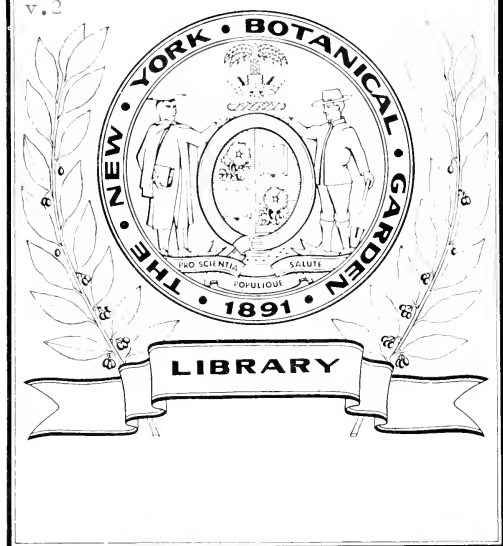


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The Thelephoraceae of North America. VIII

Coniophora

EDWARD ANGUS BURT

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THE THELEPHORACEAE OF NORTH AMERICA. VIII¹

CONIOPHORA

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CONIOPHORA

Coniophora De Candolle, Fl. Fr. 6 : 34. 1815; Persoon, Myc. Eur. 1 : 153. 1822; Karsten, Rev. Myc. 3⁹ : 23. 1881; Finska Vet.-Soc. Bidrag Natur och Folk 37 : 159. 1882; Sacc. Syll. Fung. 6 : 647. 1888; Masee, Linn. Soc. Bot. Jour. 25 : 128. 1889; Schroeter, Krypt.-Fl. Schlesien 3 : 430. 1888; Engl. & Prantl, Nat. Pflanzenfam. I.1** : 120. 1898.—*Coniophora* as a subgenus of *Corticium* Fries, Hym. Eur. 657. 1874; Cooke, Grevillea 8 : 88. 1880.—*Coniophorella* Karsten, Finl. Basidsv. 438. 1889; Bresadola, Ann. Myc. 1 : 110. 1903.

Fructifications resupinate, effused, fleshy, subcoriaceous or membranaceous; hymenium somewhat undulate-tubercular, granular, or even, usually pulverulent with the spores; cystidia present in some species; basidia simple; spores even, ochraceous, sometimes nearly colorless.

Coniophora is closely connected on one side with *Corticium* and *Peniophora* by such pale-spored species as *Coniophora polyporoidea*, on another side with the colored-spored section of *Merulius*, and on still another with *Grandinia* by several species with granular or minute papillae in the hymenium, although the spores of *Coniophora* are colored, while those of *Grandinia* are white.

Fully developed, mature fructifications of *Merulius* have the hymenial surface more or less reticulate with obtuse folds, imperfectly porose, or obsoletely toothed, while the departure from the even hymenial surface in *Coniophora* is at the most only undulate-tubercular or granular. Since some species

NOTE.—Explanation in regard to the citation of specimens studied is given in Part VI, Ann. Mo. Bot. Gard. 3 : 208, footnote. The technical color terms used in this work are those of Ridgway, Color Standards and Nomenclature. Washington, D. C., 1912.

¹ Issued September 20, 1917.

Sept. 1915 F. H. Islandy

of *Merulius* have the hymenium even in some small, immature fructifications and with a broad, marginal, even region in larger ones, it is necessary to see fully mature and well-developed fructifications to be certain that a collection of one of these connecting species is a *Coniophora* rather than a *Merulius*. The absence of a definite statement by De Candolle on this point led Fries to question the generic position of *Coniophora membranacea* DC.

The dark color of spores in the mass in spore collections is a decisive character for distinguishing some species of *Coniophora* from *Corticium* and *Peniophora*. In working with dried herbarium specimens which lack spore collections, if the natural color pigment of sections is destroyed and bleached by KHO solution, some sections should be treated with lactic acid to determine whether the spores are hyaline or pigmented like the hyphae. In my experience lactic acid does not change a common, ochraceous, fungous pigment which is dissolved and bleached by KHO solution.

All our species of *Coniophora* are saprophytic on wood and cause dry rot of the wood. The most of these species are rare or have been collected infrequently, and record is lacking of the extent of rot which they cause. *Coniophora cerebella*, more commonly called *C. puteana*, is common and widely distributed throughout the northern United States and Canada. It is very destructive to structural timber of coniferous species if poorly seasoned or if used in moist places where there is a poor circulation of air or if used in contact with the ground without previous treatment with a wood preservative. In the United States this species seems to be as important an agent of timber decay as the *Merulius lacrymans* group of species is in Europe. While *Coniophora cerebella* attacks chiefly coniferous timber of buildings, bridges, docks, etc., in forests it is often found on logs of deciduous species. *C. arida* is another species of this genus so common as to be of economic importance. This species has been collected but rarely on other than a coniferous substratum; it ranges rather farther south than the general range of *C. cerebella* but has not been received from farther south than Louisiana.

The collections which have been available seem to indicate that *Coniophora* is more abundant in temperate than in tropical regions.

Our few species which have cystidia are not segregated as *Coniophorella*, because such segregation would place two common species, *C. suffocata* and *C. olivascens*, in the position of troublesome intermediates with some of their specimens seeming to belong in *Coniophora* in the restricted sense and others in *Coniophorella*. The per cent of connecting species is obviously too large for cleavage into natural genera.

KEY TO THE SPECIES

- Neither incrustated nor hair-like cystidia present in the hymenium, with the exception of *C. suffocata* which sometimes has short cystidia barely distinguishable from the basidia, and of *C. olivascens*, some sections of which may lack cystidia..... 1
- Cystidia present 8
1. Fructification fleshy when growing, often 1 mm. thick, separable from substratum; hyphae densely interwoven, 4-7 μ in diameter, not incrustated 1. *C. cerebella*
 1. Fructification drying tawny olive to snuff-brown, 200-250 μ thick, not fleshy, separable from the substratum; spores fusiform, tapering at both ends, 18-21 \times 5-6 μ 2. *C. fusispora*
 1. Fructification not fleshy, dry; spores less than 15 μ long..... 2
 2. Spores 8 \times 3-4 μ ; fructification described originally as sulphur-cinereous and papillate..... 7. *C. sistotremoides*
 2. Hymenium not papillate..... 3
 3. Fructification not stratose; spores between 10 and 13 μ long..... 4
 3. Fructification not stratose; spores less than 10 μ long..... 6
 3. Fructification stratose, snuff-brown throughout, velvety, $\frac{1}{2}$ -1 mm. thick 11. *C. dryina*
 4. Fructification neither stratose nor with incrustated hyphae..... 5
 4. Fructification not stratose but with incrustated hyphae, avellaneous to tawny olive and Saccardo's umber..... 12. *C. suffocata*
 5. Fructification adnate, 100-500 μ thick, drying from warm buff to tawny olive or darker, with paler margin; hyphae loosely interwoven, 2-3 μ in diameter, without inflations..... 3. *C. arida*
 5. Closely resembling *C. arida* but with hyphal portions occasionally swollen to 4-7 μ in diameter..... 4. *C. Kalniae*
 6. Spores ellipsoidal, 7-8 \times 3-4 μ ; hyphae with inflations 9-12 μ in diameter, and with pyriform, vesicular hyphal ends..... 5. *C. inflata*
 6. Spores broadly ovoid..... 7
 6. Spores subglobose, 4-5 \times 4 μ ; fructification pinkish tan; hyphae not incrustated, not nodose-septate. (*C. olivascens* has nodose-septate hyphae) 10. *C. Harperi*
 7. Fructification membranaceous, separable, pinkish buff, the margin white, cottony, and usually with prominent radiating mycelial strands..... 6. *C. polyporoidea*
 7. Fructification spongy, hypochnoid, between pinkish buff and cinnamon-buff throughout and at the margin; hyphae 6-7 μ in diameter..... 8. *C. vaga*

7. Fructification light pinkish cinnamon, adnate; hyphae $2-2\frac{1}{2}$ μ in diameter, hyaline; spores $7-8 \times 6$ μ9. *C. arellanea*
 8. Cystidia large, more than 5 μ in diameter..... 9
 8. Cystidia small, only 3-5 μ in diameter..... 11
 9. Spores more than 7 μ long; fructification dark-colored, sepia, and buffy citrine to olive-brown..... 10
 9. Spores 3×2 μ ; fructification primuline-yellow.....16. *C. flava*
 10. Fructification very dark, drying Saccardo's umber to olive-brown throughout; hyphae rigid; cystidia protruding up to 120 μ
13. *C. umbrina*
 10. Fructification paler, buffy citrine and Saccardo's olive to brownish olive; hyphae paler and thinner-walled, often collapsed; cystidia protruding up to 100 μ14. *C. olivacea*
 10. Fructification drying sepia; hyphae nearly black, rigid; cystidia protruding up to 60 μ ; spores $9-10 \times 4\frac{1}{2}-6$ μ15. *C. atrocinerea*
 11. Spores $6-7 \times 2\frac{1}{2}-3$ μ ; fructification very thin, adnate, drying raw sienna, suggestive of the conidial stroma of an *Hypoxylon*.....17. *C. laeticolor*
 11. Spores $4-4\frac{1}{2} \times 2\frac{1}{2}-3$ μ , pale and concolorous with the hyphae; fructification cream-color to Naples yellow throughout; hyphae loosely interwoven, rigid, abundantly nodose-septate.....18. *C. byssoidea*
 11. Spores about $5 \times 3\frac{1}{2}$ μ , dark-colored; fructification olive-lake to olive-citrine; hyphae lax, hyaline.....19. *C. olivascens*

1. **Coniophora cerebella** Pers. Myc. Eur. 1:155. 1822; Schroeter, Krypt.-Fl. Schlesien 3: 430. 1888; Bresadola, Ann. Myc. 1: 110. 1903.

Thelephora cerebella Pers. Syn. Fung. 580. 1801; Alb. & Schw. Consp. Fung. 282. 1805.—*Thelephora puteana* Schumacher, Pl. Saell. 2: 397. 1803; Fries, Syst. Myc. 1: 448. 1821; Elenchus Fung. 1: 194. 1828; Pers. Myc. Eur. 1: 144. 1822.—*Corticium* (subg. *Coniophora*) *puteanum* (Schum.) Fries, Hym. Eur. 657. 1874; Cooke, Grevillea 8: 88. 1880.—*Coniophora puteana* (Schum.) Karsten, Finska Vet.-Soc. Bidrag Natur och Folk 37: 159. 1882; Finl. Basidsv. 435. 1889; Patouillard, Tab. Anal. Fung. 113. f. 253. 1884; Sacc. Syll. Fung. 6: 647. 1888; Masee, Linn. Soc. Bot. Jour. 25: 129. 1889.

Illustrations: Fl. Dan. pl. 2035; Patouillard, Tab. Anal. Fung. f. 253, 579; Möller, Hausschwamm-forsch. 1: pl. 3. f. 7; pl. 4. f. 8, 9, 11; pl. 5. f. 15; Hennings in Engl. & Prantl, Nat. Pflanzenfam. I. 1** : f. 67 F, G.

Fructification broadly effused, suborbicular, fleshy, separable from the substratum, drying Isabella-color and tawny olive to Brussels brown, the margin whitish and mucedinous; hymenium even, undulate or gyrose, with low and broad,

dome-shaped tubercules; in structure 300–1000 μ thick, composed of densely interwoven, hyaline, even-walled hyphae 4–7 μ in diameter; no cystidia; basidia with 4 sterigmata; spores giving their color to the hymenium, even, 10–14 \times 6–7 μ .

Fructifications usually about 4–6 cm. in diameter or elongated up to 15 cm. long, 5 cm. broad, sometimes larger, $\frac{1}{3}$ –1 mm. thick.

On logs and wood of both coniferous and frondose species, but more common on coniferous kinds. Quebec to District of Columbia and westward to British Columbia and California. Apparently rare in tropical America. July to February.

Well-developed specimens of *C. cerebella* are fleshy and thick and frequently have the hymenial surface protrude in broad, dome-shaped tubercules; young and thin fructifications are likely to be confused with *C. arida*, which has the same color but in section has its hyphae much less compactly interwoven and not as coarse as in *C. cerebella*.

Specimens examined:

Exsiccati: Cavara, *Fungi Longobardiae*, 14; Ell. & Ev., N. Am. Fungi, 1588 (in copy of Mo. Bot. Gard. Herb. but not in copies of Farlow Herb. and of U. S. Dept. Agr. Herb.); Karsten, *Fungi Fenn.*, 135; Krieger, *Fungi Sax.*, 1201.
Sweden: Femsjö, *E. Fries* (in Herb. Fries, determined by Fries).

Finland: *P. A. Karsten*, in Karsten, *Fungi Fenn.*, 135.

Austria-Hungary: definite locality not given, *Strasser*, comm. by J. Bresadola.

Germany: Saxony, *W. Krieger*, in Krieger, *Fungi Sax.*, 1201.

Italy: Pavia, *F. Cavara*, in Cavara, *Fungi Longobardiae*, 14.

Canada: definite locality not given, *J. Macoun*, 11, 23, 44, 58, 79; Lower St. Lawrence Valley, *J. Macoun*, 13.

Quebec: Hull, *J. Macoun*, 377; Montreal, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 44053).



Fig. 1
C. cerebella.
Section of fructification $\times 45$; spores $\times 665$.

- Ontario: Ottawa, *J. Macoun*, 36, 700; Harraby, Lake Rosseau, *E. T. & S. A. Harper*, 591, 594.
- Vermont: Middlebury, *E. A. Burt*, two collections; Little Notch, *E. A. Burt*.
- Massachusetts: Belmont Spring, *W. G. Farlow*, 4; Weston, *C. Bullard*, comm. by *W. G. Farlow*; Cambridge (in *Mo. Bot. Gard. Herb.*, 43890).
- New York: Albany, *H. D. House* (in *Mo. Bot. Gard. Herb.*, 14831); Floodwood, *C. H. Peck*; Ithaca, *G. F. Atkinson*, 2603, and Cornell Univ. Herb., 14190, and *L. A. Zinn*, 88 (the last in *Mo. Bot. Gard. Herb.*, 9062).
- New Jersey: Newfield, *J. B. Ellis*, in *Ell. & Ev.*, *N. Am. Fungi*, 1588 in some copies.
- Pennsylvania: Spruce Creek, *J. H. Faull*, 324 (in *Mo. Bot. Gard. Herb.*, 44928); State College, *L. O. Overholts*, 2660 (in *Mo. Bot. Gard. Herb.*, 13160).
- District of Columbia: Washington, *C. L. Shear*, 1268.
- Ohio: Cincinnati, *A. P. Morgan*, *Lloyd Herb.*, 2603.
- Michigan: Ann Arbor, *C. H. Kauffman*, 33, 46 (the latter in *Mo. Bot. Gard. Herb.*, 6823); Escanaba, *C. J. Humphrey*, 1449 (in *Mo. Bot. Gard. Herb.*, 4825); New Richmond, *R. W. Kellet*, comm. by *A. H. W. Povah*, 8 (in *Mo. Bot. Gard. Herb.*, 13263).
- Illinois: River Forest, *E. T. & S. A. Harper*, 829.
- Iowa: Webster Co., *O. M. Oleson*, 447 (in *Mo. Bot. Gard. Herb.*, 44054).
- Missouri: St. Louis, *B. M. Duggar* (in *Mo. Bot. Gard. Herb.*, 5687).
- Montana: Missoula, *J. R. Weir*, 399 (in *Mo. Bot. Gard. Herb.*, 9535); Bonner, *J. R. Weir*, 407 (in *Mo. Bot. Gard. Herb.*, 21604).
- Idaho: Priest River, *J. R. Weir*, 67, 139 (the latter in *Mo. Bot. Gard. Herb.*, 8344).
- British Columbia: Sidney, *J. Macoun*, 2 (in *Mo. Bot. Gard. Herb.*, 5756); locality not given, *J. Macoun*, 855, comm. by *J. Dearness* (in *Mo. Bot. Gard. Herb.*, 12410).
- Washington: Bingen, *W. N. Suksdorf*, 667, 880; Olympia, *C. J. Humphrey*, 6294.

California: Berkeley, *H. A. Lee*, two collections, comm. by *W. A. Setchell*, 1017, 1018 (in *Mo. Bot. Gard. Herb.*, 44243, 44244); San Francisco, *W. A. Setchell*, 1034 (in *Mo. Bot. Gard. Herb.*, 44242).

Mexico: Guernavaca, *W. A. & Edna L. Murrill*, 534, N. Y. Bot. Gard., *Fungi of Mexico* (in *Mo. Bot. Gard. Herb.*, 54511).

2. *C. fusispora* (Cooke & Ell.) Cooke in *Sacc. Syll. Fung.* 6: 650. 1888; *Massee*, *Linn. Soc. Bot. Jour.* 25: 133. 1889.

Corticium fusisporum Cooke & Ell. *Grevillea* 8: 11. 1879.—*Corticium fusisporum* (subg. *Coniophora*) Cooke, *Grevillea* 8: 89. 1880.

Type: type and cotype in Kew Herb. and in N. Y. Bot. Gard. Herb. respectively.

Fructification effused, thin, soft, readily separable, drying from tawny olive to snuff-brown, the margin mucedinous, pallid; hymenium even, pulverulent; structure in section 200–250 μ thick with (1) a layer next to the substratum of loosely and longitudinally arranged hyphae, hyaline, thin-walled, collapsing, 4–5 μ in diameter, sometimes granule-incrusted, sometimes forming rope-like mycelial strands 20–25 μ in diameter, and with (2) a compact hymenial layer; no cystidia; spores giving the color to the fructification, fusiform, tapering at both ends, curved at the base, 18–21 \times 5–6 μ .

On pine wood in wood pile and on pine logs. Newfield, New Jersey. September.

This species is so similar to *C. cerebella* in color and probably in diameter of fructification that when Ellis collected it again, seven years after his type collection, he confused these later specimens with *C. puteana* and distributed some specimens under the latter name in some copies of his exsiccati. *C. fusispora* is distinct from *C. cerebella* by being thinner, dry rather than fleshy, having longer and more pointed spores, and by being two-layered and with the layer next to the substratum composed of very loosely arranged hyphae having



Fig. 2
C. fusispora.
Spores, incrusted
hypha. \times 665.

some granular incrustation rather than of a uniformly compact, fleshy, non-incrusted hyphal structure from substratum to basidia as in *C. cerebella*.

Specimens examined:

Exsiccati: Ell. & Ev., N. Am. Fungi, 1588 (in the copies of U. S. Dept. Agr. Herb. and of Farlow Herb., but not in copy of Mo. Bot. Gard. Herb.).

New Jersey: Newfield, *J. B. Ellis, 3092 to Cooke*, type (in Kew Herb.); same locality and collector, Ell. & Ev., N. Am. Fungi, 1588 (in copies of U. S. Dept. Agr. Herb. and of Farlow Herb.).

3. *C. arida* (Fr.) Karsten, Finska Vet.-Soc. Bidrag Natur och Folk **37**: 161. 1882; Sacc. Syll. Fung. **6**: 648. 1888; Masee, Linn. Soc. Bot. Jour. **25**: 132. 1889.

Thelephora arida Fries, Elenchus Fung. **1**: 197. 1828.—*Corticium aridum* (subg. *Coniophora*) Fries, Hym. Eur. 659. 1874; Cooke, Grevillea **8**: 89. 1880.—*Coniophora Cookei* Masee, Linn. Soc. Bot. Jour. **25**: 136. 1889; Sacc. Syll. Fung. **9**: 242. 1891.

Illustrations: Fries, Icones Hym. *pl. 199. f. 1.*

Type: in Herb. Fries, authentic specimen in Kew Herb.

Fructification effused, membranaceous, adnate, drying from warm buff to tawny olive or rarely darker, the margin paler and sometimes whitish; hymenium even, pulverulent; structure in section 100–500 μ thick, composed of loosely interwoven, thin-walled, often collapsing, usually hyaline hyphae 2–3 μ in diameter, not incrustated; no cystidia; basidia with 4 sterigmata, protruding; spores tawny olive in a spore collection, even, 10–12 \times 6–7 μ .



Fig. 3
C. arida.

Section of fructification $\times 45$;
spores $\times 665$.

Fructifications 4–20 cm. long, 1–8 cm. broad, $\frac{1}{10}$ – $\frac{1}{2}$ mm. thick.

Common on prostrate limbs and logs and on under side of boards and timbers of coniferous species, rarely on frondose species. Canada to Louisiana and westward to Idaho.

Coniophora arida, although frequently confused with *C. cerebella*, is very distinct from it by brighter color and adnate habit, and dry and thin, rather than fleshy and thick, structure; in sections the hyphae of *C. arida* are only 2-4 μ in diameter, finer, thinner-walled and often collapsed, and more loosely interwoven than those of *C. cerebella*. *C. arida* and *C. cerebella* are both important timber destroyers.

Specimens examined:

Exsiccati: Cooke, *Fungi Brit.*, ed. 2, 11, under the name *Thelephora puteana*; Ell. & Ev., *Fungi Col.*, 1306, under the name *Coniophora Ellisii*; Romell, *Fungi Exs. Scand.*, 37a and b.

Sweden: Femsjö, *E. Fries*, type (in *Herb. Fries*); *L. Romell*, 207; Stockholm, *L. Romell*, 205, and two collections in Romell, *Fungi Exs. Scand.*, 37a and b.

England: Hampstead, in Cooke, *Fungi Brit.*, ed. 2, 11.

Ontario: Ottawa, *J. Macoun*, 19; Port Credit, *J. H. Faull*, Univ. Toronto Herb., 308 (in *Mo. Bot. Gard. Herb.*, 44891); Toronto, *G. H. Graham*, Univ. Toronto Herb., 683 (in *Mo. Bot. Gard. Herb.*, 44942); Wilcox Lake, *J. H. Faull*, Univ. Toronto Herb., 647 (in *Mo. Bot. Gard. Herb.*, 44927).

Vermont: Little Notch, near Bristol, *E. A. Burt*.

Massachusetts: Magnolia, *W. G. Farlow*.

Rhode Island: East Providence, *W. G. Farlow*.

New York: Albany, *H. D. House*, 1384, N. Y. State Mus. Herb., T2, and two unnumbered collections (in *Mo. Bot. Gard. Herb.*, 54579, 14832, and 54383 respectively); Karner, *H. D. House*, N. Y. State Mus. Herb., 14.189, 14.203, 14.204, and an unnumbered collection (in *Mo. Bot. Gard. Herb.*, 44723, 44724, 44726, 54381 respectively); Ithaca, *G. F. Atkinson*, 29, 9238 (in *Cornell Univ. Herb.*).

New Jersey: Newfield, *J. B. Ellis*, 3425, cotype of *Coniophora Cookei* (in *N. Y. Bot. Gard. Herb.*) and the specimen in Ell. & Ev., *Fungi Col.*, 1306.

Pennsylvania: Carbondale, *E. A. Burt*.

North Carolina: Biltmore, *E. Bartholomew*, 5659 (in *Mo. Bot. Gard. Herb.*, 44269).

Louisiana: St. Martinville, *A. B. Langlois*, cz.

Illinois: Riverside, *E. T. & S. A. Harper*, 851.

Missouri: St. Louis, *E. A. Burt* (in *Mo. Bot. Gard. Herb.*, 54696).

Idaho: Priest River, *J. R. Weir*, 83, 548 (the latter in *Mo. Bot. Gard. Herb.*, 17806); Avery, *J. R. Weir*, 393 (in *Mo. Bot. Gard. Herb.*, 11982).

4. *C. Kalmiae* (Peck) Burt, n. comb.

Corticium Kalmiae Peck, *N. Y. State Mus. Rept.* 46: 109. 1893; *Sacc. Syll. Fung.* 11: 125. 1895.

Type: in Coll. N. Y. State.



Fig. 4

C. Kalmiae.

Spores; hyphae with swollen portions, p. $\times 665$.

Fructification effused, thin, tender, adnate, drying straw-yellow to tawny olive, the subiculum and margin composed of slender, whitish filaments; hymenium glabrous, continuous; structure in section 150–300 μ thick, composed of loosely interwoven, hyaline, non-incrusted hyphae mostly 2–3 μ in diameter but with occasionally a portion of a hypha swollen and 4–7 μ in diameter; no cystidia; spores

tawny olive in a spore collection, even, 9–12 \times 6–7 μ .

Fructification 3–4 cm. long, 2–3 cm. broad.

On prostrate limbs and logs of frondose species, a single collection on hemlock spruce. Vermont and New York. September and October. Rare.

The type of this species is bright straw-yellow; the other collections which I have referred here have similar structure but are rather darker, approaching *C. arida*, from which, perhaps, *C. Kalmiae* is not specifically distinct. The occasional swollen portions of hyphae afford the best character for separation from *C. arida*.

Specimens examined:

Vermont: Little Notch, near Bristol, *E. A. Burt*.

New York: Shokan, *C. H. Peck*, type (in Coll. N. Y. State); Ithaca, *C. H. Kauffman*, Cornell Univ. Herb., 14191; *C. Thom*, Cornell Univ. Herb., 14192—both of the Ithaca specimens comm. by G. F. Atkinson.

5. *C. inflata* Burt, n. sp.

Type: in Mo. Bot. Gard. Herb.

Fructification effused, dry, membranaceous, separable, drying avellaneous, the margin mucedinous, concolorous in some places, deep olive-buff in others; hymenium even, pulverulent; in structure 300 μ thick, with hyphae next to the substratum very loosely arranged, colored, forming some rope-like strands up to 15 μ in diameter; hyphae 3–6 μ in diameter, here and there globosely inflated up to 9–12 μ in diameter, and sometimes with pyriform or subglobose, vesicular branches or hyphal ends up to 12 \times 9 μ ; no cystidia; spores colored, even, 7–8 \times 3–4 μ .

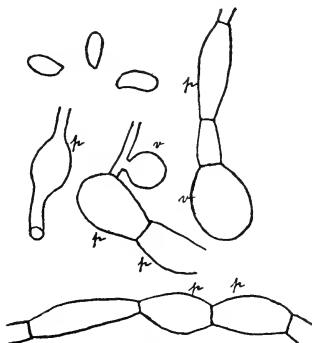


Fig. 5

C. inflata.

Spores; hyphae with inflated portions, *p*, and vesicular ends, *v*. \times 665.

Fructifications 5–10 cm. long, 3–5 cm. broad.

On a pine box in contact with the soil in a garden. Parral, Mexico. August.

This species is characterized by fructification becoming separable from substratum, by dry and loosely interwoven structure, by inflated or vesicular hyphal organs, and by smaller spores than any of the preceding species. The dry rot caused in the pine wood is of the brown, brittle type. The vesicular organs do not appear to be chlamydospores.

Specimens examined:

Mexico: Parral, Chihuahua, *E. O. Matthews*, 22, type (in Mo. Bot. Gard. Herb., 4511).

6. *C. polyporoidea* (Berk. & Curtis) Burt, n. comb.

Corticium polyporoideum Berk. & Curtis, *Grevillea* 1 : 177. 1873; *Sacc. Syll. Fung.* 6 : 618. 1888; *Massee, Linn. Soc. Bot. Jour.* 27 : 130. 1890. — *Corticium alboflavescens* Ell. & Ev. *Acad. Nat. Sci. Phila. Proc.* 1894 : 324. 1894; *Sacc. Syll. Fung.*

11 : 124. 1895. — *Coniophora alboflavescens* (Ell. & Ev.) v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 116 : 791. 1907.—*Coniophora Petersii* v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 117 : 1086. 1908, but not *Corticium Petersii* Berk. & Curtis.

Type: type and cotype in Kew Herb. and Curtis Herb.

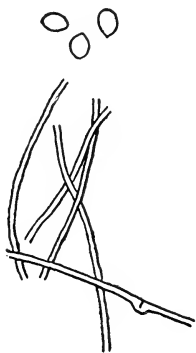


Fig. 6
C. polyporoidea.
Spores, hyphae. $\times 665$.

Fructification effused, membranaceous, separable, drying pinkish buff, the margin white, cottony, often with radiating mycelial strands; hymenium even, pulverulent; in structure 400–1000 μ thick, composed (1) of a supporting layer of very loosely interwoven, hyaline hyphae $2\frac{1}{2}$ –3 μ in diameter, incrustated with scattered granules, and (2) of a compact hymenium; no cystidia; spores slightly colored under the microscope, even or slightly rough, $6-8 \times 4\frac{1}{2}-6 \mu$.

Fructifications 1–15 cm. long, 1–5 cm. broad.

On prostrate fallen limbs and wood of various frondose and, more rarely, coniferous species, and on bark at bases of trees. New Hampshire to Florida and westward to Michigan and Arkansas. June to March.

This fine species has the color and surface texture of buckskin leather and a distinctly white margin. The spores differ from those of other species of the genus in having so little color and in absorbing eosin stain so intensely that their original color is masked by the dye and the species likely to be mistaken for a *Corticium*. The roughish spores show relationship to *Hypochnus*.

Specimens examined:

Exsiccati: Ell. & Ev., N. Am. Fungi, 1716, under the name *Corticium Petersii*, and 3005, under the name *Corticium alboflavescens*; Ell. & Ev., Fungi Col., 608, under the name *Corticium Petersii*, and 403, under the name *Corticium alboflavescens*; Ravenel, Fungi Am., 125, under the name *Cor-*

ticum ochroleucum, and 723, under the name *Corticium Petersii*.

New Hampshire: Chocorua, *W. G. Farlow*, 19.

Vermont: Middlebury, *E. A. Burt*.

New York: Alcove, *C. L. Shear*, 1213; Copake, *C. H. Peck*, N. Y. State Mus. Herb., T8 (in Mo. Bot. Gard. Herb., 54580); East Galway, *E. A. Burt*, two collections; Fort Ann, *S. H. Burnham*, 46 (in Mo. Bot. Gard. Herb., 54424); Gansevoort, *C. H. Peck*, N. Y. State Mus. Herb., T29 (in Mo. Bot. Gard. Herb., 54786); Karner, *H. D. House* (in Mo. Bot. Gard. Herb., 54382).

North Carolina: Asheville, *H. C. Beardslee*, 02125; Blowing Rock, *G. F. Atkinson*, 4196, 4319, 4329 (the last in Cornell Univ. Herb.).

South Carolina: Seaboard, in Ravenel, *Fungi Am.*, 723.

Georgia: Tallulah Falls, *A. B. Seymour*, comm. by *W. G. Farlow*, FF.

Florida: *W. W. Calkins* (in U. S. Dept. Agr. Herb.), and in Ell. & Ev., N. Am. Fungi, 1716; Gainesville, *Ravenel*, in *Ravenel*, *Fungi Am.*, 125.

Alabama: *Peters*, type and cotype (in Kew Herb. and in Curtis Herb., 4559).

West Virginia: Nuttallburg, *L. W. Nuttall*, type distributions of *Corticium alboflavescens*, in Ell. & Ev., N. Am. Fungi, 3005, and *Fungi Col.*, 403.

Michigan: Ann Arbor, *C. H. Kauffman*, 35.

Ohio: Cincinnati, *C. G. Lloyd*, 4525.

Kentucky: Harlan, *C. H. Kauffman*, 67 (in Mo. Bot. Gard. Herb., 16419); Mammoth Cave, *C. G. Lloyd*, 2561.

Arkansas: Fordyce, *C. J. Humphrey*, 5828; Arkansas National Forest, *W. H. Long*, 19861 (in Mo. Bot. Gard. Herb., 8959); Womble, *W. H. Long*, 19791 (in Mo. Bot. Gard. Herb., 6388).

7. *C. sistotremoides* (Schw.) Masee, Linn. Soc. Bot. Jour. 25 : 133. 1889; Sacc. Syll. Fung. 9 : 241. 1891.

Thelephora sistotremoides Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1 : 109. 1822; Am. Phil. Soc. Trans. N. S.

4: 168. 1832; Fries, *Elenchus Fung.* 1: 198. 1828. — *Odontia sistotremoides* (Schw.) Fries, *Epicr.* 529. 1838.

Type: a fragment in Herb. Schweinitz and portions in Herb. Fries and in Kew Herb. probably.

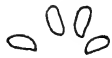


Fig. 7

C. sistotremoides.
Spores $\times 665$.

Effused, papery, papillate, sulphur-cinereous, the margin byssoid and white; papillae minute, pilose.

Broadly effused here and there on wood. Papillae abnormal, minute, occurring in the hymenium in scattered distant clusters, with the form in all respects of the teeth of *Sistotrema* and clothed with hairs as in *T. botryoides*.

—Translation of original description.

The portion of the type in Herb. Schweinitz is very small and not well preserved. I found its spores Saccardo's melles, even, $8 \times 3-4 \mu$, and hyphae of the same color, but did not detect scattered, clustered granules in the hymenial surface. The portion preserved may, however, have been from the even region between the clustered granules. Fries received a specimen of *C. sistotremoides* from Schweinitz and in 'Epicrisis' transferred this species to *Odontia*, placing it next to *Odontia fimbriata* and describing the granules as wart-like, minute, dentiform, with apex concolorous and fimbriate.

I have been on the lookout for a *Coniophora* which combines in one specimen both the granular surface described by Schweinitz and Fries and the spore characters of the authentic specimen but have not yet found it. *Coniophora olivascens* has a granular surface to its fructification, but its spores are smaller than those of *C. sistotremoides*, more subglobose in form, and its hyphae are hyaline. Schweinitz's statement that the papillae are clothed with hairs as in his *Hypochnus botryoides* is important in showing that he refers to a surface composed of matted hyphae as seen with a lens in the case of *Hypochnus botryoides* and not necessarily to the presence of hair-like cystidia protruding from the granules in sections, although Fries must have had the latter type of structure in mind to lead him to place this species in *Odontia* between *O. Barba Jovis* and *O. fimbriata*.

The northern specimens cited below have the approximate spore characters of *C. sistotremoides* but an even hymenium, hence they are all referred with doubt to this species for the present. Possibly the granular condition of this species may be confined to the vicinity of North Carolina.

Specimens examined:

Vermont: Grand View Mt., *E. A. Burt*.

Massachusetts: Magnolia, *W. G. Farlow*; Manchester, *W. G. Farlow*, 3.

New York: Alcove, *C. L. Shear*, 1130.

North Carolina: *Schweinitz*, type (in Herb. Schweinitz).

8. *C. vaga* Burt, n. sp.

Type: in Mo. Bot. Gard. Herb.

Fructification effused, spongy, hypochnoid, tomentose, drying between pinkish buff and cinnamon-buff, the margin thinning out and concolorous; in structure 300 μ thick, composed of loosely interwoven, short-celled, suberect hyphae 6-7 μ in diameter, not incrustated, not nodose-septate, slightly colored and giving their color to the fructification; no cystidia; spores slightly colored, concolorous with the hyphae, even, apiculate, $7\frac{1}{2}$ -9 \times 4 $\frac{1}{2}$ -6 μ .

Fructifications 8 cm. or more long, 3 cm. broad.

On bark of old log of *Ulmus americana*. Hudson Falls, New York. September.

In its general appearance *C. vaga* somewhat resembles *Corticium vagum* but the former is more compact and darker colored, and its spores are colored, shorter, broader, and almost mucronate-pointed.

Specimens examined:

New York: Hudson Falls, *S. H. Burnham*, 20, type (in Mo. Bot. Gard. Herb., 54498).

9. *C. avellanea* Burt, n. sp.

Type: in Burt Herb.



Fig. 8

C. vaga.

Basidium with sterigmata, spores, hypha. \times 665.

Fructification effused, dry, adnate, drying light pinkish cinnamon (exactly avellaneous of Saccardo's 'Chromotaxia'), the margin concolorous, determinate; hymenium even, pulverulent; in structure 120–200 μ thick, with the hyphae 2–2½ μ in



Fig. 9
C. avellanea.
Spores $\times 665$.

diameter, hyaline, not incrustated, not nodose-septate, running longitudinally and crowded together along the substratum, densely interwoven in the subhymenium; no cystidia; spores olive-buff in spore collection, only slightly colored under the microscope, even, 7–8 \times 6 μ .

Fructification 3–5 cm. long, 1–3 cm. broad.

