

THE AGARICACEAE OF TROPICAL NORTH AMERICA—V

WILLIAM A. MURRILL

The tropical species with ochraceous or ferruginous spores are treated in this article and the next following in the series. A majority of these species occur on decaying wood. The generic distinctions are not always clearly defined, the group being considered difficult for a beginner.

Lamellae readily separable from the context; pileus dimidiate or resupinate.

1. *TAPINIA*.

Lamellae not readily separable from the context.

Volva and annulus absent; veil present at times in young stages, but evanescent.

Pileus centrally stipitate.

Stipe cartilaginous.

Lamellae dissolving at maturity.

2. *MYCENA*.

Lamellae not dissolving at maturity.

Lamellae free.

3. *PLUTEOLUS*.

Lamellae adnate or adnexed.

Margin of pileus straight, from the first.

4. *CONOCYBE*.

Margin of pileus at first inflexed.

5. *NAUCORIA*.

Stipe fleshy.

Universal veil arachnoid, distinct from the cuticle; lamellae adnate.

6. *CORTINARIUS*.

Universal veil not arachnoid.

Lamellae sinuate or adnexed.

Pileus fibrillose or silky.

7. *INOCYBE*.

Pileus smooth and viscid.

8. *HERELOMA*.

Lamellae adnate or decurrent.

9. *RYSSOSPORA*.

Pileus dimidiate or resupinate.

10. *PHIALOCYBE*.

Volva absent, annulus present.

Pileus hygrophaneous.

11. *PHOLIOTINA*.

Pileus dry.

Stipe glabrous or fibrillose.

12. *PHOLIOTA*.

Stipe squarrose-scaly.

13. *HYPODENDRUM*.

I. *TAPINIA* (Fries) Karst. Hattsv. 452. 1879

This genus includes the dimidiate or resupinate species of the old genus *Paxillus*, in which the lamellae are usually readily separable from the pileus and anastomose with each other.

Tapinia lignea (Berk. & Curt.)

Paxillus ligneus Berk. & Curt. Jour. Linn. Soc. 9: 423. 1867.

Collected at Orizaba, Mexico, by Botteri, and said by the authors to be allied to *Paxillus panuoides*. The types at Kew much resemble this latter species, and further investigation may show that they do not merit specific distinction.

2. MYCENA (Pers.) Roussel, Fl. Calvados ed. 2. 64. 1806

Bolbitius Fries, Epicr. Myc. 253. 1838.

This genus is characterized among the ocher-spored genera by its deliquescent lamellae. There are few species in it, and these are not generally well known.

1. Mycena fragilis (Fries)

Bolbitius fragilis Fries, Epicr. Myc. 254. 1838.

Reported from the Antilles by Fries, and from two collections by Duss in Guadeloupe.

2. Mycena villipes (Fries)

Bolbitius villipes Fries, Nova Acta Soc. Sci. Upsal. III. 1: 28. 1851.

Collected and well figured in color by Oersted at Naranjo, Costa Rica. No specimens of it were found in Europe.

3. Mycena jalapensis sp. nov.

Pileus conic to expanded, thin, umbonate, gregarious, 2-4 cm. broad; surface viscid, striate, flavo-melleous, fulvous on the umbo; lamellae free, narrow, close, becoming ferruginous, at length deliquescent; spores ellipsoid or ovoid, smooth, flavo-lutaceous under a microscope, $12-14 \times 6-8\mu$; stipe cylindric, equal, hollow, glabrous, white or sulfureous, 6-8 cm. long, 2 mm. thick.

Type collected among chips in woods near Jalapa, Mexico, 5,000 ft. elevation, December 12-20, 1909, *W. A. & Edna L. Murrill* 102 (type), 128.

4. Mycena mexicana sp. nov.

Pileus subcespitose, conic to expanded, umbonate, about 2 cm. broad; surface striate, avellaneous, fuliginous on the umbo, subglabrous, dry; lamellae adnexed, rather broad, becoming ferru-

ginous and at length slightly deliquescent; spores ovoid, smooth, ochroleucous under a microscope, usually uninucleate, $8-9 \times 4.5-5\mu$; stipe slender, white, glabrous, cylindric, equal, hollow, 3-4 cm. long, 1 mm. thick.

