

DARK-SPORED AGARICS—II

GOMPHIDIUS AND STROPHARIA

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The first article of this series, published in MYCOLOGIA for March, 1922, dealt with the species of *Drosophila*, *Hypholoma*, and *Pilosace* occurring in the temperate regions of eastern North America. I shall take up now two genera having an annulus, in addition to a fleshy stipe; and these may easily be distinguished by the following key:

Lamellae decurrent, waxy; veil glutinous; spores black.	<i>Gomphidius</i>
Lamellae adnate or adnexed; veil membranous; spores purplish-brown.	<i>Stropharia</i>

GOMPHIDIUS Fries, Gen. Hymen. 8. 1836

This genus is distinguished by its glutinous veil; decurrent, waxy lamellae; and black, elongate spores. There are very few species and these occur mostly in temperate regions. The single tropical species, *G. jamaicensis*, is known only from Cinchona, Jamaica, at an altitude of 1,500 meters. *G. vinicolor* occurs in California; *G. oregonensis* is abundant on the Pacific coast; and *G. tomentosus* is rare; the last two species being known only from the coastal region.

Pileus reddish-brown, not blackening; context yellow; stipe yellowish-brown.	1. <i>G. viscidus</i>
Pileus purplish-brown or yellowish-brown, often black-spotted, but not blackening entirely; context white; stipe whitish.	2. <i>G. glutinosus</i>
Pileus pale-brownish-red, becoming entirely black on drying; stipe white, becoming black.	3. <i>G. nigricans</i>
Pileus dark-red, becoming blackish on drying; stipe vinous-red.	4. <i>G. vinicolor</i>
Pileus dull-brownish-pink, becoming black-spotted; stipe yellowish-brown.	5. <i>G. maculatus</i>
Pileus dingy-pink; stipe pale-yellow.	6. <i>G. flavipes</i>
Pileus whitish, sometimes tinged with red, becoming blackish at times; stipe whitish.	7. <i>G. furcatus</i>

1. *GOMPHIDIUS VISCIDUS* (L.) Fries, *Epier. Myc.* 319. 1838

Agaricus viscidus L. Sp. Pl. 1173. 1753.

Paxillus pubescens Ellis, *Bull. Torrey Club* 6: 76. 1876.

Pileus fleshy, convex, umbonate, 3–8 cm. broad; surface smooth, viscid, reddish-brown, not blackening; context compact, yellow; lamellae much branched, long decurrent, especially with age, rather broad, subcrowded, reddish-brown, sometimes slightly blackened in old specimens; spores subcylindric to subfusiform, smooth, translucent, uniguttulate, brownish, 16–23 x 5–8 μ ; stipe cylindric or tapering below, pale-brown with abundant yellowish-brown tomentum when young, rhubarb-colored within, solid, 4–5 cm. long, 4–10 mm. thick; veil not evident.

TYPE LOCALITY: Sweden.

HABITAT: On the ground in pine woods.

DISTRIBUTION: Eastern United States, New York to Alabama; also in Europe.

ILLUSTRATIONS: Hussey, *Ill. Brit. Myc.* 2: *pl.* 24; Pat. Tab. Fung. 2: *f.* 656; Richon & Roze, *Atl. Champ. pl.* 23, *f.* 7–10; Schaeff. Fung. Bavar. *pl.* 55; Sow. *Engl. Fungi pl.* 105.

2. *GOMPHIDIUS GLUTINOSUS* (Schaeff.) Fries, *Gen. Hymen.* 8. 1836

Agaricus glutinosus Schaeff. Fung. Bavar. Ind. 17. 1774.

Pileus fleshy, obtuse, 5–14 cm. broad; surface purplish-brown, often with black spots, sometimes yellowish-brown, never entirely blackening, glutinous; context white, soft, watery, with no distinctive odor; lamellae decurrent, forking, entire, easily separating, short, white to cinereous, sometimes dark-brown but not blackening, subcrowded, broad; spores dark-brown, smooth, fusiform, translucent, 17–23 x 4–6 μ ; cystidia cylindric; stipe cylindric or larger below, viscid, whitish, due to the dense coat of appressed fibrils, 4–9 cm. long, 8–15 mm. thick; veil heavy, glutinous, leaving an evident annulus.

TYPE LOCALITY: Bavaria.

HABITAT: On the ground in coniferous woods.

DISTRIBUTION: Northeastern North America; also in Europe.

ILLUSTRATIONS: Richon & Roze, *Atl. Champ. pl.* 23, *f.* 11–14; Ricken, *Blätterp. Deutschl. pl.* 3, *f.* 1; Schaeff. Fung. Bavar. *pl.* 36; Sow. *Engl. Fungi pl.* 7.

3. *GOMPHIDIUS NIGRICANS* Peck, Ann. Rep. N. Y. State Mus. 48:
110. 1897

Pileus convex or nearly plane, 2.5–5 cm. broad; surface pale-brownish-red, covered with a tough gluten which becomes black in drying; context firm, whitish; lamellae distant, decurrent, some of them forked, white, becoming smoky-brown, black in the dried plant; spores oblong-fusoid, $15\text{--}25 \times 6\text{--}7.5 \mu$; stipe subequal, longer than the diameter of the pileus, glutinous, solid, at first whitish, especially at the top, soon blackish by the drying of the gluten, whitish within, slightly tinged with red toward the base, 3.5–6 cm. long, 4–8 mm. thick.

TYPE LOCALITY: Westport, New York.

HABITAT: Under pine trees.

DISTRIBUTION: New England to Tennessee; also in Europe.

ILLUSTRATION: Atk. Stud. Am. Fungi *f.* 50, 51.

Good specimens are at Albany, attached to a herbarium sheet. According to Peck, the entire plant is black when dry because of a blackening gluten which covers it.

4. *GOMPHIDIUS VINICOLOR* Peck, Ann. Rep. N. Y. State Mus. 51:
291. 1898

Pileus thick, fleshy, convex or nearly plane, 2.5–6 cm. broad; surface viscid, dark-red, becoming blackish on drying; lamellae distant, decurrent, olive-brown or blackish when mature; spores oblong-fusiform, smooth, smoky-brown to black, $12\text{--}14 \times 3.5\text{--}4 \mu$; stipe subequal, glabrous, solid, vinous-red, paler within, 3–6 cm. long, 4–8 mm. thick.

