μ, 1-septate, slightly constricted, pointed at each end. Conidial locules irregularly globose or flattened, usually developed in the mesophyll, external to the dark stroma, each locule surrounded by a delicate, hyaline wall. Conidia very numerous, oval, yellow, 7 x 2μ.

On unknown member of the Rubiaceae.
Costa Rica: Siquirres, July 31, 1923, 673.

Only eight species of this genus are given by Theissen and Sydow. Conidia are mentioned for none. All differ essentially from our species.

Phragmocarpella Theissen and Sydow
74. Phragmocarpella puiggarii (Speg.) Theiss. and Syd.
On Oplismenus burmanni.

Ophiodothella v. Höhn.
Fragn., 12:no. 630, 1910.

75. Ophiodothella panamensis Stevens n. sp.
[Figures 69–71]

Spots up to about 5 mm. in diameter or by coalescence larger, irregularly circular, bordered by a narrow yellow line, each occupied by one stroma. Stromata about 1 to 2 mm. in diameter, visible from both leaf surfaces, dull black, rough. Epidermal, black clypeus present both above and below, accompanied by the development of a dark subepidermal stroma about 70 to 110μ thick on the upper side. Major portion of the stroma below the palisade layer, colorless, thin walled prosenchymatic, about 230μ thick and 700 to 900μ in diameter, extending also to some extent between the palisade cells and developing extensively between the cells of the spongy parenchyma. Locules several in each stroma, located in the hyaline stroma of the mesophyll, globose, about 230μ in diameter, developing an ostiole which becomes somewhat rostrate, opening hypophyllous. Asci long, narrow, 72 x 7μ, stalked, arising from all parts of the locule border. Spores filiform, curved, 61 to 65 x 1.5μ, obtuse, hyaline. Paraphyses none.

On Cordia heterophylla.70

Panama: Panama, Aug. 21, 1923, 1217; Juan Mina, Aug. 18, 1923, 1163.

This fungus is remarkable in several ways chiefly as follows: 1. Its most extensive stromatic development is below the palisade layer. This

70 Det. Standley.
character is seen in very few fungi. Logically the definite location of the stroma below the palisade layer is just as significant as to find it definitely subcuticular or subepidermal, characters on which Sydow and Theissen base their Trabutiineae, Schirrhineae and Phyllachorineae. This species might therefore be considered as representing a fourth and coordinate group. 2. The loculiferous stroma is pale, hyaline, yet it has the typical palisade arrangement of cells characteristic of the Dothideaceae. This is an extremely rare condition. It is approached in Anisochora and is suggested by certain fungi of the Clavicipiteae related to Dothichloe. 3. The ostiolar development is much more suggestive of the Sphaeriales than of the Dothideales, in fact, is such that the inclusion of this form in the Dothideales is perhaps rendered questionable. 4. The occurrence of filiform spores in the Dothideales is far from common. Theissen and Sydow give only four genera with filiform spores. 5. This fungus shows much similarity with Scolecodothopsis ingae, particularly in the location of the stroma below the palisade layer, but the two differ in that the present form possesses a highly developed stroma while S. ingae has a very poorly developed stroma.

**MONTAGNELLACEAE**

**Haplothecium** Theissen and Sydow


76. **Haplothecium dioscoreae** Stevens n. sp.

[Figure 72]

Spot circular, 2 to 5 mm. in diameter, tan-colored, visible from both leaf surfaces, border indefinite. Stromata visible only from below, punctiform, dull black. Locules inordinate, subglobose, 125 to 200μ in diameter, border dark, about 15μ thick. A black clypeus, 20 to 25μ thick, is present over some of the locules. Extralocular stroma hyaline, loose. Paraphyses numerous, filiform, gelatinous. Asc 90 x 11μ. Spores 14 to 18 x 7 to 8μ elliptical.

On Dioscorea sp.


The asci and spores of this fungus are very similar to those of Phyllachora utei, but the stroma is entirely different.

**DOTHIDEALES IMPERFECTI**

**Pycnidiostroma** Stevens n. gen.

Stroma of the Phyllachorineae; conidia hyaline, continuous, oval or fusiform.
77. **Pycnidiostroma eugeniae** Stevens n. sp.

[Figures 73, 117, 118]

Stromata black, subcircular, extending through the leaf, 3 to 6 mm. in diameter, margin sharply defined, raised; pycnidial locules visible from the upper surface, disposed in one row close to the circumference of the stroma. Upper and lower clypei limited to the epidermis, dark, mesostroma pale, loose. Pycnidial locules lenticular, 90 to 230 μ broad, about 80 μ deep, border hyaline, hymenium lining whole of periphery, including the top, no ostiole. Conidiophores hyaline, filiform, simple, about 7 to 10 μ long. Conidia hyaline, 1-celled, oval to fusiform, 7 x 2 μ.


On *Calyxtranthes costaricensis*. 11


The most characteristic features of this fungus are the circular arrangement of the locules, the definite raised border of the stroma, and the loose hyaline mesophyll.

**SPHAERIALES**

**CUCURBITARIACEAE**

**Otthiella** Sacc.

Syll. Fung., 1:739. (as subgenus).

78. **Otthiella fourcroyae** Stevens and De Coursey n. sp.