On decorticated coniferous wood. New York and Ohio. April and August.

C. avellanea differs from all the preceding species by its avellaneous color, closely adnate habit, thin and dense structure, fine hyphae, and nearly subglobose, slightly colored spores. *C. Harperi* is of nearly the same color, but has a loosely interwoven subiculum next to the substratum, coarser hyphae, and smaller spores.

Specimens examined:

New York: Altamont, *E. A. Burt*; East Galway, *E. A. Burt*, type.

Ohio: Madisonville, *C. G. Lloyd*, 0191.

10. *C. Harperi* Burt, n. sp.

Type: in Burt Herb.

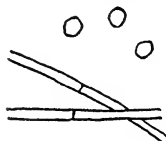


Fig. 10
C. Harperi.
Spores, hyphae.
 $\times 665$.

Fructification effused, dry, membranaceous, drying pinkish tan, brittle, not strongly attached to the substratum, the subiculum and margin whitish, floccose; hymenium even, pulverulent; in structure 150–200 μ thick, composed of loosely interwoven, suberect, hyaline hyphae not incrustated, not nodose-septate, 3½–5 μ in diameter; no cystidia; spores slightly colored, even, sometimes slightly subangular, subglobose, 4–5 \times 4 μ .

Fructification 3–7 cm. long, 2–3 cm. broad.

On white oak bark. Lake Geneva, Wisconsin. July.

This collection was at first referred to *C. olivascens*, but it differs from it in having no olivaceous component in its color, and its spores are subglobose and slightly subangular and its hyphae not nodose-septate. The fructifications are suggestive of *Corticium arachnoideum* in forming a delicate hymenial pellicle which is supported on a very thin and loose subiculum, but the hymenium and the spores are colored.

Specimens examined:

Wisconsin: Lake Geneva, *E. T. & S. A. Harper, 958*, type.

11. *C. dryina* (Berk. & Curtis) Masee, Linn. Soc. Bot. Jour. 25: 135. 1889.

Corticium dryinum Berk. & Curtis, Grevillea 1: 179. 1873; Sacc. Syll. Fung. 6: 634. 1888.

Type: type and cotype in Kew Herb. and Curtis Herb. respectively.

Fructification effused, thick, dry, adnate, velvety, drying snuff-brown both externally and within; hymenium even, velvety; in structure 500–1000 μ thick with (1) next to the substratum a thin layer composed of closely interwoven, thick-walled, rigid hyphae 4–4½ μ in diameter, nodose-septate, not incrustated, concolorous with the fructification, and with (2) a broad stratosic hymenial layer made up of about 4 or 5 sets of hymenia and supporting subhymenial layers whose hyphae are erect, branching, concolorous, 4–4½ μ in diameter; no cystidia; basidia colored like the fructification, with 4 sterigmata; spores concolorous with the fructification, even, curved, pointed at the place of attachment, 8–9 \times 3½–4 μ .

Fructification probably large, in the specimens known being about 4 cm. long, 3 cm. broad, and not having the original margin.

On rough surface of decaying oak wood. Alabama. November.



Fig. 11
C. dryina.
Section of fructification showing stratosic structure $\times 45$; spores $\times 665$.

It is surprising that only the original collection of *C. dryina* has been made, for the two portions which are the type and cotype were apparently from a large conspicuous fructification. *C. dryina* has as distinguishing characters its thickness, snuff-brown color throughout, velvety surface, absence of cystidia, and stratose structure.

Specimens examined:

Alabama: *Peters, 709*, type and cotype (in Kew Herb. and Curtis Herb., 5204, respectively).

12. *C. suffocata* (Peck) Masee, Linn. Soc. Bot. Jour. 25 : 138. 1889.

Corticium suffocatum Peck, N. Y. State Mus. Rept. 30 : 48. 1879; Sacc. Syll. Fung. 6 : 621. 1888.

Type: in Coll. N. Y. State.

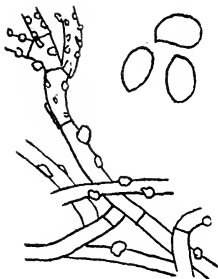


Fig. 12

C. suffocata.

Incrusted hyphae, spores.
× 665.

Fructification effused, indeterminate, membranaceous, not fleshy, somewhat separable when thick, drying from avelaneous to tawny olive and Saccardo's umber, the under side and margin usually whitish and mucedinous; hymenium even; in structure 60–500 μ thick, composed of loosely interwoven, usually hyaline, sometimes brownish, more or less incrusting hyphae $3\frac{1}{2}$ –6 μ in diameter under the incrustation, not nodose-septate; no cystidia or with

cystidia barely distinguishable from immature basidia; spores snuff-brown in a spore collection, even, 10 – 12×6 – 7μ .

Fructification 2–9 cm. long, 1–5 cm. broad.

Common on under side of coniferous boards and limbs lying on the ground, rare on frondose species. Canada to Louisiana and westward to Vancouver Island and Washington. May to January.

This species bears some resemblance to *C. cerebella* and *C. arida*, approaching the former in its separable tendency when thick and the latter in general habit, coloration, dry structure, and loose arrangement of its hyphae. It is distin-

guished from both species by having incrustated hyphae which are coarser than those of *C. arida*. The European *C. Betulae* Karst., of which I have an authentic specimen, does not form a compact hymenial membrane, is very thin, not at all separable from substratum, has the margin similar to the central portion of the fructification, hyphae frequently nodose-septate, and cystidia always present, $6\ \mu$ in diameter, emerging $20\text{--}30\ \mu$ above the basidia—differing in all the above respects from our *C. suffocata*. *C. subcinnamomea* Karst. differs by having in its hymenium noteworthy branching paraphyses and small, flexuous cystidia. *C. suffocata* is probably very destructive as a timber rot. The cystidia when occasionally distinguishable are about $6\ \mu$ in diameter and emerge up to 20 or even $40\ \mu$ above the basidia.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 328, under the name *Hymenochaete Ellisii*; Ell. & Ev., Fungi Col., 219, under the name *Coniophora puteana*.

Canada: Lower St. Lawrence Valley, *J. Macoun*, 7, 48, 55.

Ontario: Ottawa, *J. Macoun*, 416; Toronto, *G. H. Graham*, Univ. Toronto Herb., 681 (in Mo. Bot. Gard. Herb., 44939).

Vermont: Middlebury, *E. A. Burt*.

Massachusetts: Belmont Spring, *C. Bullard*, comm. by W. G. Farlow, 3, and an unnumbered specimen; Hammond's Pond, Brookline, *G. R. Lyman*, 176.

New York: Alcove, *C. L. Shear*, 1303; East Galway, *E. A. Burt*; Ithaca, *G. F. Atkinson*, 997; Karner, *H. D. House*, N. Y. State Mus. Herb., 14.165 (in Mo. Bot. Gard. Herb., 44714); Sandlake, *C. H. Peck*, type (in Coll. N. Y. State).

New Jersey: Newfield, *J. B. Ellis*, in Ellis, N. Am. Fungi, 328, and in Ell. & Ev., Fungi Col., 219, and on white oak, Feb. 3, 1877 (in Farlow Herb.).

Pennsylvania: State College, *C. R. Orton*, comm. by L. O. Overholts, 2897 (in Mo. Bot. Gard. Herb., 5719).

District of Columbia: Rock Creek, *C. L. Shear*, 1350.

Florida: *W. W. Calkins* (in U. S. Dept. Agr. Herb., under the name *Corticium epichlorum*).

Louisiana: St. Martinville, *A. B. Langlois*, *cg*.

Indiana: Millers, *E. T. & S. A. Harper*, 648.

Illinois: Glenellyn, *E. T. & S. A. Harper*, 956.

Missouri: Creve Coeur, *E. A. Burt* (in *Mo. Bot. Gard. Herb.*, 54782).

Montana: Evaro, *J. R. Weir*, 432 (in *Mo. Bot. Gard. Herb.*, 1807).

Idaho: Priest River, *J. R. Weir*, 8.

British Columbia: Vancouver Island, *J. Macoun*, comm. by *J. Dearness*, V 134 (in *Mo. Bot. Gard. Herb.*, 23093).

Washington: Bingen, *W. N. Suksdorf*, 868, 895, 956; Kalama, *C. J. Humphrey*, 6226; Olympia, *C. J. Humphrey*, 6335.

13. *C. umbrina* Alb. & Schw. ex Fries in *Sacc. Syll. Fung.* 6 : 652. 1888; Masee, *Linn. Soc. Bot. Jour.* 25 : 131. 1889.

Thelephora umbrina var. β . Alb. & Schw. *Consp. Fung.* 281. 1805.—*Thelephora umbrina* (Alb. & Schw.) Fries, *Elenchus Fung.* 1 : 199. 1828; *Epier.* 543. 1838.—*Corticium* (subg. *Coniophora*) *umbrinum* (Alb. & Schw.) Fries, *Hym. Eur.* 658. 1874.—*Coniophorella umbrina* (Alb. & Schw.) Bresadola, *Ann. Myc.* 1 : 111. 1903.

Type: location of type unknown to me.

Fructification effused, soft, not readily separable, villose beneath, drying Saccardo's umber to olive-brown, the margin usually of the same color, narrow, radiating; hymenium even, sometimes granular, tomentose, setulose; in structure 180–400 μ thick, with the hyphae colored, 3–6 μ or rarely more in diameter, rather rigid, not nodose-septate, loosely interwoven; cystidia concolorous, septate, obtuse, 100–200 \times 9–12 μ , emerging up to 120 μ , even or granule-incrusted; spores concolorous under the microscope, even, 9–12 \times 5–6 μ , flattened on one side.

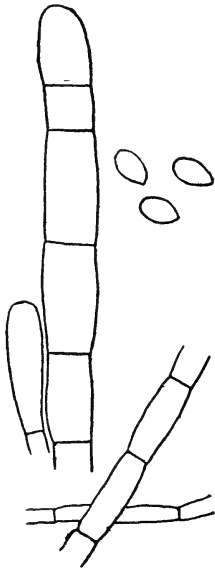


Fig. 13
C. umbrina.

Young basidium, upper portion of cystidium, spores, hyphae. \times 665.

Fructifications up to 3–8 cm. long, 2–4 cm. broad.

Under rotting pine boards and limbs on the ground. New York, Maryland, and Washington. October to December. Probably rare.

This species is characterized by its dark color—usually olive-brown—dark-colored hyphae, and very large, septate, colored, incrusting cystidia. Our American specimens agree well with that from Europe received from Bresadola, whose view of this species I follow.

Specimens examined:

Russian Poland: *Eichler*, comm. by G. Bresadola.

New York: Alcove, *C. L. Shear*, 1326.

Maryland: Takoma Park, *C. L. Shear*, 997.

Washington: Bingen, *W. N. Suksdorf*, 869, 870.

14. *C. olivacea* (Fr.) Karsten, *Finska Vet.-Soc. Bidrag Natur och Folk* **37**: 162. 1882; *Sacc. Syll. Fung.* **6**: 649. 1888; *Massee, Linn. Soc. Bot. Jour.* **25**: 129. 1889; *Bresadola, I. R. Accad. Agiati Atti III.* **3**: 116. 1897.

Hypochnus olivaceus Fries, *Obs. Myc.* **2**: 282. 1818 (in part).—*Thelephora olivacea* Fries, *Elenchus Fung.* **1**: 197. 1828 (in part).—*Corticium* (subg. *Hypochnus*) *olivaceum* Fries, *Hym. Eur.* 660. 1874 (in part).—*Corticium* (subg. *Coniophora*) *olivaceum* (Fr.) Cooke, *Grevillea* **8**: 89. 1880.—*Coniophorella olivacea* (Fr.) Karsten, *Finl. Basidsv.* 438. 1889; *Bresadola, Ann. Myc.* **1**: 110. 1903.—*Corticium leucothrix* Berk. & Curtis, *Grevillea* **2**: 4. 1873.—*Corticium* (subg. *Coniophora*) *leucothrix* (Berk. & Curtis) Cooke, *Grevillea* **8**: 89. 1880.—*Coniophora leucothrix* (Berk. & Curtis) Cooke in *Sacc. Syll. Fung.* **6**: 648. 1888; *Massee, Linn. Soc. Bot. Jour.* **25**: 133. 1889.—*Corticium brunneolum* Berk. & Curtis, *Grevillea* **2**: 4. 1873.—*Corticium* (subg. *Coniophora*) *brunneolum* (Berk. & Curtis) Cooke, *Grevillea* **8**: 88. 1880.—*Coniophora brunneola* (Berk. & Curtis) Cooke in *Sacc. Syll. Fung.* **6**: 648. 1888; *Massee, Linn. Soc. Bot. Jour.* **25**: 134. 1889.—*Hymenochaete Ellisii* Berk. & Cooke, *Grevillea* **4**: 162. 1876.—*Corticium* (subg. *Coniophora*) *Ellisii* (Berk. & Cooke) Cooke, *Grevillea* **8**: 89. 1880.—*Coniophora Ellisii* (Berk. & Cooke) Cooke in

Sacc. Syll. Fung. 6 : 648. 1888; Masee, Linn. Soc. Bot. Jour. 25 : 129. 1889.—*Coniophora fulvo-olivacea* Masee, Linn. Soc. Bot. Jour. 25 : 134. 1889; Sacc. Syll. Fung. 9 : 241. 1891.

Type: in Herb. Fries; the specimen in Kew Herb. from Fries and named by him *Thelephora olivacea* is *Coniophora Betulae*.

Fructification effused, adnate, somewhat felt-like, and separable from the substratum with a scalpel, drying buffy citrine and Saccardo's olive to brownish olive, the margin thinning out and sometimes whitish; hymenium even, tomentose, setulose; in structure 200–700 μ thick, composed of more or less colored hyphae 3–6 μ in diameter, not nodose-septate, not usually incrusted, which are loosely interwoven next to the substratum and form a very dense hymenial layer; cystidia septate, granule-incrusted, tapering upward, concolorous with the hyphae at the base, paler above, 8–12 μ in diameter, protruding 50–100 μ ; spores colored, even, 7–12 \times 4 $\frac{1}{2}$ –5 $\frac{1}{2}$ μ , often flattened on one side.



Fig. 14
C. olivacea.

Spores, protruded portion of cystidium, hyphae. \times 665.

Fructification 4–10 cm. long, 2–5 cm. broad.

On coniferous wood and bark, rarely on frondose species. Canada to Louisiana and westward to Idaho.

C. olivacea is paler externally and internally than *C. umbrina*, has fewer cystidia, and hyphae with usually thinner walls and often collapsed. I have been able to detect no morphological characters which sharply separate these species. I was not able to study in Herb. Fries the original collection from Femsjö of *Coniophora olivacea*, for the specimen was loaned to Bresadola when I was at Upsala. I have presented *C. olivacea* as understood by Bresadola in the specimen communicated to me by him and cited below. The specimen of

Thelephora olivacea from Fries in Kew Herb., determined by Fries, has small, non-septate cystidia and incrustated hyphae, and is quite different from *C. olivacea* as understood by Bresadola. The specimen in Kew Herb. is not distinct from *Coniophora Betulae* Karst.

Specimens examined:

Exsiccati: Ell. & Ev., N. Am. Fungi, 3211; Krieger, Fungi Sax., 2011; Rabenhorst-Winter, Fungi Eur., 2721.

Finland: *Karsten*, in Rabenhorst-Winter, Fungi Eur., 2721 (in Kew Herb., the type of *Coniophora fulvo-olivacea*).

Sweden: *L. Romell*, 209; Stockholm, *L. Romell*, 208.

Germany: *Schandau*, *W. Krieger*, in Krieger, Fungi Sax., 2011.

Austria-Hungary: *G. Bresadola*.

Canada: *J. Macoun*, 252; St. Lawrence Valley, *J. Macoun*, 67.

Ontario: Ottawa, *J. Macoun*, 382.

New Hampshire: Chocorua, *W. G. Farlow*.

Vermont: Middlebury, *E. A. Burt*.

New York: Floodwood, *C. H. Peck*; Ithaca, *G. F. Atkinson*, 2516; *A. J. Pieters*, Cornell Univ. Herb., 5261; *G. F. Atkinson*, Cornell Univ. Herb., 14352; *Karner*, *H. D. House* (in Mo. Bot. Gard. Herb., 54395).

New Jersey: Newfield, *J. B. Ellis*, in Ell. & Ev., N. Am. Fungi, 3211.

Pennsylvania: Trexlertown, *W. Herbst*.

Maryland: Takoma Park, *C. L. Shear*, 969.

South Carolina: Society Hill, *M. A. Curtis*, 4775, the cotype of *Corticium leucothrix* (in Curtis Herb.).

Georgia: Tallulah Falls, *A. B. Seymour & W. L. Moss*, comm. by *W. G. Farlow*, a (in Mo. Bot. Gard. Herb., 44596).

Alabama: Bessie Junction, *C. J. Humphrey*, 5355.

Louisiana: *Dr. Hale*, the cotype of *Corticium brunneolum* (in Curtis Herb., 3664); Abita Springs, *A. B. Langlois*, 2695, 2696.

Ohio: Linwood, *C. G. Lloyd*, 02834.

Missouri: Creve Coeur, *E. A. Burt* (in Mo. Bot. Gard. Herb., 54770); St. Louis, *E. A. Burt* (in Mo. Bot. Gard. Herb., 54781).

Montana: Banner, *J. R. Weir*, 405 (in Mo. Bot. Gard. Herb., 10582).

Idaho: Kaniksu National Forest, Priest River, *J. R. Weir*, 68.

15. *C. atrocinerea* Karsten in de Thümen, Myc. Univ. 1806. 1881; Soc. pro Fauna et Flora Fennica Meddel. 6: 12. 1881; Finska Vet.-Soc. Bidrag Natur och Folk 37: 162. 1882; Sacc. Syll. Fung. 6: 650. 1888; Masee, Linn. Soc. Bot. Jour. 25: 132. 1889.

Coniophorella atrocinerea Karsten, Finl. Basidsv. 438. 1889.

Type: type distribution in de Thümen, Myc. Univ., 1806.

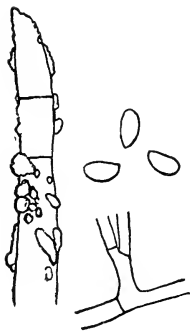


Fig. 15

C. atrocinerea.

Protruded part of
cystidium, spores,
hypha. $\times 665$.

Fructification effused, byssoid-membranaceous, adnate, drying sepia, the margin somewhat mucedinous and paler, sometimes whitish; hymenium even; in structure 250–500 μ thick, composed of loosely interwoven, nearly black, rigid, even hyphae $3\frac{1}{2}$ –5 μ in diameter, not nodose-septate, not incrusted; cystidia incrusted, septate, 9–15 μ in diameter, emerging up to 60 μ ; spores colored, even, $9-10 \times 4\frac{1}{2}-6 \mu$.

Fructifications 1–2 cm. long, 1 cm. broad, becoming confluent in crevices of the bark so as to form patches up to 8 cm. long.

In crevices of bark of pine logs. Louisiana. January.

The Louisiana collection agrees closely with the type distribution from Finland in all respects except in having slightly broader spores, which are 6 μ in diameter in the American specimen and usually about $4\frac{1}{2} \mu$ in the type, although published by Karsten as 5–6 μ . This species is very distinct by its firm, rigid, and nearly black hyphae. It is strange that two specimens of so similar and marked structure occur at such widely distant localities without intermediate stations.

Specimens examined:

Exsiccati: de Thümen, Myc. Univ., 1806.

Finland: Mustiala, *P. A. Karsten*, type distribution, in de Thümen, Myc. Univ., 1806.

Louisiana: St. Martinville, *A. B. Langlois*, 2639 in part.

16. *C. flava* Burt, n. sp.

Type: in Burt Herb. and N. Y. Bot. Gard. Herb.

Fructification effused, soft, membranaceous, separable from the substratum, drying primuline-yellow throughout, with the margin a little paler; hymenium even, cracked, somewhat pulverulent; in structure 400 μ thick (1) with the hyphae loosely interwoven next to the substratum, 3–4½ μ in diameter, occasionally nodose-septate, frequently more or less incrustated, and (2) with the hyphae more densely arranged in the subhymenium, more regularly incrustated, and containing many heavily incrustated, cylindric cystidia 8–9 μ in diameter, which do not protrude beyond the surface of the hymenium; hymenial cystidia usually not incrustated, 5–7 μ in diameter, emerging up to 30 μ , occasionally with a few incrustating granules near the base; spores concolorous with the hyphae and the fructification, borne 4 to a basidium, even, flattened or slightly curved on one side, 4×2 μ .

The portion of a fructification which I have seen is 1½×1 cm.

Substratum not noted. Jamaica. January.

Although I have seen but a small portion of a fructification, which does not afford data as to margin or substratum, this portion shows a species which should be readily recognized by its bright yellow color throughout, peeling away from the substratum in a compact sheet, small spores flattened on one side, and by heavily incrustated, wholly buried cystidia.

Specimens examined:

Jamaica: Troy and Tyre, Cockpit Country, 2000 ft. altitude, *W. A. Murrill & W. Harris*, N. Y. Bot. Gard., Fungi of Jamaica, 1089.

17. *C. laeticolor* Karsten, Finl. Basidsv. 436. 1889; Masee, Linn. Soc. Bot. Jour. 25 : 137. 1889.



Fig. 16
C. flava.

Protruded part of cystidium, *c*;
incrustated cystidium from interior of fructification, *d*;
spores, *s*.
× 665.

Xerocarpus laeticolor Karsten, Finska Vet.-Soc. Bidrag Natur och Folk **37**: 137. 1882; Soc. pro Fauna et Flora Fennica Meddel. **9**: 52. 1883.—*Corticium laeticolor* (Karst.) Sacc. Syll. Fung. **6**: 636. 1888.—*Coniophora crocea* Karsten, Rev. Myc. **9**: 10. 1887 (this synonym published by Karsten); Soc. pro Fauna et Flora Fennica Meddel. **14**: 83. 1888; Sacc. Syll. Fung. **6**: 651. 1888; Masee, Linn. Soc. Bot. Jour. **25**: 137. 1889.

Type: authentic specimen of *C. crocea* in Burt Herb.



Fig. 17

C. laeticolor.

Section showing
hyphae, cystidium,
basidia, spores.
× 665.

Fructification effused, adnate, indeterminate, drying raw sienna, the margin of the same color, thinning out; hymenium even, compact, somewhat pulverulent; in structure 60–120 μ thick, with the hyphae giving their bright color to the fructification, not incrustated, occasionally nodose-septate, 3–4 μ in diameter, ascending more or less densely from the substratum to the hymenial surface; cystidia cylindric, not incrustated, simple, or few-septate, 4–4½ μ in diameter, emerging 20–60 μ ; spores concolorous with the hyphae, even, flattened on one side or slightly curved, 6–7 × 2½–3 μ .

Fructifications 4 cm. long, 2–2½ cm. broad.

On badly decayed, coniferous wood. Elkmont, Tennessee. September. Probably rare.

This species suggests by its bright color and thin, adnate habit the conidial stroma of some species of *Hypoxyylon*, and it may have been overlooked heretofore on account of this resemblance. It is well marked by its bright color, thin and compact habit of growth, small, slender spores, and cystidia.

Specimens examined:

Finland: Mustiala, *P. A. Karsten*, under the name *Coniophora crocea*.

Tennessee: Elkmont, *C. H. Kauffman*, 70 (in Mo. Bot. Gard. Herb., 16397).

18. *C. byssoidea* (Pers.) Fries, Hym. Eur. 659. 1874 (in subg. *Coniophora*); Karsten, Finska Vet.-Soc. Bidrag Natur och Folk 37: 160. 1882; Sacc. Syll. Fung. 6: 652. 1888.

Thelephora byssoides Persoon, Syn. Fung. 577. 1801; Fries, Syst. Myc. 1: 452. 1821.—*Corticium* (subg. *Coniophora*) *byssoideum* (Pers.) Fries, Hym. Eur. 659. 1874.—*Coniophorella byssoidea* (Pers.) Bresadola, Ann. Myc. 1: 111. 1903; Sacc. Syll. Fung. 17: 183. 1905.—*Peniophora byssoidea* (Pers.) v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 117: 1084. 1908.—*Diplonema sordescens* Karsten, Finl. Basidsv. 430. 1889.—*Peniophora sordescens* (Karst.) Sacc. Syll. Fung. 9: 240. 1891.

Fructification effused, dry, at first flaxy and hypochnoid, at length compact at the disk, drying cream-color to Naples yellow, the margin flaxy; hymenium even, tomentose; in structure 150–350 μ thick, composed of very loosely interwoven, rigid, nodose-septate hyphae 3–4 μ in diameter, which give the color to the fructification; cystidia slender, tapering, sharp-pointed, non-incrusted hairs, frequently nodose-septate, concolorous with the hyphae, 3–4½ μ in diameter, emerging up to 20–60 μ ; spores concolorous with the hyphae but sometimes nearly hyaline under the microscope, even, 4–4½ \times 2½–3 μ , perhaps larger in spore collections.

Fructifications ranging from 1 to 6 cm. in diameter, or perhaps larger.

On wood and objects on the ground and running over the humus in pine woods. Canada to Louisiana and westward to British Columbia and Oregon, also in Jamaica; apparently very common in the northwest. June to December.

If one does not overlook the pale color of the small spores, this species is easily recognized, for in *Coniophora* it is noteworthy among all species of the genus by its bright color—

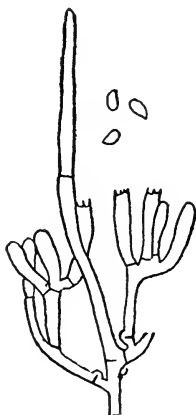


Fig. 18

C. byssoidea.

Hypha bearing cystidium and basidia; spores. \times 665.

cream-color to Naples yellow throughout—hypochnoid structure, rather stiff, loosely arranged, nodose-septate hyphae, and slender septate cystidia frequently nodose-septate.

Specimens examined:

Exsiccati: Cooke, *Fungi Brit.*, ed. 2, 607, under the name *Corticium sulphureum*; Krieger, *Fungi Sax.*, 363.

Finland: Mustiala, *P. A. Karsten*, authentic specimen of *Diplonema sordescens*.

Sweden: *L. Romell*, 78, 79; Stockholm, *L. Romell*, 110, 111, 236.

Germany: Saxony, Königstein, *W. Krieger*, in *Krieger, Fungi Sax.*, 363.

Austria-Hungary: *G. Bresadola*.

England: in Cooke, *Fungi Brit.*, ed. 2, 607, under the name *Corticium sulphureum*.

Canada: locality not given, *J. Macoun*, 10 in part, 15, 22; Lower St. Lawrence Valley, *J. Macoun*, 39, 59, 61.

Ontario: Ottawa, *J. Macoun*, 142, 143.

Vermont: Middlebury, *E. A. Burt*, two collections.

Connecticut: New Haven, *G. P. Clinton*.

New York: Fall Creek, *G. F. Atkinson*, 7994; Freeville, *G. F. Atkinson*, 2589.

Florida: locality not given, *W. W. Calkins*; Jacksonville, *R. A. Harper*, 1, 2, 3, 11 (in *Mo. Bot. Gard. Herb.*, 54527–54530 respectively).

Louisiana: De Ridder, *C. J. Humphrey*, 2527 (in *Mo. Bot. Gard. Herb.*, 12532); St. Martinville, *A. B. Langlois*, *di, j*.

Michigan: Michigamme, *C. J. Humphrey*, 1455 (in *Mo. Bot. Gard. Herb.*, 22972).

Montana: Birch Creek, Beaverhead National Forest, *C. J. Humphrey*, 2553 (in *Mo. Bot. Gard. Herb.*, 9524).

Idaho: Coeur d'Alene, *J. R. Weir*, 623 (in *Mo. Bot. Gard. Herb.*, 13853); Priest River, *J. R. Weir*, 132, 343 (in *Mo. Bot. Gard. Herb.*, 15761, 21363).

British Columbia: Kootenai Mountains, near Salmo, *J. R. Weir*, 518, 537, 623, 448, 475, 483, 492, 505, 504 in part, 486 (in *Mo. Bot. Gard. Herb.*, 19420, 1737, 13853, 8836, 20977, 21979, 21982, 2096, 14169, 20226 respectively); Sidney,

J. Macoun, 26 in part, 27 (in Mo. Bot. Gard. Herb., 5681, 8934); Vancouver Island, *J. Macoun*, comm. by J. Dearness, V 186 (in Mo. Bot. Gard. Herb., 20183).

Oregon: Joseph, *C. L. Shear*, 1037.

Jamaica: Cinchona, *W. A. & Edna L. Merrill*, N. Y. Bot. Gard., Fungi of Jamaica, 459.

19. *C. olivascens* (Berk. & Curtis) Masee, Linn. Soc. Bot. Jour. 25 : 138. 1889.

Corticium olivascens Berk. & Curtis, Grevillea 1 : 179. 1873; Sacc. Syll. Fung. 6 : 619. 1888.—*Corticium prasinum* Berk. & Curtis, Grevillea 1 : 179. 1873; Sacc. Syll. Fung. 6 : 619. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 153. 1890.—*Coniophora prasina* (Berk. & Curtis) v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 116 : 781. 1907.—*Corticium chlorinum* Berk. & Curtis, Grevillea 1 : 179. 1873; Sacc. Syll. Fung. 6 : 636. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 154. 1890.—*Coniophora subochracea* Peck, N. Y. State Mus. Rept. 50 : 114. 1897; Sacc. Syll. Fung. 14 : 225. 1899.

Type: type and cotype in Kew Herb. and Curtis Herb. respectively.

Fructification effused, dry, adnate, drying olive-lake to olive-citrine, the subiculum and margin whitish, floccose; hymenium even or minutely granular, more or less cracked; in structure 200–400 μ thick, with the granules rising up to 200 μ more, composed of hyaline, thin-walled, often collapsed, nodose-septate hyphae 3–5 μ in diameter, loosely interwoven, sometimes with rope-like hyphal strands near the substratum; granules dome-shaped, bearing hair-like cystidia scattered or in small clusters, not incrustated, often nodose-septate, 4–5 μ in diameter, emerging up to 60 μ ; spores Isabella-color in a spore collection, even, 4–6 \times 3–4 μ , mostly 5 \times 3½ μ .

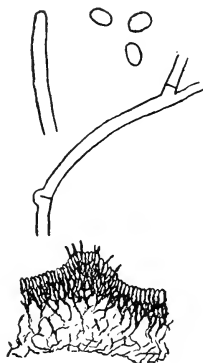


Fig. 19

C. olivascens.

Protruded part of cystidium, spores, and hypha, \times 665; section showing cystidia on a granule \times 45.

Fructifications $1\frac{1}{2}$ -3 cm. long, 1-2 cm. broad.

On coniferous bark and wood on the ground and on palmetto. Ontario to Louisiana, and in Cuba and the Bahama Islands. July to April.

C. olivascens is distinguished by its olivaceous color varying by intermediate shades to almost bottle-green, by its small spores, and by having hair-like cystidia protrude from its granules, frequently in clusters, as in the genus *Odontia*. The granular hymenial surface appears to be more frequent in northern collections than in those from the south, and the hyphae are more abundantly nodose-septate in northern specimens. Occasionally a collection will fail to show cystidia in a set of sections, especially if the fructification is rather young, but examination of other sets of sections from the oldest and most granular portions of the fructification will eventually demonstrate cystidia. *Grandinia virescens*. Pk. is colored exactly like *C. olivascens* and has the same general habit, but the spores of *G. virescens* are darker and minutely aculeate when the fructification is fully mature.

Specimens examined:

Exsiccati: Ravenel, *Fungi Car.* 5 : 29.

Canada: Ottawa, *J. Macoun*, 25.

Ontario: Port Credit, *J. H. Faull*, 321 (in *Mo. Bot. Gard. Herb.*, 44945).

Massachusetts: Boston, *Murray*, cotype (in *Curtis Herb.*, 6392).

New York: Albany, *H. D. House* (in *Mo. Bot. Gard. Herb.*, 15946); East Galway, *E. A. Burt*; Ithaca, *G. F. Atkinson*, 22977; *C. J. Humphrey*, Cornell Univ. Herb., 22562; *Karner*, *H. D. House*, 14.190, 14.169, and two unnumbered collections (in *Mo. Bot. Gard. Herb.*, 44718, 44720, 54363, 54364); Menands, *C. H. Peck*, type of *Coniophora subochracea* (in *Coll. N. Y. State*); Westport, *C. H. Peck* (in *N. Y. State Mus. Herb.* and in *Mo. Bot. Gard. Herb.*).

New Jersey: Newfield, *J. B. Ellis*, comm. by *W. G. Farlow* (in *Mo. Bot. Gard. Herb.*, 44641).

Pennsylvania: Whitehaven, *G. F. Atkinson*, 8653.

Alabama: *Peters*, type distribution of *Corticium prasinum* in

Ravenel, Fungi Car. 5 : 29, and cotype (in Curtis Herb., 6080).

Louisiana: Abita Springs, *A. B. Langlois*, 2639 in part; St. Martinville, *A. B. Langlois*, *u.*

Michigan: Ann Arbor, *C. H. Kauffman*, 21.

Bahama Islands: Nassau, *A. E. Wight*, comm. by W. G. Farlow.

Cuba: San Diego de los Banos, *Earle & Murrill*, 334, N. Y. Bot. Gard., Fungi of Cuba.

EXCLUDED SPECIES

C. capnoides Ell. & Ev. Phila. Acad. Nat. Sci. Proc. 1894 : 324. 1894; Sacc. Syll. Fung. 11 : 129. 1895.

Type: type distribution in Ell. & Ev., N. Am. Fungi, 2808.

This fungus bears its spores singly on conidiophores, as stated in the original description, and is not a basidiomycete.

C. sordulenta Cooke & Masee in Sacc. Syll. Fung. 6 : 650. 1888; Masee, Linn. Soc. Bot. Jour. 25 : 132. 1889.

Type: type in Kew Herb.

This species is not distinct from *Thelephora pallescens* Schw., whose relationship to *Hypochnus thelephoroides* (Ell. & Ev.) Burt was pointed out in my comment on the latter in Ann. Mo. Bot. Gard. 3 : 236. 1916. I have recently prepared a new set of sections from the authentic specimen of *Thelephora pallescens* Schw. in Curtis Herb. This specimen is in fine condition and shows the spores fully as rough-walled or aculeate in aqueous mounts as those of *Hypochnus thelephoroides*, which, therefore, becomes a synonym of *T. pallescens* and should be displaced in my account of our species of *Hypochnus* by the name *Hypochnus pallescens* (Schw.) Burt, with synonymy and distribution as follows:

26. **Hypochnus pallescens** (Schw.) Burt, n. comb.

Thelephora pallescens Schweinitz, Am. Phil. Soc. Trans. N. S. 4 : 167. 1832.—*Stereum pallescens* Schweinitz in Sacc. Syll. Fung. 6 : 586. 1888.—*Corticium pallescens* (Schw.) Masee, Linn. Soc. Bot. Jour. 27 : 129. 1890.—*Thelephora insinuans* Schweinitz, Am. Phil. Soc. Trans. N. S. 4 : 167. 1832.—

Stereum insinuans Schweinitz in Sacc. Syll. Fung. 6 : 586. 1888.—*Coniophora insinuans* (Schw.) Masee, Linn. Soc. Bot. Jour. 25 : 138. 1889.—*Corticium* (subg. *Coniophora*) *sordulentum* Cooke & Masee, Grevillea 16 : 69. 1888.—*Coniophora sordulenta* Cooke & Masee in Sacc. Syll. Fung. 6 : 650. 1888; Masee, Linn. Soc. Bot. Jour. 25 : 132. 1889.—*Corticium thelephoroides* Ell. & Ev. Jour. Myc. 1 : 88. 1885; Sacc. Syll. Fung. 6 : 630. 1888.—*Hypochnus thelephoroides* (Ell. & Ev.) Burt, Ann. Mo. Bot. Gard. 3 : 235. 1916.