TYPE LOCALITY: Lake Mohonk, New York.

HABITAT: On the ground in coniferous or mixed woods.

DISTRIBUTION: Eastern United States, New York to Alabama; also in California.

Good type specimens are to be seen on a sheet at Albany. The California plants are larger and have spores measuring about $17.5 \times 5 \mu$. Kauffman refers a small Michigan plant to this species as a variety and says that it may be necessary to separate it specifically because of its smaller size and smaller spores.

5. *GOMPHIDIUS MACULATUS* (Scop.) Fries, *Epicr. Myc.* 319.
1838

Agaricus maculatus Scop. *Fl. Carn.* ed. 2, 2: 448. 1772.

Pileus solitary to subcespitose, fleshy, convex, 4–8 cm. broad; surface viscid, dull-brownish-pink, becoming black-spotted; context thick, white; lamellae short-decurrent, thick, branched, of medium width, distant, at first whitish, then blackening; spores narrowly ellipsoid, smooth, pale-brown under the microscope, 18–23 x 8 μ ; stipe short, firm, equal, pale-brown, often blackening above, covered with a yellowish-brown tomentum, especially toward the base, yellowish-red within, 4–5 cm. long, 6–8 mm. thick; veil not evident.

TYPE LOCALITY: Carniola.

HABITAT: Among moss or debris in moist woods, especially under larch trees.

DISTRIBUTION: New York and Michigan; also in Europe.

ILLUSTRATION: Kauffm. *Agar. Mich.* pl. 23.

Specimens collected by Bresadola and myself in the Tyrol were described by me while fresh as follows: "Pileus viscid, smooth, glabrous, rosy-isabelline, spotted with black and becoming darker; lamellae rosy-isabelline when fresh, becoming smoky, distant, venose-connected, adnate or slightly decurrent; stipe lemon-yellow at the apex and pale-lemon-yellow at the base, smooth, glabrous, equal, concolorous, blackening like the pileus. A totally different plant from *G. viscidus*."

G. stillatus Strass., mentioned by Peck in Report 27 as occurring in the Adirondacks, should probably be referred to this species. According to Kauffman, *G. gracilis* Berk. & Br. is also probably not distinct.

6. *GOMPHIDIUS FLAVIPES* Peck, *Ann. Rep. N. Y. State Mus.* 54:
153. 1901

Pileus convex or nearly plane, 2–2.5 cm. broad; surface viscid, minutely tomentose in the center, slightly fibrillose on the margin, dingy-pink; context white; lamellae arcuate-decurrent, distant, whitish; spores oblong-fusiform, 22–30 x 6–8 μ ; stipe equal or somewhat narrowed below and pointed at the base, solid, slightly fibrillose, whitish at the apex, elsewhere pale-yellow both externally and internally, 4–6 cm. long, 6–8 mm. thick.

TYPE LOCALITY: Westport, New York.

HABITAT: In mixed woods.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Peck, Ann. Rep. N. Y. State Mus. 54: pl. 1, f. 1-4.

Specimens at Albany are small, black, and very unsatisfactory for comparison. According to Kauffman, this species may be a form of *G. maculatus*.

7. GOMPHIDIUS FURCATUS Peck, Bull. N. Y. State Mus. 5: 649.
1899

Pileus fleshy, convex or nearly plane, rarely somewhat umbonate, 2.5-5 cm. broad; surface glabrous, viscid, whitish, sometimes tinged with red, occasionally with blackish stains when old or becoming blackish when bruised; context white; lamellae thick, distant, decurrent, many of them forked, whitish, becoming sooty-brown; spores oblong or subfusiform, 15-20 x 6-8 μ ; stipe longer than the diameter of the pileus, rather slender, curved or flexuous, firm, solid, whitish, 3.5-7.5 cm. long, 3-6 mm. thick.

TYPE LOCALITY: Kasoag, New York.

HABITAT: Under or near tamarack trees in swamps.

DISTRIBUTION: New York.

Well represented at Albany by several good typical specimens on a sheet.

STROPHARIA (Fries) Quél., Champ. Jura Vosg. 110. 1872

Agaricus § *Stropharia* Fries, Monog. Hymen. Suec. 1: 409. 1857.

Geophila Quél. Ench. Fung. 111. 1886.

This rather large genus is distinguished by a fleshy stipe, adnate or adnexed lamellae, and the presence of an annulus, which last is somewhat uncertain at times because of its evanescent character. Several of the species grow on manure or manured ground and are widely distributed. The tropical species of this genus were treated in MYCOLOGIA for March, 1918, and the western species in MYCOLOGIA for November, 1912.

Pileus viscid or subviscid, glabrous, or slightly squamulose in two species.

Pileus ornamented with scattered, floccose scales.

Surface of pileus yellowish.

1. *S. distans*

Surface of pileus greenish.

2. *S. acuminata*

- Pileus glabrous, usually some shade of yellow.
- Pileus 1-5 cm. broad.
- Pileus decidedly umbonate. 3. *S. umbonatescens*
- Pileus pallid, pale-tan on the disk. 4. *S. anellariformis*
- Pileus not as above.
- Stipe rather short and thick.
- Stipe 6-7 mm. thick. 5. *S. melanosperma*
- Stipe 3-5 mm. thick. 6. *S. coronilla*
- Stipe rather long and slender.
- Stipe dry. 7. *S. siccipes*
- Stipe viscid.
- Pileus remaining hemispheric. 8. *S. semiglobata*
- Pileus more or less expanding. 9. *S. adnata*
- Pileus 4-15 cm. broad.
- Stipe nearly glabrous. 10. *S. caesiospora*
- Stipe conspicuously revolute-scaly. 11. *S. depūata*
- Pileus not viscid, glabrous, never squamulose.
- Surface of pileus whitish or yellowish.
- Parasitic on *Coprinus*. 12. *S. epimyces*
- Not parasitic in habit.
- Pileus 5-8 cm. broad. 13. *S. campestris*
- Pileus 2-5 cm. broad.
- Lamellae bluish-brown. 14. *S. caesifolia*
- Lamellae purplish-brown. 15. *S. bilamellata*
- Surface of pileus some shade of brown.
- Pileus 1-4 cm. broad.
- Pileus brown, very thin. 16. *S. tenuis*
- Pileus subcinnamon-colored, fading to ochraceous. 17. *S. merdaria*
- Pileus rich-reddish-brown. 18. *S. subbadia*
- Pileus 5-15 cm. broad.
- Lamellae whitish when young. 19. *S. rugoso-annulata*
- Lamellae violet when young. 20. *S. elegans*

I. STROPHARIA DISTANS (Pers.) Morgan, Jour. Myc. 14: 75.
1908

Agaricus distans Pers. Neues Mag. Bot. 1: 103. 1794.