[Figures 74, 119]

Perithecia cespitose, erumpent, superficial, carbonaceous, globose, 250 μ in diam., without stroma. Asci cylindrical, eight-spored, stipitate, 120 to 125 x 28 to 32 μ, aperaphysate; spores elliptical, hyaline or slightly tinted, 1-septate, constricted, 22 to 24 x 6 to 8 μ.

On *Fourcroya* sp.


It was considered advisable to distinguish between *Otthiella ribis* Tracy and Earle and this species on the basis of the wide generic separation of the hosts and considerable difference in spore measurements, though the description of *Otthiella ribis* is so general that it might be made to include this species.

Attention is called to the asci which are apparently, clearly cross-walled. See Fig. 74. This unusual occurrence has also been observed by Stevens in *Dothidina costaricensis*, see page 29.

Asci showing much the same general appearance as these are figured by Julius Klein as occurring in *Ascobolus elegans* with the comment

71 Det. Standley.
Die Sporen werden gleich nach ihrer Bildung und auch im reifen Zustande einzeln von einer farblosen Hülle umgeben, mit der sie unter einander zusammenhängen (Taf. X, fig. 19). Wie bekannt, werden die reifen Sporen, indem die Asci sich oben deckelartig öffnen, aus denselben herausgespritzt, und finden sich meist auch noch nachher durch ihre Hüllen miteinander verbunden.

Coryneliaceae

Corynelia Fries ex Acharius


79. Corynelia sps.

On Podocarpus sp.

Costa Rica: Cartago, June 23, 1923, 47.

Owing to the condition of the material the asci and spores could not be found. The apices of the perithecia were found to be 2 to 4 lobed, though the stromata closely resemble those of C. portoricensis Fitz.

Mycosphaerellaceae

Mycosphaerella Johans.

Svamper fran Island.

80. Mycosphaerella cassiae Stevens n. sp.

Spots subcircular, 3 to 7 mm. in diameter, brown to black, concentrically marked with dark lines, border definite. Perithecia numerous, hypophyllous, immersed, brown, very minute, 36 to 43μ in diameter, slightly rostrate, ostiolate, reticulate. Mycelium dark, coarse. Asci 8-spored, 29 x 11μ, aparaphysate. Spores inordinate, 2-celled, hyaline, oblong, 4 x 0.5μ.

On Cassia sp.

Costa Rica: Columbiana, July 19, 1923; 909; Siquirres, Aug. 1, 1923, 724.

The spores and perithecia are very much smaller than those of M. sordidula Spec., also on Cassia.

81. Mycosphaerella plantaginicola (Pat.)


On Plantago hirtella.12

Costa Rica: La Palma, July 8, 1923, 293; Cartago, June 23, 1923, 38; El Alto, July 6, 1923, 253 and 241.

These specimens agree well with the descriptions of the above named species and differ decidedly from M. plantaginis Sollm., which has spores 10 to 11μ long, and from M. pachyasca Rost., with spores 16 to 20 x 5 to

12 Det. Standley.
6μ. The spores are also larger than those of *M. pullemansii* P. Henn. and *M. gouveensis* P. Henn., both from Brazil. The spores of *M. calumbi* Rehm are much smaller.

**Physalosporaceae**

**Physalospora** Niessl


82. **Physalospora agaves** P. Henn.


On *Fourcroya* sps.


This specimen agrees essentially with the description of the above named species, described from Africa, and differs somewhat from *P. fourcroyae* P. Henn.

83. **Physalospora cestri** Stevens n. sp.

[Figure 75]

Spot none. Perithecia punctiform, black, subepidermal, grouped in clusters about 1 to 2 mm. in diameter, but the perithecia usually separate, sometimes two or three contiguous. Perithecia 77 to 154μ in diameter, globose, ostiole circular, 7 to 15μ in diameter, wall at base and sides dark, parenchymoid, 14 to 18μ thick. Clypeus subepidermal, 15 to 20μ thick, not equalling the diameter of the perithecium. Asci basal, 8-spored, ovate, 60 x 22μ, short stipitate, thin-walled. Paraphyses numerous, matted. Spores oblong, hyaline, continuous, 22 x 5μ, obtuse.

On *Cestrum* sp.

Costa Rica: Port Limon, Aug. 10, 1923, 865.

The absence of mycelium from the epidermal cells, though a clypeus is developed in the cells immediately below, is somewhat unique. The very narrow clypeus is also distinctive. Occasionally there is a slight development of stroma at the side of the clypeus, on the perithecium.

**Didymella** Sacc.

Mich., 1, 377.

84. **Didymella eupatorii** Stevens n. sp.

[Figures 76, 77]

Spot indefinite, consisting, where stromata are numerous, of a blanched or yellowed area in the leaf. Isolated stromata are without spot. Stromata amphigenous, often on the minor veins, black, small. In section the black stroma is seen to be mainly above the locule and epidermal, as a clypeus, 36 to 50μ thick, though hyaline stroma is found in the mesophyll to considerable distance, which in age also become black. Locules globose,
100 to 150 to 180\(\mu\) in diameter, opening epiphyllous. Ostiole sometimes through a beak, 77 x 30\(\mu\). Ascii, 8-spored, clavate, 60 x 7\(\mu\). Paraphyses filiform, numerous. Spores hyaline, fusiform, 1-septate, 21 x 3.5\(\mu\), several guttulate. Conidial locules subglobose, 80 x 60\(\mu\); conidia hyaline, continuous, oblong, 7 x 3\(\mu\), obtuse.

