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SCLEROTINIACEAE XI. ON *MOELLERODISCUS* (= *CIBORIOPSIS*)

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SUMMARY

The genus *Moellerodiscus* is shown to be an older name for *Ciboriopsis*. Five new combinations are made and one new species described in *Moellerodiscus*. Full descriptions and illustrations are presented for the six species, with special emphasis being given to the neotropical representatives.

The genus *Ciboriopsis* Dennis was described by Dennis (1962) for seven foliicolous species of inoperculate discomycetes with uniformly small asci and ascospores and an ectal excipulum composed of isodiametric or rounded cells. Of the original seven species, five were tropical, two were known only from England, and all were members of the Helotiaceae originally placed in either *Helotium* or *Phialea*. Since the original description of the genus, one additional species was added by Dennis (1964) from the U. S. and two by Kar and Pal (1970) from West Bengal. The genus has been generally accepted by most workers treating this group of fungi, such as Korf (1973), Spevak and Korf (1966), etc.

Dumont and Korf (1971) and Dumont (1971, 1972) reported that the genus *Rutstroemia* sensu White (1941) is composed of a heterogeneous assemblage of species and that generic names for segregates of that genus were being sought. Dumont (1972) adopted the names *Lanzia* and *Poculum* for two genera with ectal excipula composed of filamentous hyphae. He did not consider those foliicolous species with an ectal excipulum composed of globose to angular cells, for which *Ciboriopsis* is an appropriate genus. During my study of neotropical species of Sclerotiniaceae, I have discovered an earlier name which must be used to replace *Ciboriopsis*.

Moellerodiscus P. Hennings (1902) was described for a single neotropical species, *M. brockesia* Hennings, and was based on a single collection by Frau Brockes from St. Catharina, Brazil. After examining a portion of the type deposited at FH, I have concluded that the Hennings species falls into Dennis's concept of *Ciboriopsis*. I thus place

Ciboriopsis into synonymy with *Moellerodiscus*, and adopt the latter name.

The purpose of the present investigation is to study critically all of the species placed in *Ciboriopsis*, with special emphasis on neotropical species. This paper is not intended as a definitive monograph of the genus; rather, it is intended as an introduction to future studies. Many species which belong in *Moellerodiscus* and are currently placed in other genera, such as *Ciboria*, await further study. As a result of this investigation, it is becoming increasingly more apparent that the two genera, *Moellerodiscus* and *Ciboria*, are very closely related. No statement regarding relationships between these two can be made until the species now placed in *Ciboria*, especially the type species, *C. caucus*, are better known and understood.

The materials employed and methods used during this study are the same as those reported by Dumont (1971).

GENERIC DIAGNOSIS AND TAXONOMY

MOELLERODISCUS P. Hennings, *Hedwigia* **41**: 33. 1902 (Holotype: *M. brockesiae* P. Hennings, ut *Brockesiae*)
 = *Ciboriopsis* Dennis, *Kew Bull.* **16**: 319. 1962 (Holotype: *C. bramleyi* Dennis).

Apothecia substipitate to long stipitate, produced directly from host tissue with or without association to black line stroma, and directly from blackened, stromatized host tissue; receptacle concave to convex; in 2% KOH emitting no dye, or with an ionomidotic reaction. Asci 8-spored, 35–96 × 6–11 μm, cylindric to cylindric-clavate, J+, thin to thick walled, thickened at the rounded, obtuse, truncate or conico-truncate apex. Ascospores 3–11 × 1–5 μm, uniseriate to biseriate, ellipsoid, fusoid, ovoid, obovoid, hyaline, 0–3 guttulate, smooth. Paraphyses hyaline or pigmented, cylindric-filiform, expanded at the apex or not, septate, branched. Subhymenium well to poorly developed, brown pigmented or subhyaline, of interwoven to parallel and vertically oriented hyphae. Ectal excipulum: inner ectal excipulum absent or present as a poorly to well-defined textura porrecta with roughenings and pigmentation present or absent; outer ectal excipulum composed of textura angularis to globulosa with hyaline or pigmented and smooth or roughened walls, occasionally with short hairs produced from the outermost cells, outermost cells frequently budding. Stipe long and thread-like or short and nearly absent, the outermost cells either globose or brick-shaped, with long, narrow hyphae to the inside.

KEY TO THE SPECIES OF MOELLERODISCUS

1. Paraphyses pigmented and roughened, especially in the upper portion, ascospores $6-8(-10) \times 2-3.5(-4) \mu\text{m}$, on leaves of *Conocarpus*.....*M. conocarpi* p. 239
1. Paraphyses hyaline and smooth or if pigmented only lightly and then in the lower portion.
 2. Apothecia minute, less than 0.75 mm in diam, white to yellowish; ascospores $(6-7)-10(-11) \times (2.5-3) 3-4 \mu\text{m}$, on leaves of *Larix*.....*M. advenulus* p. 235
 2. Apothecia greater than 0.75 mm in diam, some shade of brown, rarely greenish.
3. Apothecia with ionomidotic reaction.
 4. Ascospores $(3-4) 4-5(-6) \times 1.5-2(-2.5) \mu\text{m}$, asci $32-45 \times 4-6 \mu\text{m}$.
.....*M. musae* p. 256
 4. Ascospores $(7-8) 8-10(-11) \times (3-4) 4-5 \mu\text{m}$, asci $63-82 \times (7-8) 8-10 \mu\text{m}$
.....*M. guttulatus* p. 242
3. Apothecia without ionomidotic reaction.
 5. Ectal excipulum composed of irregular to angular cells, the individual sides flat and oriented perpendicular to the surface of the apothecium; the outermost cells becoming modified and producing elongate $5-15 \times 2-4 \mu\text{m}$ projections
.....*M. tenuistipes* p. 260
 5. Ectal excipulum composed of globose, subglobose or ovoid cells, the individual cells only flattened by mutual pressure, outermost cells not producing elongate projections.....*M. lentus* p. 245

DESCRIPTIONS OF ACCEPTED SPECIES

1. **Moellerodiscus advenulus** (Phillips) Dumont, comb. nov. FIG. 1.
 ≡ *Helotium advenulum* Phillips in Phillips & Plowright, *Grevillea* 6: 24. 1877.
 ≡ *Hymenoscypha advenula* (Phillips) Phillips, *British Discomycetes* p. 133. 1887.
 ≡ *Phialea advenula* (Phillips) Saccardo, *Sylloge Fungorum* 8: 256. 1889.
 ≡ *Ciboriopsis advenula* (Phillips) Dennis, *Kew Bull.* 16: 319. 1962.

Stroma.—Substratal, visible on the host as a single black line completely encircling the leaf, the black lines composed of cells with differentially pigmented walls, irregular to epidermoid in face view, unknown in culture.

Macroconidial state.—Absent.

Microconidial state.—Unknown.

Apothecial morphology.—Apothecia minute to ca 0.75 mm in diam, to ca 1 mm high, short stipitate, produced in association with black line stroma on the host, solitary to numerous. Hymenium when fresh white to yellowish-white, drying off-white, rehydrating pallid. Receptacle when fresh concolorous with the hymenium, drying flat, flesh to dull orange,

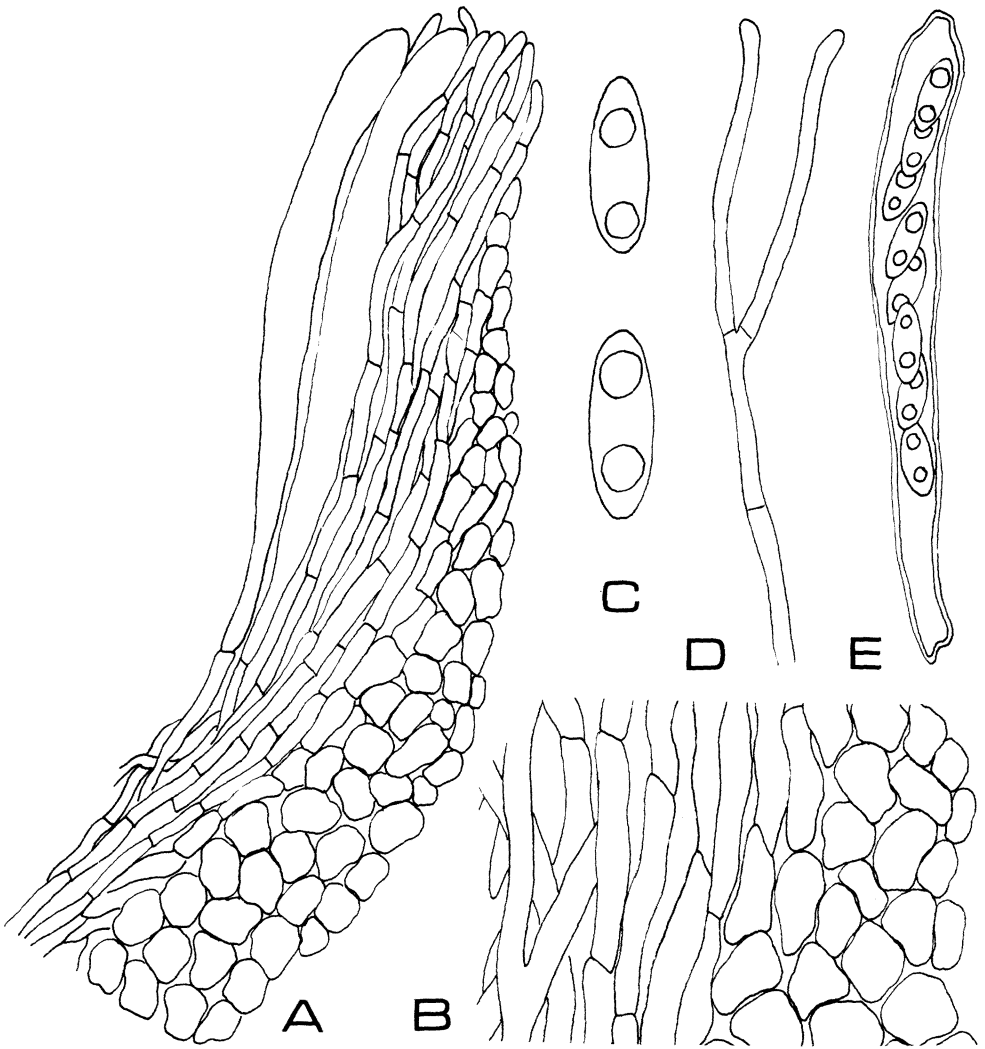


FIG. 1. *Moellerodiscus advenulus*, Cain 2761 ex NY, camera lucida drawings of median longitudinal sections of apothecia. A. Margin and upper portion of receptacle, $\times 1,000$. B. Stipe at approximately midpoint, $\times 1,000$. C. Two biguttulate ascospores, $\times 2,000$. D. Paraphysis, $\times 1,000$. E. Ascus with ascospores uniseriate, $\times 1,000$.

rehydrating flat, pallid translucent with a tint of orange. Stipe short and stout in relation to receptacle, when fresh concolorous with receptacle, drying off-white, darker toward the base, rehydrating translucent; surface smooth.

Apothecial anatomy.—Asci 8-spored, (70–)80–96 × (8–)9–10(–11) μm , produced from croziers, clavate, narrowed above and tapering gradually toward the base and there forming a bifurcating base; walls thin to ca 1 μm wide, if expanded at the conico-truncate apex only slightly so; pore strongly J+, two blue dots outlining the walls in Melzer's reagent. Ascospores (6–)7–10(–11) × (2.5–)3–4 μm , loosely uniseriate to biseriate throughout, hyaline, aseptate, smooth, ellipsoid, frequently flattened on one side and occasionally subreniform; eguttulate or with two large polar guttules. Paraphyses hyaline, branching, septate, filiform, frequently slightly expanded at the apex and there 1–3 μm wide. Subhymenium not visible as a distinct layer. Medullary excipulum small, obconical, composed of narrow, interwoven, branched, septate hyphae 1.5–3 μm broad, walls hyaline, smooth, the individual hyphae becoming parallel to each other toward the ectal excipulum and parallel to the surface of the apothecium; toward the base of the asci the hyphae becoming narrow, parallel, and vertically oriented. Ectal excipulum: inner ectal excipulum composed of 1–2 layers of narrow, hyaline hyphae lying parallel to the surface of the apothecium and continuing into the margin of the apothecium, walls thin and hyaline. Outer ectal excipulum to ca 15 μm broad toward the margin and to ca 30 μm toward the stipe, composed of a well-defined textura globulosa to a poorly-defined textura angularis; the individual cells subglobose, globose, subcuboid, ovoid to elongate and 4–7 μm wide toward the margin and 5–10(–15) μm wide toward the stipe. Outer covering layer absent. Hairs absent. Margin composed of narrow hyphae originating in the inner ectal excipulum and continuing to the tips of the asci and few subglobose to globose cells similar to those of the outer ectal excipulum. Stipe composed to the outside, of a layer to ca 30 μm wide of globose cells similar to the ectal excipulum, to the inside the central core composed of narrow, parallel hyphae extending into the receptacle.