Specimens examined:

Exsiccati: Ell. & Ev., N. Am. Fungi, 2020, under the name *Corticium dryinum*; Ell. & Ev., Fungi Col., 706, under the name *Corticium vagum*; Ravenel, Fungi Am., 719, under the name *Peniophora flavido-alba* (in copy of U. S. Dept. Agr. Herb.).

Canada: Cedar Hill, Van Island, *J. Macoun*, 62.

New Hampshire: Chocorua, *W. G. Farlow*.

Massachusetts: Sharon, *A. P. D. Piguet*, comm. by *W. G. Farlow* (in Farlow Herb. and in Mo. Bot. Gard. Herb., 54787).

New Jersey: Newfield, *J. B. Ellis*, in Ell. & Ev., Fungi Col., 706.

Pennsylvania: Bethlehem, *Schweinitz*, types of *Thelephora pallescens* and *Thelephora insinuans* (in Herb. Schw. and in Curtis Herb.).

Georgia: Darien, *H. W. Ravenel*, in Ravenel, Fungi Am., 719 (in copy of U. S. Dept. Agr. Herb.).

Florida: *W. W. Calkins*, U. S. Dept. Agr. Herb.; Jacksonville, *W. W. Calkins*, in Ell. & Ev., N. Am. Fungi, 2020; New Smyrna, *C. G. Lloyd*, 2138.

Louisiana: Lake Charles, *C. J. Humphrey*, 2538 (in Mo. Bot. Gard. Herb., 12959); St. Martinville, *A. B. Langlois*, *az, c, u, y*, 2633, 2673, and a specimen comm. by *C. G. Lloyd*, 3017.

Texas: Houston, *H. W. Ravenel*, 239, U. S. Dept. Agr. Herb. Illinois: Cerro Gordo, *L. O. Overholts*, 3284 (in Mo. Bot. Gard. Herb., 10640).

Missouri: comm. by *J. B. Ellis*, 5055, type of *Corticium sordulentum* (in Kew Herb.).

- Washington: *Carpenter*, 90, type of *Corticium theleporoides* (in N. Y. Bot. Gard. Herb., Kew Herb., Farlow Herb., and Mo. Bot. Gard. Herb.).
- British Columbia: Kootenai Mountains, near Salmo, *J. R. Weir*, 497 (in Mo. Bot. Gard. Herb., 21978); Vancouver, *J. Macoun*, V 178, comm. by J. Dearness (in Mo. Bot. Gard. Herb., 8938).
- Mexico: Colima, *W. A. & E. L. Murrill*, N. Y. Bot. Gard., Fungi of Mexico, 591 (in Mo. Bot. Gard. Herb.).
- Jamaica: Morce's Gap, *W. A. & E. L. Murrill*, N. Y. Bot. Gard., Fungi of Jamaica, 658.
- Cuba: Alto Cedro, *L. M. Underwood & F. S. Earle*, N. Y. Bot. Gard., Plants of Cuba, 1530; San Diego de los Banos, Pinar del Rio Province, *F. S. Earle & W. A. Murrill*, 572, N. Y. Bot. Gard.
- Porto Rico: Rio Piedras, *J. A. Stevenson*, 5794 (in Mo. Bot. Gard. Herb., 54691).
- Trinidad: Arepo Lavanna, *R. Thaxter*, comm. by W. G. Farlow, 20.

(To be continued.)

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The Thelephoraceae of North
America. IX

Aleurodiscus

EDWARD ANGUS BURT

Reprinted from ANNALS OF THE MISSOURI BOTANICAL
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THE THELEPHORACEAE OF NORTH AMERICA. IX¹

ALEURODISCUS

EDWARD ANGUS BURT

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ALEURODISCUS

Aleurodiscus Rabenhorst, Fungi Eur. Exs., 1824 (without diagnosis). 1874; Hedwigia **13** : 184 (without diagnosis). 1874; Schroeter, Krypt.-Fl. Schlesien **3** : 429. 1888; Engl. & Prantl, Nat. Pflanzenfam. (1.1**) : 120. 1898; Patouillard, Essai Taxon. Hym. 52. 1900; v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. **116** : 793. *pl.* 1-4. 1907; Bourd. & Galz. Soc. Myc. Fr. Bul. **28** : 349. 1913.

Fructifications resupinate, sometimes with margin free all around and somewhat saucer-shaped, rarely dimidiate and attached by the base, drying coriaceous; hymenium pulverulent; paraphyses noteworthy, modified into forms such as moniliform, or racemose by presence of short lateral branches—these paraphyses are sometimes called dendrophyses; granular or crystalline matter often in great quantity between the basidia, paraphyses, and hyphae of the fructification; basidia simple, usually large and with four large sterigmata; spores simple, usually large, with colorless cell wall.

The type species is *Aleurodiscus amorphus* (Pers.) Rabenh. originally published as *Peziza amorphia* by Persoon, then transferred to *Thelephora* by Fries when known to be a basid-

¹ Issued September 20, 1918.

Suppl. to F. H. Ravenel

iomycete, and finally referred by Fries with doubt to *Corticium* and regarded by Quelet as a *Cyphella*.

Into *Aleurodiscus* have been assembled species of related structure which were originally published in *Corticium* and *Stereum* on the basis of form of fructification, but which are noteworthy by basidia and spores often enormous in dimensions for the genera to which these species were originally referred, and which sometimes have paraphyses of remarkable form, and the fructification greatly thickened in some species by so large an amount of incrustated or granular matter as to render it very difficult to make out the detailed structure of basidia and paraphyses in good sectional preparations. The granular and crystalline matter may be dissolved from the sections by warming them on the slide in a few drops of dilute hydrochloric acid, but with the disadvantage of leaving the paraphyses and other organs with rather vague outlines, as though somewhat collapsed or disorganized.

Some species now referred to *Aleurodiscus* are intermediate between this genus and other genera by the absence of any notable development of some one or other of the foregoing characters, and it is too largely a matter of personal opinion as to just which species should be transferred. On the whole, *Aleurodiscus* is probably useful, although bound to be a source of confusion by introducing into a scheme of classification based upon form and general structure of fructification a conflicting scheme of classification based upon rather trivial, and often poorly shown, features of microscopic detail, with disregard of diversity in form and general structure of fructification involved. Innovations of this kind should certainly be exceptional.

Of the 25 species of *Aleurodiscus* which have been recognized up to the present time, 14 occur in North America, 8 in Europe, 5 in Asia and Australia, 2 in Africa, and 2 in South America. *A. acerinus* is the only one of these which is of world-wide distribution; *A. amorphus* is the only other species common to both Europe and North America, and in North America it is restricted to northern United States and Canada. Only 3 species, *A. acerinus*, *A. candidus*,

and *A. nivosus*, have wide range in the United States. Our other species are local: 7 comprise the total for New England, 7 are subtropical or tropical, and 5 are present in the Rocky Mountain states or westward.

KEY TO THE SPECIES

- Fructifications discoid, cup-shaped, pezizaeform, as in *A. amorphus*..... 1
- Fructifications normally effuso-reflexed, sometimes with margin free all around, as in *A. Oakesii*, sometimes barely showing color of under side, as in *A. candidus*, which is often strictly resupinate..... 2
- Fructifications resupinate, effused, the margin never reflexed..... 3
1. Spores minutely echinulate; paraphyses moniliform; free margin of fructification light-colored on under side; on balsam fir and spruce.....
.....1. *A. amorphus*
1. Spores even; paraphyses of bottle-brush form; free margin of under side of fructification deep mouse-gray; on hemlock in New England and New York.....2. *A. Farlowii*
1. Spores even; some paraphyses of bottle-brush form, others with moniliform tips; margin of under side of fructification light-colored; on *Ostrya* and other frondose species.....3. *A. Oakesii*
2. Spores even; some paraphyses of bottle-brush form, others with moniliform tips.....3. *A. Oakesii*
2. Spores minutely echinulate, apiculate; many paraphyses of bottle-brush form, none moniliform; sometimes resupinate; Jamaica to Grenada.....4. *A. apiculatus*
2. Spores even; paraphyses with somewhat corymbosely branched, filiform tips, made out with great difficulty because of the large amount of incrusting and crystalline matter present; fructification chalk-white, orbicular; sometimes resupinate.....5. *A. candidus*
3. Fructifications drying between antimony-yellow and yellow-ocher at the surface, white within, staining herbarium sheets and envelopes yellow.....6. *A. strumosus*
3. Fructifications not egg-yellow..... 4
4. Paraphyses heavily loaded with incrusting matter, so that their branching is not easily made out, not of bottle-brush form..... 5
4. Paraphyses with short lateral prongs, i. e., of bottle-brush form, and not organs for carrying heavy incrustation..... 6
5. Paraphyses filiform, spirally twisted or flexuous; spores even, $11-18 \times 9\frac{1}{2}-13 \mu$; globose organs staining brown with iodine, $6-15 \mu$ in diameter, scattered throughout the fructification; in Cuba and Jamaica.....7. *A. seriatus*
5. Paraphyses with corymbosely branched tips; spores even, $15-20 \times 12-16 \mu$; gloeocystidia clavate, $18-30 \times 9 \mu$; fructifications white; on bark of living cedar trees.....8. *A. nivosus*
5. Paraphyses with racemosely branched tips; spores even, $10-12 \times 6-7 \mu$; gloeocystidia not present.....9. *A. acerinus*
6. Spores even..... 7
6. Spores minutely echinulate..... 8
7. Bottle-brush portions of paraphyses $10-15 \times 3-4\frac{1}{2} \mu$ over lateral prongs; spores $13-15 \times 9-11 \mu$; on *Rubus* and *Vitis* in Massachusetts, Maryland, and Mexico.....10. *A. botryosus*
7. Bottle-brush portions $15 \times 6 \mu$ over lateral prongs; spores globose, 9μ in diameter; fructifications cream-buff, $600-800 \mu$ thick, zonate with crystalline matter; on *Quercus* in New Mexico.....11. *A. creneus*

8. Bottle-brush structure disorganized by KHO solution; spores 12-15 × 9-12 μ; fructifications white, 60-90 μ thick; on frondose wood in Cuba12. *A. tenuis*
8. Paraphyses flexuous, 6 μ in diameter, some of them with a cluster of prongs at the tips; spores subglobose, 15-20 μ in diameter; on *Tsuga* and *Pseudotsuga* in Idaho and westward.....13. *A. penicillatus*
8. Bottle-brush organs about 23×12 μ, cockroach-shaped; spores subglobose, 6-12 μ in diameter; on *Abies*, *Thuja*, and *Larix* in Idaho and British Columbia.....14. *A. Weirii*

1. **A. amorphus** (Pers.) Rabenhorst, Fungi Eur. Exs., 1824. 1874; Hedwigia 13 : 184. 1874; Cooke, Grevillea 3 : 136. 1875; Schroeter, Krypt.-Fl. Schlesien 3 : 429. 1888; v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 116 : 799. pl. 1. f. 2. 1907; Bourd. & Galz. Soc. Myc. Fr. Bul. 28 : 350. 1913.

Peziza amorpha Persoon, Syn. Fung. 657. 1801; Myc. Eur. 1 : 269. 1822.—*Thelephora amorpha* (Pers.) Fries, Elenchus Fung. 1 : 183. 1828.—*Corticium amorphum* (Pers.) Fries, Epicr. 559. 1838; Hym. Eur. 648. 1874; Sacc. Syll. Fung. 6 : 606. 1888.—*Cyphella amorpha* (Pers.) Quelet, Ench. Fung. 215. 1886.—*Nodularia balsamicola* Peck, N. Y. State Mus. Rept. 24 : 96. pl. 4. f. 23-26. 1872.

Illustrations: De Bary, Comp. Morph. and Phys. Fungi, f. 30; Hennings in Engl. & Prantl, Nat. Pflanzenfam. (1.1**): f. 67, C-D; v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 116⁵: pl. 1. f. 2; Patouillard, Tab. Anal. Fung. f. 584; Peck, N. Y. State Mus. Rept. 24 : pl. 4. f. 23-26.

Fructifications disk-shaped, scattered or sometimes confluent, somewhat fleshy, drying coriaceous, attached by a point, the margin free, elevated, incurved; hymenium convex, pulverulent, buff-pink at first, becoming deep olive-buff in the herbarium, the margin paler; in structure 500-1000 μ thick, composed of densely interwoven, hyaline hyphae 3 μ in diameter, granule-incrusted and with the granules crystalline and sometimes up to 12 μ in diameter but not so numerous as to conceal the structure of the fructification; paraphyses hyaline, filiform, flexuous, often moniliform, 4-4½ μ in diameter; basidia clavate, large, 120×18 μ, with four large sterigmata; spores subglobose with hyaline wall, minutely echinulate, 20-27×16-21 μ.

Fructifications 1-3 and 4 mm. in diameter, ½-1 mm. thick where not attached, 2 mm. thick where attached.

On balsam fir, spruce, and *Thuja plicata*. Newfoundland to New York and westward to Oregon. Infrequent.

The aspect of *A. amorphus* is that of a small *Peziza*, which may account for the infrequency of this species in the collections which have been sent to me for determination. The large, minutely spinulose spores and moniliform paraphyses are distinguishing microscopic characters. The echinulate marking of the spores is very faint in the collections from Idaho westward.

Specimens examined:

Exsiccati: Ell. & Ev.,

N. Am. Fungi,

2733; Krieger,

Fungi Sax., 619,

1908; Oudemans,

Fungi Neerlandici Exs., 285; Romell, Fungi Scand. Exs.,

130; de Thümen, Myc. Univ., 1508 (in Burt copy but not

in Mo. Bot. Gard. Herb. copy), under the name *Dasyscypha*

calycina.

Sweden: Omberg, *G. Schotte*, in Romell, Fungi Scand. Exs., 130.

Germany: Saxony, Königstein, *W. Krieger*, in Krieger, Fungi Sax., 619; Schandau, *W. Krieger*, in Krieger, Fungi Sax., 1908.

Switzerland: Neuchatel, *P. Morthier*, in de Thümen, Myc. Univ., 1508.

Holland: in Oudemans, Fungi Neerlandici Exs., 285.

France: *Fautrey* (in Lloyd Herb., 4353).

Newfoundland: Frenchman's Cove, *A. C. Waghorne*, 319 (in Mo. Bot. Gard. Herb.).

Prince Edward's Island: Rustico Bay, *J. Macoun*, 342.

Ontario: Lake Nipigon, *J. Macoun*.

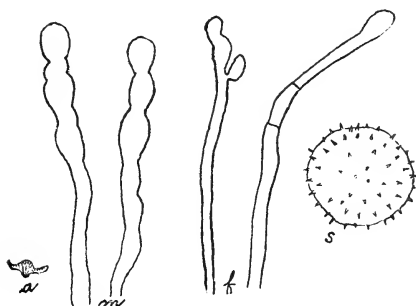


Fig. 1. *A. amorphus*. Section of fructification showing tubercular base of attachment, *a*, $\times 2$; moniliform paraphyses, *m*; flexuous paraphyses, *f*; and spore, *s*, $\times 870$.

- New Hampshire: Camp, Ellis R., *U. & C.*, from Underwood Coll. (in N. Y. Bot. Gard. Herb. and in Mo. Bot. Gard. Herb., 4773); Chocorua, *W. G. Farlow*; Shelburne, *W. G. Farlow* (in Mo. Bot. Gard. Herb., 4772).
- New York: Adirondack Mts., *S. L. Clarke* (in N. Y. Bot. Gard. Herb.); Lake Placid, *W. A. & Edna L. Murrill*, 209, 1127 (in N. Y. Bot. Gard. Herb.); East Galway, *E. A. Burt*; Indian Lake, *C. H. Peck*, type of *Nodularia balsamicola* (in Coll. N. Y. State and N. Y. Bot. Gard. Herb.); Willsboro, Essex Co., *C. O. Smith*.
- Michigan: Vermilion, *A. H. W. Povah*, 198 (in Mo. Bot. Gard. Herb., 13634).
- Wisconsin: Madison, *Miss A. O. Stucki*, 55, Univ. of Wisconsin Herb.
- Idaho: Pend d'Oreil, *J. B. Leibig*, in Ell. & Ev., N. Am. Fungi, 2733; Priest River, *J. R. Weir*, 311, 358 (in Mo. Bot. Gard. Herb., 7065 and 10229 respectively).
- British Columbia: Sidney, *J. Macoun*, 29, 31 (in Mo. Bot. Gard. Herb., 6773 and 6774 respectively).
- Washington: Chehalis, *C. J. Humphrey*, 5276; Olympic Mts., *T. C. Frye*, 18 (in Farlow Herb., N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 44301).
- Oregon: Mt. Hood, *T. C. Frye*, 15 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55444); Forest Grove, *A. R. Sweetser*.

2. A. Farlowii Burt, n. sp.

Type: in Farlow Herb. and Burt Herb.

Fructifications disk-shaped, scattered or sometimes confluent, coriaceous, attached by a point or tubercle, the margin free, incurved, under side deep mouse-gray; hymenium convex, pulverulent, avellaneous at first, becoming drab in the herbarium; in structure, with the hyphae arising from the substratum, hyaline, even, thick-walled, densely interwoven, 3 μ in diameter, not incrustated, then radiating outward in all directions to form the hymenium, made up of basidia and paraphyses, with the latter extending about 30 μ beyond the basidia; paraphyses of the racemose kind, resembling hya-

line bottle brushes, 6–7 μ in diameter over branches, with central axis bearing along its whole length short lateral branches of equal length, densely crowded together; basidia clavate, 36–54 \times 9–12 μ ; spores hyaline, even, flattened on one side, 13–18 \times 9–12 μ .

Fructifications 1–1½ mm. in diameter, unless elongated by confluence of two or three, about ½ mm. thick.

On dead twigs of hemlock, perhaps on balsam fir also. New Hampshire and New York. Rare.

A. Farlowii has the general aspect of *A. amorphus* but may be separated from this species when examined superficially, by its smaller fructifications, which are nearly black on the unattached part of the under side, while those of the larger species are light-colored; the small basidia, small spores, bottle-brush paraphyses, and absence of incrusting matter afford additional decisive characters. *A. Oakesii* has bottle-brush paraphyses which are of greater diameter than those of *A. Farlowii* and with fewer branches and its fructifications are much larger and of a different form.

Specimens examined:

New Hampshire: Chocorua, *W. G. Farlow*; King's Ravine, *W. G. Farlow*, type.

New York: Vaughns, Hudson Falls, *S. H. Burnham*, 21, and an unnumbered collection (in Mo. Bot. Gard. Herb., 44014 and 44121 respectively).

3. *A. Oakesii* (Berk. & Curtis) Cooke, *Grevillea* 3:172. 1875; v. Höhn. & Litsch. *K. Akad. Wiss. Wien Sitzungsber.* 116: 802. *pl. 3. f. 1.* 1907.

Corticium Oakesii Berk. & Curtis, *Grevillea* 1:166. 1873; *Sacc. Syll. Fung.* 6:606. 1888; *Pierce, Torr. Bot. Club Bul.* 17:301. *pl. 110. f. a-i.* 1890.

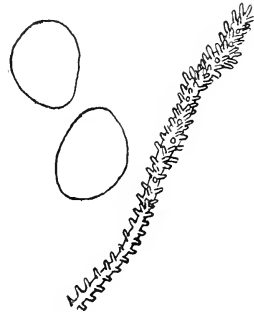


Fig. 2

A. Farlowii.

Two spores and bottle-brush paraphysis. $\times 870$.

Illustrations: Patouillard, *Rev. Myc.* **12**. *pl. 107 bis. f. 5a, d*; Pierce, *Torr. Bot. Club Bul.* **17**: *pl. 110. f. a-i*; v. Höhn. & Litsch. *K. Akad. Wiss. Wien Sitzungsber.* **116**: *pl. 3. f. 1*.

Type: type distribution in Ravenel, *Fungi Car.* **3**: 32.

Fructifications disk-shaped, pezizaeform, scattered or confluent, somewhat fleshy, drying coriaceous, attached by the

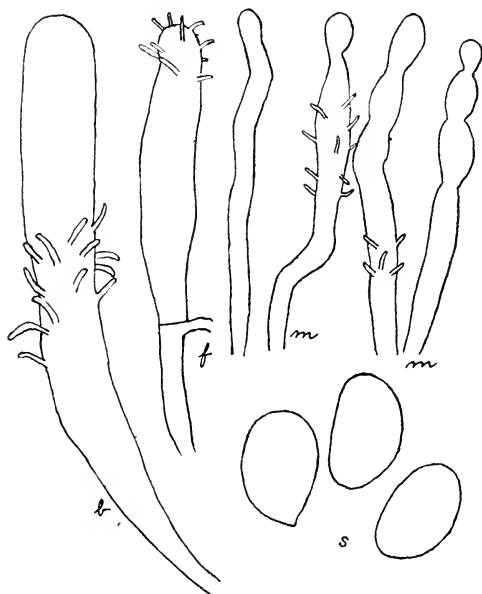


Fig. 3. *A. Oakesii*. Immature basidium, *b*; flexuous paraphyses, *f*; moniliform paraphyses, *m*, some with whorl-like clusters of lateral, bottle-brush prongs; spores, *s*. $\times 870$.

center, the margin free, elevated, incurved, whitish and tomentose on the under side; hymenium concave, pulverulent, drying avellaneous; in structure about 600μ thick, composed of hyaline hyphae $3-3\frac{1}{2} \mu$ in diameter, rather thick-walled, sometimes granule-incrusted, longitudinally arranged and interwoven next to the substratum, curving outward to bear the hymenium, consisting of basidia and filiform paraphyses with

tips of two kinds; most tips are racemose with about 12 lateral branches $3\ \mu$ long standing out from an axis $6\ \mu$ in diameter, other tips consist of 2 or 3 moniliform bodies — either kind of paraphysis may bear a cluster of lateral branches at some region more or less distant from the end; basidia $80\text{--}100\times 12\ \mu$; spores hyaline, even, $18\text{--}21\times 12\text{--}13\ \mu$.

Fructifications 1–2 mm. in diameter, becoming confluent into masses 2×1 cm.

On bark of dead *Ostrya virginica*, *Quercus alba*, *Q. macrocarpa*, *Salix*, hickory, etc. Canada to Alabama, westward to Missouri.

A. Oakesii resembles *A. amorphus* so closely in aspect that it was regarded by Fries in his 'Hymenomyces Europaei' as a synonym of the latter species, from which Cooke demonstrated that it was clearly distinct by the paraphyses. It may be separated at sight by the hymenium of *A. Oakesii* not being convex, by the fructifications becoming very large by confluence, and by its occurrence on bark of frondose species.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 935a and b; Ell. & Ev., Fungi Col., 310; Kellerman, Ohio Fungi, 125; Rabenhorst, Fungi Eur., 3232; Ravenel, Fungi Car. 3 : 32, type distribution; Shear, N. Y. Fungi, 116.

Canada: Ontario, Carleton Place, *J. Macoun*, 422; London, *J. Dearness*, 2647 (in Mo. Bot. Gard. Herb., 19516).

New England: *Oakes* (in Curtis Herb., 3102).

Vermont: Middlebury, *E. A. Burt*.

Rhode Island: *Olney* (in Curtis Herb., 1827).

New York: Alcove, *C. L. Shear*, in Shear, N. Y. Fungi, 116; Altamont, *E. A. Burt*; definite locality not given, *Sartwell* (in Curtis Herb., and in Mo. Bot. Gard. Herb., 4830); Buffalo, *G. W. Clinton* (in U. S. Dept. Agr. Herb.).

New Jersey: *Laning* (in Curtis Herb., and in Mo. Bot. Gard. Herb., 44128, 44129).

Pennsylvania: Bethlehem, *E. A. Rau*, in Ellis, N. Am. Fungi, 935a; Spruce Creek, *J. H. Faull*, Univ. of Toronto Herb., 366 (in Mo. Bot. Gard. Herb., 44915); State College, *C. R. Orton*, 3 (in Mo. Bot. Gard. Herb., 44080); Trexlertown, *W.*

- Herbst*, 85; West Chester, *Everhart, Haines, Jefferis & Gray*, in *Ellis, N. Am. Fungi*, 935b.
- West Virginia: Nuttallburg, *L. W. Nuttall*, in *Ell. & Ev., Fungi Col.*, 310.
- Alabama: *Peters*, in *Ravenel, Fungi Car.* 3:32, and (in *Curtis Herb.*, 3868).
- Ohio: Cincinnati, *A. P. Morgan* (in *Lloyd Herb.*); Columbus, *F. J. Tyler*, in *Kellerman, Ohio Fungi*, 125; Oberlin, *F. D. Kelsey* (in *Lloyd Herb.*, and in *Mo. Bot. Gard. Herb.*, 4831).
- Michigan: Ann Arbor, *A. J. Pieters* (in *U. S. Dept. Agr. Herb.*).
- Indiana: Crawfordsville, *D. Reddick*, 11.
- Illinois: River Forest, *Miss A. O. Stucki*, 11, *Univ. of Wisconsin Herb.*
- Wisconsin: Madison, four collections, as follows: collector not given (in *Mo. Bot. Gard. Herb.*, 4832); *M. C. Jensen*, comm. by *C. J. Humphrey* (in *Mo. Bot. Gard. Herb.*, 42942); *W. Trelease*, 67 (in *Mo. Bot. Gard. Herb.*, 4799); *Miss A. O. Stucki*, 54, *Univ. of Wisconsin Herb.*
- Iowa: Decorah, *E. W. D. Holway* (in *U. S. Dept. Agr. Herb.*); Webster County, *O. M. Oleson*, 1.
- Missouri: Columbia, *B. M. Duggar*, 401; Perryville, *C. H. Demetrio*, in *Rabenhorst, Fungi Eur.*, 3232.

4. *A. apiculatus* Burt, n. sp.

Type: in *Burt Herb.*

Fructifications resupinate, effused, sometimes narrowly reflexed, coriaceous, pulverulent, drying pinkish buff, the reflexed margin tomentose, white, inrolled; in structure 600–800 μ thick, with the hyphae hyaline, even, thick-walled, $3\frac{1}{2}$ –4 μ in diameter, not incrustated, not nodose-septate, loosely interwoven in the outer surface of the reflexed part, densely interwoven and longitudinally arranged in the middle region of that part and near the substratum, then curving outward and ascending to form the subhymenium and hymenium; all organs in subhymenium clothed with lateral prongs; paraphyses hyaline, some with outer end racemosely branched, 6–7 μ in diameter over branches, with the branches clothing the sides of the paraphyses for about 40–45 μ , and others with

outer end even and lateral prongs present at lower level of hymenium; basidia clavate, up to $100 \times 12-15 \mu$, with 4 prominent sterigmata about 15μ long; spores hyaline, unequilateral, apiculate, minutely echinulate, $20-25 \times 12-15 \mu$.

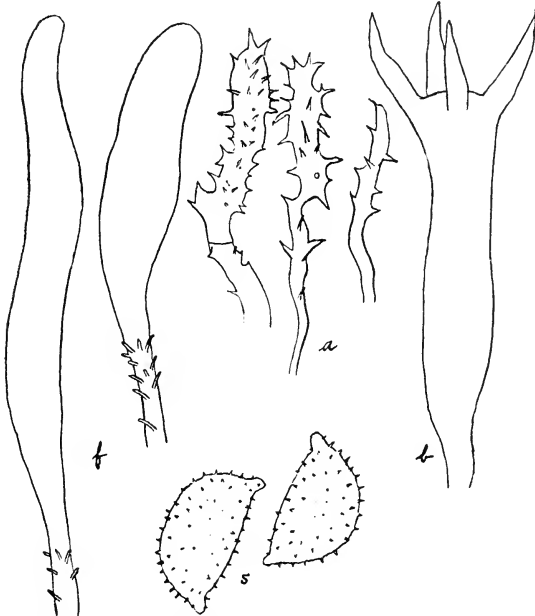


Fig. 4. *A. apiculatus*. Flexuous paraphyses, *f*; paraphyses with aculeate prongs, *a*; basidium, *b*; and spores, *s*. $\times 870$.

Fructifications $2\frac{1}{2}$ –10 cm. long, 6–15 mm. broad, with reflexed margin $1-1\frac{1}{2}$ mm. broad.

On bark of pole of frondose wood on ground at 5,000 ft. altitude, and on dead limbs. Jamaica, Porto Rico, and Grenada. November.

Until microscopic examination of the sections was made, the collections were regarded as consisting of large specimens of *A. Oakesii*, which this species resembles in aspect but from which it differs in spore characters and in the absence of mo-

niliform paraphyses. The collections from Porto Rico and Grenada are probably rather immature, for many of their spores are even.

Specimens examined:

Jamaica: Cinchona, *F. S. Earle*, 401, N. Y. Bot. Gard., Plants of Jamaica, type.

Porto Rico: Vieques Island, Campo Cieto to Ensenada Hondo, *J. A. Shafer*, 3048 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55453).

Grenada: Grand Etang, *R. Thaxter*, comm. by W. G. Farlow, 6.

5. *A. candidus* (Schw.) Burt, n. comb.

Thelephora candida Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1: 110. 1822; Fries, Elenchus Fung. 1: 189. 1828.—*Thelephora candidissima* Schweinitz, Am. Phil. Soc. Trans. N. S. 4: 167. 1832.—*Stereum candidum* (Schw.) Fries, Epier. 552. 1838; Sacc. Syll. Fung. 6: 585. 1888; Masee, Linn. Soc. Bot. Jour. 27: 200. 1890.

Type: in Herb. Schweinitz, Herb. Fries, and Curtis Herb.

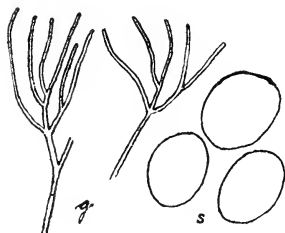


Fig. 5

A. candidus.

Granule-bearing paraphyses, *g*, after removal of the granular matter by HCl; spores of type, *s*. $\times 870$.

Fructifications scattered, resupinate, adnate, at first convex and orbicular, soon expanded, flattened, following the inequalities of the bark, white, pruinose, the margin thick, entire, blackening underneath; in structure 800 μ thick, somewhat stratose, composed of densely arranged, sub-erect, interwoven, heavily incrustated, hyaline hyphae 2–3 μ in diameter under the incrustation, of which much of the matter is large, angular, crystalline grains;

hymenium composed of clavate basidia 45–60 \times 10–15 μ , and of thin-walled, hyaline, flexuous, incrustated, hyphal paraphyses with tips bushy, somewhat corymbosely branched, branches 2–3 μ in diameter under their incrustation, not moniliform and noteworthy, as are the hyphae, by the large amount of

crystalline matter attached to them—often by only a corner or small end of the crystal; spores hyaline, even, subglobose, $15-17 \times 11-14 \mu$.

Fructifications usually 3-6 mm. in diameter, sometimes 1-2 cm.

On bark of trunks of living oaks, rarely on ash and maple. New York to Florida, westward to Missouri, in California, Mexico, and Jamaica. August to January.

This species resembles *A. disciformis* of Europe very closely in aspect but differs from it in being chalk-white, in having the margin blackening on the under side, in being thicker, somewhat zonate within, containing much more crystalline matter, and in having thinner-walled, slenderer, more hyphal-like, and more heavily incrustated paraphyses which are not at all moniliform at the tips. The spores may prove minutely rough-walled; winter collections of this species are desirable.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 1206; Ell. & Ev., N. Am. Fungi, 3208, under the name *Stereum acerinum*; Ell. & Ev., Fungi Col., 605; Ravenel, Fungi Am., 120; Ravenel, Fungi Car. 1: 32.

New York: Buffalo, *G. W. Clinton*.

Pennsylvania: Bethlehem, *E. A. Rau*, in Ellis, N. Am. Fungi, 1206.

Maryland: Takoma Park, *C. L. Shear*, 1104.

West Virginia: Nuttallburg, *L. W. Nuttall*, two collections, in Ell. & Ev., N. Am. Fungi, 3208, and in Ell. & Ev., Fungi Col., 605.

North Carolina: Salem, *Schweinitz* (in Herb. Fries and in Curtis Herb.); Blowing Rock, *G. F. Atkinson*, 4193, 4320; Chapel Hill, *H. R. Totten*, comm. by W. C. Coker, Univ. of N. Car. Herb., 1377a (in Mo. Bot. Gard. Herb., 9057).

South Carolina: Aiken, *H. W. Ravenel*, in Ravenel, Fungi Am., 120; locality not stated, *H. W. Ravenel*, Fungi Car. 1: 32.

Florida: Sands Key, *R. A. Harper*, 8 (in Mo. Bot. Gard. Herb., 54526).

Alabama: Montgomery, *R. P. Burke*, 121 (in Mo. Bot. Gard. Herb., 21223).

Ohio: Lancaster, *W. A. Kellerman*, 284.

Missouri: Creve Coeur, *L. O. Overholts*, 669 (in Mo. Bot. Gard. Herb., 4801); St. Louis, *E. A. Burt* (in Mo. Bot. Gard. Herb., 44044).

California: Muir Woods, *W. A. Merrill*, 1155, N. Y. Bot. Gard. (in Mo. Bot. Gard. Herb., 55453).

Mexico: Oaxaca, *E. W. D. Holway*.

Jamaica: Cinchona, *W. A. & Edna L. Merrill*, 565, N. Y. Bot. Gard., Fungi of Jamaica.

6. *A. strumosus* (Fries) Burt, n. comb.

Stereum strumosum Fries (Nov. Symb. Myc. 95), R. Soc. Sci. Upsal. Actis III. 1: 111. 1851; Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 333. 1868; Sacc. Syll. Fung. 6: 586. 1888; Massee, Linn. Soc. Bot. Jour. 27: 203. 1890.—*Stereum* (?) *vitellinum* Leveille in Triana & Planchon, Prod. Fl. Novo-Granat. Crypt. 157. 1863–1867.—*Stereum Mancianum* Sacc. & Cub. in Sacc. Syll. Fung. 6: 583. 1888.—*Aleurodiscus Mancianus* (Sacc. & Cub.) Patouillard, Soc. Myc. Fr. Bul. 16: 180. 1901.

Type: specimen from Fries in Kew Herb.

Fructifications resupinate, adnate, orbicular, scattered, sometimes confluent and effused, drying between antimony-yellow and yellow-ocher at the surface and white within, the margin rather thick, sometimes free, entire; in structure 300–500 μ thick, rarely strato-

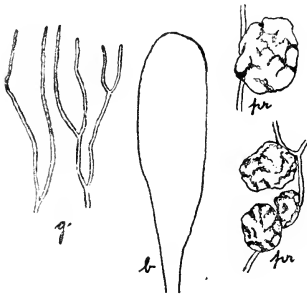


Fig. 6

A. strumosus.

Granule-bearing paraphyses, *g*, after removal of the granular matter by HCl; immature basidium, *b*; proteid bodies, *pr*. $\times 870$.

tose, composed of granule-incrusted, thin-walled, hyaline hyphae, some of which are suberect, 2 μ in diameter under incrustation, barely visible except by their load of incrusting grains, interwoven, and apparently branches from the

coarser hyphae; globose organs of proteid reaction, 6–15 μ in diameter, with shriveled or wrinkled surface, are scattered throughout the fructification; hymenium composed of granule-incrusted hyphal systems and of presumable basidia buried among the incrusted hyphae; such basidia-like bodies clavate, 60–100 \times 15–20 μ , yellow in KHO preparations, simple, none seen bearing sterigmata; detached spores hyaline, even, 18–27 \times 12–21 μ .

Fructifications 2–5 mm. in diameter, becoming up to 3 cm. long by confluence.

On bark of frondose trees. South Carolina to Louisiana, West Indies, and Mexico to Colombia.

This species may be recognized by its pulverulent, egg-yellow, orbicular fructifications which are white within and contain so much granular matter as to render other details of internal structure obscure and difficult of determination. This granular matter holds together so as to show that it is incrusting matter upon very tenuous, nonstaining hyphal filaments. While I do not doubt that the large, yellow, clavate organs near the hymenial surface but buried in the granular matter are immature basidia, still I have not demonstrated their sterigmata in the preparations of any of the collections which have been examined up to the present. The globose organs show distinctly in stained preparations which have been heated in dilute HCl to free them of the crystalline matter.