On *Eupatorium* sp.


**Gnomoniaceae**

*Glomerella* Sch. and Spaulding Sci., n. s. 17:750, 1903.

85. *Glomerella bromeliae* Stevens and Weedon n. sp.

Spots irregular in size and shape, from a few millimeters to several centimeters in diameter. Perithecia spherical, immersed, becoming erumpent, black, 105 to 299\(\mu\) in diameter and 105 to 237\(\mu\) deep. Ascii basal, 8-spored, 74 to 81 x 17\(\mu\), clavate, thick walled. Spores 14 to 21 x 5 to 7\(\mu\), hyaline, nonseptate, oblong, slightly thicker at the center. Paraphyses filiform, guttulate. Pycnidial stromata, 141 to 624 x 141 to 265\(\mu\). Pycnidial cavities 21 to 52 x 21 to 91\(\mu\). Conidia hyaline, continuous, 10 to 21 x 4 to 5\(\mu\).

On *Bromelia penguin*.

Costa Rica: Escasu, July 29, 1923, 166.

The perithecia are almost spherical but the ascigerous cavity is flask shaped, and varies from 95 to 123\(\mu\) in width x 123 to 130\(\mu\) in length, including the neck of the flask which is from 35 to 52\(\mu\) long x 24 to 42\(\mu\) wide. The ascigerous cavity is surrounded by a large-celled, black stroma, 70 to 88 x 133 to 176\(\mu\) deep, below the fertile portions, and 17 to 24\(\mu\) thick at the sides. Occasionally two perithecia are borne by the same stroma, separated by a heavy black wall and with the necks extending above the stroma surface. The stroma grows upward pushing into the epidermal cells and rupturing the cuticle. The conidia are in pycnidia which are scattered among the perithecia and are of similar structure, but are larger than the perithecia and appear to the naked eye to be more superficial, a little more elevated, black and hard. Microscopical examination shows them to be embedded in a stroma, erumpent and similar to that of the perithecia. Those having but a single pycnidium measure 141 to 176\(\mu\). The conidia are slightly larger at one end than at the other; both ends are obtuse.

**Mazzantia** Mont.

Syll. plant. crypt., 245, 1856.
86. **Mazzantia arundinellae** Stevens n. sp.

[Figures 78–80, 120]

Stroma dull black, oval or irregularly oval, 2 to 5 x 0.5 to 1.5 mm. across, immersed, subepidermal, becoming erumpent by a protruding beak or by cracking the covering epidermis. Mesostroma hyaline, of very thick walled cells, bounded by a black, compact rind about 15μ thick. Perithecia 170 to 350μ wide, deeply buried (60 to 80μ), 80 to 150μ deep, thin walled (7 to 8μ), wall and nearby mesostroma slightly brown. Ostiole long, up to 150μ and usually rising obliquely through the stroma, lined around its mouth by periphyses, and often projecting above the surface as a short beak. Asci 4 to 8 spored, 52 to 67 x 5 to 7μ, uniseriate. Paraphyses filiform, 42 to 52μ long. Spores 13 to 15 x 5 to 7μ, hyaline, non-septate, oval, the greatest diameter in the center, the ends rounded, one to several guttulae, heavy walled.

On *Arundinella hispida*.

Costa Rica: Peralta, July 12, 1923, 343.

The most distinctive characters of this fungus are the hyaline mesostroma, the black, thin rind, and the deeply buried ostiolar perithecia. The host cells, even when completely filled with mycelium, at first show no change in character, later however the host cell walls, throughout a considerable region, may disappear entirely, apparently being dissolved away. In some instances there is a considerable development of the hyaline stroma accompanying the dissolution of the host cells, this resulting in an increase in mass and an arching upward of the epidermis or other overlying tissues. The mycelium penetrates all of the host elements in the occupied region, even into the sclerenchyma fibers. Superficially the fungus resembles the Phyllachoraceae but the hyaline mesostroma, together with the well developed ostiole, deny relationship here. In many characters it is near Glomerella but its stroma is very different. Its real connection seems to be most closely with the Valsaceae or the Melanconidiaceae, though Sydow suggests the Hyponentriaceae.74

**Clypeosphaeriaceae**

**Phaeopeltosphaeria** Berl.


87. **Phaeopeltosphaeria panamensis** Stevens and King n. sp.

[Figures 81–83]

Spot small, subcircular to oval or slightly irregular, average 0.3 x 0.6 mm. (max. observed 0.7 x 0.36 mm.), occurring singly or grouped, sometimes in a more or less linear series parallel with the veins, hypophyllous, black and glabrous, usually bordered by a narrow, light colored area.

Stromata clypeate, black, arched and continuous with the tangled mycelium at the base of the perithecium. Perithecia situated in the mesophyll near the upper leaf surface, single or sparingly cespitose, in cross section narrowly to broadly bulbiform, up to 125μ across and 80μ deep, with ostiole averaging 33μ across. Ascii club-shaped, distal ends rounded, 8-spored, numerous, average 66 x 10μ. Paraphyses numerous, filiform, up to 82μ long. Spores muriform, fusiform; olivaceous or straw colored; 16 x 5μ. Hyphal development sparse to moderate, intercellular except for haustoria-like structures invading all of palisade and mesophyll of host leaves.