Etymology of the specific epithet.—Refers to the smallness of the apothecium.

Habitat.—Leaves of *Larix laricina* C. Koch and *Larix* sp.

Holotype.—North Wales, Trefrew, on larch leaves, Spring 1876. *W. Phillips* (K, isotype NY, issued in Phillips, *Elv. Brit.* no. 133).

Specimens examined.—Holotype, see above; Canada, Ontario, Norwich, leaves of *L. laricina*, *Cain 2761*, 28 May 1933 (NY).

Illustrations.—Dennis, *Mycol. Pap.* 62: fig. 96, p. 101. 1956.

Notes.—The asci of *Moellerodiscus advenulus* seem to be very different

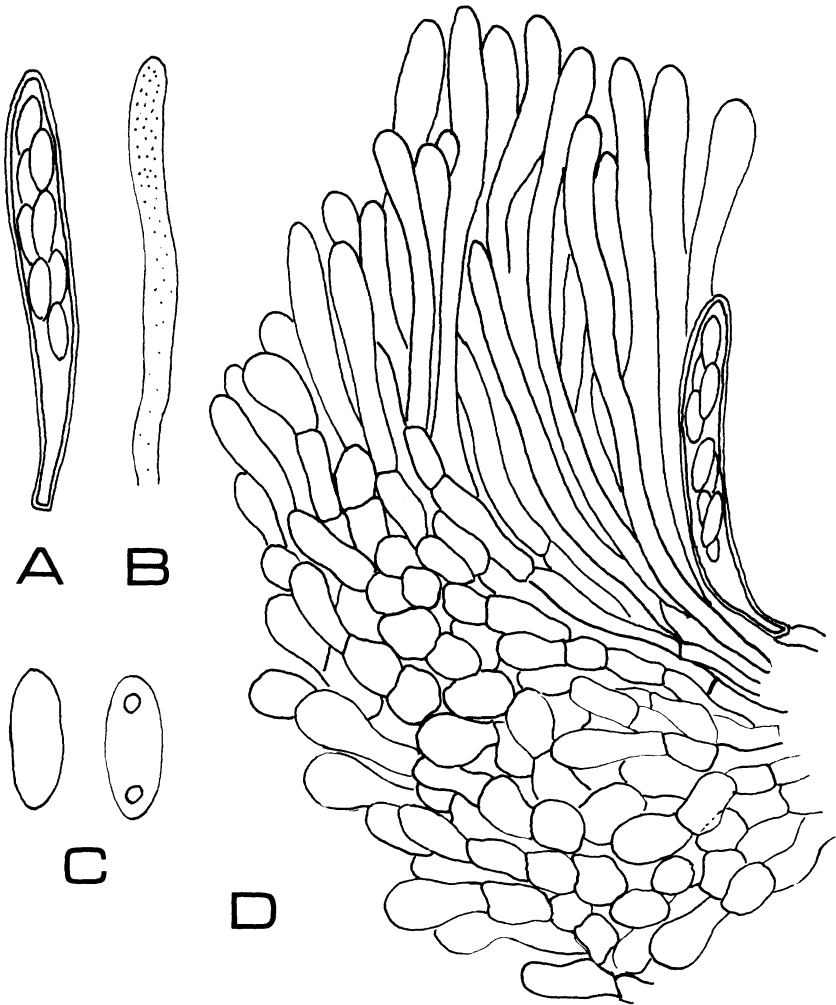


FIG. 2. *Moellerodiscus conocarpus*, Seaver 375 *ex* NY, camera lucida drawings of median longitudinal sections of apothecia. A. Ascus with ascospores biserial, $\times 1,000$. B. Paraphysis, stippling represents pigmentation, $\times 1,000$. C. Ascospores: left eguttulate, right biguttulate, $\times 2,000$. D. Margin, $\times 1,000$.

from other species in the genus. The general shape and ascus apex seem to be more like that of members of the Helotiaceae than other members of the Sclerotiniaceae. With the presence of a substratal stroma, however, there remains little doubt of its placement in the family, and because of the structure of the ectal excipulum it belongs in *Moellerodiscus*.

2. *Moellerodiscus conocarpi* (Seaver & Waterston) Dumont, comb. nov. FIGS. 2-3
≡ *Helotium conocarpi* Seaver & Waterston, *Mycologia* 34: 517. 1942.

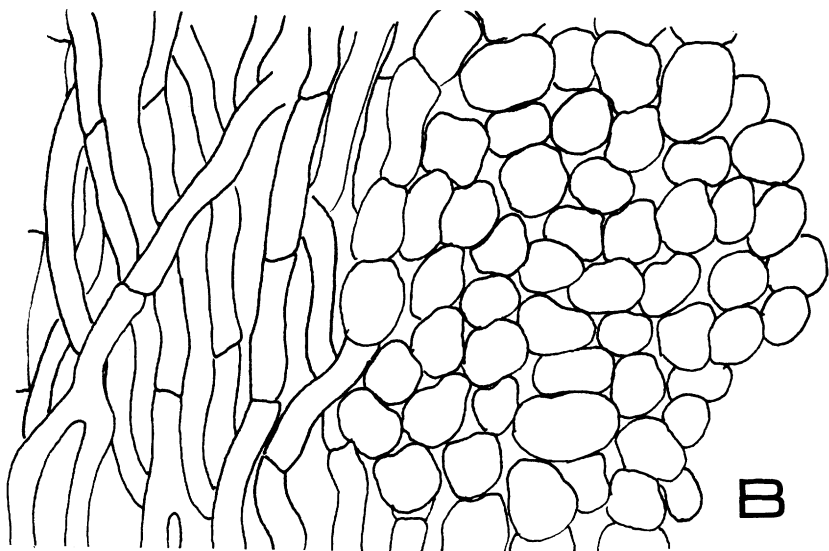
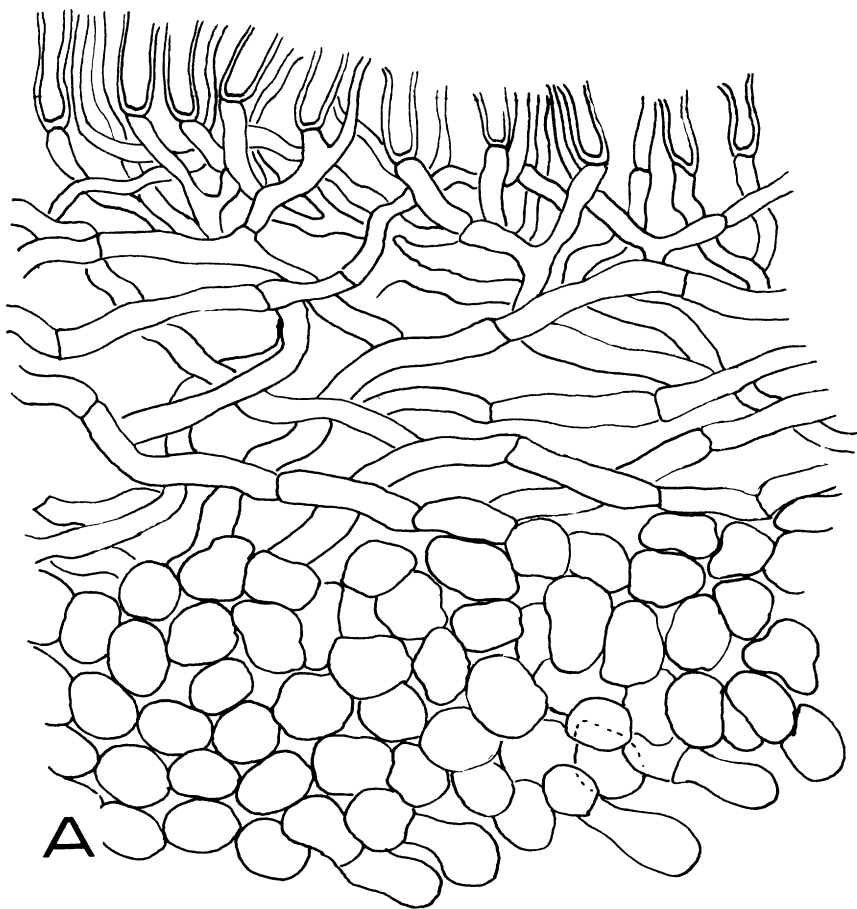
Stroma.—Substratal, rind on the host leaf not visible and presumed to be absent. In culture forming blackened substratal stromata covering large isolated areas or the entire exposed surface of the agar; the rind poorly developed, amorphous or hyphal in origin with few, isolated, tiny patches of well-developed rind cells with differentially pigmented walls, epidermoid to irregular in face view.

Macroconidial state.—Absent.

Microconidial state.—Unknown.

Apothecial morphology.—Apothecia 0.5–3 mm in diam (Seaver and Waterston, 1942), approximately same in height, substipitate or rarely long stipitate, produced singularly or in groups independent of blackened areas on the host. Hymenium when fresh light lilac, drying dark brown to black, rehydrating lighter with slight vinaceous to rose tint. Receptacle when young subglobose to globose opening by a small pore, with age flattened, concave when dry, rehydrating flat to slightly convex, nearly concolorous with the hymenium (Seaver and Waterston, 1942), margin darker, concolorous with the upper portion of the stipe. Stipe papillate to long and broader above and tapering gradually below, concolorous above with the receptacle, darker toward the base.

Apothecial anatomy.—Asci 8-spored, (45–)50–65 × 6–7 μm , produced from tiny croziers, cylindrical to slightly clavate, tapering slightly below to the crozier and there rarely becoming expanded to form a small foot; wall to ca 1 μm thick, only slightly thickened at the truncate to subrounded apex and there to ca 1.5 μm thick; pore J+, two tiny apical and two basal dots on each side connected by a thin blue line in Melzer's reagent. Ascospores 6–8(–10) × 2–3.5(–4) μm , uniseriate to biseriate, hyaline, aseptate, smooth, ellipsoid, frequently ovoid, occasionally slightly flattened on one side; occasionally with two, tiny, polar guttules, difficult to detect and most easily observed in phloxine stain, rarely with one additional in central position. Paraphyses exceeding the asci, lightly to intensely brown pigmented, especially in the apical 1/3, sparingly branched and septate, finely to coarsely roughened, filiform and rarely expanded at the apex and there 2–3.5 μm wide. Subhymenium indistinguishable from the medullary excipulum but with a narrow zone beneath the asci with the hyphae more intensely pigmented and somewhat more tightly interwoven. Medullary excipulum obconical, tapering toward and terminating before the margin, grading into the ectal ex-



cupulum; composed of loosely to tightly interwoven, branched, septate, light to dark brown hyphae 3–6 μm broad, with walls pigmented and finely to coarsely roughened. Ectal excipulum: inner ectal excipulum consisting of tightly to loosely compact 3–5 hyphal layers, lying parallel to the surface of the apothecium, the individual hyphae light brown to dark brown, 3–5 μm wide, walls finely to coarsely roughened, grading into the medullary excipulum. Outer ectal excipulum 15–25(–35) μm broad toward the margin and (25–)35–55 μm broad toward the stipe, composed of a well-defined *textura globulosa* to a poorly defined *textura angularis*; the individual cells subglobose, globose, ovoid or ellipsoid with the long axis of the cells perpendicular to the surface of the apothecium, 5–11 μm wide toward the margin and 5–20 μm toward the stipe, light brown, walls finely roughened, and appearing thickened in phloxine stain, the outermost cells giving rise to modified hairs. Hairs 15–32 μm long, 0–2 septate, slightly expanded at the apex and there 5–8 μm , broad, light brown and lightly pigmented, walls frequently finely roughened, basal cells frequently slightly expanded. Outer covering layer absent. Margin intensely pigmented, composed predominately of the greatly elongated and somewhat expanded apical cells of the hyphae originating in the ectal excipulum of the receptacle and few globose or angular cells. Stipe constructed similarly to the receptacle, to the outside a zone of *textura globulosa*, to the inside long, narrow, parallel hyphae not becoming torn apart in the central core.

Etymology of the specific epithet.—Refers to the name of the host on which it has been collected.

Habitat.—On leaf blade of *Conocarpus erectus* L.

Lectotype.—Bermuda, Paget, Seaver (375) & Waterston, leaves of *C. erectus*, 30 Nov 1940 (NY, see notes below).

Specimens examined.—Bermuda: Lectotype (see above); St. David's Island: Seaver (425) & Waterston, leaves of *C. erectus*, 7 Dec 1940, (NY, FH); Walsingham: Waterston (488), leaves of *C. erectus*, 24 Feb 1942 (CUP 32682, apothecia developed in culture); Seaver & Waterston (480), leaves of *C. erectus*, 25 Feb 1942 (NY), Waterston, leaves of *C. erectus*, 23 Dec 1942 (CUP 32616); Devonshire, Seaver & Waterston 483, leaves of *C. erectus*, 25 Mar 1942 (NY); Long Bird Island, Ogilvie 34, leaves of *C. erectus*, 22 Jan 1926 (NY, CUP).