Type collected on decayed wood in coffee plantations at Xuchiles, near Cordoba, Mexico, January 17, 1910, *W. A. & Edna L. Murrill 1127*.

3. *PLUTEOLUS* (Fries) Gillet, Champ. Fr. 1: 549. 1876

This genus has free lamellae and neither volva nor veil. Few species are known.

Pluteolus tropicalis sp. nov.

Pileus thin, delicate, expanded, 3-5 cm. broad; surface pale-isabelline or ochraceous, glabrous, striate to the disk; context very thin, brownish, mild, with a strong odor of jessamine; lamellae free, crowded, narrow, ochraceous or isabelline to dull-cinnamon; spores ellipsoid, smooth, slightly truncate at one end, with one or more nuclei, ferruginous, $12-14 \times 7\mu$; stipe cylindric, slightly tapering upward, pruinose-floccose, whitish, with flesh tints below, hollow, fragile, 7-10 cm. long, 3-4 mm. thick.

Type collected on rotting grass in a plowed field at Herradura, Cuba, August 28, 1906, *F. S. Earle 536*. Also collected in a banana field at Santiago de las Vegas, Cuba, June 18, 1904, *F. S. Earle 102*; in grassy ground at Rincon, Cuba, September 8, 1904, *F. S. Earle 165*; and several times on the ground and once in a bamboo stump at St. George's, Grenada, July and August, 1905, *W. E. Broadway*.

4. *CONOCYBE* Fayod, Ann. Sci. Nat. VII. 9: 357. 1889

Galera (Fries) Quél. Champ. Jura Vosg. 103. 1872. Not *Galera* Blume. 1825.

This genus differs from *Naucoria* in having the margin straight and appressed to the stipe, instead of incurved, in young stages.

1. *CONOCYBE TENER* (Schaeff.) Fayod, Ann. Sci. Nat. VII. 9: 357. 1889

Galera tener (Schaeff.) Quél. Champ. Jura Vosg. 104. 1872.
Galera simulans Earle, Inform. An. Estaç. Centr. Agron. Cuba 1: 236. 1906. (Type from Cuba.)

Galera grisea Earle, Inform. An. Estaç. Centr. Agron. Cuba 1: 237. 1906. (Type from Cuba.)

Galera cubensis Earle, Inform. An. Estaç. Centr. Agron. Cuba 1: 237. 1906.

This dainty little fungus occurs abundantly on lawns and in manured pastures in temperate regions, and has recently been found to be common about Santiago de las Vegas, Cuba.

Jalapa, Mexico, *W. A. & Edna L. Murrill* 139; Hope Gardens, Jamaica, *Earle* 338; Port Antonio, Jamaica, *W. A. & Edna L. Murrill* 223, 245; Cuba, *Earle* 42, 43, 53, 54, 99, 100, 101, 129, 164, 359, 360, 372, 374, *Underwood & Earle* 1122; British Honduras, *M. E. Peck*; Grenada, *Broadway*.

2. *Conocybe Hypnorum* (Batsch)

Galera Hypnorum (Batsch) Quél. Champ. Jura Vosg. 105. 1872.

This tiny species is of wide distribution in temperate regions, occurring among mosses or grasses in shaded localities. The cap is conic, striate, variable in color, usually some shade of yellowish-brown. The spores of the Mexican plants are smaller than in typical temperate specimens, and the pileus is pale-isabelline.

Jalapa, Mexico, among mosses in a pasture at the edge of a forest, *W. A. & Edna L. Murrill* 109.

3. *Conocybe echinospora* sp. nov.

Pileus conic to campanulate or convex, umbonate, solitary, 5 mm. broad and high; surface glabrous, dry, striate, fulvous-isabelline, isabelline on the umbo, margin straight, appressed, entire; lamellae broad, distant, fulvous-isabelline; spores broadly ovoid, pointed at one end, minutely echinulate, ferruginous, $7-8 \times 4-5\mu$; stipe glabrous, smooth, slightly tapering upward, very pale latericeous, 1-1.5 cm. long, less than 1 mm. thick.

Type collected on a clay bank at Cinchona, Jamaica, 5,000 ft. elevation, December 25-January 8, 1908-9, *W. A. & Edna L. Murrill* 474.