On Chaetochloa vulpiseta (Lam) H. and C. Panama, Gamboa, Aug. 16, 1923, 1350.

In general appearance the spots of this fungus resemble those of Phyllachora chaetochloae Stevens, with which they occurred on the host. It differs from Phaeopeltosphaeria caudata Berl. in the form and size of the perithecia, the size of the ascii, and the size and structure of the spores.

BASIDIOMYCETES
ENOBASIDIALES
Microstroma Niessl

Mähren Crypt. Fl., 165, 1865.

88. Microstroma Pithecolobii Lamkey
On Pithecolobium saman.
Costa Rica: El Roble, July 25, 1923, 137.

AGARICALES
POLYPORACEAE
Polyergus Mich.

Nov. Pl. gen., 129, 1729.

89. Polyergus fruticum B. and C.76
On Living leaves.

FUNGI IMPERFECTI
SPHAEROSPIDALES
HYALOSPORAE
Phylllosticta Pers.

Fr. Syst. Myc., 2:257.

76 Det. E. A. Burt.
90. **Phyllosticta begoniicola** Stevens & Baechler n. sp.

Spots dark brown with lighter yellow margins, 2 to 5 cm. in diameter, visible on both surfaces of the leaf, irregular, indefinite. Mycelium light brown, diameter 3μ. Pycnidia immersed, dark brown to black, ostiolate, 125 to 140μ. Spores irregularly oblong, obtuse, hyaline, continuous, 7 to 8 x 3μ.

On Begonia.


This differs from *Phyllosticta begoniae* P. Brun. in not forming a pale center in the spot and in having longer spores.

91. **Phyllosticta chelonanthi** Stevens n. sp.

Spots 1 to 10 mm. in diameter, subcircular, translucent, border definite, surrounded by a discolored zone 3 to 5 mm. wide that merges indefinitely with normal leaf. Young spots occupied by a single central pycnidium; older spots bearing numerous scattered pycnidia. Pycnidia 70μ in diameter, dark. Ostiole very large, nearly as large as the pycnidium. Conidia irregularly oblong, continuous, hyaline, 5 to 7 x 2μ, obtuse.

On Chelonanthus acutangulus.

Costa Rica: La Palma, July 8, 1923, 284.

92. **Phyllosticta coffeicola** Speg.

Revista de la Facultad de Agronomía Y. Veterinaria, La Plata, 1-2, 1895-96.

On cultivated coffee.


[Figures 84, 85, 122]

The specimens reported provisionally under this name show diseased or dead spots on the leaves, ranging from one to several centimeters in diameter. They are tan colored when young but black when old. Pycnidia are very numerous throughout the spot and visible under a hand lens. Also on the upper surfaces of the diseases areas appear fan-shaped radiations (Fig. 122). Careful study of these radiations fails to show them to be mycelial but they seem rather to be due to hypertrophy or mild intumescence of the epidermal cells, probably induced by mycelium. The following description of the fungus may be given:

Pycnidia epiphyllous, rarely hypophyllous, developing at first subcuticular but later pressing down through the palisade tissue, circular, 110μ in diameter, straw colored, ostiole irregular, with slightly dark border. Spores hyaline, continuous, oblong, 5 to 7 x 2μ, obtuse.

The pycnidial wall is very tenuous and is, together with the overlying cuticle, easily knocked off leaving the spore bed uncovered and thus suggesting that the fungus is not of the Sphaerioidaceae, though earlier stages clearly show that it is so.
Agreement with Spegazzini’s description is not very close nor does he mention the peculiar surface radiation. It is therefore quite possible that this is a distinct species.

The original description of this species is as follows: “Maculae orbiculares majusculae arescenti-albidae; perithecia epiphylla parenchymate immersa lenticularia (180–200μ) atra glabra, ostiolata, contextu parum distincto; sporulae cylindraceae utrinque obtusiusculae atque minute 1-guttulatae, continuae hyalinae.

Hab. Ad. folia viva et languida Coffeae arabicae.”

**Macrophoma** (Sacc.) Berl. and Vogl.

_atti Soc. Veneto-Trentina, 172, 1886._

93. **Macrophoma pandani** (Lev.) Berl. and Vogl.

_atti Soc. Veneto-Trentina, 172, 1886._


*Sphaeropsis pandani* Lev. (not *S. pandani* P. Henn.) Am. Sc. Nat., 293, 1846.

On _Pandanus_ sp.


The descriptions of _M. pandani_ are very meager, no spore measurements being given, but in so far as the description goes it is in agreement with our specimen, the following description of which we give:

Forming dark spots on the bases of Pandanus fruits. Mycelium pale yellow, 3μ in diameter. Pycnidia 190μ in diameter, immersed, brown, ostiolate. Spores vary in size, largest 25 x 14μ, hyaline, granular, thin walled, continuous.

**Phaeodidymae**

*Botryodiplodia* Sacc.

94. *Botryodiplodia* sp.