FIG. 3. *Moellerodiscus conocarpus*, Seaver 375 ex NY, camera lucida drawings of median longitudinal sections of apothecia, $\times 1,000$. A. Receptacle at midpoint between margin and stipe. B. Stipe at approximately midpoint.

Illustrations.—Seaver, *Mycologia* 34: 518, fig. 1 (upper) 1942; White, *Farlowia* 1: 153, fig. 5. 1943.

Notes.—When Seaver and Waterston (1942) described *Helotium conocarpi*, they cited two collections, nos. 375 and 425, but failed to designate a holotype. I have examined both specimens and find them to represent the same species, both also agreeing with the protologue.

Waterston (1947) designated 375 (NY) as the lectotype specimen. This is an unfortunate choice since 375 has very few apothecia, whereas 425 contains ample apothecia of this species. According to Seaver's notes the photograph illustrated in the original description is also that of 425.

From the information available this species seems to be endemic to Bermuda and restricted to a single host. By virtue of the brown pigment and roughenings on the paraphyses this species is easily recognized.

3. *Moellerodiscus guttulatus* Dumont, sp. nov. FIGS. 4-5.

M. guttulatus a *M. musae* ascis majoribus $63-82 \times (7-)8-10$ (non $32-45 \times 4-6$) μm , ascosporisque majoribus $(7-)8-10(-11) \times (3-)4-5$ (non $(3-)4-5(-6) \times 1.5-2(-2.5) \mu\text{m}$, a caeterisque reactione ionomidotica differt.

Stroma.—Substratal, visible on the host as single or double black lines extending irregularly on both surfaces of the leaf blade, frequently delimiting irregular portions of the host; the black lines composed of a rind of cells with differentially pigmented walls, epidermoid to irregular in face view. Unknown in culture.

Macroconidial state.—Absent.

Microconidial state.—Unknown.

Apothecial morphology.—Apothecia 1-2 mm in diam, to 2 mm high, scattered, produced in association with the black line stroma, when rehydrated in 2% KOH with an ionomidotic reaction and giving off a reddish-brown to reddish-yellow dye. Hymenium when fresh pale lemon to light beige, drying red vinaceous, brick red, margin black, rehydrating deep red to purple black. Receptacle when fresh flattened, drying flat, rehydrating strongly convex, when fresh concolorous with hymenium, drying darker, rehydrating concolorous with hymenium. Stipe cylindric, occasionally slightly broader above, concolorous above with receptacle, when fresh dry or rehydrated, paler or black below.

Apothecial anatomy.—Asci 8-spored, $63-82 \times (7-)8-10 \mu\text{m}$, produced from croziers most easily observed in young asci, more difficult to detect

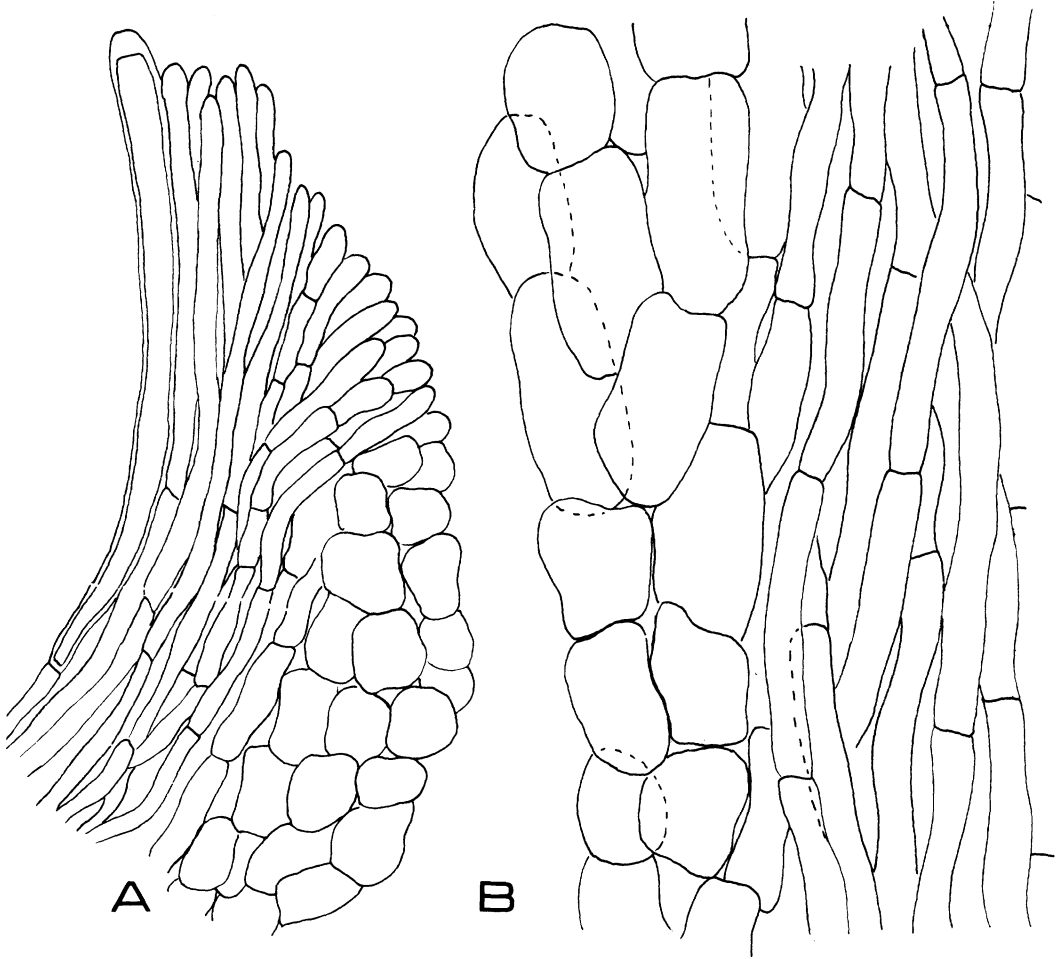


FIG. 4. *Moellerodiscus guttulatus*, Reynolds 1259 ex NY, camera lucida drawings of median longitudinal sections of apothecia, $\times 1,000$. A. Margin. B. Stipe at approximately midpoint.

in older apothecia, clavate-cylindric, tapering gradually toward the base and there generally not forming a foot; wall $1-2 \mu\text{m}$ thick, $2-4 \mu\text{m}$ at the rounded to truncate apex; pore J+, the walls outlined faint blue, the two apical and basal dots staining dark blue. Ascospores $(7-8-10(-11) \times (3-4-5 \mu\text{m})$, biseriate to uniseriate, hyaline, aseptate, smooth, ovoid to subellipsoid, in outline rarely slightly inequilateral; with two (rarely three) guttules, filling most of the ascospores and with only a narrow band of cytoplasm around the internal periphery of the

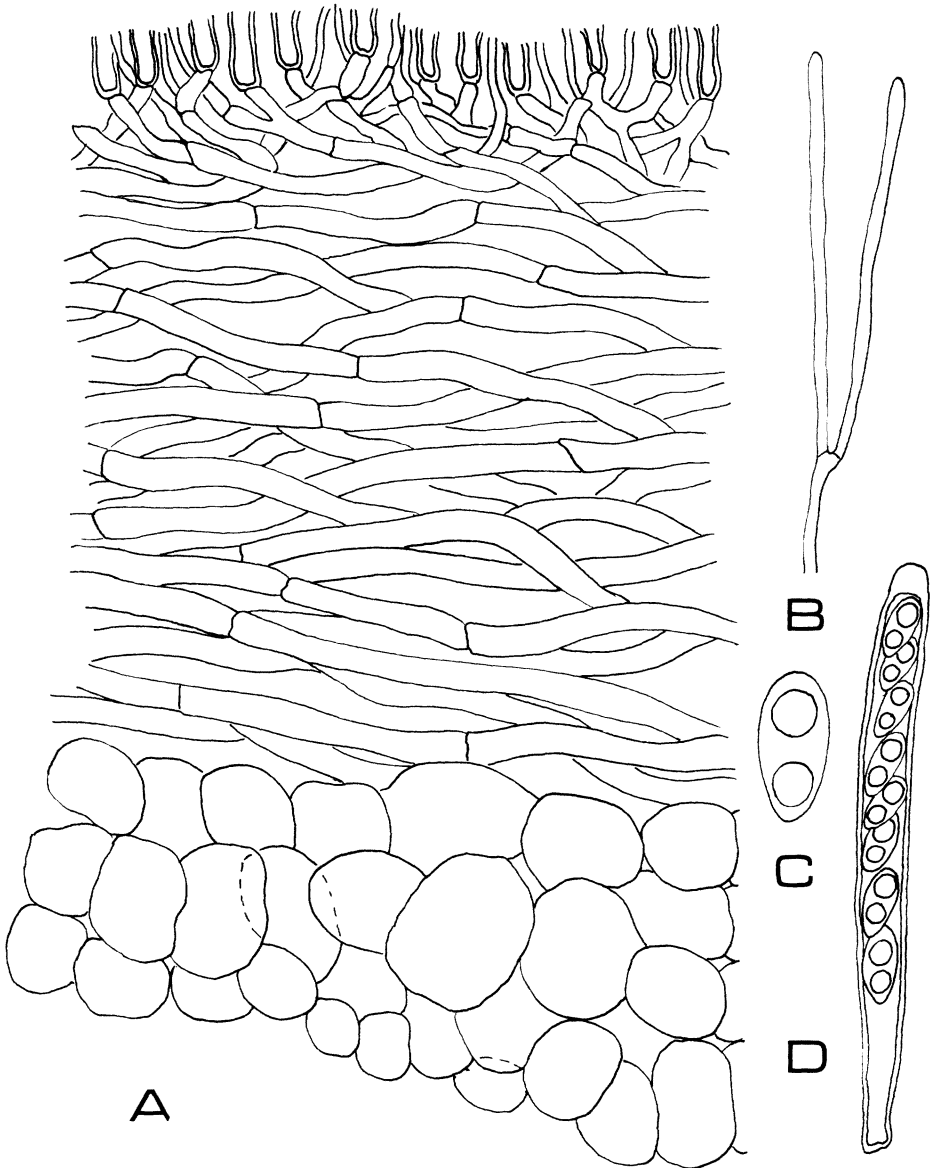


FIG. 5. *Moellerodiscus guttulatus*, Reynolds 1259 *ex NY*, camera lucida drawings of median longitudinal sections of apothecia. A. Receptacle at midpoint between margin and stipe, $\times 1,000$. B. Branching paraphysis, $\times 1,000$. C. Ascospore, $\times 2,000$. D. Ascus with ascospores uniseriate, $\times 1,000$.

ascospores and separating the large guttules; the anterior guttules generally larger than posterior. Paraphyses equal to or rarely slightly exceeding the asci, hyaline, septate, branching, filiform, generally not becoming expanded at the apex and there 2–3 μm wide. Subhymenium indistinguishable from the medullary excipulum below, but with a zone to ca 30 μm broad devoid of pigment and not refractive, composed of hyphae narrower and somewhat more tightly interwoven than the tissue below. Medullary excipulum obconical, devoid of pigment, not refractive, composed of loosely to tightly compact, branched, septate, hyaline hyphae (3–)4–8 μm wide becoming parallel toward the ectal excipulum, walls thin to slightly thickened, hyaline and smooth. Ectal excipulum: inner ectal excipulum absent. Outer ectal excipulum slightly refractive, gelatinous matrix absent, to ca 20 μm broad toward the margin and to 30 μm broad toward the stipe, composed of a well-differentiated and developed *textura globulosa* to *angularis*; the individual cells globose, ovoid, ellipsoid, to angular, hyaline, 4–8 μm wide toward the margin and 8–15 μm toward the stipe, walls subhyaline and thin to thickened and refractive, long axis of the cells perpendicular to the surface of the apothecium; individual cells not becoming modified and not producing hairs; hairs absent. Outer covering layer absent. Margin composed primarily of long, narrow hyphae originating in the ectal excipulum and medullary excipulum below; with few angular to globose cells extending primarily halfway to the tip of the asci or rarely to the tip. Stipe composed of a well-developed *textura prismatica* to *porrecta*, toward the receptacle giving rise to *textura angularis* and then *textura globulosa*; the individual hyphae hyaline, walls smooth, hyaline, slightly thickened, hairs lacking.

Etymology of the specific epithet.—Refers to the large, obvious guttules found in the ascospores.

Habitat.—On unidentified leaves.

Holotype.—Surinam, Akieransueu, across river from Asidon Hopo, *Reynolds 1259*, on unidentified leaves, 23 Dec 72 (NY).