5. NAUCORIA (Fries) Quél. Champ. Jura Vosg. 99. 1872

In this genus the lamellae are adnexed or adnate, the stipe cartilaginous, and the margin inrolled when young, usually lack-

ing a veil. The spores vary in color from ochraceous to fulvous. Temperate species are numerous and difficult; several have also been described from the tropics.

1. NAUCORIA EUTHUGRAMMUS (Berk. & Curt.) Sacc. Syll. Fung.
5: 835. 1887

Agaricus (Naucoria) euthugrammus Berk. & Curt. Jour. Linn. Soc. 10: 290. 1868.

Described from Wright's collections on rotten wood in Cuba. Very thin, less than 1 cm. broad, pallid-umbrinous, convex, striate, with filiform, hyaline stipe and minute spores.

2. NAUCORIA OINODES (Berk. & Curt.) Sacc. Syll. Fung. 5: 842.
1887

Agaricus (Naucoria) oinodes Berk. & Curt. Jour. Linn. Soc. 10: 291. 1868.

Described from specimens collected by Wright on rotten wood in Cuba. Less than 1 cm. broad, umbonate-hemispheric, vinous, glabrous, striate, with short, fuscous stipe.

3. NAUCORIA PECTINATA (Berk. & Curt.) Sacc. Syll. Fung. 5: 856. 1887

Agaricus (Naucoria) pectinatus Berk. & Curt. Jour. Linn. Soc. 10: 291. 1868.

Cespitose on logs, glabrous, striate, 2.5 cm. broad. Types at Kew and Paris are well preserved.

Cuba, *Wright 81*; Mooretown, Jamaica, *Earle 561*.

4. NAUCORIA SEMIORBICULARIS (Bull.) Quél. Champ. Jura Vosg.
100. 1872

Agaricus semiorbicularis Bull. Champ. Fr. pl. 422. f. 1. 1788.

Agaricus (Psilocybe) pediades Fries, Syst. Myc. 1: 290. 1821.

Naucoria pediades Quél. Champ. Jura Vosg. 100. 1872.

This species appears to be common throughout both temperate and tropical regions, appearing abundantly along roads and paths and in grassy places during periods of wet weather. Like most cosmopolitan species, it shows considerable variation, even in spore characters.

Costa Rica, *Oersted*; Santa Cruz, *Oersted*; Guadeloupe, *Duss*; Cuba, *Wright*, *Earle* 540; Mexico, *Maury*, *W. A. & Edna L. Murrill* 93; Castleton Gardens, Jamaica, *Earle* 233.

5. *Naucoria corticola* sp. nov.

Pileus thin, convex to subexpanded, gregarious, 1–1.5 cm. broad; surface avelaneous-isabelline, innate-fibrillose with slight tufts, resembling that of *Panus stypticus*, margin undulate, incurved when young; lamellae adnate, dull-whitish to bay-fulvous, broad, heterophyllous, rather distant; spores ellipsoid, smooth, ferruginous, $8-9 \times 4-5\mu$; stipe cylindric, equal, yellow, glabrous at the apex, whitish-pubescent below, 1 cm. long, 1 mm. thick.

Type collected on the bark of a dead stump at Cinchona, Jamaica, 5,000 ft. elevation, December 25–January 8, 1908–09, *W. A. & Edna L. Murrill* 533.

6. *Naucoria cyathicola* sp. nov.

Pileus hemispheric-umbonate to convex, 7–12 mm. broad; surface isabelline, pale-fulvous on the umbo, innate-fibrillose, margin entire, not striate; lamellae distant, squarely adnate, whitish to pale-ochraceous; spores oblong-ellipsoid, smooth, very pale yellowish under the microscope, $6 \times 3.5\mu$; stipe subequal, cylindric, fibrillose, isabelline, cartilaginous, 2 cm. long, 1.5 mm. thick; veil not evident, except in fibrils on stipe and pileus.

Type collected on dead trunks of tree-ferns at Morce's Gap, Jamaica, 5,000 ft. elevation, January 2, 1909, *W. A. & Edna L. Murrill* 699.

7. *Naucoria Earlei* sp. nov.