[Figure 86]

The specimens which are immature may be described as follows:

Spot brown, involving large area of the leaf. Pycnidia 155 to 180μ, numerous, black, immersed, ostiolate, erumpent. Spores 22 to 25 x 3 to 14μ, one-celled, hyaline. Paraphyses 38 to 55μ in length.

On _Dracaena_ sp.

Costa Rica: Guapiles, July 18, 1923, 508.

On crushing open a pycnidium spores of all sizes up to the maximum are found and their connection with their conidiophores is clearly evident. Between the conidiophores arise long slender, comparatively straight, paraphyses.
HYALODIDYMAE
Darluca Cast.


95. Darluca filum (Biv.) Cast.
Cat. Pl. Marseill Suppl., 53.
On Puccinia.
On Zea Mays.
Costa Rica: Experiencia Farm, July 17, 1923, 520.

SCOLOCOSPORAE
Septoria Fr.

Syst. Myc. 3:480.

96. Septoria cavendishiae Stevens n. sp.

[Figure 87]
Spots subcircular to irregular, definite, 3 to 15 mm. in diameter, extending through the leaf, centers tan-colored, borders red, 0.5 mm. wide, slightly raised. Pycnidia black, punctiform, opening epiphyllous, about 100μ in diameter, erumpent, ostiolate, base in the palisade tissue, about 230μ long. Spores filiform, slightly thicker in the middle and tapering toward the ends, hyaline, 3-septate, 25 to 32 x 3.5μ.
On Cavendishia sp.

97. Septoria erigerontis B. and C.
On Erigeron sp.
Costa Rica: La Palma, July 8, 280.

98. Septoria lobeliae Peck.
On Lobelia laxiflora.
Costa Rica: Agua Caliente, July 5, 1923, 220.

MELANCONIALES
Colletotrichum Corda

Sturm Cr. Fl., III, 3:41.

99. Colletotrichum iriesines Stevens n. sp.
Spots irregularly circular, definitely bordered, ashen gray, 5 to 8 mm. in diameter, extending through the leaf. Acervuli 80 to 90μ in diameter, densely setose. Setae wine colored to black, crooked, irregular, obtuse,
septate, about 60μ long, 3.5μ thick. Conidia oblong, straight, obtuse, hyaline, 12 to 18 x 4μ.

On *Iresine calea*.78
Costa Rica: Desamparados, June 24, 1923, 139.

100. **Colletotrichum peregrinum** Passer.

Diagn. F. N. IV, 14.
On *Polyscias quilfoylei*.
Panama: Panama, Aug. 13, 1923, 1002.

Large blanched spots on the leaves were so numerous as to seriously disfigure the foliage and injure the vigor of the plants. The disease was quite common in the Canal Zone.

**MONILIALES**

**MONILIACEAE**

*Oidium* (Link) em. Sacc.

Mich., 2:15, 1880.

101. **Oidium**


On *Erigeron* sp.
Costa Rica: San José, June 20, 1923, 4; Desamparados, June 27, 1923, 135.

102. **Oidium**


On *Rosa* sp. (cultivated).

103. **Oidium** sp.

On *Erythrina* sp.
Costa Rica: Aserri, June 26, 1923, 125.

On *Tabebuia* sp.
Costa Rica: San Vincente del Coronado, June 30, 1923, 177.

104. **Oidium**


On *Meibomia* sp.
Costa Rica: Desamparados, June 27, 1923, 146.

78 Det. Standley.
Botrytis Mich.

Nov. gen., 212, 1729.

105. Botrytis cinerea (group) Pers.
Syn., 690, 1801–1808.
On Rosa sp. (cult.).

Ramularia Ung.

Exanthem. 169.

106. Ramularia taraxici Karst.

On Taraxacum sp.

In the description of Ramularia as given in Saccardo’s Sylloge Fun- gorum the spores are typically 2-septate, though species are given in the same volume as having 1-septate spores. The present species in a count of 42 spores gives 4-continuous, 36 1-septate, one 3-septate. Notwithstanding this apparent disagreement with the generic description we find by comparison with specimens in various exsiccati that the spores in these specimens show similar septation.

DEMATIACEAE

Cladosporium Link


107. Cladosporium fulvum Cooke.

Rav. Amer. Fungi, n. 5599; Grev. 1883, p. 32.
On Solanum lycopersicum (Tomato).

Helminthosporium Link


108. Helminthosporium mayaguenzense Miles.

On Paspalum conjagatum.77
Costa Rica: Peralta, July 13, 435; July 11, 335; July 13, 456; Sebario, Aug. 8, 815.
Panama: Juan Mina, Aug. 18, 1167.

On Isachne arundinacea.77
Costa Rica: Siquirres, July 31, 1923, 678.

77 Det. Chase.
109. Helminthosporium ravenelli Curtin and Berk.  
On Sporobolus sp.  
Panama: Frijoles, Aug. 20, 1923, 1192.  
Costa Rica: San José, June 20, 1923, 13; Desamparados, June 27, 1923, 133; Cartago, July 2, 1923, 188.  
On Sporobolus berteroanis.  
Costa Rica: Cartago, July 7, 1923, 269; Peralta, July 12, 1923, 361

Cercospora Fres.