Agaricus squamosus Pers. Syn. Fung. 409. 1801; not *A. squamosus* Schaeff. 1774.

Agaricus subcernuus Schum. Enum. Pl. Saell. 2: 255. 1803.

Stropharia squamosa Quél. Champ. Jura Vosg. 337. 1872.

Pileus fleshy, thin, convex to plane, 3-7 cm. broad; surface subviscid to dry, with concentric, superficial, floccose scales, avella-

neous-isabelline, ochraceous on the umbo; lamellae adnate or sinuate, crowded, fuliginous at maturity, white on the edges; spores oblong-ellipsoid, pale-umbrinous under the microscope, opaque, $10-14 \times 6-7 \mu$; stipe slender, tough, stuffed or hollow, yellowish or ferruginous, squamose-villose below the annulus, 6-12 cm. long, 4-6 mm. thick; annulus ample, persistent, distant.

TYPE LOCALITY: Europe.

HABITAT: On the ground or humus in woods, fields, and gardens.

DISTRIBUTION: Northeastern United States, south to North Carolina, and west to Minnesota; also in Europe.

ILLUSTRATIONS: Berk. Outl. Brit. Fungol. *pl.* 10, *f.* 6; Cooke, Brit. Fungi *pl.* 553 (560); Lucand, Champ. Fr. *pl.* 190; Ricken, Blätterp. Deutschl. *pl.* 63, *f.* 1.

I have specimens from Romell and Bresadola and made a collection in Kew Gardens of a number of plants growing on a mixture of humus and manure. Peck's specimens at Albany collected by him in the Catskills agree with mine from Europe.

In his 44th Report, Peck mentioned specimens collected near Salamanca that were colored a beautiful orange-red, which he considered a variety of *Stropharia squamosa* and "apparently equivalent to *Agaricus thraustus* var. *aurantiacus* of Cook's Illustrations." There are also at Albany specimens collected in Indiana by J. M. Van Hook (*No.* 2558) with the following notes:

"Pileus 6 cm. broad, orange-rufous (Ridgway), dotted with few scattered, light-yellow scales, flesh white, slightly reddish immediately beneath cuticle, not viscid (at least when dry), fleshy, flesh thin near margin, thick at center, slightly umbonate. Gills becoming dark-seal-brown. Spores purple-brown, $5-7 \times 12-14 \mu$. Stipe equal, reaching 11 cm. long, somewhat tapering at base, above ring white and finely scaly upward, below ring darker colored with scales color of pileus. Ring complete. Stipe stuffed."

I have good specimens of the same variety collected at Kittanning, Pennsylvania, by Mr. Sumstine, and at Shingletown Gap, Pennsylvania, by Dr. Overholts (*No.* 3446). Accompanying the latter are the following notes:

"Pileus 4-8 cm. broad, convex then plane, 'zinc-orange' or 'orange-cinnamon' (Ridgway), sometimes radiate-rugose at the center and slightly umbonate, with 2 or 3 concentric rows of white appressed separable scales near the margin, these later disappearing, dry; margin at first appendiculate with

veil fragments; flesh whitish or somewhat concolorous, taste mild; gills medium-close or slightly distant, spotted, at first gray-slate color, later gray-black, squarely adnate or with a slight decurrent tooth, 4-8 mm. broad; stem long and slender, light-brown, pruinose above the annulus, with conspicuous white scales below, equal or slightly enlarged below, hollow, 8-15 cm. long, 3-6 mm. thick; annulus well developed, superior, becoming black above from the spores."

2. *Stropharia acuminata* (Scop.) comb. nov.

Agaricus acuminatus Scop. Fl. Carn. ed. 2, 2: 447. 1772.

Agaricus viridulus Schaeff. Fung. Bavar. Ind. 1. 1774.

Agaricus aeruginosus Curt. Fl. Lond. 70. 1788.

Stropharia aeruginosa Quél. Champ. Jura Vosg. 110. 1872.

Pileus gregarious or subcespitose, fleshy, convex to plane, sub-umbonate, 5-10 cm. broad; surface verdigris-green, then yellowish, covered with mucus, with separable viscid pellicle, sometimes dotted with scattered white scales, especially on the margin; context soft, whitish or tinged with blue; lamellae adnate or sinuate, rather broad, crowded, pallid to grayish, at length purplish-brown, whitish-flocculose on the edges; spores ovoid or ellipsoid, smooth, subhyaline with a faint yellowish-brown tint under the microscope, 7-10 x 4-5 μ ; stipe equal, hollow, viscid, scaly below the annulus, bluish, 5-8 cm. long, 5-12 mm. thick; annulus distant, rather evanescent.

TYPE LOCALITY: Carniola.

HABITAT: On the ground among leaves or in woods; also in fields in moist regions of Europe.

DISTRIBUTION: Rare from New England to South Carolina and west to California; abundant in Europe.

ILLUSTRATIONS: Bull. Herb. Fr. *pl.* 530, *f.* 1; Cooke, Brit. Fungi *pl.* 551 (555); Curt. Fl. Lond. *pl.* 309; Gill. Champ. Fr. *pl.* 132 (650); Hussey, Ill. Brit. Myc. 1: *pl.* 35; Pat. Tab. Fung. *f.* 231; Schaeff. Fung. Bavar. *pl.* 1; Sow. Engl. Fungi *pl.* 264; Trans. Wisc. Acad. Sci. 17: *pl.* 64.

This very attractive species is rare in the United States, but I have found it abundant in Sweden, England, and other parts of Europe.