Pileus thin, convex to expanded or depressed, 2–3 cm. broad; surface glabrous, pallid or alutaceous, margin even or slightly striate; lamellae slightly adnexed, subdistant, rather narrow but ventricose, pallid to fuscous; spores ellipsoid, smooth, fuscous, $10-12 \times 6-8\mu$; stipe cylindric, solid, firm, glabrous, pallid to brownish, darker than the pileus, 3–4 cm. long, 2 mm. thick.

Type collected on damp, bare ground, Castleton Gardens, Jamaica, October 28, 1902, *F. S. Earle* 230.

8. *Naucoria jalapensis* sp. nov.

Pileus thin, conic to convex, umbonate, 2.5 cm. broad; surface pearly-white, slightly yellowish on the umbo, glabrous, dry, stri-

ate, margin at first inflexed; lamellae sinuate-adnexed, broad, rather distant, plane, white to ferruginous, with a purplish tint; spores ovoid or ellipsoid, drawn to a point at one side of the base, smooth, pale-yellow under the microscope, $7 \times 4\mu$; stipe equal, cylindric, curved, milky-white, glabrous, 5 cm. long, 2 mm. thick; veil fibrillose, clinging to the young margin, soon evanescent.

Type collected on dead wood in a moist virgin forest at Jalapa, Mexico, 5,000 ft. elevation, December 12-20, 1909, *W. A. & Edna L. Murrill 161*.

9. ***Naucoria hepaticicola* sp. nov.**

Pileus hemispheric to convex, gregarious, 1 cm. broad; surface dry, glabrous, smooth, not striate, fulvous; lamellae adnate, plane or slightly arcuate, broad, distant, inserted, melleous to fulvous; spores ovoid, somewhat irregular in outline, pointed at one end, smooth, uninucleate, melleous, $7-9 \times 4-5\mu$; stipe curved, tapering upward, glabrous, smooth, cartilaginous, 1.5 cm. long, 2 mm. thick above; veil very slight, fibrillose, evanescent.

Type collected on and among liverworts on a clay bank near Jalapa, Mexico, 5,000 ft. elevation, December 12-20, 1909, *W. A. & Edna L. Murrill 131*.

10. ***Naucoria montana* sp. nov.**

Pileus hemispheric-umbonate, gregarious, 1-2 cm. broad; surface glabrous, striate, light-brown, dark-brown on the umbo; lamellae adnate, broad, of medium distance, heterophyllous; spores pip-shaped, pointed at one or both ends, minutely echinulate, ferruginous, $9-11 \times 4-5\mu$; stipe crooked, slender, cylindric, equal, glabrous, brown above, fuliginous below, 3-4 cm. long, 1-2 mm. thick.

Type collected on dead wood at Cinchona, Jamaica, 5,000 ft. elevation, December 25-January 8, 1908-09, *W. A. & Edna L. Murrill 621*. Also collected on dead wood at Morce's Gap, Jamaica, December 29, 1908, *W. A. & Edna L. Murrill 675*, and on Sir John Peak, Jamaica, 6,000 ft. elevation, January 5, 1909, *W. A. Murrill 819*.

11. ***Naucoria pellucida* sp. nov.**

Pileus thin, conic to plane, umbonate, 7 mm. broad; surface bay to latericeous on the umbo, testaceous and striate between the

umbo and the margin, dotted over the surface with translucent, gelatinous, pearly-white droplets or specks; lamellae adnexed, ventricose, distant, pale-testaceous, marked with droplets like those on the surface of the pileus; spores ellipsoid, finely echinulate, fulvous, $8 \times 5\mu$; stipe cylindric, equal, smooth, pallid above, bay below, guttate, 1 cm. long, 0.5 mm. thick.

Type collected on dead wood at New Haven Gap, Jamaica, 5,600 ft. elevation, January 4, 1909, *W. A. & Edna L. Murrill* 763. Whether the dots that cover the surface of this tiny species are the remains of a universal veil as in *Tubaria pellucida* or are droplets exuded from the plant under conditions of a maximum amount of moisture, it is impossible at this time to say.

12. *Naucoria Sacchari* sp. nov.