110. Cercospora alabamensis Atk.
On Ipomoea pes-caprae.  
Costa Rica: Puntarenas, July 24, 1923, 617.

111. Cercospora coffeicola B. and C.
On Coffea arabica.  

112. Cercospora costi Stevens, n. sp.  
Spot irregular, blanched, or ashen due to conidiophores, definitely bordered, sometimes involving a whole leaf. Conidiophore clumps ex-stomatal, up to 36μ in diameter, containing very numerous conidiophores. Conidiophores simple, straw colored to yellow, very short (usually 14μ or less), 3μ thick, straight, rigid. Conidia slender, whip-shaped, tapering slightly, hyaline, moderately curved, up to 82μ long, 3μ thick, several-septate, mycelium straw colored.  
On Costus sp.  
Panama: Gatun, Aug. 24, 1923, 1343.  

113. Cercospora diffusa E. and E.
On Solanum nigrum.  
Costa Rica: San José, June 20, 1923, 6.  
Peralta, July 13, 1923, 450.

114. Cercospora erechitis Atk.
On Erechites sp.  
Costa Rica: Experiencia Farm, July 18, 1923, 556.
This specimen agrees with the original description by Atkinson, except that he gives the spore dimensions as 70 to 230 x 3 to 4μ, whereas in this material the spores measure 37 to 80 x 3 to 5μ.

115. Cercospora nicotianae E. and E.


While working on a leaf spot of tobacco supposedly caused by Cercospora nicotianae, it was found that the fungus did not agree in all respects with the original description of Cercospora nicotianae by Ellis and Everhart. The main point of variance was in the length of the hyphae which, in the original description, is given as 75-100 4 x 5μ, while the hyphae of the fungus examined, averaged 188 x 4μ. Specimens from the University Herbarium and the State Natural History Survey proved to be of the short hyphae type and therefore agreed with the original description of Cercospora nicotianae.

The length of the hyphae was not considered as a variation within the species since no variation was found within a particular disease spot and since the hyphae are in many cases twice as long as the short stubby type. The Cercospora is therefore regarded as being a new species but the lack of sufficient material at present prevents it being described as such.

116. Cercospora porophylli Stevens and Moore n. sp.

Amphigenous, fruiting mostly on lower surface. Spots circular, center cinereous, 3 to 8 mm. in diameter, surrounded by a black ring 1 to 2 mm. wide; the entire area between spots becoming brown or smoky brown; spot on both leaf surfaces. Conidiophores brown, erect in clusters from the stomata, 40 to 80μ long, 5 to 8μ wide at the base, tapering slightly, geniculate in the upper half. Conidia hyaline, 40 to 60μ long, 3 to 4μ wide, straight, cylindrical or tapering toward apex, 1 to 5 septate, not constricted.

On Porophyllum ruderale.75

Costa Rica: Siquirres, July 18, 1923, 554.

No Cercospora is reported on Porophyllum nor any closely related genus. C. jacquiniana Thüm, more nearly resembles this species than any other, but is easily distinguished by the yellow spots and arcuate conidia.

117. Cercospora purpurea Cke.

Grev., 7:34, 1878.

On Persea gratissima.

Panama: Frijoles, Aug. 20, 1923, 1191.

These specimens agree reasonably well with the rather meager description given in the Sylloge Fungorum, except that in my specimens the conidiophores are always short, seldom exceeding 56μ, while the description reads 50 to 70μ.

75 Det. Standley.
118. Cercospora sambuci Stevens and King. n. sp.

Spots round, suboval, sometimes irregular, solitary or confluent, extending through leaf, silvery or ashen gray in centers with distinct, somewhat raised, crenulate, brownish border with surrounding purplish coloration, 1 to 5 mm. in diameter; conidiophores amphigenous, much more prominent on the upper surface, in dense tufts, brownish, becoming sparingly septate with age, straight or bent, 30 to 80 x 3 to 5μ. Conidia cylindrical, borne acrogenously, straight or curved, apical end narrowly rounded, base slightly narrowed, hyaline, 1 to 5 usually 3 or 4 septate, 24 to 69 x 3 to 5μ.

On Sambucus mexicana.79


There have previously been two species and a subspecies of Cercospora reported upon Sambucus, viz.: C. catenospora Atk., C. depazeoides (Desm.) Sacc., and C. depazeoides subsp. sambucina Ell. and Kell. The purplish coloration surrounding the spots on affected leaves does not occur in C. catenospora, neither are the conidiophores similar to those of this fungus. The spores of C. depazeoides, and also its subspecies sambucina differ from our fungus in form and septation as well as coloration.

STILBACEAE

Isaria Pers.

Tent. Disp. meth. fung., 41, 1797.

119. Isaria palmae Stevens and King n. sp.

Coremia generally erect, numerous, distributed over the substratum, each composed of closely united, parallel hyphae, all of which terminate singly on the periphery or apex. Coremia cylindrical or somewhat arcuate, sometimes tapering apically, length up to about 1 mm., width 40 to 100μ or more, white. Hyphae composing coremium non-septate, simple, hyaline, 1.75 to 2μ thick, length up to 1 mm., apex slightly dilated and sporiferous, a short irregular ring forming and extending the apex each time a spore is formed. Spores borne singly on hyphae on sides and apex of coremium, suboval, hyaline, 3 to 3.8 x 3.8 to 5μ.