3. *STROPHARIA UMBONATESCENS* (Peck) Sacc. Syll. Fung. 5:
1021. 1887

Agaricus umbonatescens Peck, Ann. Rep. N. Y. State Mus. 30:
41. 1878.

Pileus at first conic, subacute, then expanded and umbonate, gregarious, 1–2.5 cm. broad; surface smooth, glabrous, viscid, yellow, the umbo inclining to reddish; context thin, pallid, with a fetid odor; lamellae adnate to slightly decurrent, crowded, plane, broad, at length ventricose, whitish or gray to blackish-brown, with a slight olivaceous tint; spores ellipsoid, smooth, purplish-brown under the microscope, $15\text{--}19 \times 10 \mu$; stipe equal, slender, stuffed to hollow, pallid with a yellowish tint, 5–10 cm. long; annulus scanty, fugacious.

TYPE LOCALITY: Schenevus, New York.

HABITAT: On manure in pastures.

DISTRIBUTION: Massachusetts, New York, and Michigan; probably also in Europe.

ILLUSTRATIONS: Kauffm. Agar. Mich. *pl.* 51, *f.* 1; Trans. Wisc. Acad. Sci. 17: *pl.* 65, *f.* B. Compare Kalchb. Ic. Hymen. Hung. *pl.* 16, *f.* 2.

The real type of this species was collected at Schenevus. Certain other specimens so named at Albany are distinct. Sterling's specimens are wrongly named; Morris's, from Massachusetts, are correct. Kauffman says it is not infrequent in Michigan, having large spores and a rather fetid odor, and being near to *S. paradoxa* P. Henn. in shape. Harper suggests that it may be *Stropharia mammillata* Kalchb., a species published in 1874. I have specimens of this from Bresadola and they certainly look like our plant. Manure-inhabiting fungi have a way of getting about and turning up almost anywhere.

4. *Stropharia anellariformis* sp. nov.

Pileus thick, convex, obtuse, 2 cm. broad; surface viscid, smooth, not striate, pallid, pale-tan on the disk; lamellae decurrent, subdistant, broad, pale-tan to fuscous, with a purplish tint; spores broadly ellipsoid or ovoid, slightly apiculate, dark-purplish-brown under the microscope, $9\text{--}10 \times 7\text{--}8 \mu$; stipe subcylindric, larger toward the apex, atomaceous above, fibrillose below, dry, solid, concolorous, 4–5 cm. long, 2–3 mm. thick; annulus persistent, distant 1 cm. from the pileus.

TYPE LOCALITY: New Orleans, Louisiana.

HABITAT: On manure.

DISTRIBUTION: Known only from the type locality.

Type collected by F. S. Earle (43) on September 4, 1908. The species suggests *Anellaria fimiputris* and the spores resemble those of *Anellaria* and *Campanularius* in form but are lighter in color, staining the lamellae purplish-brown rather than black.

5. STROPHARIA MELANOSPERMA (Bull.) P. Karst. Bidr. Finl. Nat. Folk 32: 489. 1879

Agaricus melaspermus Fries, Epicr. Myc. 219. 1838.

Pileus fleshy, soft, convex to plane, obtuse, 3.5-4.5 cm. broad; surface smooth, glabrous, slightly viscid, often areolate, white, straw-colored on the disk; lamellae slightly adnexed, crowded, ventricose, pallid to cinereous, then violet-black; spores ovoid, fuscous, 10 x 6 μ ; stipe equal, glabrous, hollow, white, 4-6 cm. long, 6-7 mm. thick; annulus membranous, white.

TYPE LOCALITY: Europe.

HABITAT: On manure or manured ground in the open or partially shaded.

DISTRIBUTION: New England, New York, Texas, Costa Rica, etc.; also in Europe.

ILLUSTRATIONS: Bres. Fungi Trid. *pl.* 61; Cooke, Brit. Fungi *pl.* 536 (559); Pat. Tab. Fung. *f.* 555; Schaeff. Fung. Bavar. *pl.* 51; Quél. Champ. Jura Vosg. *pl.* 24, *f.* 3; Bull. Champ. Fr. *pl.* 540, *f.* 1.

Specimens so named are at Albany, collected by Burnham on lawns in Albany in August, 1905. Similar plants were found by me at Lake Placid, growing scattered under a white pine tree in the open, and I described them as follows: "Pileus semiglobose, 5 cm. broad; surface smooth, glabrous, dry when found, pure-white, becoming slightly yellow in spots on drying; context white, firm, eaten by snails; lamellae sinuate-adnate, crowded, plane, 3-4 times inserted, pure-white at first, notched on the edges; stipe equal, dry, apparently solid, fibrillose-scaly, finely frosted above the tiny, apical ring-trace, 7 cm. long, 7 mm. thick; veil slight, white, evanescent."

Specimens from Bresadola resemble *S. bilamellata* in general shape and have dark-colored lamellae with spores that are broadly ellipsoid, smooth, umbrinous under the microscope, reminding one of *Panaeolus* in shape, slightly apiculate, about 10-12 x 7-8 μ .

Bulliard's figures show the gills of young plants to be nearly white, becoming practically black when colored by the matured spores. He did not describe the species and I do not find it in DeCandolle's treatment of Bulliard's plants. Fries, according to Bresadola, confused it with Bulliard's *A. coronilla*. The original spelling was *A. melanospermus*, although practically every author using the name since Bulliard's time has abbreviated it to *A. melaspermus*. *A. bulbularis* Batsch has been called a synonym, but his figure is quite different from Bulliard's and shows no annulus at all.

6. STROPHARIA CORONILLA (DC.) Quéf. Champ. Jura Vosg. 237.
1872

Agaricus coronilla DC. Fl. Fr. 2: 202. 1805.

Pileus hemispheric to convex, at length expanded, 2-4 cm. broad; surface glabrous, slightly viscid, smooth, whitish or ochraceous, even and whitish-floccose or appendiculate on the margin; context white, firm, with a slight, unpleasant odor; lamellae adnate or sinuate, rather broad, crowded, pallid to dark-violet and at length purplish-black, the edges whitish-fimbriate; spores ellipsoid or ovoid, smooth, violet-purple under the microscope, 8-12 x 4-6 μ ; stipe equal or slightly tapering upward, dry, smooth, white or slightly yellowish, solid to hollow, flocculose above the annulus, fibrillose below, becoming shining, 3-4 cm. long, 3-5 mm. thick; annulus distant, striate above, white, persistent.