Specimens examined.—Surinam. Holotype specimen, *Reynolds 1259* (see above); Langachacha, across river from Asidon Hopo, ca 1½ h walk through forest, *Reynolds 1265*, unidentified leaves, 23 Dec 72 (NY). Venezuela, Parque Nacional Guatopo, Edo. Miranda, *Dumont-VE 895* et al., unidentified leaves, 29 Jun 71 (NY).

4. **Moellerodiscus lentus** (Berkeley & Broome) Dumont, comb. nov.
Figs. 6–7.

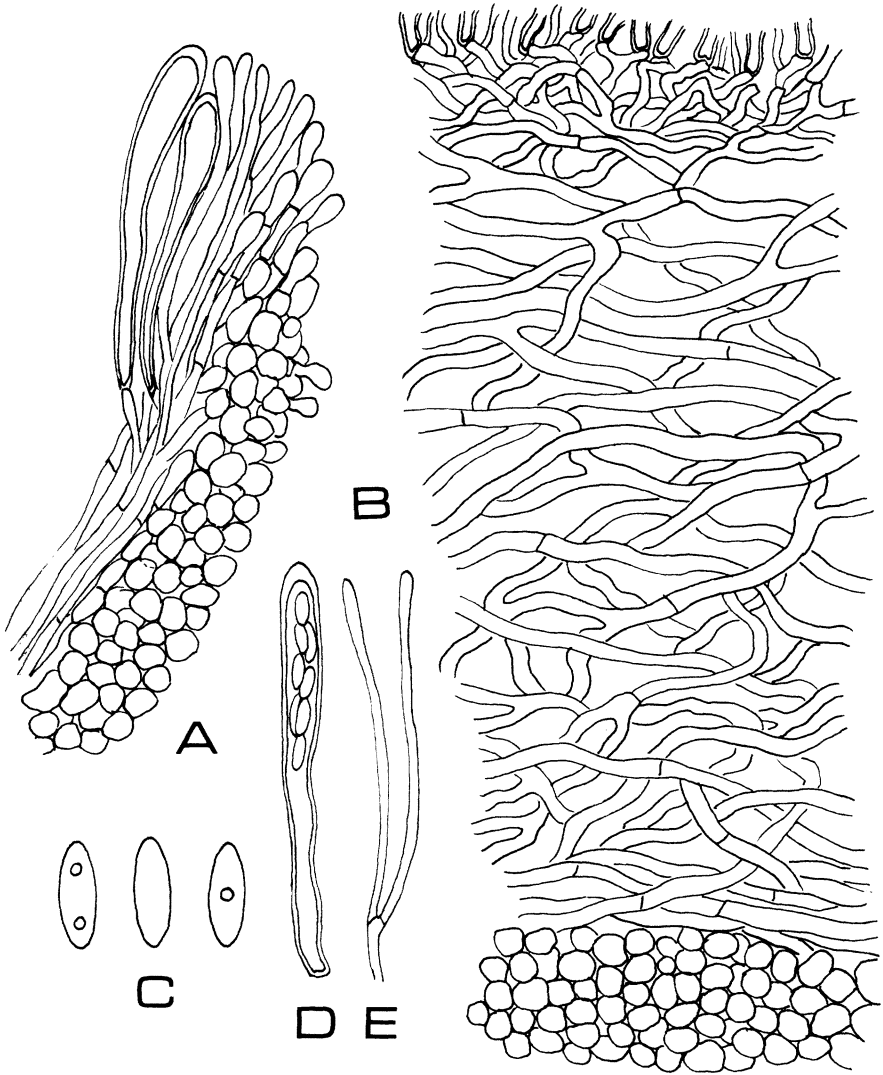


FIG. 6. *Moellerodiscus lentus*. Thwaites 104 ex K, camera lucida drawings of median longitudinal sections of apothecia. A. Margin and upper portion of receptacle, $\times 1,000$. B. Receptacle at approximately midpoint between margin and stipe, $\times 1,000$. C. Ascospores: left biguttulate, center eguttulate, right uniguttulate, $\times 2,000$. D. Ascus with ascospores biseriata, $\times 1,000$. E. Branching paraphysis, $\times 1,000$.

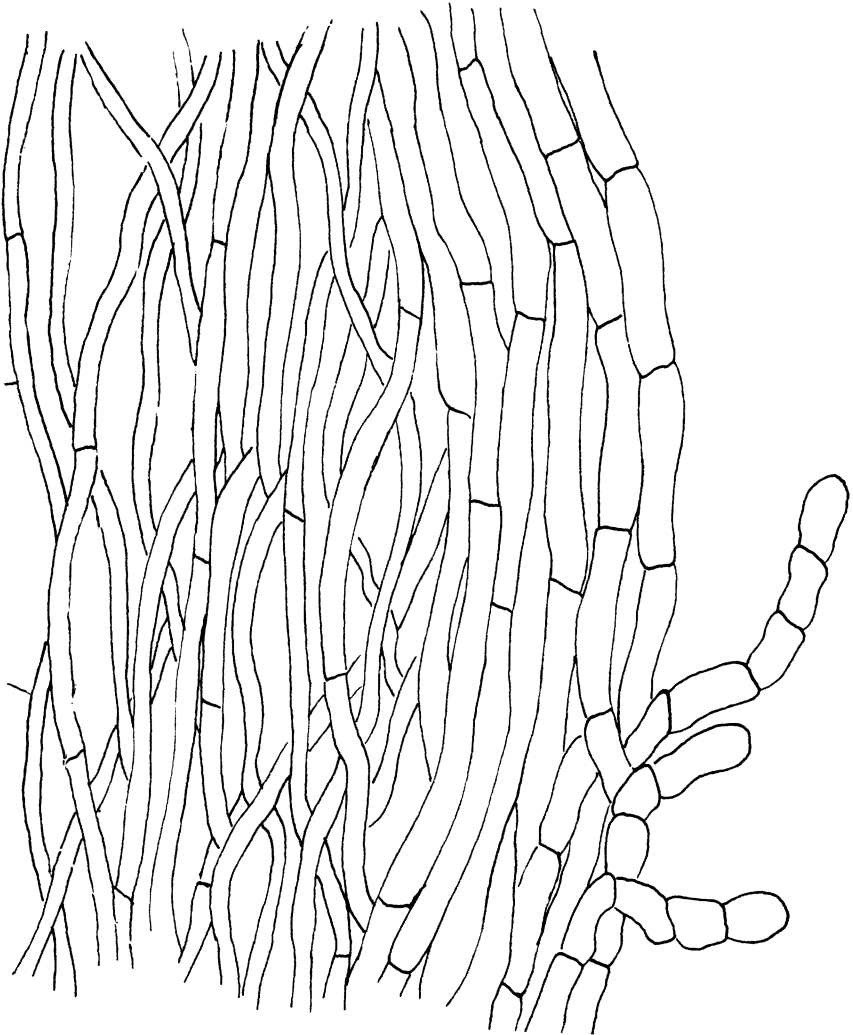


FIG. 7. *Moellerodiscus lentus*, Thwaites 104 ex K, camera lucida drawing of median longitudinal section of apothecium at approximately midpoint of stipe.

≡*Helotium lentum* Berkeley & Broome, J. Linn. Soc. Bot. 14: 108. 1873.

≡*Ciboriopsis lenta* (Berkeley & Broome) Dennis, Kew Bull. 16: 319. 1962.

=*Phialea uleana* Rehm, Hedwigia 39: 93. 1900.

≡*Ciboriopsis uleana* (Rehm) Dennis, Kew Bull. 16: 319. 1962.

- =*Helotium phlebophorum* Patouillard, Bull. Soc. Mycol. France **18**: 179. 1902.
 ≡*Ciboriopsis phlebophora* (Patouillard) Dennis, Kew Bull. **16**: 319. 1962.
- =*Helotium cecropiae* P. Hennings, Hedwigia **41**: 25. 1902.
 ≡*Phialea cecropiae* (P. Hennings) Seaver, Mycologia **17**: 50. 1925.
 ≡*Ciboriopsis cecropiae* (P. Hennings) Dennis, Kew Bull. **16**: 320. 1962.
- =*Moellerodiscus brockesiae* P. Hennings, Hedwigia **41**: 33. 1902.
 ≡*Ciboria brockesiae* (P. Hennings) von Höhnel, Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Cl. Abt. I. **120**: 387. 1911.
- =*Peziza (Hymenoscyphae) simulata* Ellis, Bull. Torrey Bot. Club **8**: 73. 1881.
 ≡*Peziza simulans* Ellis in Britton, Prelim. Cat. Fl. N. J. Geol. Surv. New Jersey. p. 102. 1881 (nomen nudum).
 ≡*Phialea simulata* (Ellis) Saccardo, Sylloge Fung. **8**: 254. 1889.
 ≡*Helotium simulatum* (Ellis) ex Saccardo, pro synonym., Sylloge Fung. **8**: 254, 1889.
 ≡*Hymenoscyphus simulatus* (Ellis) Kuntze, Rev. Gen. Pl. **3**(2): 486. 1898.
 ≡*Helotium simulatum* (Ellis) Seaver, North Amer. Cup-fungi (Inop.) p. 137. 1951.
 ≡*Ciboriopsis simulata* (Ellis) Dennis, Persoonia **3**: 65. 1964.

Stroma.—Substratal, variable, difficult to detect with the unaided eye on the host and appearing absent; or 1) forming single black lines extending irregularly along the surface of the host or embedded in the host, 2) blackened areas of the host or 3) black and crustaceous and enveloping the entire host; the blackened areas and black lines composed of rind cells with differentially pigmented walls, epidermoid to irregular in face view; in culture covering the entire exposed surface of the agar with a blackened rind (for full description see Spevak and Korf, 1969).

Macroconidial state.—Absent.

Microconidial state.—Unknown.

Apothecial morphology.—Apothecia variable, (0.5–)1–2(–3) mm in diam, (0.4–)1–5(–10) mm high, long to short stipitate, subconcave to convex, patelliform, arising scattered from substrate. Hymenium when fresh off–white, beige, yellowish to yellow–brown, tan to reddish brown,

drying some shade of brown, rehydrating slightly darker. Receptacle concolorous with the hymenium, above concolorous with hymenium and darker below or margin darker than hymenium, drying and rehydrating darker. Stipe cylindrical or slightly broader above and tapering toward the base, to 10 mm long, and 0.5 mm wide, very fragile and easily breaking in dry material, when fresh brown to reddish brown above and black toward the base, drying and rehydrating darker.

Apothecial anatomy.—Asci 8-spored, $35\text{--}76 \times 4\text{--}5(-6) \mu\text{m}$, produced from small croziers, narrow clavate to long cylindric, tapering toward the base and there becoming expanded or not to form a small foot; wall $0.5\text{--}2 \mu\text{m}$ thick, to $3 \mu\text{m}$ at the rounded to truncate apex, entire wall in youth very thick and bitunicate-like; pore reaction variable in Melzer's reagent, J+, obvious or faint and difficult to detect, when apex thin ($1\text{--}2 \mu\text{m}$ broad) reaction visible as 2 blue dots, when apex thick ($3\text{--}4 \mu\text{m}$ broad) with two basal dots staining intensely, two apical dots fainter, and the pore outlined light blue. Ascospores $(4\text{--})5\text{--}7(-9) \times (1\text{--})1.5\text{--}2.5 \mu\text{m}$, uniseriate to biseriate throughout or varied combinations of both, hyaline, aseptate, smooth, ellipsoid to ovoid, rarely subfusoid, ends rounded or rarely pointed, in outline inequilateral or less commonly equilateral, occasionally flattened on one side; eguttulate in smaller spores or developing irregular, tiny polar guttulate areas, rarely developing spherical, tiny, polar guttules to $1 \mu\text{m}$ diam, occasionally with one central guttulate area, occasionally with several asci in a single apothecium producing irregularly shaped, angular to misshapen, to subglobose spores; in overmature apothecia or poorly preserved apothecia rarely becoming one septate in the ascus. Paraphyses equal to or only slightly exceeding the asci, branching at the base of the asci and toward the middle, septate, filiform, rarely becoming expanded at the apex and there $1\text{--}2(-3) \mu\text{m}$ wide, walls occasionally thickened and to ca $1 \mu\text{m}$ thick. Subhymenium generally well-developed and vertically oriented, pigmented to ca $70 \mu\text{m}$ in the center and as narrow as $15 \mu\text{m}$ toward the margin, entire layer subhyaline to intensely pigmented, consisting of generally loosely compact, parallel to somewhat interwoven vertically oriented hyphae, occasionally vertical orientation difficult to detect and then composed of narrow, tightly interwoven hyphae; frequently with a narrow band of hyphae between the vertical hyphae and the medullary excipulum below; the individual hyphae hyaline to light brown, $1\text{--}4 \mu\text{m}$ wide, the walls hyaline to dark brown, smooth to coarsely roughened. Medullary excipulum well developed in large apothecia, not refractive, with tightly to loosely compact, interwoven to parallel (in the flank and toward the margin), hyaline or rarely light brown hyphae $(2\text{--})3\text{--}6(-8) \mu\text{m}$ wide, walls thin to slightly thickened ($0.5\text{--}2 \mu\text{m}$ thick), hyaline and smooth, rarely light brown and coarsely to finely roughened. Ectal excipulum: inner ectal excipulum generally poorly defined but differentiated from the medullary

excipulum to the inside, frequently with a zone of hyphae toward the margin lightly to intensely pigmented with finely to coarsely roughened walls. Outer ectal excipulum not refractive or refractive when walls of cells are thickened, entire layer hyaline, gelatinized matrix absent, 10–20 μm broad toward the margin, 15–30 μm broad toward the stipe, composed predominately of textura globulosa, or less commonly a textura angularis; individual cells overlapping and occasionally becoming chain-like and oriented perpendicularly to the surface of the apothecium and appearing palisade-like, generally hyaline and smooth, frequently walls greatly thickened and 1–4 μm thick; the outermost cells frequently becoming variously modified and shaped, long cylindric, pyriform, clavate to pyriform, outermost cells frequently chain-like and appearing to bud off cells. Outer covering layer and hairs absent. Margin composed primarily of narrow, pigmented hyphae originating in the inner ectal excipulum of the flank, the terminal cells becoming expanded, hyaline and frequently globose; rarely with 2–3 layers of overlapping globose cells exterior to the narrow hyphae. Stipe in the upper portion constructed similarly to the receptacle, frequently the globose cells not extending to the base of the stipe and the outermost cells formed of textura prismatica to textura porrecta, the individual hyphae lightly to intensely pigmented and finely to coarsely roughened.