On the inflorescence of palm.

Panama: Frijoles, August 20, 1923, 1206.

Stilbella Lindau

Engler-Prantl, Nat Pflanzenfamilien, 1-1xx, 489, 1900.

120. Stilbella proliferans Stevens n. sp. [Figure 88]

Coremia in groups on the surface of bark, 600 to 700μ tall, 30 to 125μ thick, simple or branched; stalk-colorless, smooth, straight, composed of

79 Det. Blake.
parallel hyphae about 1μ thick. Heads red, 60 to 310μ in diameter, flat-topped. Conidiophores simple. Conidia acrogenous, not catenulate but accumulating in large numbers on the top of the head, oval, hyaline, 1-celled, 5 to 6 x 3μ, obtuse.

On Theobroma cacao.
Costa Rica: Indiana branch, July 18, 1923, 541.
The distinctive character of this species is the branching of the coremia by proliferation. A coremium may produce its head and quantities of spores, then growth may be resumed at one or more places on the surface of the head and a new coremium superimposed on the old. This may result in quite complicated branching systems. Fig. 88. In other instances there may be only one proliferation on a head, then only one on the secondary head etc., for several repetitions.

TUBERCULARIACEAE
Fusarium Link.

Berl. Mag., 3:10, 1809.

121. Fusarium graminum Cda.80
On Paspalum virgatum.81
Panama: Frijoles, Aug. 20, 1923, 1194.
Very numerous spikelets were overgrown with an orange colored, somewhat viscous, coating so conspicuous as to be visible at considerable distance.

Pucciniopsis Speg.


122. Pucciniopsis caricae Earle.

On Carica papaya.
Panama: Gamboa, Aug. 16, 1923, 1084.
The Pucciniopsis is attached by a fungus showing a thin hyaline mycelium and slender brown conidiophores. No conidia were seen.

Scenomyces Stevens n. gen.
[Figures 89–91, 114, 123, 124, 125]
The fungus is strictly superficial on the lower sides of leaves. The mycelium is abundant, rather generally distributed over the leaf surface as a loose net. The individual threads are about 3μ thick, yellow, translucent, straight walled, not gelatinous.

80 Det. Sherbakoff.
81 Det. Chase.
In numerous places over the leaf, Fig. 123, are scattered mycelial aggregations of somewhat stellate shape, Figs. 123 to 125, which suggest perithecia or pycnidia. They will hereafter be referred to as perithecia though there is no proof that they are such. These range in extreme diameter from 1 to 1.2 mm. The number of rays varies from 4 to 6, Figs. 123 to 125, most commonly 5. The center of the perithecium where the rays meet is the most elevated point, making the perithecium about 77 to 107µ high and sloping evenly along each ray to the level of the leaf surface. From the ray laterally the mycelium is given off on both sides at acute angles, strictly parallel and contiguous, Fig. 90. Where these parallel threads meet the leaf surface the mycelium becomes irregularly arranged in a much tangled network. Fig. 89. From the apex, the ridge, of a ray more or less loose mycelium arises as a kind of a crest, and at the distal extremity of a ray, where it comes in contact with the leaf there is a pronounced bushy tuft of loose mycelium, usually some 230µ long. Frequently the upper region of the perithecium is somewhat more densely thatched than the remaining portion. In most cases the apex of the perithecium, where the several rays meet, is occupied by a thick mat of mycelium.

In other cases the center bears a clean cut, circular hole, through which, in looking down upon it through the microscope, the bare leaf surface may be seen below. Whether this hole is normal or whether it is produced by some insect or other means is unknown.

Microtome sections of perithecia show the parallel roofing structure to be only one of two layers of mycelium in thickness. The floor is 7 to 36µ thick and composed of a very loosely woven mycelium. The space below the cover and the leaf is occupied by a very loose network of mycelium, Fig. 91.

Most diligent search has failed to reveal any spores, conidia, or asci other than a few of varying character, probably strays. The perithecium appears to begin by the laying down of the basal outline as a region of especially dense mycelium, Fig. 89, and from these the parallel mycelium rises to meet at the ridge. The mycelium is of the general type so common in the Perisporiaceae.

In view, however, of the extremely unique characters presented, and even in the absence of spores the above description is given and the name *Scenomyces perplexans* is suggested.

On unknown dicotyledonous host.

Panama: Alehuela, Aug. 18, 1923, 1028.
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Fig. 72, Haplotheicum dioscoroe.

Fig. 72. Ascus and spores.

Fig. 73, Pycnidiostroma eugeniae.

Fig. 73. General sketch to show location of the pycnidal locules in the leaf.

Fig. 74, Othidiena fourcroyae.

Fig. 74. Asci showing septation, and spores.

Fig. 75, Physalospora cestri.

Fig. 75. A perithecium in a leaf showing locule border and clypeus.

Fig. 76, Didymella eupatorii.

Fig. 76. Showing rostrum, also a conidial cavity.
PLATE X
Explanation of PLATE X

Fig. 77, *Didymella eupatorii*.

Fig. 77. A stroma with several locules, one showing the ostiole.

Figs. 78–80, *Mazzantia arundinellae*.

Fig. 78. Mycelium within the epidermal cells as seen from surface view.