Pileus thin, subfleshy, convex to expanded, obtuse, 1–1.5 cm. broad; surface moist, subviscid, not striate, slightly floccose-scaly to glabrous, pale-fuscos, shading to nearly white on the margin; lamellae adnate, distant, nearly plane, rather broad, pale-fuscos; spores smooth, ellipsoid, ferruginous, $10\text{--}12 \times 7\text{--}8\mu$; stipe cylindric, hollow, floccose, concolorous, 3–4 cm. long, 1 mm. thick.

Type collected on rotting sugar-cane trash at Hope Gardens, Jamaica, October 31, 1902, *F. S. Earle* 322. The description is drawn from the very complete notes made by Professor Earle from the fresh specimens.

13. *Naucoria spinulifer* sp. nov.

Pileus hemispheric-umbonate with revolute margin, 2 cm. broad; surface innate-fibrillose, smooth, isabelline, testaceous on the umbo, cremeous at the margin; lamellae adnate, arcuate, of medium breadth and distance, dull purplish-isabelline; spores ellipsoid, smooth, ferruginous, $5\text{--}7 \times 3.5\text{--}4\mu$; cystidia hyaline, flask-shaped with short slender stalk and long cylindric neck, $10\text{--}15\mu$ thick, $30\text{--}50\mu$ long, including the stalk; stipe curved, cylindric, equal, subglabrous, stramineous above, fulvous below, 2.5 cm. long, 2.5 mm. thick.

Type collected on dead wood at Morce's Gap, Jamaica, 5,000 ft. elevation, December 30, 1908, *W. A. & Edna L. Murrill* 705.

14. *Naucoria tepeitensis* sp. nov.

Pileus very thin, convex, gregarious, reaching 12 mm. broad; surface smooth, whitish, hygrophanous, faintly striate over the

lamellae, margin entire, inrolled when young; lamellae free to adnate, whitish, dull, several times inserted, broad, distant, the edges white and slightly crenulate; spores subovoid, slightly flattened on one side, smooth, uninucleate, very pale melleous under the microscope, $6 \times 4\mu$; stipe crooked, arising from a mat of white mycelium, slightly enlarged above, smooth, glabrous, whitish, hygrophanous, 1 cm. long, about 1 mm. thick.

Type collected on a rotten log in a moist virgin forest in the Tepeite Valley, near Cuernavaca, Mexico, 7,000 ft. elevation, December 28, 1909, *W. A. & Edna L. Murrill* 485.

15. ***Naucoria Underwoodii*** sp. nov.

Pileus thin, rather fleshy, convex to expanded, scattered, 2 cm. broad; surface glabrous, hygrophanous, brownish, ochraceous when dry, the disk darker; lamellae adnexed, subcrowded, rather broad, subventricose, dull-fulvous; spores broadly ellipsoid, smooth, $8-9 \times 6-7\mu$; stipe crooked, slightly larger below, concolorous, hollow, subfibrillose, the apex floccose-fibrillose, 3 cm. long, 3 mm. thick.

Type collected on rotten wood on El Yunque, Cuba, 1,800 ft. elevation, March, 1903, *Underwood & Earle* 1237.

16. ***Naucoria xuchilensis*** sp. nov.

Pileus convex to plane, slightly depressed, solitary, 3.5 cm. broad; surface ochraceous, slightly fulvous at the center, subglabrous, even; lamellae adnate, broad, distant, inserted, fulvous; spores ovoid, smooth, uninucleate, ochroleucous, $7-9 \times 4-5\mu$; stipe cylindric, equal, glabrous, cremeous, 2 cm. long, 3 mm. thick.

Type collected in rich, low ground under coffee trees at Xuchiles, near Cordoba, Mexico, 1,500 ft. elevation, January 17, 1910, *W. A. & Edna L. Murrill* 1124.

DOUBTFUL SPECIES

Agaricus (*Naucoria*) *papularis* Fries, Nova Acta Soc. Sci. Upsal. III. 1: 225. 1851. Collected by Krebs in the island of St. Thomas. Types not found.

Naucoria sideroides (Bull.) Quél. Champ. Jura Vosg. 99. 1872. Reported by Berkeley from Wright's Cuban collections, but evidently a wrong determination.

Agaricus (Naucoria) arenicola Berk. (Fungi Zeyh. no. 6). Reported by Fries from Oersted's collections in Costa Rica, but very probably different from the South African species. Oersted's figures are unsatisfactory and no specimens are to be found.