Etymology of the specific epithet.—Refers to the shape of the apothecium.

Habitat.—*Acer* sp.: leaves; *Artocarpus incisa* L.: stipules; *Baccharis glomeruliflora* Pers.: parts not recorded; *Betula* sp.: leaves; *Cecropia peltata* L.: bracts, leaves, stipules; *Cecropia* sp.: leaves; *Citharexylum spinosum* L.: leaves; *Coccoloba uvifera* L.: fruits; *Cocos nucifera* L.: fruits; *Didymopanax morototoni* Decne. & Planch.: leaves; *Didymopanax* sp.: leaves; *Eucalyptus* sp.: leaves, fruits; *Eugenia jambos* L.: leaves, fruits; *Euterpe globosa* Gaettn.: floral sheath, base of petiole; *Inga* sp.: bud scales; *Jasminum gracile* Andr.: fruits; *Juniperus bermudiana* L.: bark, leaves, twigs, wood; *Miconia* sp.: stem; *Rhizophora mangle* L.: seedling root; unidentified substrate; burnt wood, fern rachis, floral parts, fruits, herbaceous stem, leaves, palm leaves, twigs, wood.

Holotype.—Ceylon, Peradeniya, *Thwaites 104*, unidentified leaves, Nov 1887 (K).

Specimens examined.—Bermuda. Devonshire Marsh, *Whetzel et al.*, bark of *Juniperus bermudiana*, 12 Jan 1926 (CUP 33226); Agricultural Station, *Seaver*, bark of *Juniperus bermudiana*, 12 Jan 1926 (CUP 33225); Walsingham, *Whetzel*, twigs of *Juniperus bermudiana*, 20 Jan

1926 (CUP 33227); Walsingham, Shore Castle Harbor, *Whetzel & Ogilvie*, *Baccharis glomeruliflora*, 21 Jan 1926 (CUP 33223); Trott's Pond, *Whetzel et al.*, seedling root (dead) of *Rhizophora mangle*, 25 Jan 1926 (CUP 33222); Hungry Bay, along the shore, *Seaver*, *Coccolobis uvifera*, 27 Jan 1926 (CUP 33228); Elbow Beach, *Whetzel et al.*, berry of *Coccolobis uvifera*, 28 Jan 1926 (CUP 33229); Paget East, *Seaver*, *Baccharis glomeruliflora*, 30 Jan 1926 (CUP 33224); woods near Agricultural Station, *Whetzel*, leaves of *Citharexylum spinosum*, 5 Feb 1926 (CUP 33221); Walsingham, *Waterston 445*, foliage of *Juniperus bermudiana*, 5 Aug 1941 (CUP 31510); Walsingham, *Waterston 479*, berries of *Jasminum gracile*, fall 1941 (CUP 29663a); Walsingham, *Waterston 479*, berries of *Jasminum gracile*, 5 Sep 1941 (CUP 29663b apothecia developed in laboratory); Walsingham, *Waterston 479*, berries of *Jasminum gracile*, fall 1941 (CUP 29663c apothecia developed in laboratory); Walsingham, *Waterston 479*, berries of *Jasminum gracile*, fall 1941 (CUP 29663d); Walsingham, *Waterston 479*, berries of *Jasminum gracile*, 25 Feb 1942 (CUP 29663f); Timmerman's Hill, *Waterston*, leaves of *Citharexylum spinosum*, 17 Nov 1941 (FH); Trimmingham Hill, *Waterston 473*, leaves of *Citharexylum spinosum*, 17 Nov 1941 (CUP 31509). Brazil. St. Catharina, near Blumenau, *Ule*, leaves of *Cecropia* sp., Sep 1888 (S, holotype *Helotium cecropiae*); St. Catharina, near Hahn's-Wald, *Brockes 182*, unidentified leaves, 15 Sep 1891 (FH, herb von Höhnel, isotype *Moellerodiscus brockesiae*); (no other data on locality given), *Ule 846*, on unidentified leaves, no date given (S, holotype *Phialea uleana*). Ceylon. Peradeniya, *Twaites 104*, unidentified leaves, Nov 1887 (K, holotype *Helotium lentum*); Peradeniya, collector not given, *2246*, unidentified leaf, Dec 1906 (K). Colombia. Dpto. Cauca, Eastern slope of Cordillera Occidental, road between El Tambo and Veinte de Julio, *Dumont CO-1419 et al.*, unidentified leaves, 16 Jul 1974 (NY, COL). Dominica. St. Paul Parish, between Springfield Estate and Corona Estate, *Korf et al.*, inner surface of endocarp of *Cocos nucifera*, 23 Jun 1970 (CUP-DO 143); St. Paul Parish, woods near Pont Casse, *Korf et al.*, petiole?. 26 Jun 1970 (CUP-DO 172); Springfield Plantation near Bee House, *Korf et al.*, fruits Leguminosae, 27 Jun 1970 (CUP-DO 255); Cochrane Estate, above Roseau, *Korf et al.*, blade of unidentified leaf, 28 Jun 1970 (CUP-DO 280); Cochrane Estate, above Roseau, *Korf et al.*, mesocarp of nut of *Cocos nucifera*, 28 Jun 1970 (CUP-DO 281); St. Paul Parish, near Pont Casse, *Korf et al.*, stipules of *Cecropia peltata*, 29 Jun 1970 (CUP-DO 302). Guadeloupe, Camp Jacob, *Duss 240*, unidentified leaves, date not recorded (FH, herb. Patouillard, lectotype *Helotium phlebophorum*); St. Louis, *Duss 350*,

unidentified leaf, date not recorded (FH, herb. Patouillard); Camp Jacob, St. Claude, *Pfister 1076 et al.*, unidentified fruits, 7 Jan 1973 (FH); approach to Victor Hughes trail, Grand Matouba, *Pfister 1140 et al.*, unidentified leaves, 8 Jan 1974 (FH). Jamaica. Border of Portland and St. Andrew Parish, Traveller's rest, Silver Hill Gap, *Korf et al.*, unidentified leaf, 8 Jan 1971 (CUP-MJ 108); St. Andrew Parish, trail between Holywell and source of Wag Water River, *Korf et al.*, unidentified leaf, 10 Jan 1971 (CUP-MJ 216); Portland Parish, vicinity of Newcastle, trail between Woodcutter's Gap and ruins of Major Wallin's House, *Korf et al.*, unidentified leaf, 11 Jan 1971 (CUP-MJ 300); St. Andrew's Parish, near Dick's Pond, near Holywell Recreation Area, *Korf et al.*, unidentified leaf, 11 Jan 1971 (CUP-MJ 391); St. Andrew's land and St. Andrew Parish, Traveller's rest, Silver Hill Gap, *Korf et al.*, leaf and fruit of *Eucalyptus* sp., 11 Jan 1971 (CUP-MJ 392); St. Thomas Parish, along Sulphur River, above Bath Fountain Hotel, *Korf et al.*, bracts of *Cecropia peltata*, 14 Jan 1971 (CUP-MJ 479); St. Thomas Parish, along Sulphur River, above Bath Fountain Hotel, *Korf et al.*, bract of *Cecropia peltata*, 14 Jan 1971 (CUP-MJ 483). Mexico. Puente Caederon, *Dumont*, herbaceous stem, 5 Aug 1967 (CUP-ME 98); Chiapas, between Tehuantepec and San Cristobol las Casa, *Dumont*, blackened floral parts, 13 Aug 1967 (CUP-ME 187); Chiapas, between Tehuantepec and San Cristobol las Casas, *Dumont*, blackened pericarp of unidentified fruit, 13 Aug 1967 (CUP-ME 198); Chiapas, between Tehuantepec and San Cristobol las Casas, *Dumont*, stromatized fruit or seed, 15 Aug 1967 (CUP-ME 221); Chiapas, between Tehuantepec and San Cristobol las Casas, *Dumont*, unidentified fruit, 18 Aug 1967 (CUP-ME 255); Chiapas, between Tehuantepec and San Cristobol las Casas, *Dumont*, stromatized fruit, 18 Aug 1967 (CUP-ME 257); Chiapas, road between Tuxtula Gutierrez and Villa Hermosa, *Dumont*, leaf fragments, 19 Aug 1967 (CUP-ME 273); Panama. Panama Prov., along El Llano-Cartí Road, *Dumont & Kournay*, unidentified leaves, 19 Jan 1975 (NY). Puerto Rico. Rio Piedras, *Seaver 161 & Chardon*, unidentified leaves, 1 Feb 1923 (CUP-WI 1426, NY); El Yunque, trail from forestry cabin, *Seaver 539 & Chardon*, on petiole (?*Cecropia*), 23-26 Feb 1923 (NY); El Yunque, *Seaver 555 & Chardon*, *Cecropia* sp., 23-26 Feb 1923 (CUP-WI 1820, NY); El Yunque, *Seaver 635 & Chardon*, *Cecropia* sp., 25 Feb 1923 (CUP-WI 1900, NY); El Yunque, rain forest, *Abawi*, palm leaf?, 24 Jan 1969 (CUP-PR 4216); El Yunque, trail to El Toro, *Korf et al.*, stipules of *Cecropia peltata*, 5 Jun 1970 (CUP-PR 3805); El Yunque, trail to El Toro, *Korf et al.*, *Euterpe globosa*, 5 Jun 1970 (CUP-PR 3806, NY); El Yunque, trail to falls of