TYPE LOCALITY: France.

HABITAT: On the ground in pastures, gardens, or woods.

DISTRIBUTION: Infrequent in the northeastern United States westward to Wisconsin and Kansas; also in Europe.

ILLUSTRATIONS: Bull. Herb. Fr. *pl.* 597, *f.* 1; Cooke, Brit. Fungi *pl.* 535 (558); Pat. Tab. Fung. *f.* 232; Ricken, Blätterp. Deutschl. *pl.* 63, *f.* 5; Trans. Wisc. Acad. Sci. 17: *pl.* 65, *f.* A.

EXSICCATI: Ellis & Ev. N. Am. Fungi 3511.

Peck thought his *S. bilamellata* might be this species. According to Kauffman, *S. melanosperma* is not very different; and Saccardo and Ricken say that *S. obdurata* is the same. Specimens collected by Bartholomew in Kansas appear to agree with authentic material from Bresadola and with specimens collected by me in Europe.

7. STROPHARIA SICCIPES P. Karst. Medd. Soc. Faun. Fl. Fenn. 9:
46. 1882

Pileus subfleshy, hemispheric to expanded, obtuse, orbicular, 2-3 cm. broad; surface glabrous, viscid, clay-white, yellowish on drying, even or pellucid-striate on the margin; lamellae adnate-subdecurrent, clay-colored to fuscous; spores ellipsoid, pellucid-brown, 12-15 x 7-9 μ ; stipe flexuous or strict, subfibrillose, flocculose above the annulus, dry, stuffed or hollow, pallid, 4-7 cm. long, 2 mm. thick; annulus incomplete, dry, distant, subfloccose or pruinose.

TYPE LOCALITY: Finland.

HABITAT: On manure or manured ground.

DISTRIBUTION: Northeastern United States westward to Minnesota; also in Europe.

ILLUSTRATIONS: Trans. Wisc. Acad. Sci. 17: pl. 66, f. D, E, & F; 18: pl. 18, f. I.

Peck described a variety of this species as *S. siccipes radicata* in Mus. Bull. 67: 37. 1903, based on long-radiculate specimens collected by Earle in June in the New York Botanical Garden. Harper described and figured both the species and the radicate variety. Karsten considered it a form of *Stropharia semiglobata*.

8. STROPHARIA SEMIGLOBATA (Batsch.) Quél. Champ. Jura Vosg.
112. 1872

Agaricus semiglobatus Batsch, Elench. Fung. Contin. 1: 141.
1786.

Pileus fleshy, subglobose to hemispheric, not expanding, gregarious to subcespitose, 1-4 cm. broad; surface light-yellow, smooth, glabrous, very viscid when moist; context pallid, soft; lamellae adnate, very broad, white or olive-gray, soon clouded with the ripening spores; spores ellipsoid, smooth, purplish-brown, 12-18 x 7-10 μ ; cystidia on edges of lamellae 30-45 x 3-4 μ ; stipe slender, cylindric, light-yellow, smooth, viscid, 6-9 cm. long, 2-4 mm. thick; veil glutinous when moist, leaving an incomplete, superior ring.

TYPE LOCALITY: Germany.

HABITAT: On manure or manured ground in fields or open woods.

DISTRIBUTION: Throughout temperate North America and Europe, and at high elevations in the tropics.

ILLUSTRATIONS: Atk. Stud. Am. Fungi f. 30; Batsch, Elench. Fung. f. 110; Bull. U. S. Dept. Agr. 175: pl. 25, f. 2; Cooke, Brit. Fungi pl. 539 (567); Curt. Fl. Lond. pl. 194 (as *A. glutinosus*); Hard, Mushr. f. 260; Hussey, Ill. Brit. Myc. 1: pl. 39, f. 2; Mycologia 4: pl. 56, f. 3; Palmer, Mushr. Am. pl. 12, f. 3, 4; Pat. Tab. Fung. f. 234; Ricken, Blätterp. Deutschl. pl. 63, f. 2; Sow. Engl. Fungi pl. 248; Trans. Wisc. Acad. Sci. 18: pl. 18, f. A-H.

A very common and easily recognized species. The spores vary considerably in size. Harper says there is a sterile form which differs only in having the gills white, unchanging, because there are no spores to blacken them. He gives an illustration of it.

9. *Stropharia adnata* (Huds.) comb. nov.

Agaricus adnatus Huds. Fl. Angl. ed. 2, 619. 1778.

Agaricus stercorarius Schum. Enum. Pl. Saell. 2: 286. 1803;
not *A. stercorarius* Bull. 1781.

Stropharia stercoraria Quéf. Champ. Jura Vosg. 112. 1872.

Hypholoma pecosense Cockerell, Jour. Myc. 10: 108. 1904.

Pileus solitary or gregarious, hemispheric to expanded, 2-5 cm. broad; surface smooth, glabrous, viscid, often cracking on drying, whitish or some shade of light-yellow, margin even; context soft, white or yellowish, slightly bitter; lamellae adnate with decurrent tooth, very broad, crowded, white to brownish or greenish-black, whitish-flocculose on the edges; spores smooth, elongate-ellipsoid, violet-purple under the microscope, blackish-brown in mass, 16-20 x 10-12 μ ; stipe elongate, equal or enlarged at the base, stuffed to hollow, subviscid, flocculose-scaly below the annulus, pruinose above, 8 cm. or more long; annulus distant, slight, evanescent.

TYPE LOCALITY: England.

HABITAT: On manure.

DISTRIBUTION: Temperate regions of North America; also in Europe.

ILLUSTRATIONS: Cooke, Brit. Fungi pl. 538 (566); Trans. Wisc. Acad. Sci. 17: pl. 67.