Specimens examined:

Exsiccati: Ravenel, *Fungi Car.* 3: 28, under the herbarium name *Corticium citrinum* Berk. & Rav. but not of Fries.

South Carolina: in Ravenel, *Fungi Car.* 3: 28; Black Oak, *H. W. Ravenel, 1397*, under the name *Corticium citrinum* (in Curtis Herb.).

Florida: Daytona, *R. Thaxter, 52, 62* (in Farlow Herb. and in Mo. Bot. Gard. Herb., 43942 and 43944); Ocala, *R. Thaxter, 58* (in Farlow Herb., and in Mo. Bot. Gard. Herb., 43943).

Louisiana: St. Martinville, *A. B. Langlois, 1953*.

Jamaica: Morce's Gap, *W. A. & Edna L. Murrill, 714*, N. Y. Bot. Gard., *Fungi of Jamaica*.

Cuba: *C. Wright* (in Curtis Herb.); Alto Cedro, *Earle & Murrill*, 495; Herradura, *Earle & Murrill*, 156.

Porto Rico: Bayamon, *J. A. Stevenson*, 6758 (in Mo. Bot. Gard. Herb., 55058).

Trinidad: Verdant Vale, *R. Thaxter*, comm. by W. G. Farlow, 23.

Mexico: probably portion of type (from E. Fries in Kew Herb.); Orizaba, *W. A. & Edna L. Murrill*, 778 (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 54608).

Nicaragua: *C. Wright*, U. S. Northern Pacific Expl. Exp., under the name *Corticium sulphureum* (in Curtis Herb.).

7. *A. seriatus* (Berk. & Curtis) Burt, n. comb.

Stereum seriatum Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 332. 1868; Sacc. Syll. Fung. 6: 581. 1888.

Type: in Kew Herb. and Curtis Herb.

Fructifications scattered, resupinate, adnate, orbicular or oblong, sometimes confluent, convex, white, pruinose, becoming between pinkish buff and deep olive-buff when old, the margin adnate, neither free nor elevated; in structure 600 μ thick, somewhat stratose, composed of suberect hyphae heavily incrustated with fine granules and bearing such granules laterally in adhering masses; hymenium composed of basidia and granule-incrustated

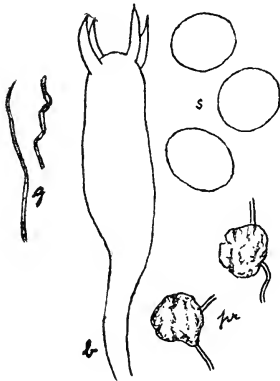


Fig. 7
A. seriatus.

Flexuous and spirally twisted paraphyses, *g*, after removal of the granular matter by HCl; basidium, *b*; spores, *s*; proteid bodies, *pr*. $\times 870$.

hyphal filaments, or paraphyses, which are filiform, thin-walled, flexuous or spirally twisted, 2 μ in diameter under the incrustation; basidia 40–50 \times 12 μ , with 4 sterigmata, each about 9 \times 3 μ ; spores hyaline, even, 11–18 \times 9 $\frac{1}{2}$ –13 μ ; globose organs of proteid reaction, 6–15 μ in diameter, with shriveled

or wrinkled surface, are scattered throughout the fructification.

Fructifications of type $2-6 \times 2-4$ mm.—15 fructifications on an area $4\frac{1}{2} \times 2$ cm.

On bark of frondose trees. Jamaica and Cuba. October to January.

In the original description *A. seriatus* was regarded as allied to *A. candidus*, but it is much closer to *A. nivosus*, differing with the latter from *A. candidus* by convex surface of fructification, by margin not at all free nor reflexed, and by incrusting matter of hyphae not occurring in large crystalline grains. All the collections which I have referred to *A. seriatus* have been scanty and bearing few spores; this species seems distinct from *A. nivosus* by the absence of clavate or cylindrical gloeocystidia and by having the paraphyses spirally twisted and usually distinct from their tips to about the base of the basidia, and by having characteristic globose organs scattered throughout the sections, such as occur in *Corticium pallidum* Bres. and have been regarded and figured by v. Höhnel & Litschauer as gloeocystidia.¹

Specimens examined:

Jamaica: Cinchona, *W. A. & Edna L. Murrill*, 565, N. Y. Bot. Gard., Fungi of Jamaica; near Hope Gardens, *W. A. Murrill*, 20, N. Y. Bot. Gard., Fungi of Jamaica; Troy and Tyre, *W. A. Murrill & W. Harris*, 1106, N. Y. Bot. Gard., Fungi of Jamaica.

Cuba: *C. Wright*, 283, type (in Curtis Herb.); Ceballos, *C. J. Humphrey*, 2847 (in Mo. Bot. Gard. Herb., 20202).

8. *A. nivosus* (Berk. & Curtis) v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. **116**: 808. *pl. 4. f. 2.* 1907.

Stereum acerinum var. *nivosum* Berk. & Curtis, Grevillea **1**: 165. 1873 (lacks description but refers to specimen in Ravenel, Fungi Car. **2**: 37); Sacc. Syll. Fung. **6**: 588. 1888.

Type: type distribution in Ravenel, Fungi Car. **2**: 37, under the name *Stereum acerinum*.

Fructifications small, resupinate, adnate, circular or oblong, convex at first, becoming plane, white, the margin thick, de-

¹ K. Akad. Wiss. Wien Sitzungsber. **116**: 838. *text f. 20.* 1907.

terminate, adnate; in structure 200–250 μ thick, not stratose, composed of erect, interwoven, thin-walled, hyaline hyphae about 2 μ in diameter, bearing a large amount of incrusting granular matter; hymenium consisting of basidia, gloeocystidia, paraphyses, and many incrustated hyphae; gloeocystidia clavate, hyaline, even, 18–30 \times 9 μ ;

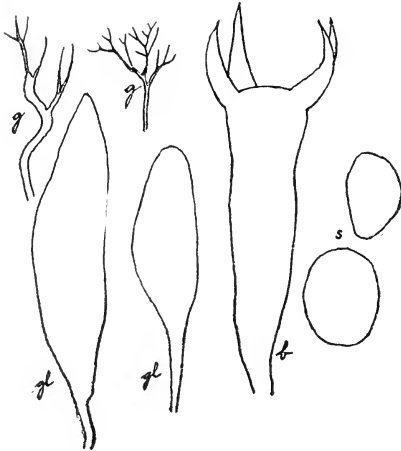


Fig. 8. *A. nivosus*. Granule-bearing paraphyses, *g*, after removal of the granular matter by HCl; gloeocystidia, *gl*; basidium, *b*; spores, *s*. $\times 870$.

paraphyses about 2–3 μ in diameter under the incrustation, cylindric, flexuous, more or less irregular in form, somewhat corymbosely branched at surface of hymenium and with branches loaded with crystalline matter; basidia clavate, 40–60 \times 12–16 μ , only rarely found, with 4 divergent sterigmata; spores hyaline, even, 15–20 \times 12–16 μ .

Fructifications 3–30 mm. long, about 2–6 mm. broad.

On bark of living trees, common on *Juniperus virginiana*, occurs also on *Juniperus occidentalis* and *Chamaecyparis*. Vermont to Texas, westward to Oregon, and in Jamaica. Throughout the year.

A. nivosus is intermediate between *A. candidus* and *A. acerinus*, differing from the former by thinner and more elongated fructifications which are not at all stratose within, by incrusting matter not in the form of large, angular, crystalline grains, by margin with no tendency to be free nor blackening on under side, and by the common occurrence of the fructification on bark of living red cedar. It differs from *A. acerinus* by presence of gloeocystidia, which show best near

the substratum, by the corymbosely branched paraphyses, and by the larger spores. Von Höhnel's figures and description of *A. nivosus* are incorrect in regard to spores and paraphyses.

Specimens examined:

Exsiccati: Bartholomew, *Fungi Col.*, 2880; Ellis, *N. Am. Fungi*, 326; Ell. & Ev., *Fungi Col.*, 1207; Rabenhorst, *Fungi Eur.*, 3647a and b; Ravenel, *Fungi Am.*, 119; Ravenel, *Fungi Car.* 2: 37, type distribution; Shear, *N. Y. Fungi*, 52; de Thümen, *Myc. Univ.*, 711.

Vermont: Middlebury, *E. A. Burt*.

Massachusetts: Cambridge, *E. A. Burt*; Medford, *W. Trelease*, 80 (in *Mo. Bot. Gard. Herb.*, 5059); Waltham, *E. A. Burt*; Waverly, *W. A. Setchell*.

Connecticut: Norwich, *W. A. Setchell*.

New York: Alcove, *C. L. Shear*, in Shear, *N. Y. Fungi*, 52; Orient, *R. Latham*, 189 (in *Mo. Bot. Gard. Herb.*, 44228).

New Jersey: Newfield, *J. B. Ellis*, 1518, comm. by W. G. Farlow (in *Mo. Bot. Gard. Herb.*), in Ellis, *N. Am. Fungi*, 326, and in Ell. & Ev., *Fungi Col.*, 1207.

Virginia: Woodstock, *C. L. Shear*, 1194.

South Carolina: *H. W. Ravenel*, in Ravenel, *Fungi Car.* 2: 37; Aiken, *H. W. Ravenel*, in Ravenel, *Fungi Am.*, 119, and in de Thümen, *Myc. Univ.*, 711; Clemson College, *P. H. Rolfs*, 1618.

Florida: Gainesville, *N. L. T. Nelson*, 95 (in *Lloyd Herb.*).

Alabama: Spring Hill, *C. Mohr*, comm. by H. von Schrenk (in *Mo. Bot. Gard. Herb.*, 43020).

Texas: Austin, *W. H. Long*, 534.

Ohio: Oxford, *L. O. Overholts*, 662 (in *Mo. Bot. Gard. Herb.*, 55445).

Kentucky: Mammoth Cave, *C. G. Lloyd*, 2560.

Missouri: Perryville, *C. H. Demetrio*, in Rabenhorst, *Fungi Eur.*, 3647b.

Arkansas: Batesville, *E. Bartholomew*, in Bartholomew, *Fungi Col.*, 2880.

Kansas: Manhattan, *W. A. Kellerman*, in Rabenhorst, *Fungi Eur.*, 3647a, and (in *U. S. Dept. Agr. Herb.*).

Oregon: White Pine, *J. R. Weir*, 398 (in Mo. Bot. Gard. Herb., 16266).

Jamaica: Cinchona, *F. S. Earle*, 417, N. Y. Bot. Gard., Plants of Jamaica.

9. *A. acerinus* (Pers.) v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 116: 804. pl. 2. f. 6. 1907; Bourd. & Galz. Soc. Myc. Fr. Bul. 28: 352. 1913.

Corticium acerinum Persoon, Obs. Myc. 1: 37. 1796; Romell, Bot. Not. 1895: 71. 1895.—*Thelephora acerina* Persoon, Syn. Fung. 581. 1801; Myc. Eur. 1: 152. 1822; Fries, Syst. Myc. 1: 453. 1821; Hym. Eur. 648. 1874.—*Stereum acerinum* (Pers.) Fries, Epicr. 554. 1838; Sacc. Syll. Fung. 6: 587. 1888.

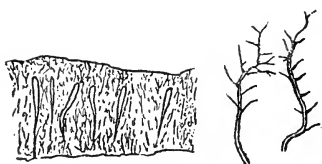


Fig. 9

A. acerinus.

Vertical section of fructification showing scattered immature basidia and absence of gloecystidia, $\times 92$; granule-bearing paraphyses after removal of the granular matter by HCl. $\times 870$.

Fructifications scattered, resupinate, crustaceous, adnate, thin, even, white, the margin abrupt; in structure 45–80 μ thick, consisting of densely arranged, hyaline, thin-walled, suberect hyphae about 2–3 μ in diameter, heavily incrustated, rising between the basidia to

the surface and terminating in a racemose manner with short, slender branches, loaded with crystalline matter; basidia clavate, 30–45 \times 6 μ ; spores hyaline, even, 10–12 \times 6–7 μ .

Fructifications about 3 mm. in diameter, rarely elongated up to 10 mm. long, 3 mm. broad.

On bark of trunks of living maple, oak, etc. Vermont to Texas, westward to Missouri, and in Cuba and Mexico. Throughout the year.

This species may be recognized by its occurrence in scattered, small, white, circular or oblong fructifications on the bark of trunks of living white oak, maple, elm, ash, etc. The smaller spores, racemose paraphyses, and absence of gloecystidia are structural characters separating the species from *A. seriatus* and *A. nivosus*. Our American collections are

frequently merely a thin mycelium containing a great deal of incrusting matter and not showing basidia and spores.

Specimens examined:

Exsiccati: Berkeley, Brit. Fungi, 65; Fl. Exs. Austro-Hungarica, 3152, under the name *Corticium calceum*; Romell, Fungi Scand. Exs., 125, 127.

Sweden: Stockholm, *L. Romell*, in Romell, Fungi Scand. Exs., 125, 127.

Austria-Hungary: Peggau, *Wettstein*, in Fl. Exs. Austro-Hungarica, 3152; Trento, *G. Bresadola*.

England: *M. J. Berkeley*, in Berkeley, Brit. Fungi, 65.

New Hampshire: Chocorua, *W. G. Farlow*; Jaffrey, *W. G. Farlow*.

Vermont: Grand View Mt., *E. A. Burt*; Middlebury, *E. A. Burt*.

New York: *G. F. Atkinson*, 7987; Alcove, *C. L. Shear*, 1302, 1305; Buffalo, *G. W. Clinton*, comm. by U. S. Dept. Agr. Herb.; East Galway, *E. A. Burt*; Ithaca, *L. A. Zimm*, 90 (in Mo. Bot. Gard. Herb., 9061), *G. F. Atkinson*, 22964; Orient, *R. Latham*, 59 (in Mo. Bot. Gard. Herb., 44234); Vaughns, *S. H. Burnham*, 11 (in Mo. Bot. Gard. Herb., 44106).

Pennsylvania: State College, *L. O. Overholts & A. S. Rhoads*, comm. by L. O. Overholts, 3143 (in Mo. Bot. Gard. Herb., 5720).

Maryland: Plummers Island, *C. L. Shear*, 1183; Takoma Park, *C. L. Shear*, 1070.

North Carolina: Chapel Hill, *H. R. Totten*, comm. by W. C. Coker, Univ. of N. Car. Herb., 2020 (in Mo. Bot. Gard. Herb., 8871).

South Carolina: Clemson College, *P. H. Rolfs*, 1824.

Florida: Cocoonut Grove, *R. Thaxter*, 89 (in Farlow Herb., and in Mo. Bot. Gard. Herb., 43913); Palm Beach, *R. Thaxter*, 9 (in Farlow Herb., and in Mo. Bot. Gard. Herb., 43925).

Alabama: Montgomery County, *R. P. Burke*, 64 (in Mo. Bot. Gard. Herb., 15119).

Mississippi: Hattiesburg, *C. J. Humphrey*, 5442.

Louisiana: Baton Rouge, *Edgerton & Humphrey*, comm. by C. J. Humphrey, 5600.

Texas: Houston, *H. W. Ravenel*, 269, comm. by U. S. Dept. Agr. Herb.

Missouri: Creve Coeur Lake, *L. O. Overholts*, 3168 (in Mo. Bot. Gard. Herb., 5707).

Mexico: Jalapa, *W. A. & Edna L. Merrill*, 331 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 54502); Orizaba, *W. A. & Edna L. Merrill*, 776 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 54613).

10. *A. botryosus* Burt, n. sp.

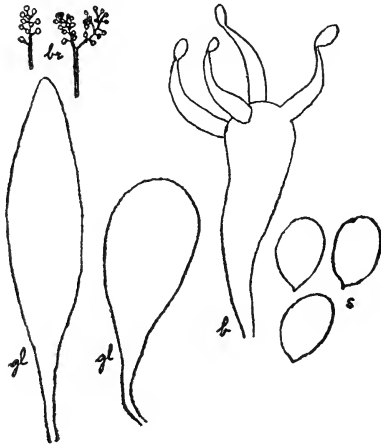


Fig. 10. *A. botryosus*. Racemose paraphyses, *br*; gloeocystidia, *gl*; basidium, *b*; and spores, *s*. $\times 870$.

Type: in Burt Herb.

Fructifications resupinate, effused, adnate, scattered, becoming confluent, at first white and very thin, finally thicker, cracking in drying and sometimes pale olive-buff, the margin thinning out, pruinose; in structure 150–200 μ thick, composed of erect, crowded hyphae, gloeocystidia, basidia, and short, erect, bottle-brush branches similar to the paraphyses; hyphae hyaline, even, thin-walled, with irregular outlines, 2 μ in

diameter; gloeocystidia usually near the substratum, cylindrical, flexuous, $80 \times 6-7 \mu$, or sometimes clavate, $45 \times 12-16 \mu$; basidia clavate, about $40 \times 12 \mu$, with 4 divergent sterigmata 15 μ long, 3–4 μ in diameter at base; spores hyaline, even, $13-15 \times 9-11 \mu$; paraphyses with tips racemose and the short lateral prongs minutely globose at the end; racemose portions $10-15 \times 3-4 \frac{1}{2} \mu$ over branches; similar racemose

branches are more or less abundant through the whole of the fructification.

Fructifications at first $2-3 \times 1-1\frac{1}{2}$ mm., becoming confluent over areas $3-8$ cm. \times $5-10$ mm.

On dead stems of *Rubus* and *Vitis*. Massachusetts, Maryland, and Mexico. November to April. Rare.

This species closely resembles in aspect and general details of structure an authentic specimen of *A. cerussatus* in my herbarium, but differs from the latter species chiefly in having bottle-brush organs not confined to the hymenial surface but distributed through the whole thickness of the fructification; other less important differences are slightly larger spores and basidia and much larger sterigmata, and less widely effused fructifications. *A. botryosus* resembles *A. nivosus* somewhat in aspect but differs from it by having bottle-brush paraphyses. *Thelephora albidocarnea* Schw., originally collected on *Vitis* and to which I have referred in my herbarium two scanty collections on *Vitis*, has aspect very similar to *A. botryosus*, but sectional preparations of *T. albidocarnea* do not show gloeocystidia and apparently have much smaller basidia and spores. *T. albidocarnea* should receive consideration when collections resembling *A. botryosus* are made on *Vitis*.

Specimens examined:

Massachusetts: Sharon, *A. P. D. Piguet*, two collections (in Farlow Herb., and in Mo. Bot. Gard. Herb., 54774, 55277).

Maryland: Takoma Park, *C. L. Shear*, 1025, type, 1127, and 1357.

Mexico: Jalapa, *W. A. & Edna L. Murrill*, 320 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 54497).

11. *A. cremeus* Burt, n. sp.

Type: in Mo. Bot. Gard. Herb.

Fructifications resupinate, effused, adnate, convex at first, then confluent and plane, drying cracked and cream-buff, the margin thick and entire; in structure $600-800$ μ thick, containing much crystalline matter arranged in layers, with hyphae suberect, interwoven; hymenium composed of clavate basidia, bottle-brush paraphyses $6-7$ μ in diameter, and of

clavate, even-walled paraphyses 6 μ in diameter with the tip more or less constricted to form a single moniliform body; gloeocystidia few, inconspicuous, clavate or cylindric, flexuous, 30–45 \times 5–6 μ ; no basidia with sterigmata observed; probable spores imbedded in hymenial surface, spherical, even, hyaline, 9 μ in diameter.



Fig. 11

A. cremeus.

Bottle-brush paraphysis, *br*; other paraphyses, *m*; gloeocystidium, *gl*. $\times 870$.

Fructifications at first 2–5 mm. long, about 1–2½ mm. broad, becoming confluent into masses 5 cm. long, 1–1½ cm. broad.

On decorticated dead wood of *Quercus Gambelii*. New Mexico. September.

A. cremeus belongs in the group with *A. botryosus*, *A. cerussatus*, and *A. penicillatus* but is much thicker than these and differs in its other characters as enumerated. *A. croceus* Pat., of Ecuador, differs by reflexed margin, larger and ovoid spores, and absence of paraphyses with moniliform tips.

Specimens examined:

New Mexico: Cienega Canyon, *W. H. Long*, 21528, type (in Mo. Bot. Gard. Herb., 55128).

12. *A. tenuis* Burt,
n. sp.

Type: in Mo. Bot. Gard. Herb. and in Lloyd Herb.

Fructifications resupinate, effused, very thin, white, pruinose, the margin entire; in structure 60–90 μ thick, composed of two kinds of densely arranged, erect organs which start from the substratum and extend to surface of hymenium — (1)

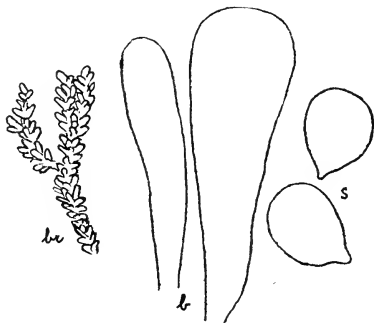


Fig. 12

A. tenuis.

Paraphyses before treatment with KHO, *br*; immature basidia, *b*; and spores, *s*. $\times 870$.

bushy, branched, cylindric, bottle-brush paraphyses about $4\frac{1}{2}$ μ in diameter over prongs, uniformly clothed for their length with such lateral outgrowths which are disorganized and dissolved by KHO solution but not affected by dilute hydrochloric acid nor lactic acid, and (2) deeply staining, cylindric organs usually $4\frac{1}{2}$ – 5 μ in diameter, sometimes clavate and then up to 9 μ in diameter; spores hyaline, even, 12 – 15×9 – 12 μ .

Fructifications 1 – $1\frac{1}{2}$ cm. broad, 7 cm. long, and broken at both ends.

On small dead twigs of frondose wood. Cuba. March.

This species may be recognized at the time of collection by its snow-white color, very thin fructification which resembles a thin *Corticium*, and occurrence along one side of small dead twigs of frondose species; the small, even spores and bushy paraphyses whose bottle-brush outer surface is disorganized by treatment of preparation with KHO solution afford good distinctive microscopical characters. Mature basidia, when found, may show that this species belongs in *Sebacina* rather than in *Aleurodiscus*—a view which seems the more probable because of the peculiar effect of KHO solution upon the paraphyses.

Specimens examined:

Cuba: *C. G. Lloyd*, 421, 422, type (in Mo. Bot. Gard. Herb., 55178, 55179 respectively).

13. *A. penicillatus* Burt, n. sp.

Type: in Burt Herb.

Fructification resupinate, effused, adnate, cracking in drying, pale ochraceous-buff at first, becoming between light buff and pinkish buff in the herbarium, the margin determinate; in structure about 200 μ thick, composed of loosely interwoven, suberect, hyaline hyphae 3 μ in diameter, occasionally nodose-septate, not incrustated; hymenium composed of large, clavate basidia about 75×18 μ , with large sterigmata, and of flexuous paraphyses about 6 μ in diameter, of several forms, of which the most noteworthy have about the obtuse apex a cluster of about 12 acicular branches, each about 4 μ long; spores hya-

line, minutely echinulate, subglobose, 15–18 μ , or rarely 20 μ , in diameter.

Fructifications at first about 2–3 mm. in diameter, then laterally confluent into patches up to 10 cm. long and 2 cm. broad.

On stem and twigs of dead standing seedling of *Pseudotsuga taxifolia* and on limbs of *Tsuga heterophylla* on the ground. Idaho, Washington, and Oregon. September and October. Rare.

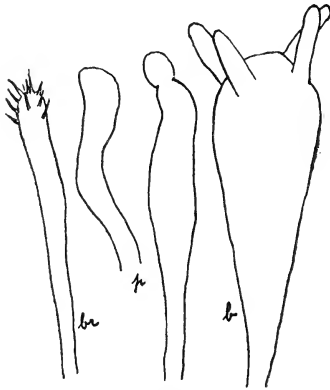


Fig. 13
A. penicillatus.

Brush paraphyses, *br*; other paraphyses, *p*;
basidium *b*. $\times 870$.

This species is so thin and widely effused that it is likely to be regarded as a *Corticium* until examined with a microscope. If sought for especially it could probably be recognized when collected by its buff color and occurrence upon western

Tsuga and *Pseudotsuga*. The minutely echinulate, globose spores, brush-shaped paraphyses occurring between ordinary flexuous paraphyses, and the thin fructification wholly destitute of crystalline and granular matter are a good combination of characters separating *A. penicillatus* from other resupinate species.

Specimens examined:

Idaho: Priest River, *J. R. Weir*, 109, 129 (in Mo. Bot. Gard. Herb., 10811 and 12721).

Washington: Hoquiam, *C. J. Humphrey*, 6384; Sequim, *J. M. Grant*, comm. by Mrs. F. W. Patterson (in Mo. Bot. Gard. Herb., 8936).

Oregon: Eugene, *C. J. Humphrey*, 6084, type.

14. *A. Weirii* Burt, n. sp.

Type: in Burt Herb.

Fructification resupinate, broadly effused, adnate, glabrous, becoming cracked into small polygonal masses, drying cartridge-buff, the margin thinning out; in structure 200–900 μ thick, composed of thin-walled, irregular, hyaline hyphae 2 μ in diameter, which bear laterally here and there short, erect branches with ovoid body $15 \times 4-4\frac{1}{2}$ μ , from which radiate 6–12 prongs, each $4-4\frac{1}{2}$ μ long, and constitute the paraphyses at surface of the hymenium; basidia with sterigmata not found; spores hyaline, minutely echinulate, subglobose, $6 \times 5-6$ μ in one specimen, $10-12 \times 9-10\frac{1}{2}$ μ in another.



Fig. 14
A. Weirii.

Cockroach-shaped paraphyses, *c*; somewhat similar hyphal branches from interior of section, *br*; immature basidium, *b*; spore, *s*. $\times 870$.

Fructification 1–3 cm. long, 1–2 cm. broad on bark; 8–10 cm. long, 2–3 cm. broad on decorticated wood—broken off at one end and along one side in the latter specimens.

On rotting wood of *Abies grandis* and *Thuja plicata* and on bark of *Larix occidentalis*. Idaho and British Columbia. August and September.

A. Weirii has the aspect of a widely effused *Corticium*, but it is distinguished from any *Corticium* of similar aspect by the minutely echinulate spores; the cockroach-shaped paraphyses distinguish this species from other species of *Aleurodiscus*.

Specimens examined:

Idaho: Priest River, *J. R. Weir*, 70, type, and 389 (the latter in Mo. Bot. Gard. Herb., 12249).

British Columbia: Kootenai Mts., near Salmo, *J. R. Weir*, 459, 490 (in Mo. Bot. Gard. Herb., 8768 and 21980 respectively).

(To be continued.)

The Thelephoraceae of North
America. X

Hymenochaete

EDWARD ANGUS BURT

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THE THELEPHORACEAE OF NORTH AMERICA. X¹

HYMENOCHAETE

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HYMENOCHAETE

Hymenochaete Léveillé, Ann. Sci. Nat. Bot. III. 5:150. 1846; Berk. & Curtis, Linn. Soc. Bot. Jour. 10:333. 1868; Cooke, Grevillea 8:145. 1880; Sacc. Syll. Fung. 6:588. 1888; Masee, Linn. Soc. Bot. Jour. 27:95. 1890; Engl. & Prantl, Nat. Pflanzenfam. (1:1**):121. 1898.

Fructifications coriaceous to hard, of varied form from stipitate to resupinate; hymenium even or rarely granular, containing slender, somewhat conical, colored setae between the basidia; basidia simple; spores hyaline, even.

There is no type species, for this genus is a fine example of basing the generic conception upon a group of thelephoraceous species, some stipitate, some dimidiate, some reflexed, and some resupinate, which agree in having setae in the hymenium.

In addition to the distinctive morphological character of elongated, conical setae in the hymenium, there is also a chemical substance in the tissue of all the species of *Hymenochaete* which I have studied, that causes an immediate darkening of sections when dilute potassium hydrate is brought in contact with them. This darkening is so great as to make the sections too opaque for study if more than a mere trace of this usually useful reagent is employed to swell the sections. One has to use instead lactic acid to have the sections remain clear enough to show their fine structural details. The greatly elongated, colored cystidia and conducting organs which are present in the deeper tissue and curve into, or even protrude above, the hymenial surface in some species of *Stereum*, as, for example, *S. umbrinum*, *S. abietinum*, *S. glaucescens*, etc.,

¹ Issued December 23, 1918.

have been confused by some authors with setae and have led to the publication of several such species under *Hymenochaete*. Istvanffi¹ has shown that there is a fundamental difference between such organs and the conical, pointed setae which are characteristic of *Hymenochaete*. In any doubtful case which the student may meet it would be well to aid conclusion by the color reaction with solution of potassium hydrate already mentioned. In my experience the dimensions of setae are not sufficiently constant to hardly more than grade these organs as large, medium, and small.

According to our present knowledge, *Hymenochaete* attains its greatest development both in form and in number of species in the western continent where it culminates in a small group of indigenous stipitate species. Temperature conditions are important in the geographical distribution of the species of this genus; this is shown by the long east and west range across North America of common species, in comparison with the much shorter north and south range. Furthermore, *Hymenochaete* is a genus of tropical species rather than of the cooler portion of the north temperate zone, for in contrast with the 29 species occurring from the Gulf States to Brazil only 13 species are known north of the latitude of Virginia, and from Europe perhaps 9 species, of which 6 are well known.

Original descriptions of the species of *Hymenochaete* have required considerable modification with regard to characters referring to form, because they were based upon too limited an amount of material. In the case of species of *Thelephoraceae* growing on prostrate logs, the inclination of the substratum at the point of attachment and the position of the substratum as to whether over or under the fructification are important in determining the habit and form of the fructification. For example, a species present in quantity on a log slightly raised above the ground will often show fine resupinate specimens on the under side of the log; about an eighth of a circumference up the side of the log the upper margin is reflexed, becoming longer reflexed and with a shorter resu-

¹ Physiologische Anatomie der Pilze. Jahrb. f. wiss. Bot. 29 : 410. 1896.

pinate base as the fungus occurs higher on the side of the log; beyond one-fourth of a circumference upward from the bottom of the log, umbonate-sessile, dimidiate, and flabelliform specimens are frequently collected. I have a fine campanulate specimen of *Stereum fasciatum* which I found on the top of a log surrounded by this species. For these reasons the form of fungi growing on prostrate logs is not as reliable a character as it is in case of species growing on the ground or in the case of a flowering plant, and a student having in hand only a resupinate or only a flabelliform fructification from some herbarium must not be too confident that the respective species are always resupinate or always flabelliform.

The degree of differentiation in structure of the fructification of *Hymenochaete* has not been used in systematic work heretofore, so far as I am aware. Such structure affords, however, constant, positive, fundamental characters of easy determination. In the simplest condition of the fructification in this genus, only a setigerous layer is present, in the next degree higher of development, a hyphal layer connects the setigerous layer with the substratum or may be extended from the substratum as the upper surface of the pileus; in a still more highly developed condition, the hyphal layer is differentiated into an intermediate layer and a denser and dark zone, and usually into a second hyphal layer adnate to the substratum or forming the surface of the pileus.