Rio de la Mina, *Korf et al.*, flower sheaths of *Euterpe globosa*, 5 Jun 1970 (CUP-PR 3838); El Yunque near km 10.4, Rte. 191, *Korf et al.*, base of petiole of *Euterpe globosa*, 6 Jun 1970 (CUP-PR 3858); El Yunque, km 10.4, Rte. 191, *Korf et al.*, fruit husks of *Cococs nucifera*, 6 Jun 1970 (CUP-PR 3859); El Yunque, near km 10.4, Rte. 191, *Korf et al.*, leaf base of *Cecropia peltata*, 6 Jun 1970 (CUP-PR 3864, NY); El Yunque, along streamlet, *Korf et al.*, *Cecropia peltata*, 6 Jun 1970 (CUP-PR 3880, NY); El Yunque, trail to falls of Rio de la Mina, *Korf et al.*, sheath of floral inflorescence of *Euterpe globosa*, 8 Jun 1970 (CUP-PR 3924, NY); El Yunque, trail to falls of Rio de la Mina, *Korf et al.*, stipules of *Cecropia peltata*, 8 Jun 1970 (CUP-PR 3932, NY); El Yunque, crossing of Quebrada Linguete and Rte. 191, *Korf et al.*, leaf of *Didymopanax* sp., 9 Jun 1970 (CUP-PR 3984); El Yunque crossing of Quebrada Linguete and Rte. 191, *Korf et al.*, stipules of *Cecropia peltata*, 9 Jun 1970 (CUP-PR 3990); El Yunque, crossing of Quebrada Linguete and Rte. 191, *Korf et al.*, rachis of unidentified fern, 9 Jun 1970 (CUP-PR 3997); El Yunque along trail to falls of Rio de la Mina, *Korf et al.*, floral sheath of *Euterpe globosa*, 10 Jun 1970 (CUP-PR 4010, NY); Maricao Forest Reserve, *Korf et al.*, stromatized fruit husks of *Eugenia jambos*, 12 Jun 1970 (CUP-PR 4023); Maricao Forest Reserve, *Korf et al.*, leaf blade of *Eugenia jambos*, 12 Jun 1970 (CUP-PR 4026, NY); Maricao Forest Reserve, *Korf et al.*, leaf blades of *Didymopanax morototoni*, 12 June 1970 (CUP-PR 4029); Maricao Forest Reserve, *Korf et al.*, stem of *Miconia* sp., 12 Jun 1970 (CUP-PR 4031); Maricao Forest Reserve, *Korf et al.*, unidentified leaves, 12 Jun 1970 (CUP-PR 4032, NY); Maricao Forest Reserve, *Korf et al.*, bark, 12 Jun 1970 (CUP-PR 4033); Maricao Forest Reserve, *Korf et al.*, unidentified twigs, 12 Jun 1970 (CUP-PR 4034); Maricao Forest Reserve, *Korf et al.*, duff, 12 Jun 1970 (CUP-PR 4036); Maricao Forest Reserve, *Korf et al.*, bud scales of *Inga* (?), 12 Jun 1970 (CUP-PR 4044); Maricao Forest Reserve, *Korf et al.*, bud scales of *Inga*(?), 12 Jun 1970 (CUP-PR 4045); Maricao Forest Reserve, *Korf et al.*, leaf blade of *Eugenia jambos*, 12 Jun 1970 (CUP-PR 4051, NY); trail from the Maricao Fish Hatchery, *Korf et al.*, bud scales of *Inga* sp., 13 Jun 1970 (CUP-PR 4059); Maricao Forest Reserve, *Korf et al.*, on stipule of *Artocarpus incisus*, 13 Jun 1970 (CUP-PR 4076); Maricao, woods near fish hatchery, *Korf et al.*, stipules of *Cecropia peltata*, 13 Jun 1970 (CUP-PR 4079); Maricao near fish hatchery, *Korf et al.*, petiole of *Cecropia peltata*, 13 Jun 1970 (CUP-PR 4105); along trail from the Maricao Fish Hatchery, *Korf et al.*, burnt wood in fireplace, leaf?, 15 Jun 1970 (CUP-PR 4134); Maricao Forest Reserve, *Korf et al.*, fruit of

Eugenia jambos, 16 Jun 1970 (CUP-PR 4140, NY); Maricao Forest Reserve, *Korf et al.*, bud scales of *Eugenia jambos*, 16 Jun 1970 (CUP-PR 4142); Maricao Forest Reserve, *Korf et al.*, duff, 16 Jun 1970 (CUP-PR 4148); Maricao Forest Reserve, *Korf et al.*, unidentified leaf blades, 16 Jun 1970 (CUP-PR 4149); Maricao Forest Reserve, in woods, *Korf et al.*, unidentified fruit, 16 Jun 1970 (CUP-PR 4150); along Rio Nueve Pasos, near Rosario, *Korf et al.*, unidentified twig, 17 Jun 1970 (CUP-PR 4175); along Rio Nueve Pasos, near Rosario, *Korf et al.*, unidentified leaf blades and veins, 17 Jun 1970 (CUP-PR 4203); El Yunque, Experimental Forest, *Pfister*, unidentified leaf and ?fruit, 15 Feb 1972 (FH). United States of America. New Jersey, Newfield, *J. B. Ellis*, maple leaves in swamp, 18 Jun 1879 (NY, holotype *Pezia simulata*). New York, McLean, McLean Bogs, *Abawi et al.*, leaves of *Acer* sp., 25 May 1964 (CUP 48065); Schuyler Co., Alpine, Hendershot Gulf, *Spevak*, leaf of *Acer* sp., 22 Jul 1964 (CUP 48070); same locality *Korf*, dead fruits on twig, 22 Jul 1964 (CUP 48071); same locality *Spevak*, leaf of *Acer* sp., 22 Jul 1964 (CUP 48072); data as preceding (CUP 48074); data as preceding (CUP 48076); same locality and host, *Kimbrough et al.*, 11 Jul 1963 (CUP 48251). Twin Valleys Camp, Lewis, *Korf 5872*, leaves of *Betula* sp., 15 Apr 1968 (CUP). Venezuela. Aragua, north of Rancho Grande, *Dumont VE-1442 et al.*, unidentified bract, 5 Jul 1971 (NY); Aragua, above Maracay, on the Maracay-Choroní road, *Dumont VE-1990 et al.*, on petioles of unidentified leaf, 12 Jul 1971 (NY); Tachira, 30 km N. of San Cristobal, on San Cristobal-La Grita road, *Dumont VE-3273 et al.*, unidentified leaf, 28 Jul 1971 (NY); Dto. Fed., El Avila, above Los Venados, *Dumont VE-5881 et al.*, unidentified petioles, 24 Jul 1972 (NY); Dto. Fed., El Avila, above Los Venados, *Dumont VE-5975 et al.*, unidentified leaf, 24 Jul 1972 (NY); Dto. Fed., El Avila, above Los Venados, *Dumont VE-5978 et al.*, petiole of unidentified leaf, 24 Jul 1972 (NY); Dto. Fed., El Avila, above Los Venados, *Dumont VE-5979 et al.*, unidentified leaf, 24 Jul 1972 (NY); Dto. Fed., El Avila, above Los Venados, *Dumont VE-5981 et al.*, unidentified leaf, 24 Jul 1972 (NY); Dto. Fed., El Avila, trail between Quebrada Mariperez and Hotel Humboldt, *Dumont VE-6207 et al.*, unidentified leaf, 27 Jul 1972 (NY).

Illustrations.—Rehm, *Hedwigia* 39: PL. VI, figs 29a–c. 1900 (as *Phialea uleana*); Dennis, *Kew Bull.* 1954: 323, fig. 32. 1954. (as *Helotium phlebophorum*); Dennis, *Persoonia* 3: 67, fig. 46, 1964 (as *Ciboriopsis simulata*); *Spevak and Korf, Lloydia* 29: 133, figs. 1–6. 1966 (as *Ciboriopsis simulata*).

Notes.—*Moellerodiscus lentus* is the most variable species studied in the genus and one of the most variable in the family both with respect to the hymenium and sterile tissue of the apothecium. I have observed extreme variation in many collections, but consider this variation to fall within the “normal” range for a single species. I have studied specimens from a wide geographical area but find no consistency in the variation. No correlation can be established between the variation of different characters. There is always a gradation of characters from the more typical or normal to the extreme. Thus, I do not feel that recognition of more than one species or any infraspecific taxa is warranted. Although I have been able to detect morphological and anatomical variation, I offer no explanation for it, nor am I able to offer any generalizations regarding it.

I have been unable to locate the type specimen of *Moellerodiscus brockesia* P. Hennings at S, K, B, FH, CUP, BPI, NY. I have found in the von Höhnel collections at the FH slides prepared by von Höhnel during his study of this species and taken from Hennings’s specimen at Berlin. Although the preservation of the slides is rather poor, I have been able to determine that the type species of *Moellerodiscus* would fall into Dennis’s 1962 concept of *Ciboriopsis*. Since *Moellerodiscus* has priority, I adopt that name, and *Ciboriopsis* then falls into taxonomic synonymy with *Moellerodiscus*. However, because of the preservation of the slides, I have been unable to study all of the critical features to determine exactly what species is represented by this collection. From the information available it is probable that this collection is *M. lentus*, but a definite decision cannot be made now. A final judgment may be made when more of the type specimen can be studied so that additional features can be observed or when topotype material can be gathered and studied.

Helotium phlebophorum Patouillard (1902) was described from Guadeloupe but no holotype was designated. Of the three collections in the Patouillard herbarium at FH which were studied by Patouillard, two, *Duss* 240 and 350, are *Moellerodiscus lentus* and fall within the concept of the protologue of *M. phlebophorum*. The third collection, *Duss* 319, is *Lambertella microspora* (Seaver) Dumont. Of the two collections *Duss* 240 contains more apothecial material than *Duss* 350. I (thus) designate *Duss* 240, as the lectotype specimen for *Helotium phlebophorum*.

Dumont (1974) discussed the typification of *Phialea microspora* Seaver and indicated that Dennis’s transfer of this species to *Ciboriopsis* apparently was based on his study of a single collection, *Seaver* 161, from

Puerto Rico, which could not have been the type specimen. According to Dumont (1974), Seaver's species is best placed in *Lambertella* von Höhnel. As suggested by Dumont, *Seaver 161* is *Moellerodiscus lentus*.

5. ***Moellerodiscus musae*** (Dennis) Dumont & Korf, comb. nov. FIGS. 8-9.

≡ *Ciboriopsis musae* Dennis, Kew Bull. 1958: 460. 1958.

Stroma.—Substratal, easily visible on the host leaf as blackened petioles or irregular, elongated blackened portions of the midvein, delimited by a black line, or as single black lines delimiting circular to subcircular portions of the leaf, in close proximity to the midvein; in section the blackened petioles and midvein without a well-developed rind and with

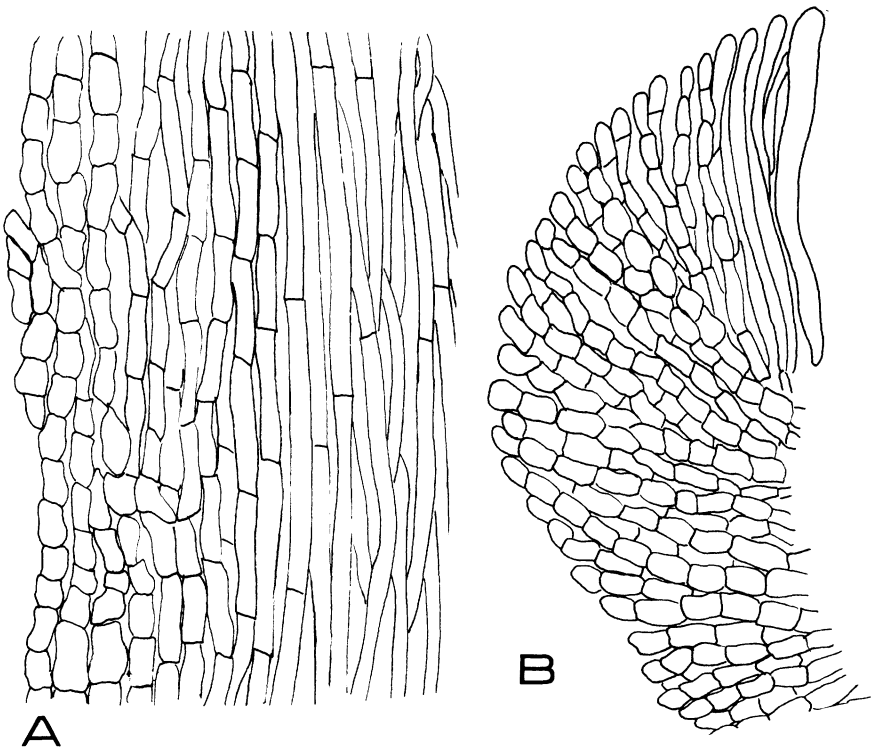


FIG. 8. *Moellerodiscus musae*, Dumont-VE 1515 *ex NY*, camera lucida drawings of median longitudinal sections of apothecia, $\times 1,000$. A. Stipe at approximately midpoint. B. Margin and upper portion of receptacle.

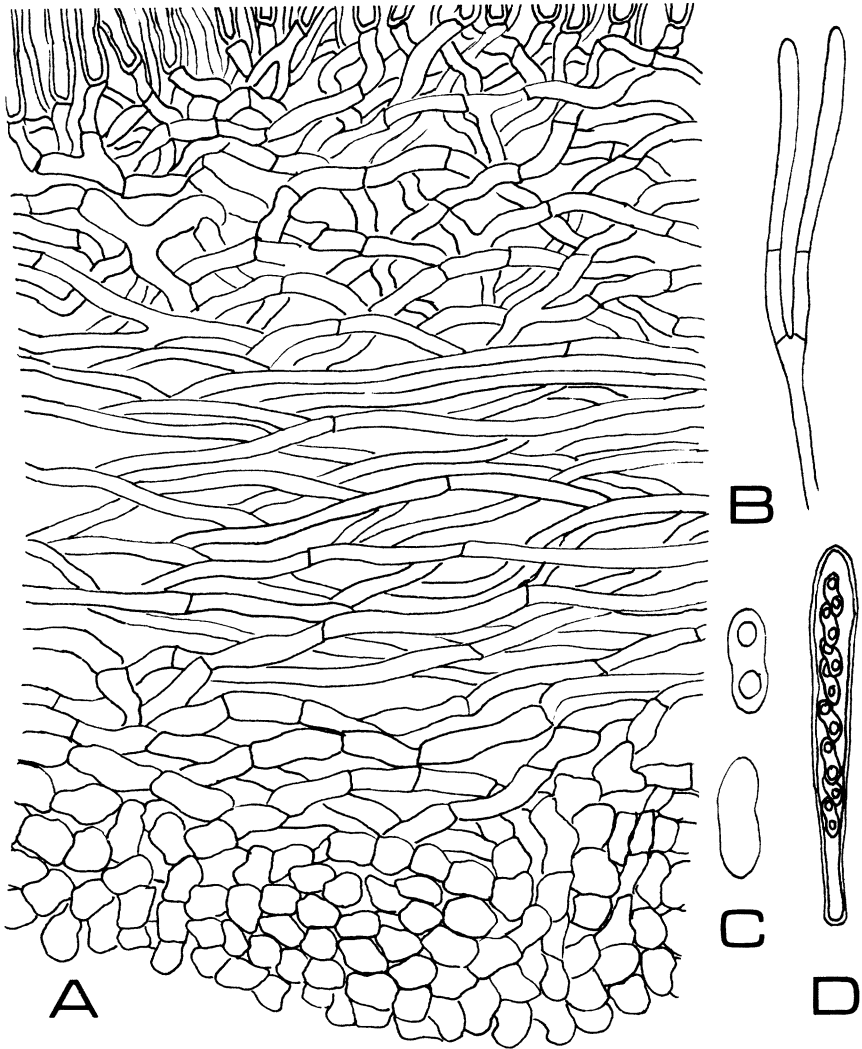


FIG. 9. *Moellerodiscus musae*, Dumont-VE 1515 *ex NY*, camera lucida drawings of median longitudinal sections of apothecia. A. Receptacle at approximately midpoint between margin and stipe, $\times 1,000$. B. Branching paraphysis, $\times 1,000$. C. Ascospores: upper biguttulate, lower eguttulate, $\times 2,000$. D. Ascus with ascospores uniseriate, $\times 1,000$.

only scattered rind cells; the black line a rind consisting of cells with differentially pigmented walls irregular to epidermoid in face view. Unknown in culture.