Agaricus (Naucoria) cerodes Fries, Epicr. Myc. 195. 1838. Reported from Santo Domingo, but probably another case of incorrect determination.

Agaricus (Naucoria) copriniceps Berk. & Curt. Jour. Linn. Soc. 10: 290. 1868. Collected by Wright in Cuba. Spores too dark for *Naucoria*; probably a *Psathyra*, one of the brown-spored genera.

6. CORTINARIUS (Pers.) Roussel, Fl. Calvados ed. 2. 61. 1806

This very large and difficult temperate genus has been divided comparatively recently along the subgeneric lines laid down by Fries, but for our present purpose, where only one or two species are concerned, it seems best to retain the old name and to omit synonyms.

Cortinarius mexicanus sp. nov.

Pileus convex, solitary, 4 cm. broad; surface pallid with a lilac tint, ferruginous in places, slightly viscid when moist, margin even; lamellae slightly arcuate, adnexed or rarely free, close, regular, deep-lilac; spores boat-shaped, slightly one-sided at one end, regular, minutely echinulate, ferruginous, $11-12 \times 4-5\mu$; stipe shining-white with a lilac tint, this tint deepening above, cylindric, abruptly bulbous at the base, 5 cm. long, about 6 mm. thick; veil fibrillose, evanescent, soon ferruginous from the spores.

Type collected on humus in a moist virgin forest at Jalapa, Mexico, December 12-20, 1909, *W. A. & Edna L. Murrill* 197.

DOUBTFUL SPECIES

Cortinarius Sintenisii P. Henn. Engl. Jahrb. 17: 498. 1893. Collected by P. Sintenis on trunks in Porto Rico, and said by the author to be allied to *C. cinnamomeus*. The type specimens have not been examined.

7. *INOCYBE* (Fries) Quél. Champ. Jura Vosg. 151. 1872

A very large and difficult temperate genus having sinuate or adnexed lamellae and a silky or fibrillose pileus.

***Inocybe jamaicensis* sp. nov.**

Pileus convex with a prominent umbo, especially when young, gregarious, 2–3 cm. broad, 1.5 cm. thick; surface fulvous, minutely imbricate-fibrillose-scaly, margin fading to isabelline with age; lamellae adnate, dirty-white, distant, heterophyllous; spores irregular, angular or nodulose, nearly hyaline under the microscope, copious, $8-9 \times 5\mu$; cystidia turbinate, pointed at each end, $25 \times 17\mu$; stipe equal or slightly larger above, cylindric, avellaneous to brownish below, nearly white above, 3–4 cm. long, 3–5 mm. thick.

Type collected in a clay road at Cinchona, Jamaica, December 25–January 8, 1908–09, *W. A. & Edna L. Murrill* 595.

8. *HEBELOMA* (Fries) Quél. Champ. Jura Vosg. 334. 1872

This genus has a smooth and usually somewhat viscid cap, sinuate or adnexed lamellae, a fleshy stipe, and a slight, evanescent veil. It is well represented in temperate regions.

1. *Hebeloma Broadwayi* sp. nov.

Pileus fleshy, convex to expanded, 2–4 cm. broad; surface white, glabrous, subviscid, not striate; lamellae adnexed, crowded, rather narrow, white to ochraceous-fulvous, the edge white, crenulate; spores ochraceous-fulvous, ellipsoid, $12-14 \times 7-8\mu$; stipe cylindric, white, glabrous, hollow, 3–4 cm. long, 2–4 mm. thick.

Type collected along roadsides in lowlands at St. George's, Grenada, *W. E. Broadway*.

2. *Hebeloma cinchonense* sp. nov.

Pileus convex to expanded, umbonate, gregarious, 3–6 cm. broad, 1–2 cm. thick; surface pale-isabelline, rarely milky-white with a stramineous tinge, viscid, smooth, margin white, thin, straight, slightly cottony; context white, without characteristic taste; lamellae white, sinuate-adnexed, ventricose, broad; spores pip-shaped, smooth, with a single large, clear nucleus, pale-melleous under the microscope, $8 \times 4\mu$; stipe fleshy with a thin rind,



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