KEY TO THE SPECIES

- | | |
|---|-----------------------|
| Fructifications in preparations of sections show at least both a setigerous layer and a hyphal layer destitute of setae..... | 1 |
| Fructifications lack a hyphal layer, i. e., have the setigerous layer seated directly on the substratum..... | 16 |
| Fructifications dimidiate or flabellate, of unknown structure.... | 37. <i>H. pallida</i> |
| 1. Not stratose, i. e., consisting of but one setigerous layer of more or less thickness and of a hyphal layer..... | 2 |
| 1. Stratose, composed of two or more strata, of which each consists of a setigerous layer and a hyphal layer..... | 6 |
| 2. Hyphal layer simple and homogeneous throughout, i. e., not with a portion differentiated as an internal or bordering, conspicuously denser and darker zone..... | 3 |
| 2. Hyphal layer not simple but differentiated into an intermediate layer and at least a bordering, denser and darker zone on the side towards the substratum or upper surface of the reflexed part..... | 9 |
| 3. Fructification stipitate, erect; stem with two or more short branches at or near its apex and each bearing an expanded pileus...1. <i>H. damaecornis</i> | |

3. Old, dark, zonate specimens of above.....*Stage *H. formosa*
3. Fructification stipitate, erect; stem bearing a single reniform pileus....
.....2. *H. reniformis*
3. Not stipitate, but resupinate, or with pileus reflexed or sessile..... 4
4. Always resupinate so far as known yet. Guard against locating here the first-stratum stage of the stratose species and resupinate stages of reflexed species of the *H. aspera* group..... 5
4. Reflexed or dimidiate; resupinate specimens of *H. Cacao* and *H. aspera* have been found and perhaps may yet be found for the other species in this group..... 7
5. Fructification clay-color to antique brown, 100-140 μ thick, with hyphae loosely interwoven, suberect, 3-4 μ in diameter; setae 30-75 \times 6-8 μ , scattered in the outer half of fructification; on *Corylus*, *Ostrya*, and *Vaccinium*18. *H. arida*
5. Hyphal layer very thin usually and may be overlooked unless substratum is included in the sections; setigerous layer up to 500 μ or more thick, zonate; causes a pocketed rot of wood; in Cuba, Venezuela, and Brazil19. *H. unicolor*
5. Hyphal layer 1-2 mm. thick, very compact; setae few, 70-90 \times 9 μ , starting from the dark subhymenium; parasitic on living limbs of *Alnus*, *Benzoin*, etc., where they rub together.....20. *H. agglutinans*
6. Not cracked, antique brown to Brussels-brown, finally 2-6 strata thick, with the setigerous layers 30-45 μ thick and equalled or exceeded by the alternating hyphal layers.....21. *H. cinnamomea*
6. Not cracked, antique brown to Brussels-brown, finally up to 15 strata thick; strata with layers thinner than in the preceding species; paraphyses colored, with branched tips; in Panama22. *H. digitata*
6. Cracking in drying, Argus-brown, very compact, finally several strata thick, with setigerous layers 45-200 μ thick, and exceeding the hyphal layers.....23. *H. spreta*
7. Setigerous layer 90 μ thick, with setae crowded together in all its parts; in Cuba, Jamaica, and Venezuela.....3. *H. Cacao*
7. Setigerous layer not more than 60 μ thick..... 8
8. Pileus rough on the upper side with strigose, matted fibers; hymenium granular like that of *Thelephora terrestris*; margin with bright-colored mycelial strands; in Cuba, Jamaica, and Venezuela4. *H. aspera*
8. Pileus bay, sericeous, becoming somewhat zonate, radially plicate; margin lobed, often proliferous, yellow ochre; setae very large, 90-120 \times 12-15 μ ; in Jamaica and Guiana.....5. *H. Berkeleyana*
8. Pileus Argus-brown above and beneath, concentrically sulcate and somewhat zonate and shining above, very thin and papery; setae 65-90 \times 9-10 $\frac{1}{2}$ μ ; in South Carolina and the West Indies to Chile6. *H. Sallei*
8. Pileus Brussels-brown to cinnamon-brown, radiately fibrillose with adnate fibrils, concentrically ridged; hymenium snuff-brown; setae 60-90 \times 7 $\frac{1}{2}$ -10 μ ; from Ontario to New Jersey....7. *H. borealis*
9. Setigerous layer not more than 50 μ thick..... 10
9. Setigerous layer more than 50 μ thick..... 13
10. Always resupinate so far as known. Compare also *H. Curtisii* and *H. rigidula*, which are sometimes resupinate..... 11
10. Usually reflexed or dimidiate, sometimes resupinate..... 12
11. Hymenium Isabella-color to tawny olive, cracked, margin somewhat sulphur-yellow; the adnate, bordering, dark zone next to substratum absent in some places; from Alabama to Mexico.....24. *H. epichlora*
11. Hymenium between wood-brown and Saccardo's umber; intermediate layer, connecting dark zone, and hyphal layer adnate to substratum are present; in Cuba.....25. *H. dura*
12. Becoming narrowly reflexed, Benzo-brown, rather rigid; hymenium Benzo-brown; setae crowded together in all parts of the setigerous layer; in Cuba and Venezuela.....8. *H. rigidula*

12. Resupinate or reflexed, drying pliant, antique brown; hymenium velvety, antique brown; setae few and usually far apart, $60-70 \times 6-8 \mu$; Massachusetts to Texas and westward to Oregon9. *H. Curtisii*
12. Dimidiate and imbricated, or effuso-reflexed, concentrically sulcate, Argus-brown, pliant; hymenium buckthorn-brown; setae few and far apart, $30 \times 5-6 \mu$; Porto Rico to Venezuela and Guiana.....10. *H. luteo-badia*
13. Always resupinate so far as known yet. Compare *H. tabacina* and *H. rubiginosa* which are frequently resupinate..... 14
13. Usually reflexed or dimidiate, sometimes resupinate..... 15
14. 200-700 μ thick, tawny olive to Brussels-brown, separable from the substratum; a narrow, dark zone divides the hyphal layer into an intermediate layer and a broad layer attached to the substratum; Arkansas to Mexico and in Cuba.....26. *H. leonina*
14. 120-260 μ thick, fulvous; lower dark zone is adnate to substratum; cystidia present; in Louisiana and Jamaica.....27. *H. fulva*
14. 120-240 μ thick, between Verona-brown and cinnamon-drab, slightly glaucous, adnate; lower dark zone bordering the intermediate layer is adnate to substratum; paraphyses colored, with pinnatifid tips; Georgia to Mexico, and in Cuba and Jamaica...28. *H. pinnatifida*
15. Usually reflexed, sometimes resupinate, thin, sericeous, and antique brown at first, finally glabrous and deep brownish drab, the margin and intermediate layer orange-yellow; hymenium snuff-brown to sepia, deeply cracked in resupinate portions into radiating systems, about one system for each centimeter of area; common throughout Canada and United States.....11. *H. tabacina*
15. Fructifications imbricated, conchiform, umbonate-sessile, or reflexed, sericeous, lineate-radiate, becoming variegated with concentric brown zones; closely related to *H. tabacina* but not cracking into radiating systems; found on vertical surfaces; Canada to Carolina.....12. *H. badio-ferruginea*
15. Reflexed, sometimes resupinate, coriaceous-rigid, thick, concentrically sulcate, Brussels-brown, becoming fuscous-black, the margin ochraceous-tawny; hymenium colliculose, bister, with conspicuous setae; Canada to Mexico and westward to the Pacific, and in Porto Rico...13. *H. rubiginosa*
15. Broadly reflexed, coriaceous-rigid, shallowly concentrically sulcate, zonate, Prout's brown; hymenium even, Sudan-brown; setigerous layer zonate, 300-400 μ thick, having scattered setae $35-40 \times 4\frac{1}{2}-5 \mu$; in Jamaica.....14. *H. reflexa*
15. Imbricated, flabelliform, dimidiate, umbonate-sessile, or reflexed, thin, pliant when dry, concentrically sulcate, becoming snuff-brown to Rood's brown; hymenium even, antique brown; setigerous layer 80-100 μ thick, having setae $35-45 \times 4\frac{1}{2}-6 \mu$; in Cuba and Porto Rico.....15. *H. cubensis*
16. Fructifications somewhat hoof-shaped, sessile, with a black, hard crust on the upper side; hymenium whitish, 3 mm. thick, zonate within; in Mexico.....16. *H. unguolata*
16. Fructification with upper edge sometimes barely reflexed, and black; hymenium drab, 400-1000 μ thick; growing on bark of living trunks of oak, elm, etc.; New Jersey to Florida and in the West Indies.....17. *H. corticolor*
16. Always resupinate so far as known..... 17
17. Setae crowded, $27-45 \times 4\frac{1}{2}-5 \mu$; hymenium cinnamon-brown to Prout's brown; in Cuba and Jamaica.....29. *H. multisetae*
17. Colorless, incrustated cystidia and colored setae present, the setae about $30 \times 4\frac{1}{2} \mu$, only rarely emergent; hymenium vinaceous-buff; in Cuba.....30. *H. anomala*
17. Having setae larger than $27-45 \times 4\frac{1}{2}-5 \mu$ and not having cystidia..... 18
18. Cinnamon-brown to bister and Rood's brown, cracked into small 4-6-sided areas, 150-500 μ thick; setae $60-70 \times 8-12 \mu$, starting in all parts of the fructification; Canada to Texas, westward to Kentucky, and in Jamaica.....31. *H. corrugata*

18. Tawny olive, not cracked, up to $90\ \mu$ thick; setae $60-90 \times 9-12\ \mu$, all starting from the dark zone next to the substratum; Vermont to Pennsylvania and Illinois.....32. *H. episphaeria*
18. Dresden-brown, differs in structure from *H. episphaeria* by having spores $7-9 \times 3\frac{1}{2}\ \mu$ and by containing crystalline masses $12-15\ \mu$ in diameter; in Louisiana and Cuba.....33. *H. cervina*
18. Between bister and Vandyke-brown, slightly velvety when young, becoming glabrous, cracked, $200-300\ \mu$ thick, dark and opaque; setae $50-90 \times 8-10\ \mu$, starting in all parts of the fructification; in Jamaica34. *H. opaca*
18. Raw umber to mummy-brown, somewhat cracked, $30-75\ \mu$ thick; setae $36-45 \times 5-7\ \mu$; on *Thuja* and *Tsuga*; Vermont to Florida and in British Columbia.....35. *H. tenuis*
18. Bister to warm sepia, somewhat colliculose, not cracked; $150-200\ \mu$ thick; setae abundant, $60-75 \times 8-9\ \mu$, starting in all parts of the fructification; with general aspect of resupinate *H. rubiginosa* but thin and adnate; in Vermont, Maryland, Ohio, and Kentucky36. *H. fuliginosa*

ARRANGEMENT OF THE SPECIES

- I. Stipitate species 1-2
- II. Dimidiate, umbonate-sessile and reflexed species, many of which occur resupinate.
- a. Hyphal layer not differentiated into an intermediate layer proper and a bordering, denser, dark zone on its upper side..... 3-7
- b. Hyphal layer differentiated into an intermediate layer and at least a bordering, denser, dark zone on its upper side.
- * Setigerous layer not more than $50\ \mu$ thick..... 8-10
- ** Setigerous layer more than $50\ \mu$ thick..... 11-15
- c. No hyphal layer..... 16-17
- III. Resupinate species, none of which occur reflexed.
- a. Hyphal layer not differentiated into an intermediate layer proper and a bordering, denser, dark zone on the side towards the substratum.
- * Not stratose 18-20
- ** Stratose 21-23
- b. Hyphal layer differentiated into an intermediate layer and at least a bordering, denser, dark zone on the side towards the substratum.
- * Setigerous layer not more than $50\ \mu$ thick..... 24-25
- ** Setigerous layer more than $50\ \mu$ thick..... 26-28
- c. No hyphal layer—setigerous layer seated directly on the substratum. No. 17 is nearly always resupinate.
- * Setae small, $27-45 \times 4\frac{1}{2}-5\ \mu$ 29
- ** Both setae and colorless, incrustated cystidia present..... 30
- *** Setae larger than $27-45 \times 4\frac{1}{2}-5\ \mu$ and not having cystidia.. 31-36
- IV. Dimidiate, somewhat flabellate species whose structure is not known... 37

1. *Hymenochaete damaecornis* Link ex Léveillé, Ann. Sci. Nat. Bot. III. 5 : 151. 1846; Sacc. Syll. Fung. 6 : 589. 1888; Masse, Linn. Soc. Bot. Jour. 27 : 96. 1890. Plate 16, fig. 1.

Stereum damicorne Link, Ges. Naturforsch. Freunde Berlin Mag. 3 : 40. 1809; Fries, Epicr. 546. 1838; R. Soc. Sci. Upsal. Actis III. 1 : 109. 1851; Lloyd, Letter 46 : 6. 1913.—*Thelephora damaecornis* Link ex Fries, Linnaea 5 : 524. 1830.—*Hymeno-*

chaete formosa Léveillé, Ann. Sci. Nat. Bot. III. 5 : 151. 1846.
—An *Thelephora speciosa* Fries, Linnæa 5 : 525. 1830?

Fructifications with several to many pilei borne on very short branches of a common central stem at or near its apex; stem cylindric, velutinous with setae, hazel to Brussels-brown; pilei coriaceous, thin, expanded, drying strongly inrolled, even or sometimes rugose, silky and antique brown when young, finally glabrous except for setae which are scattered over the upper surface and more abundant towards the stem, bister, and sometimes concentrically zonate with narrow dark zones near the margin; hymenium a little darker than the upper surface, Prout's brown to Mars brown, abundantly and conspicuously setulose; in structure 200–500 μ thick, composed of a setigerous layer up to 150 μ thick and of a hyphal layer constituting the remainder and not bordered on either side by a dense, dark zone; setae 90–150 \times 9–15 μ , emerging up to 60 μ , tapering upward from the base, starting from all parts of the setigerous layer; spores hyaline, even, 5–5½ \times 4–4½ μ .

Fructifications 3–15 cm. high, 1½–3 cm. broad; individual pilei 1–1½ cm. long, 1–3 cm. broad; stem 2–14 cm. long, 2–3 mm. in diameter in dried specimens not cited under *H. formosa* on a following page.

On roots of trees and among leaves in thick woods. West Indies and Mexico to Brazil. October to March.

H. damaecornis exhibits wide variation in the dimensions of its fructifications and in the number of pilei which are borne on the central stem; the short branches of the latter are somewhat flattened in radial planes with respect to the central stem if so many pilei are present that some are borne along the sides of the stem below the terminal cluster. Where only four pilei are present in a symmetrical terminal cluster, there is bifurcation of the main stem into two flattened branches, and of these again into the more broadly flattened bases of the individual pilei. There is often a curious twisting of the end of the branch and base of the pileus through an angle of 90 degrees to bring the plane of the pileus dorsal-ventral, if we may compare it with a leaf. In this connection,

the lateral pilei of *H. Schomburgkii* in Hennings' figure in Engler & Prantl's 'Nat. Pflanzenfam.' are perhaps conventional. In the collection made in Jamaica by Murrill and Harris, 1057, as cited below, there is one old fructification with pileus dark-colored and obscurely zonate which could be referred to *H. formosa*; this fructification is in a cluster of younger, azonate fructifications. The specimen upon which Fries based his *Thelephora speciosa* was evidently a fructification of *H. damaecornis* with upper surface of the pilei bearing more setae than the normal, for he gives its distinctive character as "undique velutino" and on the preceding page has described the stem of *H. damaecornis* as "velutinus," which we know to be by setae. The specimen collected by Peck in Providence, New York, which is cited in Sacc. 'Syll. Fung.' as the northern station of *Hymenochaete speciosa*, has no setae and should not have been referred to this species. I have omitted reference to Plumier, Filic. Am. pl. 168. figs. H, K, as illustrations of *H. damaecornis*, for it is incredible that the draftsman who executed pls. 1-167 of that work could have had before him a specimen of *H. damaecornis* when he made figs. H and K of pl. 168.

Specimens examined, additional to those cited under *H. formosa*:

Cuba: *C. Wright*, 272 (Curtis Herb.); Sierra Nipe, Oriente, *J. A. Shafer*, 3326 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55553).

Jamaica: Mabiss River, *L. M. Underwood*, 1399, comm. by N. Y. Bot. Gard. Herb.; Troy and Tyre, *W. A. Murrill & W. Harris*, 1057 (in N. Y. Bot. Gard. Herb., Mo. Bot. Gard. Herb., 55552, and in Burt Herb.).

Honduras: *M. E. Peck* (in N. Y. Bot. Gard. Herb.).

* Stage **H. formosa** Léveillé, Ann. Sci. Nat. Bot. III. 5 : 151. 1846; Sacc. Syll. Fung. 6 : 589. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 96. 1890.—Compare *Bresadola*, *Hedwigia* 35 : 289. 1896. Plate 16, fig. 2.

An *Hymenochaete Schomburgkii* Hennings in Sacc. Syll. Fung. 9 : 227. 1891; Engl. & Prantl, Nat. Pflanzenfam. (I. 1**) : 121. f. 68 F. 1898?

Illustrations: Broteria 5: *pl.* 2. *f.* 3.

Fructifications with several to many pilei borne on very short branches of a common central stem at or near its apex; stem cylindric, velutinous with setae, hazel to Brussels-brown; pilei coriaceous, thin, expanded, drying strongly inrolled, even or sometimes rugose, silky and antique brown when young, finally glabrous except for setae which are scattered over the upper surface and more abundant towards the stem, bister, concentrically zonate, with narrow, dark zones near the margin; hymenium a little darker than the upper surface, Prout's brown to Mars brown, abundantly and conspicuously setulose; in structure 250–400 μ thick, composed of a setigerous layer up to 150 μ thick and of a hyphal layer constituting the remainder, and not bordered on either side by a denser dark zone; setae 90–150 \times 9–15 μ , emerging up to 40 μ , tapering upward from the base, starting from all parts of the setigerous layer; spores not found.

Fructifications 5–8 cm. high, 2–3 cm. broad; individual pilei up to 2 cm. broad and 2 cm. long in specimens seen; stem 3–5 cm. long, 2–4 mm. in diameter in dried specimens.

On the ground and buried wood. Guadalupe and Honduras to Brazil. October.

I have seen only two collections which seem referable to *H. formosa* and the one of these from Honduras contains a young, bright-colored fructification which affords the details concerning the young stage given in the body of the above description and does away with the distinction as to zonation of pileus upon which L  veill   founded *H. formosa*, the original description of which appears to have been based upon an old form of *H. damaecornis* at a period in mycological work when mere form differences were over-emphasized. I give *H. formosa* with full description in the hope that more ample collections may be accumulated which are not confined to a single stage of development.

Specimens examined:

Exsiccati: Rick, Fungi Austro-Am., 10.

British Honduras: *M. E. Peck* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55551).

Brazil: Sao Leopoldo, Rio Grande do Sul, *J. Rick*, in *Rick*, *Fungi Austro-Am.*, 10.

2. *H. reniformis* (Fries) Lévillé, *Ann. Sci. Nat. Bot.* III. 5 : 151. 1846; Cooke, *Grevillea* 8 : 145. 1880; Sacc. *Syll. Fung.* 6 : 588. 1888; Masee, *Linn. Soc. Bot. Jour.* 27 : 96. *pl.* 5. *f.* 1. 1890; Romell, *K. Svenska Vet.-Akad. Bihang till Handl. Afd. III.* 26¹⁶: 42. 1901.

Stereum reniforme Fries, *Epier.* 546. 1838; *R. Soc. Sci. Upsal. Actis* III. 1 : 109. 1851; Lévillé, *Ann. Sci. Nat. Bot.* III. 2 : 210. 1844; Berkeley, *Ann. & Mag. Nat. Hist.* 10 : 382. *pl.* 11. *f.* 11. 1842.

“*S. reniforme*, coriaceum, cinnamomeum, pileo dimidiato *reniformi* integerrimo *zonato*, stipite e basi torulosa decumbente adscendente, hymenio laevi velutino. In American calidiori. Eumorphum, subvelutinum. Pileus uncialis.”

—Original description of Fries.

In typical specimens of this species a single reniform pileus is borne at the apex of the stem. Berkeley, *loc. cit.*, referred to this species a specimen whose pileus is slightly bilobed, which he figured, and he noted that the whole fructification was sprinkled with short, bright, brown setae. Romell describes the spores as hyaline, obliquely ellipsoidal, $5-6 \times 4 \mu$.

H. reniformis has been collected several times in Brazil but not yet in the West Indies or Central America, so far as I know.

3. *H. Cacao* Berkeley, *Linn. Soc. Bot. Jour.* 10 : 333. 1868; *Linn. Soc. Trans.* II. 1 : 403. *pl.* 46. *f.* 1-3. 1879; Sacc. *Syll. Fung.* 6 : 592. 1888; Masee, *Linn. Soc. Bot. Jour.* 27 : 100. 1890.

Stereum Cacao Berkeley, *Hooker's London Jour. Bot.* 6 : 169. 1854.

Illustrations: *Linn. Soc. Trans.* II. 1 : *pl.* 46. *f.* 1-3; *Engl. & Prantl, Nat. Pflanzenfam. (I. 1**)* : 122. *text f.* 68 *D, E.*

Type: in Kew Herb. and a portion in Mo. Bot. Gard. Herb.

Fructifications sessile, flabelliform, connate, deeply lobed and plicate, upper surface velvety, concentrically sulcate, Brussels-brown; hymenium between fuscous and blackish

brown (3); in structure 600 μ thick, composed of a setigerous layer 90 μ broad and of a hyphal layer 500 μ broad, having densely arranged, colored hyphae $4\frac{1}{2}$ μ in diameter, running longitudinally, curving on the one side into the hymenium and on the other into the surface of the pileus; setae ventricose at base, $18 \times 4\frac{1}{2} - 5$ μ , densely crowded together in all parts of the broad setigerous layer; spores hyaline, even, 4×3 μ .

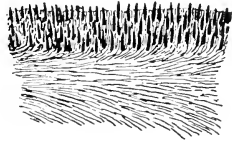


Fig. 1
H. Cacao.
Section $\times 68$. From type.

Fructifications $3\frac{1}{2}$ cm. broad, 3 cm. long.

On dead wood. Jamaica, Cuba, and Venezuela. July. Rare.

By the kindness of Sir David Prain, I have been able to study a portion of the type of *H. Cacao* collected in the Khasia Mountains, India; it has the hymenium olive-drab now but is of the same form and structure as American specimens. The American specimens are a rich tobacco-brown with darker hymenium. This species is noteworthy by having the setae densely crowded together through a zone 90 μ broad. The collection by Earle, 406, cited below, seems referable to *H. Cacao* on account of the color of the hymenium and structure in section but it is wholly resupinate.

Specimens examined:

India: Khasia Mts., *Dr. Hooker*, portion of type comm. by Sir David Prain (in Mo. Bot. Gard. Herb., 55559).

Jamaica: Cinchona, *F. S. Earle*, 406, comm. by N. Y. Bot. Gard. Herb., and *W. J. Robinson* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55481).

Cuba: *C. Wright*, 526 (in Curtis Herb.).

Venezuela: *Fendler* (in Curtis Herb.).

4. *H. aspera* Berk. & Curtis, Linn. Soc. Bot. Jour. 10 : 334. 1868; Sacc. Syll. Fung. 6 : 592. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 100. 1890.

An *Hydnum resupinatum* Swartz, Prodr. 149. 1788; Fl. Ind. Occ. 3 : 1921. 1806?—An *Thelephora setosa* Swartz in Berkeley, Ann. & Mag. Nat. Hist. 10 : 381. pl. 11. f. 10. 1842? Not *Hymenochaete setosa* Berk. & Curtis, Grevillea 1 : 165.

1873; Sacc. Syll. Fung. 6: 538. 1888.—*Hydnochaete setosa* (Swartz) Lloyd, Myc. Notes 41: 559. text f. 766. 1916.

Illustrations: Berkeley, Ann. & Mag. Nat. Hist. 10: pl. 11. f. 10; Lloyd, Myc. Notes 41: 559. text f. 766.

Type: in Kew Herb. and Curtis Herb., and of *Thelephora setosa* in Brit. Mus. Herb.

Fructifications broadly reflexed and with a narrow, resupinate base, or dimidiate, sessile, imbricated, laterally confluent, very thin, drying pliable, with upper surface rough



Fig. 2
H. aspera.

Section $\times 68$. See pl. 16, f. 3.

with coarse, strigose, matted fibers, very shallowly concentrically sulcate; hymenium granular, snuff-brown; in structure 150–400 μ thick, with a narrow setigerous layer consisting of the hymenium, and with the hyphal layer composed of longitudinally arranged, colored hyphae 2 μ in diameter which curve outward and become interwoven to form the upper surface of the pileus—no dense, dark zones present; setae scattered, 60–75 \times 6 μ , tapering from the base, emerging up to 30 μ , some starting from the subhymenium but mostly from the hymenium; spores hyaline, even, 3 \times 2 μ as seen on basidia.

Pilei of fructifications 1–2½ cm. long, 1–5 cm. broad, sometimes resupinate on areas up to 5 \times 3 cm.

On dead frondose wood on the ground in forests. Cuba, Jamaica, and Venezuela. October to March.

H. aspera may be recognized by its thin, pliant pileus, which is rough on the upper surface with strigose matted fibers, by granular hymenium which is as granular as in *Thelephora terrestris*, and by the short, brighter-colored mycelial strands which form the resupinate margin.

Specimens examined:

Cuba: *C. Wright*, 211, type (in Curtis Herb.); Alto Cedro, *F. S. Earle*, 340, *Earle & Murrill*, 488, and *Underwood & Earle*, 1513, all from N. Y. Bot. Gard. Herb.; Ciego de Avila, Puerto Principe, *Earle & Murrill*, 605, comm. by N. Y. Bot. Gard. Herb.

5. *H. Berkeleyana* (Montagne) Cooke, *Grevillea* 8: 147. 1880; *Sacc. Syll. Fung.* 6: 596. 1888.

Stereum Berkeleyanum Montagne, *Ann. Sci. Nat. Bot.* IV. 1: 140. 1854; *Syll. Crypt.* 178. 1856.

Type: authentic specimen in Kew Herb.—probably portion of type.

Fructifications effuso-reflexed, cespitose-imbricated, often dimidiate, radiately rugose, sericeous, with the hairs radially decumbent, bay, becoming somewhat zonate with interrupted blackish zones, radially plicate, the margin lobed, sometimes proliferous, yellow ocher; hymenium not rimose, antique brown; in structure 500–600 μ thick, with the hyphal layer not bordered on either side by a dark, dense zone, and composed of closely and longitudinally arranged, colored, very thick-walled hyphae $3\frac{1}{2}$ –4 μ in diameter and up to 5 μ on the upper surface of the pileus; setae scattered, not crowded, 90 – 120×12 – 15μ , emerging 60–75 μ , tapering from the base upward to a slender point; spores hyaline, even, $6 \times 3\frac{1}{2} \mu$.

Fructifications with reflexed part 1 cm. broad, 1 cm. long, laterally confluent into clusters up to 3 cm. broad.

On bark and rotten wood. Jamaica and Guiana. December and January. Rare.

The general aspect of *H. Berkeleyana* is suggestive of that of *H. badio-ferruginea* but the former has its pilei more crowded together than the latter and radially plicate. The absence of any dark zones bordering the intermediate layer of *H. Berkeleyana* sharply separates this species from the *H. tabacina* group when sections are examined, and places the species in the group with *H. attenuata* and *H. Sallei*, from both of which it is distinct by its plicate, more crowded pilei, covering of the pilei, and larger setae. I had not received the collections from Jamaica, cited below, when I studied the authentic specimen from Montagne at Kew, but these later

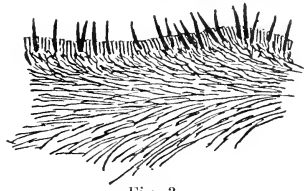


Fig. 3

H. Berkeleyana.

Section $\times 44$. See *pl. 16, f. 5*.

collections agree so well with the original description and my preparation of *H. Berkeleyana* that I regard them as certainly the same species.

Specimens examined:

Jamaica: Chester Vale, *W. A. & Edna L. Merrill*, 371, comm. by N. Y. Bot. Gard. Herb.; Cinchona, *W. A. & Edna L. Merrill*, 445, comm. by N. Y. Bot. Gard. Herb.

Guiana: Cayenne, from Montagne (in Kew Herb.).

6. **H. Sallei** Berk. & Curtis, Linn. Soc. Bot. Jour. 10 : 333. 1868; Cooke, Grevillea 8 : 146. 1880; Sacc. Syll. Fung. 6 : 593. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 101. 1890.

Stereum elegantissimum Speggazzini, Soc. Cientif. Argentina Anal. 16 : 38. 1883.—*Hymenochaete elegantissima* (Speg.) Sacc. Syll. Fung. 6 : 594. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 99. 1890.—*Stereum tenuissimum* Fries, R. Soc. Sci. Upsal. Actis III. 1 : 111. 1851, but not of Berkeley, Hooker's London Jour. Bot. 6 : 510. 1847.—*Hymenochaete tenuissima* Berkeley, Linn. Soc. Bot. Jour. 10 : 333. 1868, but not *Stereum tenuissimum* Berkeley, Hooker's London Jour. Bot. 6 : 510. 1847.

Illustrations: Broteria 5 : pl. 2. f. 4. 1906.

Type: in Kew Herb. and Curtis Herb.

Fructifications very thin, papery, flexible when dry, umbonate-sessile and laterally confluent, or reflexed and imbricated,

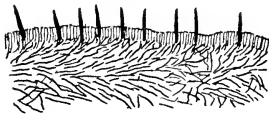


Fig. 4

H. Sallei.

Section $\times 68$. From type.
See pl. 17, f. 15.

at first fibrous on the upper surface, antique brown, soon silky-fibrous, with the fibers radially arranged, Argus-brown to auburn, concentrically sulcate, and at length somewhat zonate and shining, the margin lobed; hymenium Argus-brown; in structure 200-

400 μ thick, with the hyphal layer simple, not bordered by a dark zone, composed of somewhat loosely interwoven and longitudinally arranged, thick-walled, colored hyphae $3\frac{1}{2}$ - $4\frac{1}{2}$ μ in diameter; setae 65 - 90×9 - $10\frac{1}{2}$ μ , emerging up to 60 μ , starting from the subhymenium which is not ap-

preciably darker than adjacent tissue; spores hyaline, even, $3-4 \times 1\frac{1}{2}-2\frac{1}{2} \mu$.

Fructifications $1\frac{1}{2}-3$ cm. in diameter and laterally confluent, or with reflexed part $1-2\frac{1}{2}$ cm. long, up to 4 cm., and more, broad by lateral confluence.

On dead twigs, prostrate limbs, and at base of trees of frondose species. South Carolina, West Indies, Mexico, and South America to Paraguay and Chile. September to May. Common.

Fully developed specimens of *H. Sallei* may be recognized by their thin, papery pileus which may be folded without breaking, which is a rich Argus-brown both on the upper side and hymenium, and concentrically sulcate, somewhat zonate, and shining on the upper side also. Collections of young specimens of this species when first found were referred by early authors to *H. tenuissima*, a Ceylon species, of which good material is now available for comparison in the collection from Ceylon distributed in Sydow, *Fungi Exotici Exs.*, 318, and in Elmer, *Philippine Island Plants*, 9850, both of which I have compared with a portion of the type communicated by Sir David Prain through the kindness of Miss Wakefield. The true *H. tenuissima* has its upper surface clothed with coarse pubescence, as stated in the original description, and the fibers of this pubescence do not finally become decumbent, radiately arranged, and the surface shining; the hymenium of *H. tenuissima* is somewhat radiately rugose and between Isabella-color and Dresden-brown—not antique brown.

Specimens examined:

Exsiccati: Balansa, Pl. du Paraguay, 3916, under the name *Hymenochaete elegantissima*; Ravenel, *Fungi Am.*, 718, under the name *Hymenochaete badio-ferruginea*; Rick, *Fungi Austro-Am.*, 31, under the name *Hymenochaete tenuissima*; Smith, *Central Am. Fungi*, 149, under the name *Hymenochaete tabacina*.

South Carolina: Seaboard, *H. W. Ravenel*, in *Ravenel, Fungi Am.*, 718.

Florida: *C. G. Lloyd*, 2071.

- Cuba: *C. Wright*, 278, type (in Kew Herb. and in Curtis Herb.), and 531, under the name *H. tenuissima* (in Kew Herb.), and 275, under the name *H. tenuissima* (in Curtis Herb.); Alto Cedro, *F. S. Earle*, 339, and *Earle & Murrill*, 514, *Underwood & Earle*, 1512, 1569, 5182, all comm. by N. Y. Bot. Gard. Herb.; Artemisa, *O. Ames & R. G. Leavitt*, comm. by W. G. Farlow; El Yunque, Mt. Baracoa, *Underwood & Earle*, 765, 1235, comm. by N. Y. Bot. Gard. Herb.; La Gloria, Camagüey, *J. A. Shafer*, 741 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55509); Omaja, *C. J. Humphrey*, 2750 (in Mo. Bot. Gard. Herb., 8639); Sierra Nipe, *J. A. Shafer*, 3375 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55510); Tacajo, Nipe Bay, *F. S. Earle*, B.
- Porto Rico: Espinosa, *J. A. Stevenson*, 6373 (in Mo. Bot. Gard. Herb., 55081).
- Jamaica: Castleton Gardens, *F. S. Earle*, 246, comm. by N. Y. Bot. Gard. Herb.; Cinchona, *W. A. & Edna L. Murrill*, 445, comm. by N. Y. Bot. Gard. Herb.; Mandeville, *A. E. Wight*, comm. by W. G. Farlow; Mansfield, near Bath, *Wm. R. Maxon*, comm. by W. G. Farlow, and *L. M. Underwood*, 2780, comm. by N. Y. Bot. Gard. Herb.; Moore Town, *W. A. & Edna L. Murrill*, 162, 1113, comm. by N. Y. Bot. Gard. Herb.; Troy and Tyre, *L. M. Underwood*, 2970, comm. by N. Y. Bot. Gard. Herb., and *W. A. Murrill & W. Harris*, 858, 924, 1010, comm. by N. Y. Bot. Gard. Herb.
- St. Kitts: Molyneaux Estate, *N. L. Britton & J. F. Cowell*, 338, comm. by N. Y. Bot. Gard. Herb.
- Grenada: Grand Etang, *R. Thaxter*, comm. by W. G. Farlow, 1.
- Mexico: Cordoba, *Salle* (in Kew Herb.); Xuchiles, Cordoba, *W. A. & Edna L. Murrill*, 1215 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 54606); Jalapa, *W. A. & Edna L. Murrill*, 190 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 54447), and *C. L. Smith*, in *Smith*, Central Am. Fungi, 149; Orizaba, *W. A. & Edna L. Murrill*, 751, 794 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 54630, 54642).

Brazil: Rio Grande do Sul, *J. Rick*, in Rick, *Fungi Austro-Am.*, 31.

Paraguay: in Balansa, *Pl. du Paraguay*, 3916 (in Kew Herb.).

Chile: Central Chile, *R. P. Nataniel Costes* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 44782).

7. *H. borealis* Burt, n. sp.

Type: in Burt Herb.

Fructifications thin, pliant, imbricated, reflexed, attenuated towards the base, or umbonate-sessile and attached along one side, radiately fibrillose, concentrically ridged, Brussels-brown to cinnamon-brown; hymenium even, not cracked, snuff-brown; in structure 240–340 μ thick, with the setigerous layer 60 μ thick, and with the hyphal layer not bordered on either side by a dense, dark zone, and having its hyphae rather loosely interwoven and longitudinally arranged, colored, $2\frac{1}{2}$ μ in diameter; setae scattered, $60-90 \times 7\frac{1}{2}-10$ μ , emerging up to 60 μ , starting from all parts of the setigerous layer; spores hyaline, even, $4-6 \times 2-3$ μ .

Fructifications 8–12 mm. in diameter, reflexed portion up to 4 mm. long.

On decorticated frondose wood. Ontario to New Jersey. October to April. Rare.

H. borealis is distinguished by having a simpler structure in section than any other of the pileate species which occur in the north. The absence of dark, dense zones bordering on an intermediate layer separates it at once from *H. badioferruginea*. *H. attenuata* of the East Indies is a closely related species but the latter has its pileus strigose-hirsute.

Specimens examined:

Ontario: London, *J. Dearness*, 1017 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55513).

Vermont: Abby Pond, Ripton, *E. A. Burt*, type.

New Jersey: Newfield, *J. B. Ellis* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55503).

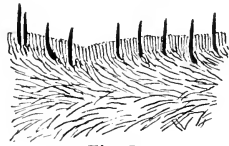


Fig. 5

H. borealis.

Section $\times 68$. From type.
See pl. 16, f. 6.

8. *H. rigidula* Berk. & Curtis, Linn. Soc. Bot. Jour. 10 : 334. 1868; Cooke, Grevillea 8 : 146. 1880; Sacc. Syll. Fung. 6 : 593. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 99. 1890.

An *H. fulvella* Berk. & Curtis in Cooke, Grevillea 8 : 148. 1880; Sacc. Syll. Fung. 6 : 598. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 104. 1890?—An *H. pulcherrima* Masee, Linn. Soc. Bot. Jour. 27 : 104. pl. 5. f. 4. 1890; Sacc. Syll. Fung. 9 : 229. 1891?—An *H. scruposa* Masee in Cooke, Grevillea 20 : 11. 1891; Sacc. Syll. Fung. 11 : 123. 1895?

Type: in Kew Herb. and Curtis Herb.

Fructifications resupinate, effused, becoming narrowly reflexed, lobed, coriaceous, rather rigid, with the upper surface of the reflexed part velvety, snuff-brown at first, later Benzo-

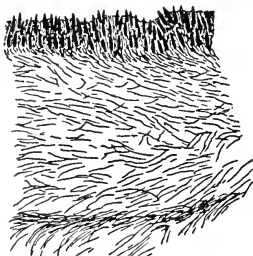


Fig. 6
H. rigidula.
Section $\times 68$. From type.

brown; hymenium Benzo-brown, ochraceous-tawny near the margin; in structure 300–500 μ thick, with the setigerous layer 30–45 μ broad and with the intermediate layer comprising most of the thickness of the fructification and bordered on each side by a narrow, dense, dark zone, of which that on the setigerous side is the less distinct; hyphae of intermediate layer 3–4 μ in diameter, colored, somewhat interwoven and longitudinally arranged; setae conical,

30–45 \times 6–8 μ , larger ones sometimes found, emerging up to 30 μ , very numerous, starting from all portions of the setigerous layer; spores probably hyaline, even, 4 \times 1½–2 μ .

Fructifications with reflexed portion ½–1 cm. long, resupinate over areas 4 \times 1–1½ cm.

On dead wood and bark of frondose species. Cuba and Venezuela. March. Rare.

On account of the dark zones bordering its intermediate layer, *H. rigidula* belongs in the small group, of which *H. tabacina* and *H. rubiginosa* are more common examples; it is distinguishable from all these species by the great number and crowded arrangement of its setae in the setigerous layer,

a feature which it shares with *H. Cacao*. *H. rigidula* differs from *H. Cacao* by having its intermediate layer bordered by a prominent dark zone on its outer side, by being effuso-reflexed, and with less black in the color of its hymenium. In dried condition it is more rigid than *H. tabacina* and the other species of its group with the exception of *H. rubiginosa*, from all forms of which it may be distinguished at sight by less conspicuous setae when viewed with a hand lens and by the much thinner, setigerous layer when sections are examined. So few spores of *H. rigidula* have been seen in the preparations that the spore dimensions given are very doubtful. My belief in the specific identity of *H. fulvella* is based upon the similarity of sectional preparations; since noting this similarity of structure, I have not had an opportunity to confirm my opinion by placing the original specimens side by side and comparing them with regard to general aspect. I did not find *H. pulcherrima* when I was at Kew, and in reply to my letter to Miss Wakefield concerning the original Fendler number for this type, Sir David Prain has written, "With regard to *H. pulcherrima* Mass., the specimen indicated by Masee as No. 3721a was removed by him from a gathering of *H. fulvella* B., the label of which, in Berkeley's handwriting, is 'Stereum fulvellum B. & C. 173, Venezuela.' Masee named it on the sheet 'H. scruposa,' but evidently he changed the name before publishing it."—It seems probable that in the year following the publication of *H. pulcherrima*, Cooke saw the specimen upon which it was based, still labelled with only the herbarium name *H. scruposa* Masee and published the latter. I have studied the specimen in Curtis Herbarium labelled "*Stereum fulvellum* B. & C., Fendler, 173. Venezuela" and found it to have the characteristic structure of *H. rigidula* and *H. fulvella* and to agree well with the published descriptions of *H. fulvella*, *H. pulcherrima*, and *H. scruposa*.

Specimens examined:

Cuba: *C. Wright*, 529, type (in Kew Herb. and in Curtis Herb.); Herradura, *Earle & Murrill*, 170, comm. by N. Y. Bot. Gard. Herb.; San Diego de los Baños, *Earle & Murrill*, 219, comm. by N. Y. Bot. Gard. Herb.