Similar to *S. semiglobata* in habit and appearance, but gills becoming brownish-black or greenish-black instead of cloudy-black, and spores usually lighter in color, appearing olivaceous under a microscope. The cap is also not so persistently hemispheric as in

S. semiglobata. The two species approach each other very closely at times.

10. STROPHARIA CAESIOSPORA Kauffm. *Mycologia* 9: 166. 1917

Pileus convex, obtuse, firm or slightly elastic, gregarious, 4-9 cm. broad; surface chamois to honey-yellow (Ridg.), subviscid, even; margin somewhat crenate-lobed; context white, rather thick and compact, thin on the margin; lamellae crowded, narrow, adnexed-emarginate, at length rounded behind, heterophyllous, drab to hair-brown or ashy-gray; spores minute, ovoid, smooth, with a purplish-cinereous tint under the microscope, ashy in mass with a tint of purple, $5-6 \times 3-4 \mu$; stipe equal or slightly bulbous at the base, whitish, slightly lacerate above the annulus, stuffed to solid, fibrillose-glabrescent, 4-9 cm. long, 6-12 mm. thick; annulus persistent, membranous, flocculose below, striate-ridged above, becoming gray from the spores.

TYPE LOCALITY: Elkmont, Tennessee.

HABITAT: On the ground among debris in chestnut and conifer mixed woods.

DISTRIBUTION: Found several times in the vicinity of Elkmont.

11. STROPHARIA DEPILATA (Pers.) Sacc. *Syll. Fung.* 5: 1012.
1887

Agaricus depilatus Pers. *Syn. Fung.* 408. 1801.

? *Stropharia Hardii* Atk. *Jour. Myc.* 12: 194. 1906.

Pileus solitary or gregarious, convex to plane, obtuse, 4-15 cm. broad; surface glabrous, viscid, livid-yellow to cinnamon; margin even, often appendiculate; context firm, whitish, with somewhat disagreeable taste and no odor; lamellae rather crowded, adnate-decurrent, broad, white to purplish-black; spores ellipsoid, smooth, dark-gray with a purplish tint under the microscope, $9-14 \times 5-8 \mu$; stipe equal, solid to hollow, revolute-scaly below the annulus, floccose-scaly above, white to pale-yellow, 6-20 cm. long, 1-1.5 cm. thick; annulus distant, ample, scaly, white, persistent.

TYPE LOCALITY: Europe.

HABITAT: On much-decayed wood or humus in woods.

DISTRIBUTION: Northeastern United States westward to Michigan; also in Europe.

ILLUSTRATION: *Trans. Wisc. Acad. Sci.* 17: pl. 62, 63.

Specimens from Bresadola and Romell are in the Garden herbarium. Plants collected by me late in August on humus under a pine log in Maine, where I obtained several collections, had a "pale, dull-yellow cap, which was viscid when fresh; white, appendiculate margin; stipe and edges of gills pure-white." I also found it twice in deep, rich woods in the Adirondacks. Peck's specimens were at first referred to *Agaricus Hornemanni*, which was Fries's name for this species before he adopted that of Persoon. *Stropharia Hardii*, according to Harper, is probably this species, although the spores are described as smaller. I have not seen the types.

12. STROPHARIA EPIMYCES (Peck) Atk. Plant World 10: 128.
1907

Panaeolus epimyces Peck, Ann. Rep. N. Y. State Mus. 35: 133.
1884.

Stropharia coprinophila Atk. Jour. Myc. 8: 118. 1902.

Pileus fleshy, at first subglobose, then convex to expanded, 2-6 cm. broad; surface white, then dingy, silky-fibrillose; context soft, white or whitish, with mild odor and taste; lamellae adnexed, rounded behind, somewhat crowded, dingy-white, becoming brown or blackish, with white edges; spores ellipsoid, smooth, dark-purplish-brown under the microscope, almost black in mass, 7-8.5 x 4-6 μ ; cystidia clavate or subventricose, on a slender stalk, 40-60 x 10-14 μ ; stipe short, stout, tapering upward, strongly striatulate and minutely mealy or pruinose, solid in the young plant, hollow in the mature plant, but with the cavity small, white-annulate near the base from the white, floccose veil, 2.5-7 cm. long, 5-15 mm. thick.

TYPE LOCALITY: North Greenbush, New York.

HABITAT: Parasitic in groups on *Coprinus comatus*, *C. atramentarius*, and perhaps other species of the genus.

DISTRIBUTION: Northeastern North America, Canada to New York and west to Minnesota; perhaps also in Europe.

ILLUSTRATIONS: Plant World 10: f. 22-24; Hard, Mushr. f. 227; Jour. Myc. 2: pl. 80; Mycologia 8: pl. 178, f. C, D; pl. 179, f. A, B.

Interesting studies have recently been made of this rather queer species by Harper, Atkinson, Kauffman, and McDougall. Harper

calls attention to Lanzi's figures of *Pilosace algeriensis* as closely resembling our plant. Kauffman, as well as McDougall, says our plant is not a *Pilosace*, and he keeps it in *Stropharia* where Atkinson placed it. Specimens growing on *Coprinus comatus* were sent me in 1915 by Mr. Boughton, of Pittsford, New York, but they were not in good shape for study. My notes on them read: "Pileus cream-colored, 6 cm. broad; context white, taste mild; lamellae like those of *Agaricus campestris* in appearance: stipe white, 5 cm. long, 1.4 cm. thick. Not a *Panaeolus*, but like *Agaricus* without a ring." These would seem to agree with Harper's latest conclusions, but not with McDougall's.

13. *Stropharia campestris* Peck ms.

Pileus convex to plane or nearly so, gregarious, 5–8 cm. broad; surface smooth, moist when fresh, yellowish-white or cream-colored, becoming darker on drying; context compact, yellowish-white, with farinaceous or slightly bitter taste; lamellae thin, adnate, slate-colored tinged with violaceous, becoming blackish-brown tinged with purple; spores ellipsoid, purplish-brown, 10–12 x 6–8 μ ; stipe equal or slightly bulbous at the base, solid, annulate, white, 2.5–5 cm. long, 4–10 mm. thick.

TYPE LOCALITY: Morrisville Island, Pennsylvania.

HABITAT: On grassy ground.

DISTRIBUTION: New York and Pennsylvania.

According to Mr. Sterling, the bitter taste is destroyed by cooking and the mushroom is edible and better in flavor than *Agaricus campester*, for which it is sometimes mistaken and from which it may be separated by its adnate, not free, gills. The gills are at first concealed by the white veil, which finally ruptures and adheres partly to the margin of the pileus and partly to the stem. It is closely related to *Stropharia caesifolia*, from which it differs in the color of the gills and possibly in flavor.