Macroconidial state.—Absent.

Microconidial state.—Unknown.

Apothecial morphology.—Apothecia 2–5 mm in diam, 1–5(–22) mm high, short to long stipitate, produced from stromatized petiole, or blackened midveins, when fresh concave to convex, drying concave, rehydrating concave. In 2% KOH with an ionomidotic reaction and emitting a reddish to pinkish brown, to light purple-brown dye, in ammonia emitting a bright yellow dye (Dennis, 1958). Hymenium when fresh brown to beige with a tint of green or olivaceous green, “Fresh olive yellow, Maerz & Paul” (Dennis, 1958), “Seguy 211–213, 196, 191” (Korf field notes, pers. comm.) drying nearly black, brown with tint of red, rehydrating black. Receptacle when fresh generally concolorous with hymenium, “Seguy 246, 256” (Korf field notes, pers. comm.), drying rusty orange to reddish, to grey black, concolorous with hymenium, rehydrating black. Stipe cylindrical, broader above, tapering below, concolorous above with the receptacle when fresh, dry or rehydrated, and black at the base.

Apothecial anatomy.—Asci 8-spored, 32–45 × 4–6 μm , produced from small croziers, cylindrical to cylindrical-subclavate, tapering toward the base and generally not expanded to form a small foot; wall 1–2 μm thick, to 3 μm at the obtuse to rounded apex, in youth very thickened and occasionally bitunicate-like; pore J+, the entire pore strong intense blue to purple, or only as two basal dots staining deep blue in Melzer’s reagent. Ascospores (3–)4–5(–6) × 1.5–2(–2.5) μm , uniseriate to biseriata, hyaline, aseptate, smooth, subellipsoid, ovoid, fusoid, both ends frequently pointed, in outline equilateral, occasionally slightly inequilateral and flattened on one side, with two well-defined, polar guttules, frequently filling most of the ascospores and larger than 1 μm in diam, anterior guttule generally larger than posterior. Paraphyses equal to or slightly exceeding the asci, in mass appearing light brown in color, individually generally difficult to detect pigmentation, occasionally with reddish brown, tiny granules especially observed in the lower portion, branching at the base of the asci and toward the middle and less commonly above the middle, septate, filiform, rarely becoming expanded at the apex, and there 1–2 μm wide, walls occasionally somewhat thickened. Subhymenium to ca 40 μm broad in the middle, generally not tapering greatly toward the margin, entire layer light to dark brown, the individual hyphae loosely to tightly interwoven, occasionally lightly pigmented, 1.5–3 μm wide, the walls slightly thickened, frequently brown and coarsely to finely roughened, with light brown to golden brown amorphous mucilaginous or gelatinous material irregularly deposited between the hyphae but not forming an entire layer. Medullary excipulum in the center of the apothecium composed of loosely interwoven hyphae becom-

ing predominately parallel to each other and to the surface of the apothecium in the flanks, the individual hyphae 2–6 μm wide, walls slightly thickened, subhyaline to light brown, smooth to coarsely roughened, occasionally with the golden-brown mucilaginous material irregularly dispersed. Ectal excipulum: inner ectal excipulum not differentiated from the parallel hyphae of the medullary excipulum, but with hyphae nearest to the cells of the outer ectal excipulum becoming loosely arranged and somewhat interwoven. Outer ectal excipulum frequently refractive when walls of cells thickened, entire layer hyaline or lightly pigmented toward the margin to ca 25 μm broad toward margin and to ca 35 μm broad toward the stipe, of a well-defined *textura globulosa* to *textura angularis*; the individual cells globose, angular to elongate with the long axis perpendicular to the surface of the apothecium, the individual cells toward the margin, 2–5(–10) μm wide, the walls frequently very thickened and to 3 μm thick, generally smooth and hyaline to subhyaline, the individual cells 3–10(–15) μm toward the stipe; occasionally the contents of the cells appearing granular and reddish; occasionally with the golden brown mucilaginous material present. Outer covering layer absent. Hairs absent. Margin lightly to intensely pigmented, composed of radiating hyphae originating in the subhymenium and ectal excipulum or elongated cells losing hyphal orientation and to ca 5 μm long, the apical cells rarely slightly elongated, walls slightly thickened, frequently pigmented, rarely roughened. The stipe constructed differently from the receptacle, the inner hyphae the same diameter as the outer hyphae, but longer and when pigmented lighter, cells of the outer hyphae shorter than inner hyphae and occasionally becoming variously modified and occasionally several together in isolated external areas becoming globose to subglobose, toward the receptacle giving rise to more regular, globose cells.

Etymology of the specific epithet.—Refers to the host, *Musa sapienta*, on which the type was collected.

Habitat.—On unidentified leaves and leaves of *Musa sapienta*, *Tabebuia heterophylla*, *Tabebuia* sp. and *Clusia* sp.

Holotype.—Bolivia, Rio Yariza, Prov. Nor. Yungas, Dpto. La Paz, *Singer B1377*, leaf of banana, 23 Feb 1956 (K via CUP).

Specimens examined.—Holotype. Bolivia, *Singer B1377* (See above); Guadeloupe. La Soufriere, unidentified leaf, possibly *Eugenia* sp., *Pfister 580*, 20 Jul 1973 (FH). Puerto Rico. woods near Maricao Forest Reserve, leaves of *T. heterophylla*, *Korf et al.*, 12 Jun 1970 (CUP-PR)

4022); woods near Maricao Forest Reserve, leaf of *T. heterophylla*, Korf *et al.*, 16 Jun 1970 (CUP-PR 4141, NY); along Rio Nueve Pasos, Korf *et al.*, leaf of *Tabebuia* sp., 17 Jun 1970 (CUP-PR 4176). Venezuela. Edo. Yuracuy, in mts. N. of Niragua, Dumont VE-1515 *et al.*, leaf of *Clusia* sp., 7 Jul 71 (NY).

Illustrations.—Dennis, Kew Bull. 1958: 461, fig. 3. 1958.

Notes.—This species is closely related to *Moellerodiscus lentus*. In *M. musae* the apothecia in 2% KOH give off a reddish purple dye and have obviously biguttulate ascospores, whereas in *M. lentus* the ionomidotic reaction is lacking, and the ascospores have 2 tiny guttules or are eguttulate. Dixon (1975), in his study of *Chlorociboria*, noted that the type of *C. musae* was a member of the Sclerotiniaceae. He also reported that it was closely related to other species placed in *Ciboriopsis*, but failed to make the combination into that genus. After examining slides prepared by him during his study, we concur with his decision and make the combination into *Moellerodiscus*, an older name for *Ciboriopsis*.

6. **Moellerodiscus tenuistipes** (Schroeter) Dumont, comb. nov.

Figs. 10–12

≡ *Ciboria tenuistipes* Schroeter, Kryptogamen-Fl. Schlesien 3(2): 61. 1893.

≡ *Ciboriopsis tenuistipes* (Schroeter) Palmer, Acta Mycol. 5: 251. 1969.

≡ *Ciboriopsis bramleyi* Dennis, Kew Bull. 16: 319. 1962.

Stroma.—Doubtfully present on host. See notes below.

Macroconidial state.—Absent.

Microconidial state.—Unknown.

Apothecial morphology.—Apothecia 0.5–1(–2) mm in diam, (1–)2–5(–7) mm high, long stipitate, occasionally produced from blackened areas of the host plant, solitary to numerous. Receptacle reddish brown drying beige to tan, rehydrating lighter; patelliform, flat, drying flat to slightly convex, rehydrating strongly convex. Stipe cylindrical or tapering slightly below, thin, delicate, receptacle easily becoming detached in dry material, reddish brown becoming black at the base, surface smooth.

Apothecial anatomy.—Asci 8-spored, 35–45(–60) × (4–)5–6 μm, produced from tiny croziers, cylindrical to subclavate, tapering slightly below

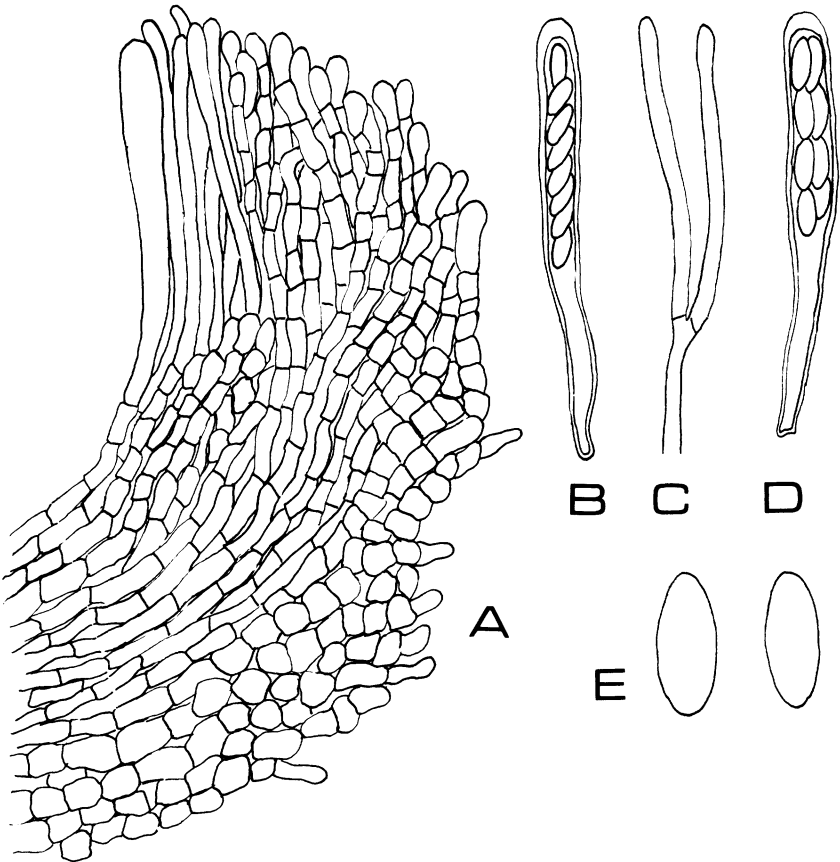


FIG. 10. *Moellerodiscus tenuistipes*, Bramley K 60/64 *ex NY*, camera lucida drawings of median longitudinal sections of apothecia. A. Margin and upper portion of receptacle, $\times 1,000$. B. Ascus with ascospores uniseriate, $\times 1,000$. C. Branching paraphysis, $\times 1,000$. D. Ascus with ascospores biseriate, $\times 1,000$. E. Ascospores $\times 2,000$.

to the crozier and there becoming slightly expanded to form a small foot; wall thin to ca $1 \mu\text{m}$ thick, only slightly enlarged at the rounded to subtruncate apex and there to ca $2 \mu\text{m}$ thick; pore strongly J+, the walls deep blue in Melzer's reagent. Ascospores $5-7(-8.5) \times 2(-3) \mu\text{m}$, uniseriate throughout or biseriate above and uniseriate below, hyaline, smooth, aseptate, ellipsoid, subfusoid, subovoid, generally slightly broader at one end, in outline inequilateral, eguttulate. Paraphyses equal to or slightly exceeding the asci, hyaline or occasionally walls lightly pigmented in the basal 1/3, simple or rarely branched toward the base, sparingly septe toward the base, filliform rarely expanded at the apex. Sub-