Grenada: Grand Etang, *R. Thaxter*, comm. by W. G. Farlow.
 Venezuela: *Fendler*, 175, type of *Hymenochaete fulvella* (in
 Kew Herb.), and 173 (in Curtis Herb., under the name
Stereum fulvellum).

9. *H. Curtisii* (Berk.) Morgan, Cincinnati Soc. Nat. Hist.
 Jour. 10: 197. 1888.

Stereum Curtisii Berkeley, *Grevillea* 1: 164. 1873; *Sacc.*
Syll. Fung. 6: 581. 1888; *Massee*, *Linn. Soc. Bot. Jour.* 27:
 195. 1890.

Type: type distribution in Ravenel, *Fungi Car.* 3: 26.

Fructifications at first orbicular, then effused, confluent, be-
 coming reflexed, coriaceous, thin, separable, drying pliant, the
 upper surface at first silky, fibrillose, somewhat concentrically
 ridged, antique brown, becoming
 glabrous and hair-brown when old;
 hymenium not cracking, velvety,
 antique brown; in structure 140-
 240 μ thick, with intermediate layer
 bordered by a narrow, dense, dark
 zone towards the upper surface of
 the pileus or the substratum, the
 hyphae densely and longitudinally
 arranged, colored, thin-walled, $2\frac{1}{2}$ μ in diameter; setae few
 and far apart usually, $60-70 \times 6-8$ μ , emerging up to 45 μ ,
 tapering upward to a sharp point; spores hyaline, allantoid,
 $6-7 \times 1\frac{1}{2}-2$ μ .

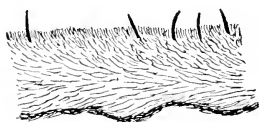


Fig. 7

H. Curtisii.

Section $\times 68$. From type.

See *pl. 17, f. 9*.

Fructifications confluent along under side of limbs for 2-20
 cm. or more, $1\frac{1}{2}-2\frac{1}{2}$ cm. broad; reflexed lobes 5 mm. long, 10-15
 mm. broad.

On rotting limbs of *Quercus* and other frondose species.
 Massachusetts to Texas and westward to Oregon—in low alti-
 tudes. April to December. Common.

H. Curtisii may be recognized by its rich antique brown
 color, thin, pliant, reflexed portions, velvety hymenium which
 is not at all cracked, and by the notable scarcity of setae which
 cannot be found in the hymenium with a pocket lens and are
 sometimes lacking in thin sections in microscopic prepara-

tions. The geographical range of *H. Curtisii* overlaps on the north the southern range of *H. tabacina*, and it is itself displaced in the West Indies, Mexico, and further south by *H. Sallei*.

Specimens examined:

Exsiccati: Bartholomew, *Fungi Col.*, 2381, 2882, 4290, 4635; Ellis, *N. Am. Fungi*, 16; Ell. & Ev., *Fungi Col.*, 103; Rabenhorst-Winter, *Fungi Eur.*, 3525, under the name *Stereum tabacinum*, with note; Ravenel, *Fungi Am.*, 222, 446; *Fungi Car.* 3: 26; de Thümen, *Myc. Univ.*, 113.

Massachusetts: Cambridge, *L. M. Underwood*, 1080 (in *N. Y. Bot. Gard. Herb.*, and in *Mo. Bot. Gard. Herb.*, 55542); East Sudbury, *A. B. Seymour*, *T* 18 (in *Seymour Herb.*, and in *Mo. Bot. Gard. Herb.*, 18349).

Connecticut: Central Valley, *J. L. Sheldon*, 5, comm. by *N. Y. Bot. Gard. Herb.*

New York: Grand View, *H. von Schrenk* (in *Mo. Bot. Gard. Herb.*, 43024); New York Botanical Garden, Bronx Park, *Class in Mycology* (in *N. Y. Bot. Gard. Herb.*, and in *Mo. Bot. Gard. Herb.*, 55533); Staten Island, *S. C. Edwards*, in *Lloyd Herb.*, 06902; White Plains, *W. H. Ballou* (in *Mo. Bot. Gard. Herb.*, 55032).

New Jersey: from Laning *Herb.* (in *Mo. Bot. Gard. Herb.*, 5182); Forked River, *W. H. Ballou*, 2; Lakefield, *E. A. Daniels*, comm. by *H. Webster*; Newfield, *J. B. Ellis*, comm. by *Lloyd Herb.*, also (in *Mo. Bot. Gard. Herb.*, 55534), and in *Ellis, N. Am. Fungi*, 16, in *Ell. & Ev., Fungi Col.*, 103, and in *de Thümen, Myc. Univ.*, 113.

Pennsylvania: from Michener *Herb.*, two specimens (in *Mo. Bot. Gard. Herb.*, 55528, 55529); Bethlehem, *Schweinitz* (in *Herb. Schweinitz*, under the name *Thelephora leprosa* of *Syn. N. Am. Fungi*, No. 636); Ohio Pyle, *W. A. Murrill*, 1067 (in *N. Y. Bot. Gard. Herb.*).

Maryland: Hyattsville, *F. L. Scribner*, 83, comm. by *U. S. Dept. Agr. Herb.*; Takoma Park, *C. L. Shear*, 1074.

District of Columbia: *W. A. Murrill*, 1464 (in *N. Y. Bot. Gard. Herb.*, and in *Mo. Bot. Gard. Herb.*, 55535); Takoma Park, *P. L. Ricker*, 819.

- Virginia: *W. A. Merrill* (in N. Y. Bot. Gard. Herb.); Arlington, *W. H. Long*, 12690 (in Mo. Bot. Gard. Herb., 44164); Mt. Vernon, *P. L. Ricker*, 1122; Woodstock, *C. L. Shear*, 1190.
- North Carolina: *H. W. Ravenel* (in Curtis Herb., 1646).
- South Carolina: *H. W. Ravenel*, type distribution, in *Ravenel, Fungi Car.* 3 : 26; Aiken, *H. W. Ravenel*, in *Ravenel, Fungi Am.*, 446; Clemson College, *P. H. Rolfs*, 1822, 1823, and *H. D. House*, in *Bartholomew, Fungi Col.*, 2381.
- Georgia: Darien, *H. W. Ravenel*, in *Ravenel, Fungi Am.*, 222.
- Florida: *C. G. Lloyd*, 2116 (in *Lloyd Herb.*); West Palm Beach, *R. Thaxter*, 83 (in Mo. Bot. Gard. Herb., 43900).
- Alabama: Auburn, *F. S. Earle*, 123, and an unnumbered specimen (in Mo. Bot. Gard. Herb., 55537, 55538); New Albany, *A. B. Seymour*, 2930 (in N. Y. Bot. Gard. Herb.).
- Mississippi: Jackson, *E. Bartholomew*, 5791 (in Mo. Bot. Gard. Herb., 44123), and in *Bartholomew, Fungi Col.*, 4635; Ocean Springs, *F. S. Earle*, 182 (in Mo. Bot. Gard. Herb., 5176), and an unnumbered specimen, comm. by U. S. Dept. Agr. Herb.
- Louisiana: Acadia Parish, *A. B. Langlois*; Alden Bridge, *W. Trelease* (in Mo. Bot. Gard. Herb., 5169); St. Martinville, *A. B. Langlois*, comm. by *Lloyd Herb.*, 2423.
- Texas: Gonzales, *C. L. Shear*, 1230; Houston, *H. W. Ravenel*, 36, 38, 134, 160, comm. by U. S. Dept. Agr. Herb.
- Ohio: Oberlin, *F. D. Kelsey*, 821 (in N. Y. Bot. Gard. Herb.).
- Kentucky: Crittenden, *C. G. Lloyd*, 3126; Mammoth Cave, *C. G. Lloyd*, 1189.
- Tennessee: Elkmont, *C. H. Kauffman*, 76 (in Mo. Bot. Gard. Herb., 44997).
- Wisconsin: Blue Mounds, *Miss A. O. Stucki*, 29, Univ. of Wisconsin Herb.; Madison, *W. Trelease*, 77, 79 (in Mo. Bot. Gard. Herb., 5169, 5170, and in *Seymour Herb.*), and *Miss A. O. Stucki*, 63, Univ. of Wisconsin Herb.
- Minnesota: Princeton, *C. J. Humphrey*, 990 (in Mo. Bot. Gard. Herb., 10274).
- Missouri: Bismarck, *L. O. Overholts* (in Mo. Bot. Gard. Herb., 55539); Columbia, *B. M. Duggar*, 88; Perryville, *C.*

H. Demetrio, in Rabenhorst-Winter, *Fungi Eur.*, 3525; Jefferson Barracks, St. Louis, *E. A. Burt*, and *L. O. Overholts* (in *Mo. Bot. Gard. Herb.*, 43774 and 44049 respectively).

Arkansas: Batesville, *E. Bartholomew*, in *Bartholomew, Fungi Col.*, 2882; Cass, *W. H. Long, 19804* (in *N. Y. Bot. Gard. Herb.*, and in *Mo. Bot. Gard. Herb.*, 9141).

Oklahoma: Spiro, *E. Bartholomew*, in *Bartholomew, Fungi Col.*, 4290.

Nebraska: Long Pine, *V. B. Walker, 9* (in *Mo. Bot. Gard. Herb.*, 13932).

Oregon: Portland, *J. R. Weir, 544* (in *Lloyd Herb.*, 0311, and in *Mo. Bot. Gard. Herb.*, 19624).

10. *H. luteo-badia* (Fries) v. Höhn. & Litsch. *K. Akad. Wiss. Wien Sitzungsber.* 116 : 754. 1907.

Thelephora luteo-badia Fries, *Linnaea* 5 : 526. 1830.—*Stereum luteo-badium* Fries, *Epier.* 547. 1838; *Sacc. Syll. Fung.* 6 : 571. 1888; Lloyd, *Letter* 46 : 6. 1913.—*Thelephora Kunzei* Hooker, *Bot. Misc.* 2 : 163. *pl. 85.* 1831.—*Hymenochaete Kunzei* (Hooker) Masee, *Linn. Soc. Bot. Jour.* 27 : 100. 1890; *Sacc. Syll. Fung.* 11 : 122. 1895.—*Stereum laetum* Berkeley, *Acad. Nat. Sci. Phila. Jour.* 2 : 279. 1853.—*Hymenochaete laeta* Berkeley in Cooke, *Grevillea* 8 : 146. 1880; *Sacc. Syll. Fung.* 6 : 591. 1888; Masee, *Linn. Soc. Bot. Jour.* 27 : 99. 1890.—*Stereum pulchrum* (Schweinitz) Cooke in *Sacc. Syll. Fung.* 6 : 561. 1888.

Illustrations: Hooker, *Bot. Misc.* 2 : *pl. 85.*

Type: type distribution in Weigelt Exs., under the name *Thelephora badia* Hook.?—a specimen in *Mo. Bot. Gard. Herb.*, 5205.

Fructifications dimidiate and imbricated or effuso-reflexed, lobed, very thin, coriaceous, pliant when dry, velvety when young, becoming somewhat glabrous and minutely fibrillose when older, concentrically sulcate, and sometimes zonate or radiately rugose, drying Argus-brown; hymenium even, dry-

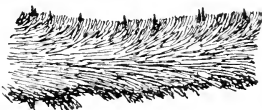


Fig. 8
H. luteo-badia.
Section $\times 68$. From type.
See *pl. 17, f. 11.*

ing buckthorn-brown; in structure 200–300 μ thick, with a broad, compact intermediate layer of longitudinally arranged, colored hyphae 2–2½ μ in diameter, which is connected with the velvety covering of the upper surface of the pileus by a narrow, dark zone; setae very few, tapering from the base, 30×5–6 μ , emerging 10–20 μ above the hymenium; spores hyaline, even, 4–4½×2½ μ .

Fructifications 1½–2½ cm. long, 2–4 cm. broad; resupinate portion of reflexed specimens may be up to 3 x 2 cm. in specimens seen so far.

On rotting trunks of frondose species. Porto Rico to Venezuela and Guiana. May. Probably common.

H. luteo-badia is a beautiful tropical species which is well characterized by its name, for the contrast in color between the buckthorn-brown or tawny olive hymenium and the Argus-brown (chestnut color) upper surface of the pileus is a constant and distinguishing character; setae are as few and far apart in the hymenium as they are in *H. Curtisii*; the absence of a dark subhymenial zone bordering the hyphal layer is an additional character which separates *H. luteo-badia* from many other species of *Hymenochaete*.

Specimens examined:

Porto Rico: Ponce, *F. S. Earle*, 114, 159, comm. by N. Y. Bot. Gard. Herb.

Trinidad: Sangre Grande, *R. Thaxter*, comm. by W. G. Farlow, 29.

Venezuela: *Fendler 174* (in Curtis Herb.); Margarita, *A. F. Blakeslee*, two collections, comm. by W. G. Farlow.

British Guiana: *Sir R. Schomburgh*, comm. by G. Bresadola; also specimen under name *Thelephora laeta*, ex. Hooker Herb. (in Herb. Berkeley in Kew Herb.).

Dutch Guiana: Surinam, *Weigelt*, distributed under the name *Thelephora badia* Hook.?, the type distribution of both *Thelephora luteo-badia* and *Thelephora Kunzei* (in Mo. Bot. Gard. Herb., 5250); specimen from Herb. Schweinitz under the herbarium name *Thelephora pulchra*, type of both *Stereum laetum* and *Stereum pulchrum* (in Curtis Herb.).

11. *H. tabacina* Sowerby ex Lévillé, Ann. Sci. Nat. Bot. III. 5 : 152. 1846; Cooke, Grevillea 8 : 145. 1880; Sacc. Syll. Fung. 6 : 590. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 112. 1890.

Helvella nicotiana Bolton, Hist. Funguses, 174. pl. 174. 1789.—*Auricularia tabacina* Sowerby, British Fungi, pl. 25. 1797.—*Thelephora tabacina* (Sow.) Fries, Syst. Myc. 1 : 437. 1821; Elenchus Fung. 1 : 173. 1828.—*Stereum tabacinum* (Sow.) Fries, Epier. 550. 1838; Hym. Eur. 641. 1874.—*Thelephora avellana* Fries, Syst. Myc. 1 : 442. 1821 (in part); Elenchus Fung. 1 : 188. 1828 (in part).—*Stereum avellanum* Fries, Epier. 551. 1838 (in part); Hym. Eur. 642. 1874 (in part).—*Hymenochaete avellana* (Fr.) Cooke, Grevillea 8 : 146. 1880; Sacc. Syll. Fung. 6 : 592. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 103. 1890.—*Thelephora imbricatula* Schweinitz, Am. Phil. Soc. Trans. N. S. 4 : 166. 1832.—*Hymenochaete imbricatula* (Schw.) Lévillé, Ann. Sci. Nat. Bot. III. 5 : 152. 1846; Cooke, Grevillea 8 : 146. 1880; Masee, Linn. Soc. Bot. Jour. 27 : 103. 1890.—*H. imbricata* Sacc. Syll. Fung. 6 : 593. 1888.

Illustrations: Bolton, Hist. Funguses, pl. 174; Sowerby, British Fungi, pl. 25—type illustration.

Fructifications coriaceous, effuso-reflexed, often imbricated, sometimes wholly resupinate, thin, sericeous, antique brown, at length becoming glabrous and deep brownish drab, the margin and intermediate layer orange-yellow; hymenium snuff-brown to sepia, often deeply cracked where resupinate, with a series of radial anastomosing cracks for each centimeter of area; in structure 340–600 μ thick, with the setigerous

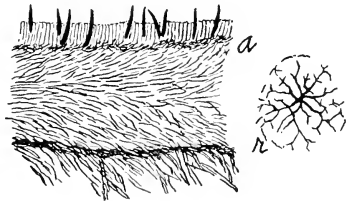


Fig. 9

H. tabacina.

Section, *a*, $\times 68$; system of radiating cracks in hymenium, *r*, $\times 4\frac{1}{2}$. See pl. 17, f. 16.

layer 100 μ thick, and with the intermediate layer bordered on each side by a narrow, dark, dense zone; hyphae $2\frac{1}{2}$ –3 μ in diameter, orange-yellow, longitudinally arranged in the intermediate layer; setae 60–90 \times 6–12 μ , emerging up

to 50 μ , originating from all parts of the setigerous layer although chiefly from the dark, subhymenial zone; spores hyaline, even, curved, $5-6 \times 1\frac{1}{2}-2 \mu$, as seen in preparation of sections.

Reflexed portion 3-7 mm. long, 10-15 mm. broad, often laterally confluent; resupinate portions up to 3×30 cm. and more.

On dead limbs, usually of frondose species. Canada to Mexico, Maine to the Pacific coast, Alaska to California. Common in the north, rare further south. Throughout the year.

H. tabacina is the commonest species of its genus in the northern United States and may be recognized by its reflexed fructifications tobacco-colored with bright golden yellow margin and intermediate layer, and by having the hymenium deeply cracked in resupinate portions into radiating systems, one system for about each centimeter of area. The specimen under the name *Stereum avellanum* from Fries in Kew Herb. is the old glabrous, somewhat reddish stage of *H. tabacina*; this specimen has led to the transfer of *Stereum avellanum* to *Hymenochaete* by British authors and Saccardo. An older specimen of *Thelephora avellana* in Herb. Fries collected by E. Fries at Femsjö is not distinct from *Stereum glaucescens* but is unfortunately on coniferous wood, while *T. avellana* was published as occurring on *Corylus*, a frequent substratum in Europe for *H. tabacina*. The type of *Thelephora imbricatula* in Herb. Schweinitz is a mixture of *Hymenochaete tabacina*, mounted on the right of the card, and of *H. corrugata*, mounted at the left. Both these species are present in the sample of *T. imbricatula* in Curtis Herb. but their order has been reversed in mounting. The portion of the original description pertaining to characters of reflexed portions of the fructifications is obviously based upon the *H. tabacina* portion of the type. Since Lévillé's transfer of *T. imbricatula* to *Hymenochaete* was probably based upon an authentic specimen from Schweinitz in Museum of Paris Herb., in 1846, this specimen will probably show whether any of *H. corrugata*

was mixed in the type of *H. imbricatula* as distributed by Schweinitz.

Specimens examined:

- Exsiccati: Bartholomew, Fungi Col., 3134; Berkeley, Brit. Fungi, 248; Ellis, N. Am. Fungi, 13; Ell. & Ev., Fungi Col., 102; Krieger, Fungi Sax., 270; Libert, Pl. Crypt. Arduennae, 121; Oudemans, Fungi Neerlandici Exs., 240; Shear, N. Y. Fungi, 314; de Thümen, Myc. Univ., 211, 211b.
- Finland: Mustiala, *P. A. Karsten*, in de Thümen, Myc. Univ., 211.
- Sweden: *L. Romell*, 37, 38; Stockholm, *L. Romell*, 342.
- Germany: Saxony, in Krieger, Fungi Sax., 270.
- Austria-Hungary: Trient Alps, *J. Bresadola*.
- Holland: in Oudemans, Fungi Neerlandici Exs., 240.
- England: in Berkeley, Brit. Fungi, 248.
- France: *F. Fautrey* (in Lloyd Herb., 3316).
- Belgium: in Libert, Pl. Crypt. Arduennae, 121.
- Newfoundland: *A. C. Waghorne* (in Mo. Bot. Gard. Herb., 5179, 5180); Chappel, *A. C. Waghorne*, 12 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 5178).
- Quebec: Gaspé, *J. Macoun*, 244; Montreal, *R. J. Blair*, comm. by L. O. Overholts, 3814 (in Mo. Bot. Gard. Herb., 54993).
- Ontario: Bond Lake, *J. H. Faull*, Univ. of Toronto Herb., 351 (in Mo. Bot. Gard. Herb., 44881); London, *J. Dearness*; Ottawa, *J. Macoun*, 22, 229; Port Credit, *J. H. Faull*, Univ. of Toronto Herb., 350, 351 (in Mo. Bot. Gard. Herb., 44876, 44866); Toronto, *Thos. Langton*, Univ. of Toronto Herb., 502 (in Mo. Bot. Gard. Herb., 44843); Wilcox Lake, *G. H. Graham*, Univ. of Toronto Herb., 686 (in Mo. Bot. Gard. Herb., 44940).
- Maine: Orono, *P. L. Ricker* (in Seymour Herb.); Piscataquis County, *W. A. Murrill*, 1943, 2007, 2075, 2110, 2175 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55522-6); Penobscot County, *W. A. Murrill*, 1802 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55527); Pittston Farm, *E. R. Hodson*, comm. by P. L. Ricker, 202; Portage, *L. W. Riddle*, 5.

- New Hampshire: Chocorua, *W. G. Farlow*, two collections; Gilmanton, *J. Blake*, comm. by P. L. Ricker; Mt. Wonalancet, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 42846); North Woodstock, comm. by Univ. of Wisconsin Herb., 11; Shelburne, *W. G. Farlow* (in Mo. Bot. Gard. Herb., 4782), and *H. von Schrenk* (in Mo. Bot. Gard. Herb., 5172).
- Vermont: Abby Pond, Ripton, *E. A. Burt*; Little Notch, *E. A. Burt*; Lost Pleiad Pond, *E. A. Burt*; North Ferrisburg, *E. A. Burt*; Ripton, *E. A. Burt*.
- Massachusetts: Cambridge, *G. R. Lyman*; Fresh Pond, *G. R. Lyman*; Magnolia, *W. G. Farlow*; Sharon, *A. P. D. Piguet*, comm. by W. G. Farlow, 1 (in Mo. Bot. Gard. Herb., 55006).
- Connecticut: Central Village, *J. L. Sheldon*, comm. by N. Y. Bot. Gard. Herb.; Norwich, *W. A. Setchell*.
- New York: *Torrey*, part of type of *Thelephora imbricatula* Schw. (on right of card in Herb. Schweinitz and on left of card in Curtis Herb.); Adirondacks, *G. F. Atkinson*, *b*; Alcove, *C. L. Shear*, 1101, 1308, and in Shear, N. Y. Fungi, 314; Altamont, *E. A. Burt*; Brookton, *H. Fitzpatrick*, 1054 (in Mo. Bot. Gard. Herb., 54773); East Galway, *E. A. Burt*, two collections; Fort Ann, *S. H. Burnham*, 18 (in Mo. Bot. Gard. Herb., 54422); Freeville, *G. F. Atkinson*, 2584; Riverside Park, New York City, *H. J. Whittimore*, 18 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55511); Vaughns, *S. H. Burnham*, 10 (in Mo. Bot. Gard. Herb., 44001).
- New Jersey: Forked River, *W. H. Ballou*, 3; Newfield, *J. B. Ellis*, in Ellis, N. Am. Fungi, 13, in Ell. & Ev., Fungi Col., 102, and in de Thümen, Myc. Univ., 211b.
- Pennsylvania: State College, *A. S. Rhoads & C. R. Orton*, 12 (in Mo. Bot. Gard. Herb., 44092); Trexlertown, *W. Herbst*, comm. by Lloyd Herb., 3593; Wright's Gap, *A. S. Rhoads*, comm. by L. O. Overholts, 3409 (in Mo. Bot. Gard. Herb., 7152).
- Delaware: Wilmington, *A. Commons*, 1427 (in N. Y. Bot. Gard. Herb.).
- North Carolina: Blowing Rock, *G. F. Atkinson*, 4031, 4331.

- Michigan: Ann Arbor, *L. N. Johnson*, 1654 (in N. Y. Bot. Gard. Herb.); Glen Lake, *C. G. Lloyd*, 02554, 02555; Isle Royal, *Allen & Stuntz*, 41, 43, both comm. by Univ. of Wisconsin Herb.; Vermillion, *A. H. W. Povak*, 141, 138, 311, 193, 147, 358, 351, 188, 213, 149, 192, 197, 70, 328 (in Mo. Bot. Gard. Herb., 15588, 17200, 16526, 20697, 21065, 21552, 22080, 20470, 20615, 20650, 20674, 22122, 22322, and 22350 respectively).
- Wisconsin: Madison, *V. B. Walker*, 8 (in Mo. Bot. Gard. Herb., 11963).
- Minnesota: Lake Itaska, comm. by *E. L. Jensen*, 7 (in Mo. Bot. Gard. Herb., 10372).
- Missouri: Cox's Switch, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 42864).
- Colorado: Tolland, 8000–10000 ft. altitude, *F. J. Seaver & E. Bethel* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 42761).
- Montana: comm. by *E. L. Jensen*, 6 (in Mo. Bot. Gard. Herb., 10362); Evaro, *J. R. Weir*, 430, 417, 418 (in Mo. Bot. Gard. Herb., 3469, 14771, 14769); Missoula, *J. R. Weir*, 433, 429 (in Mo. Bot. Gard. Herb., 3917, 13019).
- Idaho: Priest River, *J. R. Weir*, 94, 89, 100, 101 (in Mo. Bot. Gard. Herb., 8153, 12554, 15945, 15835), and 18.
- Alaska: Sitka, *W. Trelease*, 583a (in Mo. Bot. Gard. Herb., 5168).
- British Columbia: Hastings, *J. Macoun*, 63; Kootenai Mts., near Salmo, *J. R. Weir*, 514 (in Mo. Bot. Gard. Herb., 1740); Sidney, *J. Macoun*, 38, 68, 76 (in Mo. Bot. Gard. Herb., 6688, 55366, 55367).
- Washington: Bingen, *W. N. Suksdorf*, 686, 691, 718, 743, 746, 873; Bainbridge Island, *E. Bartholomew*, in Bartholomew, *Fungi Col.*, 3134; Kalama, *C. J. Humphrey*, 6163, 6201; Seattle, *W. A. Murrill*, 123, and an unnumbered specimen (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55530, 55531).
- Oregon: Blue Mts., *C. L. Shear*, 789, 796; Corvallis, *C. E. Owens*, 2082, 2138 (in Mo. Bot. Gard. Herb., 44248, 44698); Philomath, *G. B. Posey*, comm. by *C. E. Owens*, 2058 (in

Mo. Bot. Gard. Herb., 43879); Wallowa Lake, *C. L. Shear*, 790, 792, 794.

California: *R. A. Harper*, 129 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55532); Ferndale, *S. C. Edwards* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55533); Mt. Tamalpais, Marion Co., *W. A. Setchell & C. C. Dobie*, 1026 (in Mo. Bot. Gard. Herb., 44240); Muir Woods, *R. A. Harper* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55534); Palo Alto, *W. A. Merrill & L. S. Abrams*, 1290 (in N. Y. Bot. Gard. Herb.); San Mateo Mts., *E. B. Copeland*, comm. by C. F. Baker, 1800, and (in Mo. Bot. Gard. Herb., 5173).

Mexico: Jalapa, 5000 ft. altitude, *W. A. & Edna L. Merrill*, 118, 119 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 10925, 10747).

12. *H. badio-ferruginea* (Mont.) Lévillé, Ann. Sci. Nat. Bot. III. 5 : 152. 1846; Cooke, Grevillea 8 : 146. 1880; Sacc. Syll. Fung. 6 : 591. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 101. 1890.

Stereum badio-ferrugineum Montagne, Ann. Sci. Nat. Bot. II. 20 : 367. 1843; Syll. Crypt. 178. 1856.

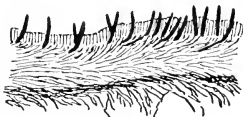


Fig. 10
H. badio-ferruginea.
Section $\times 68$. From authentic specimen.
See *pl. 16, f. 4*.

Type: in Museum of Paris Herb., according to Lévillé, *loc. cit.*; authentic specimen of later collection from Montagne to Berkeley, in Kew Herb.

Fructifications imbricated, conchiform, umbonate-sessile or reflexed, thin, drying pliant, with the upper surface sericeous, lineate-radiate, Sayal-brown when young, becoming variegated with concentric, glabrous, bay or chestnut-brown zones; hymenium snuff-brown, sometimes minutely cracked; in structure 200–300 μ thick, with a dark, dense, subhymenial zone and with the hyphal layer composed of a broad intermediate layer of longitudinally arranged, golden-yellow hyphae $3\frac{1}{2}$ μ in diameter, connected with the loosely arranged

hyphae of the upper surface of the pileus by a narrow, dark, dense zone; setae cylindric below, acute, $50-75 \times 8-10 \mu$, emerging up to 50μ , starting from various parts of the dark subhymenial zone, abundant but not crowded; spores hyaline, even, somewhat curved, $4-6 \times 1-2 \mu$, as seen in preparations of sections.

Fructifications with pilei 4-7 mm. long, 4-10 mm. broad, sometimes laterally confluent; resupinate portions, when present, $\frac{1}{2}-2 \times 2\frac{1}{2}-7\frac{1}{2}$ cm.

On erect rotting stumps of frondose species—rarely on prostrate logs. Canada to Carolina. June to January. Occasional.

This species is so closely related to *H. tabacina* that I have been doubtful whether it is not a form of the latter somewhat modified in form of fructifications through growing on a vertical surface. *H. badio-ferruginea* may be separated from *H. tabacina* by growing upon a vertical surface and by the small imbricated, conchiform pilei which are thinner than those of *H. tabacina*, and by the hymenium either not at all cracked or with narrow cracks which do not form systems radiating from several centers in the resupinate portion—each system of cracks from its own center. The type of *H. badio-ferruginea* was collected in New York by Menand. All European specimens of *H. tabacina* which I have seen are distinct also from *H. badio-ferruginea* in the characters enumerated above.

Specimens examined:

Canada: Bushwood, *J. Macoun*, 115.

New Brunswick: Tobique River, *G. N. Hay*.

Maine: Piscataquis County, *W. A. Murrill*, 1941, 2232, 2246, 2248 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55515-55518); Penobscot County, *W. A. Murrill*, 1807 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55506).

New Hampshire: *P. Wilson* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55519); Camp, Ellis R., *U. & C.*, from Underwood Coll., 8 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55502); White Mts., *U. & C.*, 19,

32, from Underwood Coll. (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55520, 55521).

Vermont: Middlebury, *E. A. Burt*.

New York: Adirondacks, *G. F. Atkinson*, *a*; East Galway, *E. A. Burt*, two collections; Floodwood, *E. A. Burt*.

New Jersey: Lakewood, *E. A. Daniels*, comm. by H. Webster.

Carolina: specimen determined by Montagne (in Kew Herb.).

13. *H. rubiginosa* Dickson ex Lévillé, Ann. Sci. Nat. Bot. III. 5 : 151. 1846; Cooke, Grevillea 8 : 145. 1880; Sacc. Syll. Fung. 6 : 589. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 97. 1890; Brown, Mycologia 7 : 1. *pl.* 149-151. 1915.

Helvella rubiginosa Dickson, Fasc. Pl. Crypt. Brit. 1 : 20. 1785; Sowerby, Brit. Fungi, *pl.* 26. 1796.—*Thelephora rubiginosa* Schrader, Spic. Fl. Germ. 185. 1794; Persoon, Syn. Fung. 567. 1801; Myc. Eur. 1 : 120. 1822; Fries, Syst. Myc. 1 : 436. 1821.—*Stereum rubiginosum* Fries, Epicr. 550. 1838; Hym. Eur. 641. 1874.—*Auricularia ferruginea* Bulliard, Herb. de la France 2 : 281. *pl.* 378. 1787; Sowerby, Brit. Fungi, *pl.* 26. 1796.—*Stereum ferrugineum* Bulliard ex Fries, Epicr. 550. 1838; Hym. Eur. 640. 1874; Sacc. Syll. Fung. 6 : 565. 1888.—*Hymenochaete ferruginea* (Bulliard) Masee, Linn. Soc. Bot. Jour. 27 : 103. 1890; Bresadola, I. R. Accad. Agiati Atti III. 3 : 109. 1897.

Illustrations: Bulliard, Herb. de la France, *pl.* 378; Fl. Danica, *pl.* 1619. *f.* 2; Sowerby, Brit. Fungi, *pl.* 26; Rabenhorst, Krypt.-Fl. 1 : 320. *f.* 1; Brown, Mycologia 7 : *pl.* 149-151.

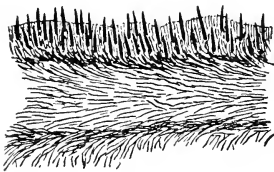


Fig. 11

H. rubiginosa.

Section $\times 68$. See *pl.* 17, *f.* 14.

Fructifications coriaceous-rigid, effused, reflexed, or sometimes wholly resupinate, separable, somewhat fasciate above, concentrically sulcate, velvety, Brussels-brown, finally glabrous, fuscous-black, the margin ochraceous-tawny; hymenium conspicuously setulose under a lens, somewhat colliculose, bitter; in structure 500-700 μ thick, with the broad, dense, dark, setigerous layer 160 μ thick and with the intermediate layer

composed of longitudinally arranged, colored hyphae $2\frac{1}{2}$ μ in diameter and bordered above by a narrow, dense, dark zone; setae very numerous, slightly curved, tapering upward to a very sharp point, $50-60 \times 5-6$ μ , emerging up to 45 μ , starting from all parts of the setigerous layer; spores hyaline, even, $4-6 \times 2-3$ μ .

Fructifications with reflexed portion 1-2 $\frac{1}{2}$ cm. long, 1-3 cm. broad and sometimes larger by lateral confluence; resupinate portion 7-8 \times 1-3 cm.

On decaying logs and stumps of oak and other frondose species. Canada to Mexico, westward to Oregon and California, and in Porto Rico. July to February, persisting to June. Common.

H. rubiginosa may be recognized by its rigid pileus, velvety, concentrically sulcate, and Brussels-brown (rubiginous) in color, by the colliculose, bister hymenium whose dark red component color and setae show to advantage in reflected light, and by the brighter ochraceous margin. Even resupinate specimens may be recognized at sight by being separable from the substratum, and by the form and color of the hymenium and the contrasting bright margin. The structure in section is equally constant and distinctive. This species produces a pocketed heart rot in oak wood.

Specimens examined:

Exsiccati: Bartholomew, Fungi Col., 3133; Berkeley, Brit. Fungi, 247; Ellis, N. Am. Fungi, 327; Kunze, Fungi Sel., 203; Rabenhorst, Herb. Myc., 212.

England: in Berkeley, Brit. Fungi, 247; Kenilworth, *W. A. Murrill* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55542).

Sweden: Upsala, *E. Fries*, det. by Fries as *Stereum ferrugineum*, comm. by L. Romell, 27; Femsjö, *L. Romell*, 35; Halland, *L. Romell*, 36; Lapland, *L. Romell*, 396, 397.

Germany: *J. Kunze*, in Kunze, Fungi Sel., 203 (in Mo. Bot. Gard. Herb., 44098); from Persoon, under the name *Thelephora rubiginosa* (in Kew Herb.); Dresden, in Rabenhorst, Herb. Myc., 212.

- Austria-Hungary: Löcse, *V. Greschick*, comm. by Bresadola, under the name *Hymenochaete ferruginea*.
- Canada: *J. Macoun*, 92; Lower St. Lawrence Valley, *J. Macoun*, 63; London, Ontario, *J. Dearness*, 981 (in N. Y. Bot. Gard. Herb.).
- Maine: Orono (in N. Y. Bot. Gard. Herb.).
- Vermont: Lake Dunmore, *E. A. Burt*, two collections; Middlebury, *E. A. Burt*, two collections.
- Massachusetts: Webster, *R. G. Leavitt*.
- Connecticut: *V. S. White* (in N. Y. Bot. Gard. Herb.); Central Village, *J. L. Sheldon*, 25, comm. by N. Y. Bot. Gard. Herb.; Redding, *F. S. Earle*, 455, and *Underwood & Earle*, 498 (both in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55540, 55541).
- New York: Alcove, *C. L. Shear*, 241; East Galway, *E. A. Burt*, five collections; Ithaca, *G. F. Atkinson*, 22942, 22942a, and *Van Hook*, comm. by G. F. Atkinson, A, and *H. P. Brown* (in Mo. Bot. Gard. Herb., 44099); Karner, *H. D. House* (in N. Y. State Mus. Herb., and in Mo. Bot. Gard. Herb., 54355); New Berlin, *W. H. Long*, 19070 (in Mo. Bot. Gard. Herb., 44163); New York Botanic Garden, *Class in Mycology* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55543).
- New Jersey: Fort Lee, *W. A. Murrill* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55545); Hackensack Swamp, *W. H. Ballou*, 1.
- Pennsylvania: Bear Meadows, *A. S. Rhoads*, 10 (in Mo. Bot. Gard. Herb., 44087); Kittanning, *D. R. Sumstine*; Ohio Pyle, *W. A. Murrill*, 1087 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55546); Sayre, *W. C. Barbour*, 1386 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55547); Spruce Creek, *J. H. Faull*, Univ. of Toronto Herb., 348 (in Mo. Bot. Gard. Herb., 44880); Trexlertown, *C. G. Lloyd*, 0019, 0256; West Chester, *Haines*, *Everhart & Jefferis*, in Ellis, N. Am. Fungi, 327.
- Maryland: Takoma Park, *C. L. Shear*, 1274.
- Virginia: Blacksburg, *Miss V. W. Murrill*, 19 (in N. Y. Bot.