The above description and notes made by Dr. Peck were kindly furnished me by Dr. House. The type of this species was collected in August, 1905, by E. B. Sterling. I also have plants collected by L. M. Underwood on the Columbia Campus in October, 1899.

14. STROPHARIA CAESIFOLIA Peck, Bull. Torrey Club 22: 489
1895

Pileus convex, 2.5–5 cm. broad; surface glabrous, white or whitish, sometimes brownish on the disk; lamellae close, rounded or emarginate behind, light-blue becoming dingy-bluish-brown; spores subellipsoid, 10–12.5 x 6–7.5 μ ; stipe equal or slightly thickened at the base, solid, glabrous, white or whitish, 2.5–4 cm. long, 4–6 mm. thick; annulus white.

TYPE LOCALITY: Rockport, Kansas.

HABITAT: In low sandy pastures.

DISTRIBUTION: Known only from the type locality.

A portion of the type is in the Garden herbarium. Bartholomew remarks that this species is much like the common mushroom, except that its gills have a fine light-blue color instead of pink. In the dried specimens they are dingy-grayish-blue, inclining to brown.

15. STROPHARIA BILAMELLATA Peck, Bull. Torrey Club 22: 204.
1895

Pileus fleshy, convex, becoming nearly plane in large plants, obtuse, 2.5–5 cm. broad; surface even, whitish or yellowish, glabrous; context pure-white; lamellae thin, close, adnate, purplish-brown in mature plants; spores ellipsoid, purplish-brown, 10 x 5–6 μ ; stipe commonly short, solid, sometimes hollow in large plants, white, annulate, 2.5 cm. long, 6–8 mm. thick; annulus well-developed, pure-white, striately lamellate on the upper edge.

TYPE LOCALITY: Pasadena, California.

HABITAT: In grass in streets or in cultivated fields.

DISTRIBUTION: New York to Alabama; also in California.

ILLUSTRATION: Bull. N. Y. State Mus. 122: pl. 112, f. 5–10.

Described from California, but found also at a few places in the eastern United States. Mr. B. C. Williams collected it at Newark, New York; Braendle at Washington, D. C.; Coker at Chapel Hill, North Carolina; and Earle at Auburn, Alabama. When Peck received Braendle's specimens, he revised his description. The species resembles *S. coronilla*.

16. *Stropharia tenuis* sp. nov.

Pileus convex, subumbonate, thin, 2.5 cm. broad; surface dry, with delicate, floccose patches, faintly striate, brown; lamellae ad-

nexed, crowded, of medium width, subconcolorous; spores broadly ellipsoid, obtuse at both ends, smooth, dark-purplish-brown under the microscope, $7 \times 5 \mu$; stipe slender, fragile, tapering upward, enlarged at the base, glabrous, silky, hollow, concolorous but slightly paler, 7 cm. long, 2-3 mm. thick; annulus distant 2.5 cm. from the pileus, ample, persistent.

TYPE LOCALITY: Chalmitte, New Orleans, Louisiana.

HABITAT: On the ground in wet woods.

DISTRIBUTION: Vicinity of New Orleans, Louisiana.

Collected by F. S. Earle, *No. 116* (type), September 8, 1908; also on September 7, 1908, *No. 101*. A thin, fragile plant resembling certain species of *Drosophila*, but having an ample, persistent annulus. The color of the pileus in dried specimens varies from avellaneous to umbrinous or fuliginous; the stipe and annulus being nearly white.

17. STROPHARIA MERDARIA (Fries) Quéf. Champ. Jura Vosg.
III. 1872

Agaricus merdarius Fries, Syst. Myc. 1: 291. 1821.

Pileus gregarious, convex to plane, obtuse, 3-4 cm. broad; surface glabrous, moist, hygrophanous, becoming striatulate, subcinnamon-colored when moist, ochraceous when dry; lamellae adnate, broad, yellowish to umbrinous; spores globose to ellipsoid, brownish-black, $12-17 \times 6-9 \mu$; stipe tough, short, stuffed or hollow, dry, flocculose, pallid, 2.5 cm. or more long; annulus lacerate, fugacious; veil often appendiculate.

TYPE LOCALITY: Sweden.

HABITAT: On manure.

DISTRIBUTION: North central United States; also in Europe.

ILLUSTRATIONS: Cooke, Brit. Fungi *pl. 537* (565); Fries, Ic. Hymen. *pl. 130, f. 3*; Lucand, Champ. Fr. *pl. 139*; Ricken, Blätterp. Deutschl. *pl. 66, f. 1*.

I have excellent material collected by Romell and myself in Sweden, in which the spores are elongate-ellipsoid, smooth, opaque, yellowish under the microscope, reaching $17 \times 9 \mu$. Harper describes and figures what he considers *S. submerdaria* Britz., and says that Morgan refers it to *S. merdaria* as a variety. Kauffman finds this species in Michigan and follows Karsten in placing it in *Psilocybe*, since the stipe is described as tough.

18. *Stropharia subbadia* sp. nov.

Pileus rather fleshy, convex to nearly plane, solitary or gregarious, 1–2 cm. broad; surface smooth, dry, rich-reddish-brown, lighter on the margin, which is not striate, covered with an evanescent yellowish tomentum when young; lamellae sinuate, sub-ventricose, not crowded, rather broad for the size of the plant, whitish to dark-cinereous, at length purplish-brown, entire and whitish on the edges; spores ellipsoid, smooth, pale-purplish-brown under the microscope, about $7.5\text{--}8.5 \times 5.5 \mu$; stipe short, of medium thickness, equal, fibrillose-scaly, especially below, tawny-white, 2–3 cm. long, 2–3 mm. thick; veil slight, white, mostly becoming distributed along the stipe instead of forming a definite annulus.

TYPE LOCALITY: Auburn, Alabama.

HABITAT: On the ground in dry pastures.

DISTRIBUTION: Vicinity of Auburn, Alabama.

This may belong to *Drosophila*; a study of fresh plants is needed. Dried specimens suggest dried specimens of *S. coronilla*, but are differently colored and lack the ample, persistent annulus. The types were collected by F. S. Earle on October 16, 1900. Also collected by him on October 14, 1900, near the type locality in a close-cropped pasture of Bermuda grass.