Fig. 79a. Diagram (transverse) showing the stroma in the tissues; rind, hyaline messtroma, locules.

Fig. 79b. Longitudinal section showing the same features.

Fig. 80. Detail drawing showing character of the rind and messtroma in the host cells.

Figs. 81–83, *Phaeopeltisphaeria panamensis*.

Fig. 81. Cross section of a perithecium showing the structure of the clypeus.

Fig. 82. Asci and paraphyses.

Fig. 83. Spores.

Figs. 84, *Phylllosticta coffeicola*.

Fig. 84. Section showing healthy coffee leaf, thick epidermis.
PLATE XI
Explanation of PLATE XI

Fig. 85, *Phyllosticta coffeicola*.

Fig. 85. Drawing showing pycnidia, one merely subcuticular and other in the palisade tissue.

Fig. 86, *Botryodiplodia sp.*

Fig. 86. Conidia, conidiophores and paraphyses.

Fig. 87, *Septoria cavendishiae*.

Fig. 87. Section showing relation of pycnidium to host tissue.

Fig. 88, *Stilbella prolifera*ns.

Fig. 88. Coremia showing mode of branching.

Figs. 89–91, *Scenomyces parplexans*.

Fig. 89. The origin of a perithecium.

Fig. 90. Detail of a portion of the above.

Fig. 91. A perithecium (?) in section.
PLATE XII
Explanation of PLATE XII

Figs. 92-95, Tryblidiella rufula.

Fig. 92. Photograph showing ascigerous disks on the twig.
Fig. 93. Same as Fig. 92, more enlarged.
Fig. 94. Same as Fig. 92, but disks more open.
Fig. 95. Photomicrograph of a disk in section.
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Figs. 96, 97, *Acropermum foliicolum*.

Fig. 96. Showing habit on diseased leaves.

Fig. 97. Photomicrograph of perithecia.

Fig. 98. *Pseudoparodiella vernoniae*.

Fig. 98. Photograph of leaves showing colonies. Largest leaf 13 cm. long.

Fig. 99. *Dimeridellopsis costaricensis*.

Fig. 99. Photomicrograph showing perithecia and setae.

Fig. 100. *Dimerina dodonaese*.

Fig. 100. Photomicrograph of a group of perithecia.
PLATE XIV
Explanation of PLATE XIV

Figs. 101, 102, Polystomella costaricensis.

Fig. 101. Photograph of a leaf showing stromata.

Fig. 102. Photograph of a stroma enlarged.

Figs. 103, 104, Rheumatopeltis querci.

Fig. 103. Photograph of a leaf showing thallus.

Fig. 104. Photograph of a spot showing the strap-shaped bands and the loculiferous stromata.
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Explanation of PLATE XV

Fig. 105, Hyperus costaricensis.

Fig. 105. Photograph of a group of perithecia.

Fig. 106, Trabutia xylosmae.

Fig. 106. Photograph of leaf showing stromata. Leaf 45 mm. long.

Fig. 107, Hypostigma polyadelpha.

Fig. 107. Photomicrograph showing a group of perithecia.

Fig. 108, Catacouma costaricensis.

Fig. 108. Photograph showing distribution of the stromata on the leaf. Actual length of leaf 10.5 cm.

Fig. 109, Catacouma zanthoxyli.

Fig. 109. Photograph of a leaf showing groups of stromata. Actual length of leaf 93 mm.
PLATE XVI
Explanation of PLATE XVI

Fig. 110, Calocoma zanthoxyli.

Fig. 110. Photograph of a single group of stromata enlarged.

Fig. 111, Phyllachora casimiroae.

Fig. 111. Photograph of a leaf showing the stromata. Leaf 13.5 cm. long.

Fig. 112, Phyllachora icacoreae.

Fig. 112. Photograph of leaf showing stromata.

Fig. 113, Phyllachora meibomiae.

Fig. 113. Photograph of a leaf showing stromata.

Fig. 114, Scenomyces perplexans.

Fig. 114. Photograph of a leaf showing the perithecia.

Fig. 115, Phyllachora stevensii.

Fig. 115. Photomicrograph of a group of stromata.
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PLATE XVII
Explanation of PLATE XVII

Fig. 116, *Phyllachorella schistocarphae*.

Fig. 116. Photograph showing grouping of the punctiform stromata.

Fig. 117, 118, *Pycnidiospora eugeniae*.

Fig. 117. Photograph showing stromata on leaf.

Fig. 118. Photomicrograph showing a single stroma with the row of pycnidial locules around the edge.

Fig. 119, *Othiella fourcroyae*.

Fig. 119. Photomicrograph showing groups of perithecia.

Fig. 120, *Mazzantia arundinellae*.

Fig. 120. Photograph of a portion of culm showing stromata.

Fig. 121, *Phyllachora picramniae*.

Fig. 121. Photograph of leaves showing stromata.
PLATE XVIII
Explanation of PLATE XVIII

Fig. 122. *Phylllosticta coffeicola*.

Fig. 122. Photomicrograph showing radiations on surface of diseased spot.

Figs. 123, 124, 125, *Scenomyces perplexans*.

Figs. 123, 124, 125. Photomicrographs of perithecia showing various numbers of rays.
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