- Gard. Herb., and in Mo. Bot. Gard. Herb., 55548); Woodstock, *C. L. Shear*, 1192.
- North Carolina: comm. by W. H. Long, 12930, 19123 (in Mo. Bot. Gard. Herb., 44162, 44165); Blowing Rock, *G. F. Atkinson*, 4030, 4188, 4309, 4310, 4312, 4321; Pink Bed Valley, Transylvania Co., *W. A. Murrill & H. D. House*, 422 (in N. Y. Bot. Gard. Herb.).
- Florida: *C. G. Lloyd*, 4858.
- Alabama: Montgomery, *R. P. Burke*, 149 (in Mo. Bot. Gard. Herb., 44905).
- Louisiana: Bogalusa, *C. J. Humphrey*, 5499 (in Mo. Bot. Gard. Herb., 13613); St. Martinville, *A. B. Langlois*.
- Ohio: *C. G. Lloyd*, 3910; Cincinnati, *A. P. Morgan*, comm. by Lloyd Herb., 2636, and *C. G. Lloyd*, 4527; Linwood, *C. G. Lloyd* (in Lloyd Herb., 07374, and in Mo. Bot. Gard. Herb., 55554); Miami Valley, *A. P. Morgan* (in Mo. Bot. Gard. Herb., 5177).
- West Virginia: Eglon, *C. G. Lloyd*, 02714; Morgantown, *J. L. Sheldon*, 3537, comm. by N. Y. Bot. Gard. Herb.
- Tennessee: Elkmont, *C. H. Kauffman*, 75 (in Mo. Bot. Gard. Herb., 21462).
- Indiana: Crawfordsville, *D. Reddick*, 1, 16; Lafayette, *C. R. Orton*, 6 (in Mo. Bot. Gard. Herb., 44083).
- Illinois: River Forest, *E. T. & S. A. Harper*, 630.
- Wisconsin: Blue Mounds, Univ. of Wisconsin Herb., 24; Madison (in Mo. Bot. Gard. Herb., 4996).
- Missouri: Creve Coeur, *E. A. Burt* (in Mo. Bot. Gard. Herb., 10405), and *P. Spaulding* (in Mo. Bot. Gard. Herb., 44097); Upper Creve Coeur, *E. A. Burt* (in Mo. Bot. Gard. Herb., 44048).
- Arkansas: Cass, *W. H. Long*, 19806 (in Mo. Bot. Gard. Herb., 8966).
- Nebraska: Saultillo, *C. L. Shear*, 1093.
- Kansas: Emporia, *E. Bartholomew*, in Bartholomew, *Fungi Col.*, 3133.
- Arizona: Santa Catalina Mts., *G. G. Hedgcock & W. H. Long*, comm. by *C. J. Humphrey*, 2507 (in Mo. Bot. Gard. Herb., 42934).

- Oregon: Corvallis, *C. E. Owens*, 2137, 2148 (in Mo. Bot. Gard. Herb., 44696, 9187).
 California: Palo Alto, *W. A. Murrill & L. S. Abrams*, 1161 (in N. Y. Bot. Gard. Herb.).
 Mexico: Guernavaca, *W. A. & Edna L. Murrill*, 406 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 54533).
 Porto Rico: El Duque, *J. A. Stevenson & J. R. Johnston*, 1487 (in Mo. Bot. Gard. Herb., 6597); Rio Piedras, *J. A. Stevenson & R. C. Rose*, comm. by *J. A. Stevenson*, 6514 (in Mo. Bot. Gard. Herb., 55088).

14. *H. reflexa* Burt, n. sp.

Type: in Burt Herb. and N. Y. Bot. Gard. Herb.

Fructifications effused, broadly reflexed, thin, rigid, fibrillose, Prout's brown, finally glabrous, shallowly concentrically

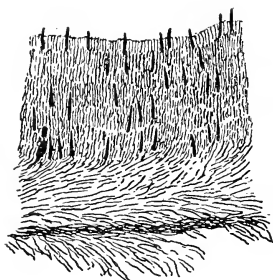


Fig. 12

H. reflexa.

Section $\times 68$. From type.
 See pl. 17, f. 13.

sulcate and zonate, with obscure blackish zones in the furrows; hymenium even, not cracked, Sudan-brown; in structure 500–600 μ thick, composed of a zonate setigerous layer 300–400 μ thick and of an intermediate layer bordered on the upper side by a dense, but not dark, zone which connects with the more loosely arranged hyphae of the upper surface of the pileus; setigerous layer very compact, composed of crowded, erect hyphae, between which are scattered,

slender setae, slightly curved, sharp-pointed, $35-40 \times 4\frac{1}{2}-5 \mu$, emerging up to 30 μ , present in all parts of the layer; hyphae of intermediate layer densely, longitudinally arranged, colored, $2\frac{1}{2} \mu$ in diameter; no spores found.

Fructification with reflexed portion 2 cm. long, about 8 cm. broad; resupinate strip 3 mm. across at base of reflexed portion is all of resupinate portion which was collected.

Under side of decaying wood. Jamaica. January. Rare.

H. reflexa bears some resemblance to *H. rubiginosa* in its rigid and dark-colored pileus; a similar resemblance to *H.*

rubiginosa was stated by Fries, *Elenchus Fung.* 1: 174, in the comment of the original description of *Thelephora leprosa* collected in Brazil. If the specimen of *Thelephora leprosa* upon which L veill  based his transfer of this species of *Hymenochaete* is still in the Museum of Paris Herbarium and is from the original collection, comparison with this specimen may show that *H. reflexa* should be regarded as a synonym of *T. leprosa*. The structure in section of *H. reflexa* is very like that of *H. unicolor*, but the hymenium is of different color and all the collections of *H. unicolor* have the margin closely adnate.

Specimens examined:

Jamaica: Troy and Tyre, *W. A. Murrill & W. Harris, 989*, type, comm. by N. Y. Bot. Gard. Herb.

15. *H. cubensis* Burt, n. sp.

Type: in Burt Herb. and N. Y. Bot. Gard. Herb.

Fructifications imbricated, flabelliform, dimidiate, umbonate-sessile and attached along one side, or effused and reflexed, thin, coriaceous, pliant when dry, minutely tomentose, concentrically sulcate, antique brown when young, becoming snuff-brown to Rood's brown; hymenium even, antique brown; in structure 300–400 μ thick, with a setigerous layer 80–100 μ broad and a narrow intermediate layer which

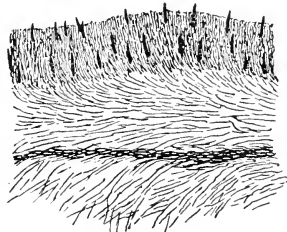


Fig. 13

H. cubensis.

Section $\times 68$. From type.
See *pl. 17, f. 8*.

is connected by a narrow, dark, dense zone with the loosely arranged hyphae of the upper surface of the pileus; setae not abundant, $35-45 \times 4\frac{1}{2}-6 \mu$, emerging up to 30μ , slender, somewhat falcate, sharp-pointed, occurring in all parts of the setigerous layer which contains many colored, amorphous grains also; hyphae of intermediate layer $2\frac{1}{2}-3 \mu$ in diameter, colored; spores hyaline, even, $4-4\frac{1}{2} \times 2 \mu$.

Fructifications 1 cm. from umbo to margin, or when dimidiate 1–2 cm. broad, 1–2 cm. long, and sometimes larger by

lateral confluence; resupinate portions about 2 cm. in diameter present in one collection.

On rotting frondose wood and logs in dense forests, causing a pocketed rot. Cuba and Porto Rico. February and March. Frequent.

H. cubensis is related to *H. reflexa* in structure, but its fructifications are smaller and thinner than those of the latter, and are nearly always umbonate-sessile or dimidiate—only very rarely reflexed—and do not become glabrous and dark-colored, with resemblance to *H. rubiginosa*. Such ample collections of *H. cubensis* have been made that it seems as though this species should have been described heretofore, but I have failed to find anything in earlier work to which these specimens may be referred.

Specimens examined:

Cuba: Alto Cedro, *L. M. Underwood & F. S. Earle*, 1491, type, and 1565, and *Earle & Murrill*, 456, all comm. by N. Y. Bot. Gard. Herb.; La Gloria, Camagüey, *J. A. Shafer*, 739 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55549); Managua, Havana Province, *Earle & Murrill*, 21, comm. by N. Y. Bot. Gard. Herb.

Porto Rico: Monte Cerrote, near Adjuntas, *N. L. Britton & S. Brown*, 5479 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55550).

16. *H. unguolata* Burt, n. sp. Plate 17, fig. 17.

Type: in Mo. Bot. Gard. Herb. and N. Y. Bot. Gard. Herb.

Pileus very hard, tuberculate-ungulate, sessile, decurrent, triangular in section, with the upper surface black, crust-like, glabrous, the margin obtuse; hymenium oblique, pruinose, between white and pearl-gray; in structure 3 mm. thick, no intermediate layer found, composed of a setigerous layer 1 mm. or more thick, of layered structure, and of the stony pseudoparenchymatous crust; setae $75 \times 9 \mu$, tapering from the base, very abundant, starting from all parts of the setigerous layer; no spores found.

Pileus 3 mm. long, 5–12 mm. wide, 2–3 mm. thick.

On bark of dead standing trunk or stump in virgin forest, 5000 ft. altitude. Mexico. December.

H. unguolata is unique in our species of this genus by its small, hoof-shaped fructifications with ashy white hymenium and crust-like, dull black upper surface. The fructifications are so hard that they turn the edge of the razor immediately in sectioning and have not afforded good preparations for showing the structure above the setigerous layer. *H. unguolata* probably belongs in the group with *H. corticolor*.

Specimens examined:

Mexico: Jalapa, *W. A. & Edna L. Merrill*, 176, type (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 44970).

17. **H. corticolor** Berk. & Ravenel, *Grevillea* 1 : 165. 1873; Cooke, *Grevillea* 8 : 147. 1880; Sacc. *Syll. Fung.* 6 : 595. 1888; Massee, *Linn. Soc. Bot. Jour.* 27 : 111. 1890.

Type: type distribution in Ravenel, *Fungi Car.* 3 : 30.

Fructifications hard, woody, either wholly resupinate, adnate, and following the inequalities of the substratum, or with the upper edge thickened, barely reflexed, black, glabrous; hymenium drab, even; in structure 400–1000 μ thick, lacking an intermediate layer, with the setigerous layer constituting the whole thickness of the fructification and composed of densely arranged, suberect, interwoven, pale hyphae, much crystalline matter, and scattered setae; setae 60–75 \times 9 μ , emerging up to 45 μ , sharp-pointed, distributed in all parts of the fructification; spores hyaline, even, flattened on one side, 4½ \times 3½ μ .

Resupinate over areas 1–3 \times 1½–5 cm., with reflexed margin 1–1½ mm. broad.

On bark, often in its crevices, of living trunks of oak, elm, *Magnolia*, and other frondose species. New Jersey to Florida, and in Cuba, Jamaica, and Grenada. Autumn to February.



Fig. 14

H. corticolor.

Section \times 44. From type.

See *pl. 16, f. 7*.

The absence of an intermediate layer is likely to place the usual collections of resupinate *H. corticolor* in the group of species with *H. corrugata*, *H. cervina*, *H. Pellicula*, *H. tenuis*, etc., from all of which *H. corticolor* is distinguishable at sight by its great thickness, drab hymenium, black upper surface of reflexed edge, and occurrence on the bark of living tree trunks. This species attains its best development in South Carolina and Florida. The black upper surface of the reflexed edge is a good character for separation from *H. unicolor*.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 408; Ravenel, Fungi Car. 3 : 30; Fungi Am., 121.

New Jersey: Newfield, *J. B. Ellis*, in Ellis, N. Am. Fungi, 408.

Maryland: Takoma Park, *C. L. Shear*, 1003, 1096.

South Carolina: *H. W. Ravenel*, Curtis Herb., 1553 (in Kew Herb.), and in Ravenel, Fungi Car. 3 : 30, type distribution.

Florida: Cocoanut Grove, *R. Thaxter*, 79 (in Farlow Herb., and in Mo. Bot. Gard. Herb., 43984); Daytona, *R. Thaxter*, 13 (in Farlow Herb., and in Mo. Bot. Gard. Herb., 43933); Gainesville, *N. L. T. Nelson* (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55455), and *H. W. Ravenel*, in Ravenel, Fungi Am., 121.

Cuba: San Diego de los Baños, *Earle & Murrill*, 198, comm. by N. Y. Bot. Gard. Herb.

Jamaica: Cinchona, *W. A. & Edna L. Murrill*, 419, comm. by N. Y. Bot. Gard. Herb.

Grenada: Grand Etang, *R. Thaxter*, comm. by W. G. Farlow, 13.

18. **H. arida** Karsten in Sacc. Syll. Fung. 9 : 228. 1891; Bresadola, Ann. Myc. 1 : 93. 1903.

Hymenochaetella arida Karsten, Finska Vet.-Soc. Bidrag Natur och Folk 48 : 428. 1889.—*H. laxa* Karsten, Finska Vet.-Soc. Bidrag Natur och Folk 48 : 429. 1889.—*Hymenochaete laxa* Karsten in Sacc. Syll. Fung. 9 : 228. 1891.—*Corticium simulans* Berk. & Rav. in Cooke, Grevillea 6 : 132. 1878 (without description but with reference to Ravenel, Fungi Am., 10); Ravenel, Fungi Car. 5 : 25 (without description); de

Thümen, Myc. Univ., 512 (without description).—Probably not *Corticium simulans* Berk. & Broome, Linn. Soc. Bot. Jour. 14 : 72. 1873.—*Hymenochaete simulans* (Berk. & Rav.) Peck, N. Y. State Mus. Rept. 49 : 34. 1897 (without description); v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 116 : 775. 1907.

Type: authentic specimen from Karsten in Burt Herb.

Fructifications resupinate, effused, scattered, orbicular at first, then laterally confluent, thin, dry, adnate, not cracked, drying clay-color to antique brown, the margin thinning out; in structure 100–140 μ thick, composed of loosely interwoven, suberect hyphae 3–4 μ in diameter, colored like the fructification, stiff, not nodose-septate, forming a homogeneous layer, without a dense zone from substratum to hymenium, and bearing scattered setae in the upper portion of the layer; setae 30–75 \times 6–8 μ , emerging up to 35 μ , not numerous, tapering upward; spores in spore collection from Swedish specimen white, even, allantoid, 6–7 \times 2 μ as seen in side view, 2½–3 μ broad in front view, and 6–7 \times 3½–4 μ , flattened on one side in American specimens.



Fig. 15

H. arida.

Section \times 68. From authentic specimen.

Fructifications at first 2–3 \times 2 mm., later laterally confluent over areas 9 \times 1–1½ cm.

On bark of dead branches of *Corylus*, *Ostrya virginica*, and *Vaccinium arboreum*. Finland, Sweden, Vermont to South Carolina, and in Michigan. October to April.

The fructifications of *H. arida* are at first small, scattered, and suborbicular and later become confluent and elongated so as to resemble closely in aspect and color *Coniophora arida*. The spores of American collections are about twice the breadth of those of European specimens cited, but the agreement between the European and American specimens is so close in general aspect and in the very simple structure of the fructification in section that I believe the American and European specimens are of the same species. The distinguishing characters of *H. arida* are its resemblance in aspect to *Coniophora arida*, structure consisting of a single, homo-

geneous layer of loosely interwoven, suberect hyphae, with setae distributed in outer half of the layer, rather large spores, and the occurrence in the United States upon bark of *Ostrya* and *Vaccinium arboreum*. Von Höhnel and Litschauer in their notes on types in Karsten's herbarium¹ referred *Hymenochaete arida* and *H. laxa* to *H. unicolor* and *H. cinnamomea* respectively — species with which they have nothing in common except color.

Specimens examined:

Exsiccati: Ravenel, *Fungi Car.* 5 : 25; *Fungi Am.*, 10; de Thümen, *Myc. Univ.*, 512.—in each under the name *Corticium simulans* B. & Rav.

Finland: Mustiala, *P. A. Karsten*, authentic specimen and another specimen communicated by Bresadola; Runsala, *P. A. Karsten*, authentic specimen of *Hymenochaetella laxa*.

Sweden: Upsala, *C. G. Lloyd*, 08425 (in *Lloyd Herb.*, and in *Mo. Bot. Gard. Herb.*, 55472).

Vermont: Middlebury, *E. A. Burt*.

New York: Fort Ann, *S. H. Burnham*, 41 (in *Mo. Bot. Gard. Herb.*, 54456).

South Carolina: Aiken, *H. W. Ravenel*, in Ravenel, *Fungi Car.* 5 : 25, *Fungi Am.*, 10, and in de Thümen, *Myc. Univ.*, 512.

Michigan: Ann Arbor, *C. H. Kauffman*, 32.

19. **H. unicolor** Berk. & Curtis, *Linn. Soc. Bot. Jour.* 10 : 335. 1868; Cooke, *Grevillea* 8 : 148. 1880; Sacc. *Syll. Fung.* 6 : 597. 1888; Masee, *Linn. Soc. Bot. Jour.* 27 : 108. 1890; Lloyd, *Myc. Notes* 41 : 572. *text f.* 780, 781. 1916.

H. fuliginosa Berk. & Curtis, *Linn. Soc. Bot. Jour.* 10 : 335. 1868; not *H. fuliginosa* (Pers.) Lév.

Type: in Kew Herb.

Fructification resupinate, long and broadly effused, adnate, dense, cracked, brittle, scaling off from the wood, drying antique brown; in structure 500–700 μ thick, composed of a very thick, somewhat zonate, setigerous layer and of a thin hyphal layer which is often not sharply distinguishable from the setigerous layer; hyphae $2\frac{1}{2}$ –3 μ in diameter; setae scat-

¹ K. Akad. Wiss. Wien Sitzungsber. 115 : 1577, 1578. 1906.

tered in all parts of the setigerous layer, sometimes slightly falcate, $50-60 \times 5-6 \mu$, emerging up to 40μ , tapering from the base to a slender and sharp apex; basidia with 4 sterigmata; spores in spore collection white, even, $5-5\frac{1}{2} \times 3\frac{1}{2}-4 \mu$; causing pocketed rot in decorticated hard wood.

Covering decorticated poles 20 feet long.

On dead frondose wood. Cuba, Venezuela, and Brazil. December to April.

H. unicolor has the coloration and general aspect of *H. cinnamomea* and *H. sprata* but is usually rimose in contrast with the former and with a more velvety hymenium than the latter and is of a very dense structure with its hyphae arranged parallel with the rather uniformly distributed setae, while *H. cinnamomea* and *H. sprata* are stratose, with alternating layers of loosely interwoven hyphae separating the two or more hymenial layers. The dry rot produced in the wood by *H. unicolor* is a pocketed rot, as shown by the fine collection by Lloyd and well shown in his fig. 781, cited above, while the rot produced by *H. sprata* is a soft, fibrous sap rot which attacks the sap-wood uniformly from the outer surface. The specimen referred by Berkeley and Curtis to *H. fuliginosa*, collected in Cuba, *C. Wright*, 188, differs so slightly from the type of *H. unicolor* that it will probably be included in *H. unicolor* when better known by other collections.

Specimens examined:

Cuba: *C. Wright*, 541, type (in Kew Herb.) and an unnumbered collection of 1857, under the name of *H. cinnamomea* (in Curtis Herb.), and 188, under the name *Hymenochaete fuliginosa* (in Kew Herb.); *C. G. Lloyd*, 142, 171 (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55458, 55473); Ceballos, *C. J. Humphrey*, 2585, 2590, 2696, 2829, 2964 (in Mo. Bot. Gard. Herb., 16043, 16052, 1778, 14838, 1766).

Jamaica: Troy and Tyre, *W. A. Murrill & W. Harris*, 991, comm. by N. Y. Bot. Gard. Herb.



Fig. 16
H. unicolor.
Section, *a*, $\times 44$;
seta, *b*, and spores,
s, $\times 850$.

Venezuela: Margarita, *A. F. Blakeslee*, comm. by W. G. Farlow.

Brazil: Blumenau, *A. Möller*, comm. by J. Bresadola, under the name *Hymenochaete fuliginosa*, as listed in *Hedwigia* 35 : 289. 1896.

20. *H. agglutinans* Ellis, Torr. Bot. Club Bul. 5 : 46. 1874; Sacc. Syll. Fung. 6 : 602. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 106. 1890; Graves, Mycologia 6 : 279. *pl.* 145. 1914.

Hymenochaete ambiens Berk. & Curtis in Cooke, Grevillea 8 : 147. 1880; Sacc. Syll. Fung. 6 : 596. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 106. 1890.

Type: probably in N. Y. Bot. Gard. Herb.

Fructifications resupinate, effused, adnate, orbicular, at first of loose texture and cream-buff, then thick, very compact, concentrically sulcate, and antique brown, with the margin thick, determinate, and cream-buff, finally becoming black during the winter, infecting living limbs where they rub together and finally uniting them firmly; in structure 1-2 mm. thick, composed of a single homogeneous hyphal layer of densely interwoven, thick-walled hyphae concolorous with the fructification and bearing at the outer surface of this layer an opaque subhymenium upon which the setae stand; setae 70-90 \times 9 μ , protruding 60 μ , few, scattered, starting from the subhymenium; basidia and spores not found.

Fructifications 3-7 cm. in diameter, 1-2 mm. thick.

Infecting living branches of *Alnus*, *Benzoin*, *Acer*, etc., where they rub together. August to April. New Hampshire to Florida, westward to Idaho, and in Cuba. Frequent.

This species is easily recognized by its remarkable habit of joining together branches which have rubbed together and formed areas for infection. From these areas the fructification spreads so as to often encircle one or both limbs, at the same time killing the portions of the limbs beyond the fructification, as described by Graves in his article cited above.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 939; Ell. & Ev., Fungi Col., 807; de Thümen, Myc. Univ., 309.

- New Hampshire: Chocorua, *W. G. Farlow*.
- Vermont: Lost Pleiad Pond, Ripton, *E. A. Burt*; Middlebury, *E. A. Burt*.
- Massachusetts: Cherry Brook, Weston, *A. B. Seymour, T 4* (in Mo. Bot. Gard. Herb., 43888); Magnolia, *W. G. Farlow*; Sharon, *A. P. D. Piguet*, comm. by *W. G. Farlow* (in Mo. Bot. Gard. Herb., 55475); Waltham, *A. B. Seymour, T 5* (in Mo. Bot. Gard. Herb., 43889).
- Connecticut: Storrs, *A. E. Moss*, comm. by *P. W. Graff*, 39 (in Mo. Bot. Gard. Herb., 44791).
- New York: Albany, *C. G. Lloyd, 07112* (in Lloyd Herb.); Al-
cove, *C. L. Shear, 999*; Brooklyn, *F. H. Ames* (in Lloyd
Herb., 438); Chappaqua, *Mrs. C. E. Ryder & Mrs. W. A.*
Murrill (in N. Y. Bot. Gard. Herb.); Ithaca, *G. F. Atkin-*
son, 2022; Scarsdale, *Mrs. Livingston & Miss Crane*, comm.
by N. Y. Bot. Gard. Herb.
- New Jersey: *C. F. Austin, 57* (in Curtis Herb. as an unde-
termined *Corticium* and in Kew Herb. as the type of
Hymenochaete ambiens Berk. & Curtis); Newfield, *J. B.*
Ellis, in Ellis, N. Am. Fungi, 939, in Ell. & Ev., Fungi Col.,
807, and in de Thümen, Myc. Univ., 309.
- Pennsylvania: Trexlertown, *W. Herbst, 1*.
- North Carolina: Biltmore Estate, *W. A. Murrill* (in N. Y.
Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55477).
- Florida: Sorrento, *R. Thaxter, 74* (in Farlow Herb., and in
Mo. Bot. Gard. Herb., 43896).
- Ohio: Linwood, *C. G. Lloyd, 1879*.
- Wisconsin: Madeline Island, near Bayfield, *V. B. Walker, 4*
(in Mo. Bot. Gard. Herb., 6631).
- Idaho: Priest River, *J. R. Weir, 345* (in Mo. Bot. Gard. Herb.,
6853).
- Cuba: Alto Cedro, Santiago, *F. S. Earle, 346*, from Herb. de
Cuba Estacion Central Agronomica.

21. *H. cinnamomea* (Pers.) Bresadola, I. R. Accad. Agiati
Atti III. 3 : 110. 1897.

Thelephora cinnamomea Persoon, Myc. Eur. 1 : 141. 1822;
Fries, Elenchus Fung. 1 : 201. 1828.—*Corticium cinnamomeum*

(Pers.) Fries, *Epier.* 561. 1838; *Hym. Eur.* 650. 1874.—*Hymenochaetella rudis* Karsten, *Hedwigia* 35: 173. 1896.—*Hymenochaete rudis* Karsten in *Sacc. Syll. Fung.* 14: 218. 1899.

Type: specimen determined by Fries in Herb. Fries.

Fructification resupinate, widely effused, adnate, velvety, not cracked, drying antique brown to Brussels-brown, the margin tomentose-fibrillose; in structure becoming 500–1000 μ thick, stratose, ranging up to 6 strata, each composed of a setigerous layer 30–45 μ broad and of a hyphal layer of equal or greater breadth, with hyphae colored like the fructification, loosely interwoven, 3 μ in diameter; setae 60–90 \times 5–6 μ , protruding up to 60 μ , tapering upward from the base, originating in all parts of the setigerous layers; spores hyaline, even, 4½–6 \times 2–2½ μ as seen in sectional preparations, stated by Bresadola to be 6–9 \times 2½ μ as obtained from spore collections.

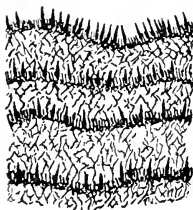


Fig. 17

H. cinnamomea.

Section \times 44. From specimen in Herb. Fries.

Fructifications 3–7 \times 1½–2½ cm.

On bark and decaying wood of both frondose and coniferous species but usually on the former. New York to California and British Columbia. June to April. Rare.

H. cinnamomea closely resembles in color and general aspect *Hypochnus ferrugineus* but is thicker and with a more compact hymenium. I base my idea of *H. cinnamomea* on the specimen from Norway determined by Fries and the fine specimens of identical structure collected in Lapland by Romell, in Finland by Karsten, and in Ardennes by Libert. The specimen from Hungary, received from Bresadola, has the same aspect, velvety, not cracked, and a thin surface setigerous layer but varies toward *H. sprete* by having its deeper setigerous layers more than 45 μ broad and exceeding the adjoining hyphal layers. This specimen from Bresadola formerly led me to regard *H. sprete* as a synonym of *H. cinnamomea* and to refer to *H. cinnamomea* for my correspond-

ents many specimens which will be found cited under *H. spreta*. *H. cinnamomea* appears clearly distinct from *H. spreta* by its velvety surface, not contracting greatly in thick specimens nor cracking to the substratum so as to form small, isolated, rectangular masses, by setigerous layers 30–45 μ broad and usually narrower than the adjoining hyphal layers, and spores up to $4\frac{1}{2}$ –9 μ long. Several of the American specimens cited below are first-stratum stages.

Specimens examined:

Exsiccati: Libert, Pl. Crypt. Arduennae, 122.

Norway: Christiania, *M. N. Blytt* (in Herb. Fries, det. by E. Fries).

Sweden: *L. Romell*, 85, first-stratum stage; Lapland, *L. Romell*, 398, 399.

Finland: Mustiala, *P. A. Karsten*, authentic specimen of *Hymenochaetella rudis*.

Hungary: *Kmet*, det. and comm. by J. Bresadola.

Belgium: in Libert, Pl. Crypt. Arduennae, 122.

New York: Staten Island, *W. H. Ballou* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55544).

Ohio: Cincinnati, *C. G. Lloyd*, 4507.

Illinois: Riverside, *E. T. & S. A. Harper*, 657.

Nebraska: Woodlawn, *C. L. Shear*, 1026, first-stratum stage.

Kansas: Rooks Co., *E. Bartholomew*, first-stratum stage.

California: Santa Barbara, *O. M. Oleson*, 17, first-stratum stage.

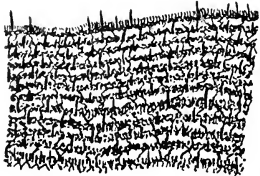
British Columbia: Sidney, *J. Macoun*, 37, 99, 111 (in Mo. Bot. Gard. Herb., 6687, 55364, 55365). Nos. 37 and 111 are in the first-stratum stage.

22. *H. digitata* Burt, n. sp.

Type: in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.

Fructification resupinate, long and broadly effused, adnate, drying between Brussels-brown and antique brown, with hymenium somewhat granular, the margin determinate, very thin; in structure stratose, 800 μ thick, composed of about 15 narrow, loosely interwoven, hyphal layers alternating with the same number of very dense, dark and opaque setigerous layers

of about equal breadth and equal to the loosely interwoven layers; hyphae about $2\ \mu$ in diameter, concolorous with the fructification; setae $50\text{--}60 \times 6\ \mu$, emerging up to $50\ \mu$, tapering



a

p

from base to a sharp point, colored like the fructification; paraphyses colored like other organs, filiform, divided at the apex into about three short, finger-like branches or prongs; basidia and spores not found.

Fig. 18

H. digitata.Section, *a*, $\times 44$; paraphyses, *p*, $\times 500$. From type.

Fructification 13×5 cm., broken off along three sides—probably large.

On bark of rotten logs in forests. Panama. March.

H. digitata belongs in the group of species with stratose fructifications, of which *H. spreta* is the best known. *H. digitata* should be easily recognized by its bright ferruginous brown color, fructification composed of very many and very narrow strata, and paraphyses with digitately, or sometimes pinnately, branched tips. Setae occur not only in the hymenial surface but also rather sparingly in the other setigerous layers throughout the fructification.

Specimens examined:

Panama: El Boquete, Chiriqui, *W. R. Maxon*, 5559, type, Smithsonian Survey of Panama Canal Zone (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55469).

23. *H. spreta* Peck, N. Y. State Mus. Rept. 30: 47. 1879; Sacc. Syll. Fung. 6: 595. 1888.

Hymenochaete laevigata Masee, Linn. Soc. Bot. Jour. 27: 107. 1890.

Type: in N. Y. State Mus. Herb.

Fructifications resupinate, long and widely effused, adnate, rimose, drying Argus-brown to snuff-brown, the margin thinning out, velvety when young; in structure $300\text{--}500\ \mu$ thick,

stratose, composed of 1-3, or rarely up to 5, pairs of setigerous and hyphal layers, with the setigerous layers very dense, about 45-200 μ thick, exceeding the alternating hyphal layers which are composed of loosely interwoven, thick-walled, colored, even hyphae 3 μ in diameter; setae numerous, slender, subfalcate, 60-75 \times 6 μ , originating at all levels in each setigerous layer, protruding up to 50 μ ; spores hyaline, even, 4 $\frac{1}{2}$ \times 2 $\frac{1}{2}$ μ .

Fructifications 4-25 \times 2-10 cm.

Usually on decaying wood of frondose species, rarely on coniferous wood. Canada to Alabama and westward to Washington, California, and British Columbia. April to January. Common.

The stratose structure of well-developed fructifications of *H. spreta* locates this species in a small group of three species, of which the others are *H. digitata* and *H. cinnamomea*, from both of which thick fructifications of *H. spreta* may be separated readily by being deeply cracked and having setigerous layers from 45-150 μ , or rarely more, in thickness, very compact, and exceeding in thickness the adjoining, loosely interwoven hyphal layers. Fructifications of *H. spreta* in its first-stratum stage, consisting of but one hyphal layer and one setigerous layer, are frequently not cracked but have the setigerous layer 45 μ or more thick and thicker than the hyphal layer.

Specimens examined:

Exsiccati: Ell. & Ev., N. Am. Fungi, 1936, 3304 — the latter under the name *Hymenochaete unicolor*; Ell. & Ev., Fungi Col., 806, under the name *H. unicolor*.

Canada: Comox, Van Island, *J. Macoun*, 18.

Prince Edward's Island: *J. Macoun*, 344.

Ontario: London, *J. Dearness*; Ottawa, *J. Macoun*, 6.

New Hampshire: Chocorua, *W. G. Farlow*, two collections, one of which (in Mo. Bot. Gard. Herb., 55258).

Vermont: Middlebury, *C. G. Lloyd*, 10671 (in Lloyd Herb.,

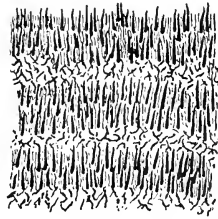


Fig. 19
H. spreta.
Section \times 44. From type.

- and in Mo. Bot. Gard. Herb., 55483), and *E. A. Burt*, four collections.
- New York: Alcove, *C. L. Shear*, 1310; East Galway, *E. A. Burt*; Hudson Falls, *S. H. Burnham*, 45 (in Mo. Bot. Gard. Herb., 54458); Ithaca, *G. F. Atkinson*, 8656; Karner, *H. D. House* (in N. Y. State Mus. Herb., 14.159, and in Mo. Bot. Gard. Herb., 44710); New York, *W. H. Ballou* (in Lloyd Herb., 12121, and in Mo. Bot. Gard. Herb., 55457).
- New Jersey: Newfield, *J. B. Ellis* (in N. Y. Bot. Gard. Herb. and in Mo. Bot. Gard. Herb.).
- Pennsylvania: Bethlehem, *Schweinitz* (in Herb. Schweinitz, under the name *Thelephora laevigata* and the type of *Hymenochaete laevigata* Masee).
- District of Columbia: Takoma Park, *C. L. Shear*, 1346.
- Georgia: Ribbon Brook, Tallulah Falls, *A. B. Seymour*, comm. by *W. G. Farlow*, EE (in Mo. Bot. Gard. Herb., 44603).
- Florida: Cocoanut Grove, *R. Thaxter*, 55 (in Farlow Herb., and in Mo. Bot. Gard. Herb., 43491); Nixon-Lewis Hammock, Dade Co., *J. K. Small & C. A. Mosier*, 5396 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55485).
- Alabama: Auburn, *F. S. Earle* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55486).
- West Virginia: Eglon, *C. G. Lloyd*, 1450, 1565 (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55484 and 55488); Nuttallburg, *L. W. Nuttall*, in Ell. & Ev., N. Am. Fungi, 3304, and in Fungi Col., 806.
- Ohio: Cincinnati, *A. P. Morgan*, comm. by *C. G. Lloyd*, 2610, and *C. G. Lloyd*, 3578.
- Indiana: Crawfordsville, *D. Reddick*, 15; Millers, *E. T. & S. A. Harper*, 934.
- Kentucky: Crittenden, *C. G. Lloyd*, 07159, 10836 (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55468 and 55487).
- Montana: Evaro, *J. R. Weir*, 422 (in Mo. Bot. Gard. Herb., 14766).
- Idaho: Priest River, *J. R. Weir*, 2.
- Washington: Bingen, *W. N. Suksdorf*, 849; Sedro-Woolley, *C. J. Humphrey*, 7487 (in Mo. Bot. Gard. Herb., 10968);

Stanwood, *C. J. Humphrey*, 6395, 7395 (in Mo. Bot. Gard. Herb., 42935 and 11042).