19. *Stropharia rugoso-annulata* Farlow ms.

Pileus fleshy, hemispheric to convex, 5–15 cm. broad; surface glabrous or at times slightly and innately fibrillose on the margin, chestnut-colored, becoming paler on drying; context firm, thin, whitish, with mild taste; lamellae thin, crowded, wider than the thickness of the pileus, adnate, whitish when young, becoming dark-brown or almost black with age; spores ellipsoid, dark-brown, $10\text{--}12 \times 6\text{--}8 \mu$; stipe equal or slightly tapering upward, spongy within, sometimes becoming hollow with age, whitish, silky-fibrillose, with mycelium at the base at times, 5–8 cm. long, 10–12 mm. thick; annulus whitish, appearing double, the lower membrane radiately splitting on the margin.

TYPE LOCALITY: Newton, Massachusetts.

HABITAT: Rich, cultivated grounds.

DISTRIBUTION: Massachusetts.

Two collections are at Albany, one from George E. Morris and the other from G. B. Fessenden. I have specimens collected by Morris in a corn field at Waban, Massachusetts, September 13,

1905. The descriptive notes were kindly supplied in manuscript by Dr. House.

20. *Stropharia elegans* sp. nov.

Pileus fleshy, convex to plane, upturned at the margin in dried specimens, solitary, 5–10 cm. broad; surface dry or slightly moist, nearly smooth, glabrous, subshining, umbrinous, tinged with light-brown in younger stages, becoming isabelline-ochraceous-melleous at maturity; context white, very thin, except at the center, without characteristic odor, taste mild and peculiar, like some bulbs; lamellae adnexed, arcuate, crowded, rather narrow, entire and concolorous on the edges, dark-smoky to dark-violet, at length purplish-fuliginous; spores ovoid, smooth, umbrinous under the microscope, about 10–12 x 7–8 μ ; stipe slender, tapering decidedly upward from a bulbous base, glabrous, solid, white, smooth, and shining above the annulus, cream-colored below and longitudinally striate just below and near the annulus, 10–12 cm. long, 2–3 cm. thick at the base, 5–10 mm. thick at the apex; annulus large, membranous, white or slightly yellowish, fixed, distant about 3 cm. from the pileus, lobed on the margin.

TYPE LOCALITY: New York Botanical Garden, New York City.

HABITAT: In rich, low, partly shaded soil.

DISTRIBUTION: Known only from the type locality.

Collected on September 12, 1912, by Miss Mary E. Eaton and drawn in color by her. She found larger specimens at the same spot on September 16, 1912. A very beautiful plant, with brownish-umber cap, dark-violet gills, and a yellow stipe which tapers upward decidedly from a bulbous base.

DOUBTFUL AND EXCLUDED SPECIES

Stropharia albocyanea (Desmaz.) Quéf. Champ. Jura Vosg. 236. 1872. According to Harper, this species occurs with us, being smaller than *S. aeruginosa* and having a white, dry stipe. Morgan referred to it as *S. pseudocyanea* (Letell.). Peck's specimens so named, from North River, New York, and those collected by Simon Davis at North Bethlehem, New Hampshire, differ from each other and from Bresadola's specimens.

Stropharia albonitens (Fries) Quéf. Champ. Jura Vosg. 3: 11. 1875. Reported from Michigan by Kauffman, who says that it

may be known by the gray color of the gills and the yellowish tint on the stem in age.

Agaricus (Stropharia) Feildeni Berk. Jour. Linn. Soc. 17: 14. 1880. Collected on Bellot Island, Greenland, by Captain Feilden. The description is inadequate and I have not seen the type. Miss Wakefield, however, has kindly examined it for me and writes as follows:

"The type consists of one specimen about 6 cm. across in very bad condition. There is practically no stalk, only a mass of soil beneath. It gives one the impression of having been a dwarf, abnormal form. The upper surface of the pileus is also much covered with soil, so that one can judge little about it. The gills, as much as one can see of them, are very short. If it were ever found again the spores might serve to identify it. They are almost globose, and rather large, 7-9 x 7-8 μ ."

Stropharia Howeana (Peck) Sacc. Syll. Fung. 5: 1026. 1887. (*Agaricus Howeanus* Peck, Bull. Buffalo Soc. Nat. Sci. 1: 53. 1873.) See *Pholiota Howeana* Peck, Bull. N. Y. State Mus. 122: 147. 1908.

Stropharia irregularis Peck, Bull. Torrey Club 27: 16. 1900. An annulate form of *Drosophila appendiculata*.

Stropharia Johnsoniana Peck, Ann. Rep. N. Y. State Mus. 41: 84. 1888. (*Agaricus Johnsonianus* Peck, Ann. Rep. N. Y. State Cab. 23: 98. 1872.) See *Pholiota Johnsoniana* Peck, Bull. N. Y. State Mus. 122: 147. 1908.

Stropharia micropoda Morg. Jour. Myc. 14: 73. 1908. Described from specimens growing on rotten wood at Preston, Ohio. Stover suggests that it may not be distinct from *Gymnopilus polychrous*.

Stropharia obturata (Fries) Qué. Champ. Jura Vosg. 110. 1872. (*Agaricus obturatus* Fries, Syst. Myc. 1: 283. 1821.) Reported from Illinois on the basis of a photograph taken by W. S. Moffatt. According to some, the species is not distinct from *S. coronilla*. Peck's specimens so named appear to belong in *Pholiota*.

Stropharia Schraderi Peck, Bull. Torrey Club 32: 80. 1905. Described from specimens collected by F. F. Schrader in sandy, grassy soil about stumps at Washington, D. C. The types have been examined and the species appears to me to belong in *Pholiota*.

Stropharia umbilicata Peck, Bull. N. Y. State Mus. 167: 49. 1913. Described from specimens collected among chips and sawdust in Minnesota. The types at Albany resemble *S. aeruginosa* in some ways, but are probably *Gymnopilus polychrous*, since specimens from New York called *S. umbilicata* by Peck seem identical with the Minnesota types and also with *G. polychrous*.

NEW YORK BOTANICAL GARDEN.