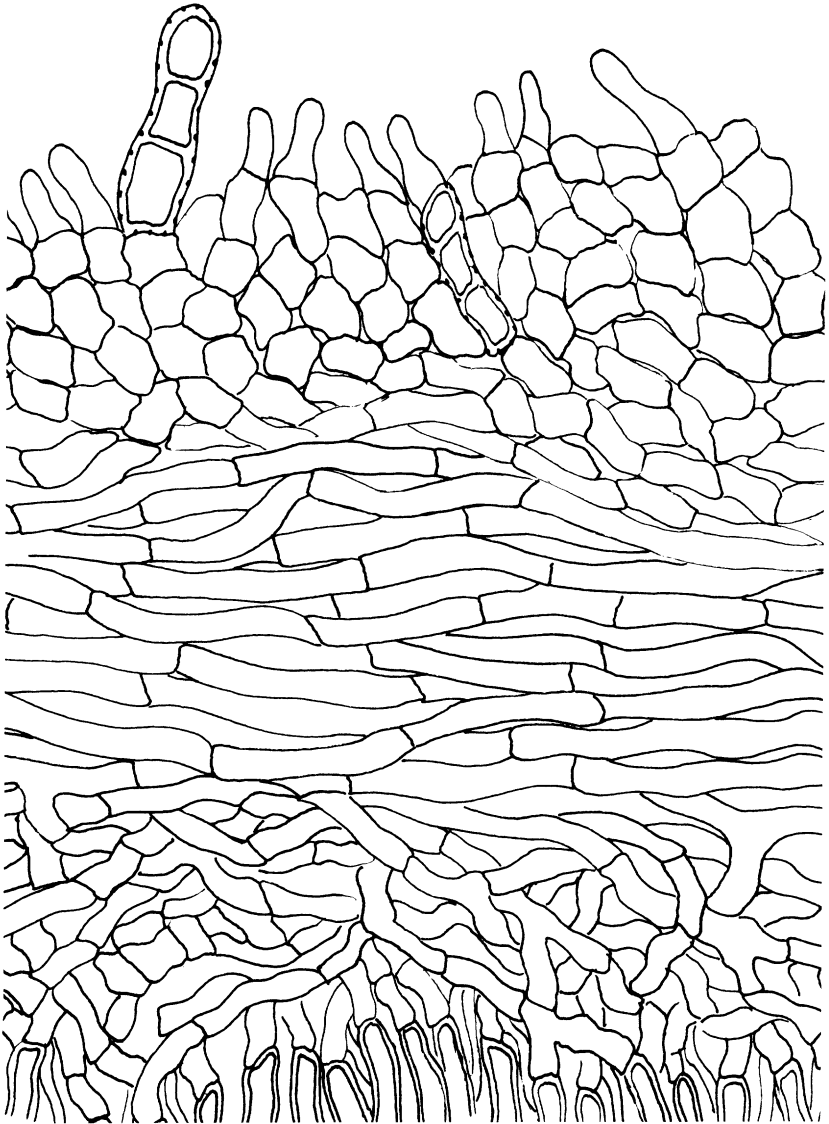


FIG. 11. *Moellerodiscus tenuistipes*, Bramley K 60/64 ex NY, camera lucida drawing of median longitudinal section of apothecium at approximately midpoint between margin and stipe, $\times 1,000$.

hymenium to ca 30 μm in the center, narrowing toward the margin, entire layer oriented more or less perpendicularly, hyaline to subhyaline, composed of tightly to loosely interwoven textura intricata, individual hyphae

2–6 μm broad, walls smooth or rarely slightly roughened and lightly pigmented. Medullary excipulum obconical, tapering toward and terminating before the margin, not refractive; composed of loosely to tightly interwoven hyphae 2–4(–5) μm wide, walls to ca 1 μm thick; hyaline to frequently lightly pigmented and roughened. Ectal excipulum: inner ectal excipulum to ca 10 μm broad toward the margin and to ca 25 μm toward the stipe, composed of loosely parallel to slightly interwoven hyphae (toward the outer ectal excipulum) 2–4 μm broad, walls frequently pigmented and roughened, roughening and pigmentation more intense toward margin. Outer ectal excipulum to ca 10 μm broad toward the margin and ca 30 μm toward stipe, composed of a well-defined *textura angularis* to a poorly defined *textura globulosa*; the individual cells generally angular, and generally oriented perpendicular to surface of apothecium, the outermost becoming modified and producing filiform, rarely septate protrusions 5–15 μm long and 2–4 μm wide, occasionally with light brown and coarsely roughened walls to ca 1 μm thick. Outer covering layer absent. Margin narrow, generally intensely pigmented, composed predominately of rectangular cells of the inner ectal excipulum continuing into margin, but with few angular to globose cells to the outside, protrusions when present smaller than on the flank below. Stipe composed of a tightly compact *textura porrecta* to *prismatica* lacking angular to globose cells, individual cells with intensely pigmented and coarsely roughened walls.

Etymology of the specific epithet.—Refers to the thin stipe of the apothecium in the type collection.

Habitat.—*Castanea sativa* Mill.: spines of leaves of involucre, spines of burrs, catkins; *Chamaenerion angustifolium* Schur.: stems and leaves; *Filipendula ulmaria* Maxim: leaf; *Potentilla palustris* Scop.: fruit, and unidentified fruit and leaf; *Rubus fruticosus* L.: leaves.

Holotype.—Poland, Falkenberg, Guschwitz, Schroeter, leaves of *Rubus fruticosus* (WRSL via CUP).

Specimens examined.—Poland, holotype see above. England, Yorkshire, Pickering, Kingthrope Woods, *Bramley*, leaves and stems of *Chamaenerion angustifolium*, Sep 1960 (K 60/64, holotype of *Ciboriopsis bramleyi*); Lancashire, Pond S. of Rufford, *J. T. Palmer 2401*, fruit and leaves of *Potentilla palustris*, 29 Jun 1963 (ex CUP = Korf 3264); Cheshire, Bramhall, *J. T. Palmer 2452*, spines of *Castanea sativa* burrs, 31 May 1964 (ex CUP = Korf 3265); Derbyshire, near Bakewell, The Grotto, *J. T. Palmer 2454*, catkins of *Castanea sativa*, 6 Jun 1964 (ex CUP =

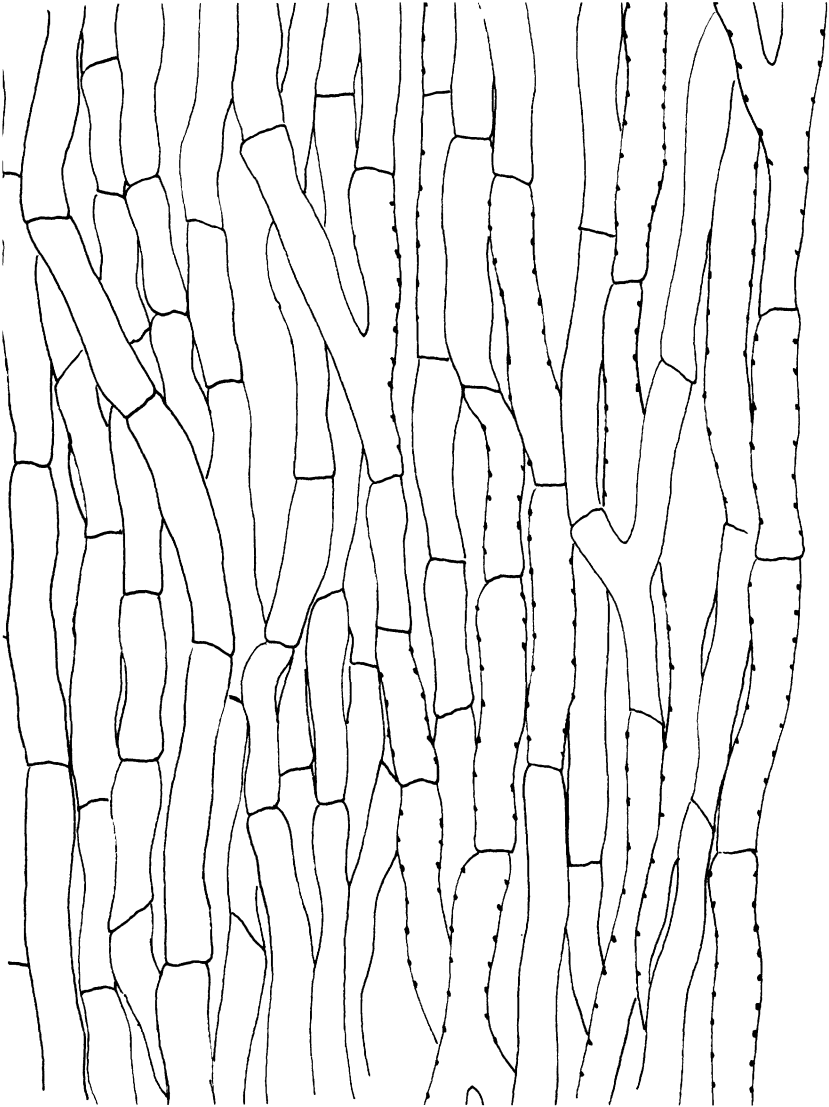


FIG. 12. *Moellerodiscus tenuistipes*, Bramley K 60/64 ex NY, camera lucida drawing of median longitudinal section of apothecium at approximately midpoint of stipe, $\times 1,000$.

Korf 3266) ; Derbyshire, near Bakewell, The Grotto, *J. T. Palmer 2455*, spines of leaves of involucre of *Castanea sativa*, 6 Jun 1964 (ex CUP = Korf 3267) ; Lancashire, Rufford, E. of railway station, *J. T. Palmer 2461*, unidentified fruit and leaf of *C. angustifolium*, 13 Jun 1964 (ex

CUP = Korf 3268); Cheshire, Bramhall, *J. T. Palmer 65154*, leaf of *Filipendula ulmaria*, 1 Sep 1965 (ex CUP = Korf 3302).

Illustrations.—(All cited as *Ciboriopsis bramleyi*) Dennis, Kew Bull. **16**: 318, fig. 2. 1962; Dennis, British Ascomycetes, pl. XIVb, 1968; Spevak and Korf, *Lloydia* **29**: 133, figs. 7, 8. 1966; Palmer, *Acta Mycol.* **5**: Pl. I, figs. 1–19. 1969.

Notes.—I have been unable to detect a rind on the surface of the host. The host tissue is frequently blackened, but examination of sections of the blackened areas has failed to reveal a true rind. I have noted well-developed rind cells at the base of the stipe of the apothecium. The stroma produced in culture as reported by Spevak and Korf (1966) is somewhat anomalous for the family Sclerotiniaceae. This is the only case which I know where a true rind composed of cells with differentially pigmented walls which are irregular to epidermoid in face view is not formed in culture.

Spevak and Korf (1966) report the ectal excipulum of the apothecium to be 3-layered. My interpretation is that the ectal excipulum is composed of two layers and that the zone of *textura intricata* which they describe is not a well defined area but merely represents an area where the parallel hyphae of the inner ectal excipulum grade into the cells of the outer ectal excipulum. They also report the thickness of the flank in section to be ca 750 μm , but my largest comparable measurement is ca 100 μm . Equally puzzling are the measurements for the breadth given for two of the layers, ca 350 μm and 150 μm .

EXCLUDED SPECIES

1. *Ciboriopsis microspora* (Seaver) Dennis, Kew Bull. **16**: 319. 1962.
 ≡ *Phialea microspora* Seaver, *Mycologia* **17**: 50. 1925.

Dumont (1974) has indicated that this species should be placed in the genus *Lambertella*. For a full discussion of the nomenclatural and taxonomic problems see Dumont (1974).

IMPERFECTLY KNOWN SPECIES

1. *Ciboriopsis brunii* Kar & Pal, *Mycologia* **62**: 685. 1970.
2. *Ciboriopsis carnea* Kar & Pal, *Mycologia* **62**: 685. 1970.

Ciboriopsis brunii and *C. carnea* were both described from single specimens from West Bengal by Kar and Pal (1970). The describing authors indicated that isotypes of the two species, respectively PCC 43

and 42, were deposited at CUP, but according to the director of herbarium, Dr. R. P. Korf, this material was never received. Dr. Kar in personal communication has informed me that the types were maintained in 4 percent formalin, and that all of the material has disintegrated. No material of either could be located at BPI or K.

From the original description and accompanying illustrations, it seems that both species could be referred to *Moellerodiscus*, but in view of the lack of type material, I hesitate to make the new combinations. They seem to be most closely related to *M. lentus*. There are few differences between the two West Bengal species; and, with the exception of their J negative asci, they are similar to *M. lentus*. Owing to the lack of material for study, I can only suggest that the two be placed into synonymy with *M. lentus*. A definite decision cannot be made until neotype specimens for the two are designated, which I am now not prepared to do.

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