California: Palo Alto, *W. A. Murrill & L. S. Abrams*, 1240 (in N. Y. Bot. Gard. Herb.).

British Columbia: *J. Macoun*, in Ell. & Ev., N. Am. Fungi, 1936; Kootenai Mts., near Salmo, *J. R. Weir*, 494 (in Mo. Bot. Gard. Herb., 21796); Sidney, *J. Macoun*, 79, and an unnumbered collection (in Mo. Bot. Gard. Herb., 9967, 6687).

24. *H. epichlora* (Berk. & Curtis) Cooke, *Grevillea* 8:147. 1880; *Sacc. Syll. Fung.* 6:596. 1888.

Corticium epichlorum Berk. & Curtis, *Grevillea* 1:178. 1873; Masee, *Linn. Soc. Bot. Jour.* 27:119. 1890.—*Hymenochaete asperata* Ell. & Ev. *Torr. Bot. Club Bul.* 27:50. 1890; *Sacc. Syll. Fung.* 16:188. 1902.

Type: type distribution in Ravenel, *Fungi Car.* 5:24.

Fructification resupinate, broadly effused, thin, adnate, cracked, drying Isabella-color to tawny olive, with a thin olive-ocher subiculum forming a slight margin; in structure 75–120 μ thick, with the hyphal layer composed of loosely arranged, ascending, thin-walled hyphae 2½ μ in diameter, colored like the fructification, in some places forming a narrow, dense zone next to the substratum; setae scattered, 36–45 \times 4½–5 μ , protruding up to 30 μ , starting from different levels of the hymenium and subhymenium, tapering upward to a slender point; spores in spore collection white, even, 3–4½ \times 2–2½ μ , flattened on one side.



Fig. 20
H. epichlora.
Section \times 63. From type.

Fructifications 5–10 \times 1–3 cm. and broken off at both ends—probably large.

On bark of dead *Symplocos*, *Vitis*, and other frondose woods. Alabama to Louisiana and in Mexico. August to November.

H. epichlora has some resemblance in aspect to *H. corrugata* on account of its cracked hymenial surface but it is dis-

tinguished from the latter species by the somewhat sulphur-yellow margin and subiculum which forms a broad hyphal layer destitute of setae between the subhymenium and the substratum; the spores of *H. epichlora* are shorter than those of *H. corrugata* and the setae are fewer and smaller.

Specimens examined:

Exsiccati: Ravenel, *Fungi Car.* 5 : 24, type distribution.

Alabama: *Peters*, 6118 (in Kew Herb.), and in Ravenel, *Fungi Car.* 5 : 24.

Louisiana: Abita Springs, *A. B. Langlois*, 2647 to *Ellis*, type of *Hymenochaete asperata* (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55491); Baton Rouge, *Edgerton & Humphrey*, comm. by C. J. Humphrey, 5727; St. Martinville, *A. B. Langlois*, *al*, *am*.

Mexico: Jalapa, *W. A. & Edna L. Merrill*, 338, 344, 345 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 54480, 54460, and 54461).

25. *H. dura* Berk. & Curtis, *Linn. Soc. Bot. Jour.* 10 : 334. 1868; *Cooke, Grevillea* 8 : 147. 1880; *Sacc. Syll. Fung.* 6 : 596. 1888; *Massee, Linn. Soc. Bot. Jour.* 27 : 105. 1890.

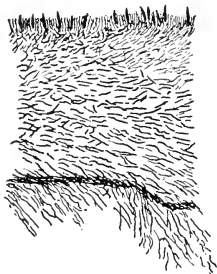


Fig. 21
H. dura.

Section $\times 68$. From type.

Type: in Kew Herb. and Curtis Herb.

Fructifications resupinate, orbicular, rigid when dry, spongy when moistened, drying between wood-brown and Saccardo's umber, the margin thick, obtuse, paler than the hymenium; in structure 600–700 μ thick, with the intermediate layer bordered on each side by a narrow, dense, dark zone, that on the under side connecting the intermediate layer with a dense hyphal layer 100 μ broad, situated on the substratum; hyphae of

intermediate layer baryta-yellow, 2 μ in diameter, longitudinally arranged, somewhat loosely interwoven; setae 30–36 \times 5–6 μ , scattered between the hair-like paraphyses which they exceed but slightly, terminating in slender, curved, very

sharp-pointed tips, confined to the hymenium; spores hyaline, even, $5 \times 3 \mu$.

Fructifications 1–3 cm. in diameter.

On dead, erect trees. Cuba. February. Rare.

In the original description, *H. dura* was said to be allied to *H. unicolor*, but if so, it is in aspect only, for when seen in section it is wholly different in structure from the latter, having a narrow setigerous layer and a broad, intermediate layer which is connected by a conspicuous dark zone with a well-developed hyphal layer next to the substratum. This structure in section places *H. dura* in the group with *H. tabacina*, from which, and from the other species of this group, it is distinct by its hairy hymenium and small, scattered setae.

Specimens examined:

Cuba: *C. Wright*, 241, type (in Kew Herb. and in Curtis Herb.).

26. *H. leonina* Berk. & Curtis, Linn. Soc. Bot. Jour. 10 : 334. 1868; Cooke, Grevillea 8 : 148. 1880; Sacc. Syll. Fung. 6 : 597. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 107. 1890.

Type: in Kew Herb. and Curtis Herb.

Fructifications resupinate, widely effused, thick, coriaceous, separable from substratum when moist, not cracked, drying tawny olive to Brussels-brown, the margin tomentose; in structure 200–700 μ thick, composed of (1) a compact setigerous layer 50–75



Fig. 22

H. leonina.

Section $\times 44$. From type.

μ thick, with the setae starting at different levels within it, and of (2) a broad, supporting hyphal layer 100–600 μ thick, composed of loosely interwoven, rather longitudinally arranged hyphae 3 μ in diameter, stiff, colored like the fructification; in fully developed, thick fructifications the hyphal layer is divided parallel with the substratum by a narrow, dark zone; setae 60–80 \times 7–9 μ , emerging up to 50 μ , conical, tapering from the base to the apex; spores hyaline, even, $5-6 \times 3-3\frac{1}{2} \mu$.

Probably large; small fructifications laterally confluent for 10 cm., 1–2 cm. broad; large fructifications 7 cm. in diameter and broken off on three sides.

On frondose limbs. Arkansas to Mexico, and in Cuba. August to March.

H. leonina has been resupinate in all collections which seem referable here by structure. The species is well marked by its usual tawny olive color, coriaceous structure which enables it to be dissected away from the substratum when moist, by the distribution of the setae in the hymenium and the dark, dense subhymenium, and by the broad, bright-colored hyphal layer which is finally divided in the middle by a narrow, dark zone.

Specimens examined:

Arkansas: Fordyce, *C. J. Humphrey*, 5837.

Louisiana: Baton Rouge, *C. J. Humphrey*, 5691 (in Mo. Bot. Gard. Herb., 20707); St. Martinville, *A. B. Langlois*, 2091, *ai*.

Mexico: Vera Cruz, Sanborn, *C. R. Orcutt*, 2920 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 37362).

Cuba: *C. Wright*, 532, type (in Kew Herb. and in Curtis Herb.); *C. G. Lloyd*, 143 (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55474); Alto Cedro, *Earle & Murrill*, 505, comm. by N. Y. Bot. Gard. Herb.; Baracoa, *Underwood & Earle*, 780, comm. by N. Y. Bot. Gard. Herb.; Pinar del Rio Province, *Earle & Murrill*, 197, comm. by N. Y. Bot. Gard. Herb.

27. *H. fulva* Burt, n. sp.

Type: in Burt Herb. and N. Y. Bot. Gard. Herb.

Fructifications resupinate, effused, thin, adnate, not cracking in drying, between Saccardo's umber and cinnamon-brown, the margin entire, determinate; in structure 120–260 μ thick, with the intermediate layer bordered on each side by a dark, dense zone—that on the under side directly adnate to the substratum and that on the other being subhymenial in position, 40–105 μ thick, bearing at first few setae but thickening with age and at length having many setae starting in all its parts; hyphae of intermediate layer colored, loosely interwoven, $2\frac{1}{2}$ –3 μ in diameter; setae 75–90 \times 7 $\frac{1}{2}$ –9 μ , emerg-

ing up to $60\ \mu$, not crowded, starting in the dark subhymenial zone and rising through the hymenium, tapering upward from the base; cystidia $12\text{--}30 \times 6\text{--}18\ \mu$, largest when

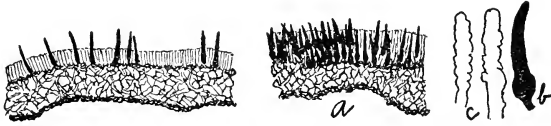


Fig. 23

H. fulva.

Section on left, $\times 68$, from type; section *a*, $\times 68$, seta, *b*, and cystidia, *c*, $\times 375$, from Langlois, *aj*.

seated on the dark, subhymenial zone; spores borne 4 to a basidium, hyaline, even, $4\frac{1}{2}\text{--}5 \times 2\frac{1}{2}\text{--}3\ \mu$.

Fructifications $1 \times 1\text{--}1\frac{1}{2}$ cm., becoming laterally confluent for 7 cm. or more.

On rotting fallen limbs of frondose species. In Louisiana and Jamaica—at 4500–5200 ft. altitude in the latter. December.

H. fulva may be recognized among resupinate species by its fulvous color, not cracking, presence of an intermediate layer bordered on each side by a dark zone, with that on the under side seated directly on the substratum, and by the cystidia.

Specimens examined:

Louisiana: St. Martinville, *A. B. Langlois, aj*, and a specimen comm. by Lloyd Herb., 2422 in part.

Jamaica: Cinchona, *W. A. & Edna L. Murrill, 645*, type, comm. by N. Y. Bot. Gard. Herb.; Blue Hole, *W. A. Murrill, 182\frac{1}{2}*, comm. by N. Y. Bot. Gard. Herb.

28. *H. pinnatifida* Burt, n. sp.

Type: in Lloyd Herb. and Burt Herb.

Fructifications resupinate, effused, adnate, scattered, sometimes confluent, somewhat orbicular, drying between Verona-brown and cinnamon-drab, slightly glaucous, the margin antique brown, narrow, rather thick, somewhat velvety; in structure $120\text{--}240\ \mu$ thick, composed of a setigerous layer $40\text{--}80\ \mu$ broad and of a loosely interwoven intermediate layer which is

bordered on each side by a narrow, dense, dark zone; hyphae $3-3\frac{1}{2} \mu$ in diameter, colored, thick-walled; setae $40-70 \times 6-7 \mu$, emerging up to 30μ , tapering from the base, abundant but not



Fig. 24

H. pinnatifida.

Section, *a*, $\times 68$; paraphyses, *p*, $\times 640$.
See *pl. 17, f. 12*.

crowded; colored paraphyses $1-2 \mu$ in diameter, with pinnatifid tips, are conspicuous in the hymenium; spores hyaline, even, flattened on one side, $4-5 \times 1\frac{1}{2} \mu$, borne 4 to a basidium as seen in preparations of sections.

Fructifications about 1-3 cm. in diameter.

On bark of fallen frondose limbs. Georgia to Louisiana, in Mexico, Cuba, and Jamaica. August to April. Apparently common.

H. pinnatifida has some resemblance to resupinate *H. rubiginosa*, but the setae of the former are less conspicuous with the aid of a lens; the presence of colored paraphyses with pinnatifid tips distinguishes *H. pinnatifida* from all other non-stratose species.

Specimens examined:

Exsiccati: Ell. & Ev., *N. Am. Fungi*, 1713, under the name *Hymenochaete insularis*; Ravenel, *Fungi Am.*, 122, under the name *Hymenochaete rubiginosa*.

Georgia: Atlanta, *E. Bartholomew*, 5675 (in *Mo. Bot. Gard. Herb.*, 44260).

Florida: *G. C. Fisher* (in *Lloyd Herb.*, 08238); *W. W. Calkins*, 82, 93 (in *N. Y. Bot. Gard. Herb.*, and in *Mo. Bot. Gard. Herb.*, 55489, 55490), and in Ell. & Ev., *N. Am. Fungi*, 1713; Gainesville, *H. W. Ravenel*, in Ravenel, *Fungi Am.*, 122; Jacksonville, *W. W. Calkins* (in *N. Y. Bot. Gard. Herb.*, and in *Mo. Bot. Gard. Herb.*); New Smyrna, *C. G. Lloyd*, 2139, type, and 2140.

Alabama: Auburn, *F. S. Earle*, 114 (in *N. Y. Bot. Gard. Herb.*, and in *Mo. Bot. Gard. Herb.*, 55492).

Mississippi: Jackson, *E. Bartholomew*, 5798 (in *Mo. Bot. Gard. Herb.*, 44268).

Louisiana: Abita Springs, *A. B. Langlois*, 2647 to Burt; Bogalusa, *C. J. Humphrey*, 5491; St. Martinville, *A. B. Langlois*, 1621, *cb*, *cd*, *D*, and a specimen from Lloyd Herb., 2422 in part; definite locality not stated, *A. B. Langlois*, 136 (in U. S. Dept. Agr. Herb., in Farlow Herb., and in Mo. Bot. Gard. Herb., 44047).

Mexico: *Botteri*, 31 (in Curtis Herb., under the name *Hymenochaete rubiginosa*).

Cuba: Managua, *Earle & Murrill*, 6, 31, comm. by N. Y. Bot. Gard. Herb.

Jamaica: Mandeville, *A. E. Wight*, comm. by W. G. Farlow.

29. *H. multisetae* Burt, n. sp.

Type: in Mo. Bot. Gard. Herb. and Humphrey Herb.

Fructifications resupinate, effused, adnate, thin, cinnamon-brown to Prout's brown, finally somewhat cracked, the margin determinate; in structure 35–100 μ thick, lacking an intermediate layer, with the setigerous layer dense and opaque; setae very abundant and crowded, small, 27–45 \times 4½–5 μ , emerging up to 30 μ , starting from all parts of the setigerous layer, tapering upward; spores hyaline, even, 3–4 \times 1–2 μ , but few found.



Fig. 25
H. multisetae.
Section \times 68. From
type.

Fructifications 2–10 \times 1–2 cm., sometimes encircling small limbs.

On fallen hardwood limbs in wet wooded region. Cuba and Jamaica. December and January.

H. multisetae belongs in the same group of species as *H. opaca*, which it resembles in aspect. It may be distinguished from the latter by its thinner fructifications and smaller setae.

Specimens examined:

Cuba: Ceballos, *C. J. Humphrey*, 2808, type (in Mo. Bot. Gard. Herb., 1786).

Jamaica: Chester Vale, *W. A. & Edna L. Murrill*, 325, 346, comm. by N. Y. Bot. Gard. Herb.; Moneague, *W. A. Murrill*, 1186, comm. by N. Y. Bot. Gard. Herb.; Troy and Tyre,

W. A. Merrill & W. Harris, 926, comm. by N. Y. Bot. Gard. Herb.

30. *H. anomala* Burt, n. sp.

Type: in Burt Herb. and N. Y. Bot. Gard. Herb.

Fructification resupinate, adnate, thin, vinaceous-buff, cracked, the margin determinate; in structure 75–125 μ thick, lacking a hyphal layer, composed of scattered setae, cystidia, suberect, colorless, incrusting hyphae, and crystalline matter; setae 20–50 \times 4½ μ , emerging up to 20 μ but usually not emerging, flexuous, tapering upward, starting



Fig. 26

H. anomala.

Section, *a*, \times 120; seta, *b*, and cystidia, *c*, \times 375. From type.

from all parts of the setigerous layer; cystidia colorless, incrusting, 16–20 \times 6 μ , not emergent; spores hyaline, even, 4 \times 2½ μ .

Fructification 2½ cm. \times 5 mm., broken off at one end.

On prostrate decorticated limbs in dry thickets. Cuba. March. Rare.

H. anomala is noteworthy by its pale color, small fructification, setae only rarely protruding, and incrusting hyphae and cystidia. It differs from *H. cervina* in paler color outside and within, and in having cystidia.

Specimens examined:

Cuba: Managua, *Earle & Merrill, 36*, type, comm. by N. Y. Bot. Gard. Herb.

31. *H. corrugata* (Fr.) Lévillé, *Ann. Sci. Nat. Bot.* III. 5 : 152. 1846; *Cooke, Grevillea* 8 : 147. 1880; *Sacc. Syll. Fung.* 6 : 595. 1888; *Massee, Linn. Soc. Bot. Jour.* 27 : 110. 1890.

Thelephora corrugata Fries, *Obs. Myc.* 1 : 154. 1815; *Elenchus Fung.* 1 : 224. 1828; *Persoon, Myc. Eur.* 1 : 134. 1822.—*Corticium corrugatum* Fries, *Epier.* 565. 1838; *Hym. Eur.* 656. 1874.—*Hymenochaete insularis* Berkeley, *Grevillea* 1 : 165. 1873; *Cooke, Grevillea* 8 : 148. 1880; *Sacc. Syll. Fung.* 6 : 598. 1888; *Massee, Linn. Soc. Bot. Jour.* 27 : 107. 1890.

Type: authentic specimen from Fries reported in Kew Herb. by Masee, *loc. cit.*

Fructifications resupinate, widely effused, closely adnate, cracked into small 4-6-sided areas, sometimes grumous, drying from cinnamon-brown to bister and Rood's brown and sometimes weathered to mouse-gray, the margin thinning out and sometimes paler; in structure 150-500 μ thick, composed of densely interwoven hyphae 3 μ in diameter, colored like the fructification, and of very numerous setae 60-70 \times 8-12 μ , emerging up to 50 μ , somewhat cylindric below, tapering above, distributed throughout the fructification; spores white in collection on slide, even, allantoid, $4\frac{1}{2}$ -7 \times 1 $\frac{1}{2}$ -2 μ .

Very variable in size, ranging from $2\frac{1}{2}\times 1$ cm. to 20×7 cm., sometimes much larger.

Very common on dead fallen limbs and trunks of frondose species, such as beech, maple, birch, and alder, rarely on coniferous wood. Canada to Texas and westward to Ohio and Kentucky, and in Jamaica. July to April.

The distinguishing characters of *H. corrugata* are its closely adnate fructification, which cracks into small, polygonal areas about 1-3 to a mm. and sometimes scales off, distribution of the rather stout setae throughout the whole very dense fructification from substratum to hymenium, and white, allantoid spores about $4\frac{1}{2}$ -7 \times 1 $\frac{1}{2}$ -2 μ . American collections of *H. corrugata* have a broader range in color than the European collections cited below. *H. insularis* Berk. is based upon a specimen Rood's brown in color, with whitish margin, orbicular form, and thickness of 160 μ . I have tried to regard *H. insularis* as a distinct species but it intergrades too completely in all its characters with typical *H. corrugata*. *H. episphaeria* (Schw.) is very near *H. corrugata* but is less cracked, extremely thin, and has most of its setae starting conspicuously on a dark delimiting zone next to the substratum.

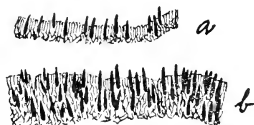


Fig. 27

H. corrugata.

Section of young fructification, *a*, and of older fructification, *b*, $\times 68$.

Specimens examined:

- EXSICCATI: Bartholomew, *Fungi Col.*, 4425, 4931; Berkeley, *Brit. Fungi*, 249, 298; Ellis, *N. Am. Fungi*, 14; Ell. & Ev., *Fungi Col.*, 8; Krieger, *Fungi Sax.*, 717, 1422, the latter under the name *Hymenochaete cinnamomea*; *Krypt. Exs. Vind.*, 714; Ravenel, *Fungi Am.*, 123, under the name *Hymenochaete crocata*, 124; *Fungi Car.* 5: 26; Shear, *N. Y. Fungi*, 53; de Thümen, *Myc. Univ.*, 9.
- England: Berkeley, *Brit. Fungi*, 249, 298.
- France: (in *Lloyd Herb.*, 3346).
- Germany: Saxony, *W. Krieger*, in *Krieger, Fungi Sax.*, 717, 1422.
- Austria-Hungary: Rosenau, *P. Strasser*, *Krypt. Exs. Vind.*, 714.
- Canada: *J. Macoun*, 17, 19, 25; Lower St. Lawrence Valley, *J. Macoun*, 63.
- Ontario: Casselman, *J. Macoun*, 362, 365; London, *J. Dearness*, in *Bartholomew, Fungi Col.*, 4425, and (in *Lloyd Herb.*, 12001); Temagami, *C. G. Lloyd*, 07564 (in *Lloyd Herb.*).
- Quebec: Hull, *J. Macoun*, 242.
- Maine: Costigan, *W. A. Merrill*, 1761 (in *N. Y. Bot. Gard. Herb.*, and in *Mo. Bot. Gard. Herb.*, 55459); Orono, *F. L. Harvey*, comm. by P. L. Ricker, 1, 2.
- New Hampshire: *P. Wilson* (in *N. Y. Bot. Gard. Herb.*, and in *Mo. Bot. Gard. Herb.*, 55471); Chocorua, *W. G. Farlow*.
- Vermont: Middlebury, *E. A. Burt*, two collections; Smugglers' Notch, *E. A. Burt*; Ripton, *E. A. Burt*.
- Massachusetts: Magnolia, *W. G. Farlow*, two collections; Sharon, *W. G. Farlow* (in *Mo. Bot. Gard. Herb.*, 6960), *A. P. D. Piguet*, two collections, comm. by *W. G. Farlow* (in *Mo. Bot. Gard. Herb.*, 44046, 55228); Wellesley, *L. W. Riddle*, 15.
- New York: Adirondack Mts., *C. H. Peck*, *T* 27 (in *N. Y. State Mus. Herb.*, and in *Mo. Bot. Gard. Herb.*, 54650); Albany, *C. G. Lloyd*, 07179 (in *Lloyd Herb.*, and in *Mo. Bot. Gard. Herb.*, 55482); Alcove, *C. L. Shear*, 1003, and in *Shear, N. Y. Fungi*, 53; Catskill Mts., *C. H. Peck*, *T* 11 (in *N. Y. State Mus. Herb.*, and in *Mo. Bot. Gard. Herb.*, 54578); East Galway, *E. A. Burt*; Freeville, *G. F. Atkinson*, 3279;

- Fort Ann, *S. H. Burnham*, 39 (in Mo. Bot. Gard. Herb., 54423); Hudson Falls, *S. H. Burnham*, 30 (in Mo. Bot. Gard. Herb., 54482); Ithaca, *G. F. Atkinson*, 2815; Karner, *H. D. House* (in N. Y. State Mus. Herb., and in Mo. Bot. Gard. Herb., 55196); Lake Placid, *W. A. & Edna L. Murrill*, 152 (in N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55001); North Greenbush, *H. D. House*, two collections (in N. Y. State Mus. Herb., and in Mo. Bot. Gard. Herb., 54385/6); Orient, *R. Latham*, 154 (in Mo. Bot. Gard. Herb., 44229).
- New Jersey: Newfield, *J. B. Ellis*, in *Ellis*, N. Am. Fungi, 14, in *Ell. & Ev.*, Fungi Col., 8, and in *de Thümen*, Myc. Univ., 9.
- Pennsylvania: Charter Oak, *L. O. Overholts*, 3773 (in Mo. Bot. Gard. Herb., 54991); Trexlertown, *W. Herbst*, 79.
- Maryland: Takoma Park, *C. L. Shear*, 1161.
- North Carolina: *M. A. Curtis*, 4456, type of *H. insularis* (in Kew Herb. and in Curtis Herb.).
- South Carolina: Aiken, *H. W. Ravenel*, in *Ravenel*, Fungi Am., 123, 124.
- Florida: New Smyrna, *C. G. Lloyd*, 2120.
- Alabama: *Peters*, in *Ravenel*, Fungi Car. 5 : 26; Montgomery, *R. P. Burke*, 53, 63 (in Mo. Bot. Gard. Herb., 16746, 18222).
- Mississippi: Jackson, *E. Bartholomew*, 5780 (in Mo. Bot. Gard. Herb., 9188), and in *Bartholomew*, Fungi Col., 4931.
- Louisiana: St. Martinville, *A. B. Langlois*, cc, and an unnumbered collection.
- Texas: Houston, *H. W. Ravenel*, 261.
- West Virginia: Eglon, *C. G. Lloyd*, 1411 (in *Lloyd Herb.*, and in Mo. Bot. Gard. Herb., 55470); Paw Paw, *C. L. Shear*, 1178.
- Michigan: Isle Royal, *Allen & Shuntz*, 16, comm. by Univ. of Wisconsin Herb.
- Ohio: Cincinnati, *A. P. Morgan*, comm. by *Lloyd Herb.*, 2593; College Hill, *Aiken*, comm. by *Lloyd Herb.*, 2328.
- Kentucky: Crittenden, *C. G. Lloyd*, N; Harlan, *C. H. Kauffman*, 74 (in Mo. Bot. Gard. Herb., 21533).
- Jamaica: Morce's Gap, *W. A. & Edna L. Murrill*, 732, comm. by N. Y. Bot. Gard. Herb.

32. *H. episphaeria* (Schw.) Masee, Linn. Soc. Bot. Jour. 27:111. 1890; Cooke, Grevillea 20:11. 1891; Sacc. Syll. Fung. 11:123. 1895.

Thelephora episphaeria Schweinitz in Fries, Elenchus Fung. 1:225, 1828; Am. Phil. Soc. Trans. N. S. 4:169. 1832.

Type: in Herb. Schweinitz, Kew Herb., and Curtis Herb.

Fructification resupinate, effused, closely adnate, conforming to the irregularities of the substratum, drying buckthorn-brown to tawny olive; in structure up to $90\ \mu$ thick, with hyphae rigid, interwoven, $2-2\frac{1}{2}\ \mu$ in diameter, giving their color to the fructification; setae $60-90 \times 9-12\ \mu$, emerging up to $15\ \mu$, cylindrical, obtuse, starting directly from the dark, opaque, delimiting zone next to the substratum, as differentiated in permanent preparations which were treated with KHO solution and stained with eosin; no spores found in type, but hyaline, even, allantoid, $4-5 \times 1\frac{1}{2}-2\ \mu$ in collections referred here.



Fig. 28
H. episphaeria.
Section $\times 68$. From
type.

Fructifications 1-2 cm. broad, 2-5 cm. long.

Under side of dead frondose limbs—type on *Alnus* and *Diatrype stigma*. Vermont to Pennsylvania and Illinois.

H. episphaeria resembles *H. arida* and *H. cinnamomea* in aspect, but is thinner, lacks a hyphal layer, and has its setae starting from the substratum, or very near it, and extending up through the hymenium.

Specimens examined:

Vermont: Middlebury, *C. G. Lloyd*, 07221 (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55558).

Massachusetts: Weston, *A. B. Seymour*, T 19 (in Mo. Bot. Gard. Herb., 18358).

New York: Albany, *C. G. Lloyd*, 07120 (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55481).

Pennsylvania: Bethlehem, *Schweinitz*, type (in Herb. Schweinitz, in Kew Herb., and in Curtis Herb.); Trexlertown, *W. Herbst*, comm. by Lloyd Herb., 3612.

Ohio: Cincinnati, *A. P. & L. V. Morgan*, under the name *H. insularis*, comm. by U. S. Dept. Agr. Herb.

Illinois: River Forest, *E. T. & S. A. Harper*, 742.

33. *H. cervina* Berk. & Curtis, Linn. Soc. Bot. Jour. 10 : 334. 1868; Cooke, Grevillea 8 : 147. 1880; Sacc. Syll. Fung. 6 : 596. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 114. 1890.

Type: in Kew Herb. and Curtis Herb.

Fructification resupinate, effused, adnate, very thin, usually cracked, drying Dresden-brown, the margin thinning out; in structure 80–200 μ thick, composed of densely interwoven, suberect hyphae, of crystalline masses, and of setae; hyphae $2\frac{1}{2}$ –3 μ in diameter, giving their color to the fructification; crystalline masses 12–15 μ in diameter; setae distributed in all parts of the section and some starting from the substratum, 60–90 \times 10–12 μ , emerging up to 40 μ , tapering from the base to a sharp apex; spores hyaline, even, 7–9 \times 3 $\frac{1}{2}$ μ .

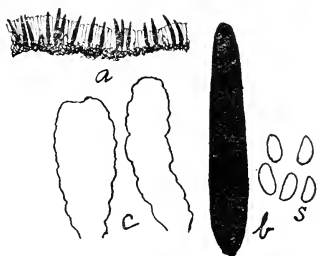


Fig. 29

H. cervina.

Section, *a*, \times 68; seta, *b*, cystidia, *c*, and spores, *s*, \times 640. From type.

Fructifications 5 cm. or more long, about 1–2 cm. broad.

On dead limbs and decorticated wood. Illinois, Louisiana, and Cuba.

By reason of its thin fructification, few hyphae, and abundant setae starting from substratum, *H. cervina* is near *H. episphaeria* in structure and general aspect, but may be distinguished from this species by larger spores and by the presence of cystidia which finally become crystalline masses. Berkeley's comment that specimens of *H. cervina* resemble *Hymenochaete Curtisii* is misleading and probably due to his having referred to *H. cervina* a collection of *Stereum umbrinum*, the Curtis Herb., 2308.

Specimens examined:

Louisiana: *A. B. Langlois*, 267, comm. by U. S. Dept. Agr. Herb.

Cuba: *C. Wright*, 213, type (in Kew Herb. and in Curtis

Herb.); Alto Cedro, *Underwood & Earle, 1527*, comm. by N. Y. Bot. Gard. Herb.

34. *H. opaca* Burt, n. sp.

Type: in Burt Herb. and N. Y. Bot. Gard. Herb.

Fructifications resupinate, effused, adnate, when young slightly velvety, very thin, and between bistre and Vandyke-brown, finally becoming glabrous, somewhat thicker, Vandyke-



Fig. 30

H. opaca.

Section $\times 68$. From type.

brown and cracked, the margin thinning out; in structure 200–300 μ thick, lacking an intermediate layer, with the setigerous layer very dense and opaque and composed of suberect, interwoven, dark hyphae, and of setae; setae 50–90 \times 8–10 μ , emerging up to 60 μ , starting from all parts of the setigerous layer;

spores hyaline, even, $3\frac{1}{2}$ –5 \times 1 $\frac{1}{2}$ –2 μ .

Fructifications 3–5 \times 1–2 cm.

On bark of dead frondose limbs. Wet, wooded region, 2000–4000 ft. altitude. Jamaica. December and January.

H. opaca belongs in the group with *H. corrugata* and *H. tenuis*, from both of which it differs by its velvety surface when young, different color, darker hyphae, and denser and more opaque structure in sectional preparations.

Specimens examined:

Jamaica: Chester Vale, *W. A. & Edna L. Murrill, 297*, comm. by N. Y. Bot. Gard. Herb.; Cinchona, *W. A. & Edna L. Murrill, 538*, type, comm. by N. Y. Bot. Gard. Herb.; Troy and Tyre, *W. A. Murrill & W. Harris, 923, 937*, comm. by N. Y. Bot. Gard. Herb.

35. *H. tenuis* Peck, N. Y. State Mus. Rept. 40 : 57. 1887; Sacc. Syll. Fung. 6 : 599. 1888; Masee, Linn. Soc. Bot. Jour. 27 : 109. 1890.

Type: in N. Y. State Mus. Herb.

Fructifications resupinate, effused, becoming confluent, very thin, adnate, somewhat cracked, velvety, drying from raw amber to mummy-brown, the margin thinning out, indeter-

minate; in structure 30–75 μ thick, composed of a setigerous layer of densely interwoven hyphae $1\frac{1}{2}$ μ in diameter and of very numerous setae uniformly distributed from substratum



Fig. 31
H. tenuis.
Section $\times 68$. From
type.

to hymenium, 36–45 \times 5–7 μ , protruding up to 30 μ , tapering upward, and terminating in slender, somewhat curved, very sharp tips; spores in spore collection white, even, flattened on one side, $4\frac{1}{2}$ – $5\frac{1}{2}$ \times 2– $2\frac{1}{2}$ μ .

Fructifications $\frac{1}{2}$ – $1\frac{1}{2}$ \times $\frac{1}{2}$ cm., finally confluent over areas up to 7 \times 2– $2\frac{1}{2}$ cm.

On bark and decorticated wood of fallen limbs of *Thuja*, *Tsuga*, and *Sabal*. Vermont to Florida and in British Columbia. August to June. Rare.

H. tenuis belongs in the group of species with *H. corrugata* and *H. episphaeria*, from which it differs by occurrence on coniferous substratum, raw umber color, and smaller setae and the spores. The cracking of the fructification tends toward rectangular areas, as in *H. spreta*, rather than to 5- or 6-sided polygons, characteristic of *H. corrugata*.

Specimens examined:

Vermont: Ripton, *E. A. Burt*.

New York: Altamont, *E. A. Burt*; Adirondack Mts., *C. H. Peck*, type (in N. Y. State Mus. Herb.).

Pennsylvania: Bellefonte, *L. O. Overholts*, 3730 (in Mo. Bot. Gard. Herb., 55095).

Florida: Green Cove Springs, *Dr. Martin* (in Ellis Coll. of N. Y. Bot. Gard. Herb., and in Mo. Bot. Gard. Herb., 55004).

British Columbia: Kootenai Mts., near Salmo, *J. R. Weir*, 499 (in Mo. Bot. Gard. Herb., 3916).

36. *H. fuliginosa* (Pers.) Bresadola,¹ Ann. Myc. 1: 93. 1903.

Thelephora fuliginosa Persoon, Myc. Eur. 1: 145. 1822.—*Stereum fuliginosum* (Pers.) Fries, Epicr. 554. 1838; Hym.

¹ Bresadola states, *loc. cit.*, that *H. fuliginosa* as understood by him is not *H. fuliginosa* (Pers.) Lév., although both give the same synonymy with the name. Lévillé's combination has priority if both authors refer to the same species and it precludes Bresadola's later use of this name for a different species: hence, if, as Bresadola states, *H. fuliginosa* sensu Lévillé is distinct from *H. fuliginosa* sensu Bresadola, then *Hymenochaete fusca* Karsten is the name which should stand instead of the combination by Bresadola.

Eur. 645. 1874.—*Hymenochaetella fusca* Karsten, Hedwigia 35 : 174. 1896.—*Hymenochaete fusca* Karsten in Sacc. Syll. Fung. 14 : 218. 1900.

Fructifications resupinate, broadly effused, adnate, thin, not cracked, somewhat colliculose, bister to warm sepia, conspicuously setulose under a lens, the margin determinate; in structure with setigerous layer 150–200 μ thick, sessile upon the substratum; setae abundant, 60–75 \times 8–9 μ , emerging up to 45 μ , starting from all parts of the setigerous layer; spores of spore collection white, even, 4 \times 2 μ .



Fig. 32

H. fuliginosa.

Section \times 68. From Bresadola. See pl. 17, f. 10.

Covering areas up to 15 \times 5 cm.

On decorticated, rotting wood of frondose species. Vermont, Maryland, Ohio, Kentucky, and in Cuba. June to October. Local.

H. fuliginosa has the aspect of a resupinate *H. rubiginosa*, but is not separable and lacks the conspicuous ochraceous-tawny margin of the latter; when sections are viewed with the microscope they show a setigerous layer like that of *H. rubiginosa* but differing by having this setigerous layer seated directly upon the substratum instead of upon an intermediate layer. The structure in section places *H. fuliginosa* in the group of species with *H. corrugata*; it is distinguished from the latter by not cracking, by colliculose surface, and by color. American specimens agree well with that received from Bresadola, whom I have followed as to name for the present.

Specimens examined:

Sweden: authentic specimen from Karsten of *Hymenochaete fusca*, comm. by J. Bresadola.

Austria-Hungary: Hungary, *Kmet*, det. and comm. by J. Bresadola.

Vermont: Middlebury, *E. A. Burt*, three collections, and *C. G. Lloyd*, 10693 (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55555).

Maryland: Takoma Park, *C. L. Shear*, 1157.

- Ohio: Cincinnati, *A. P. Morgan*, comm. by Lloyd Herb., 2642; locality not stated, *C. G. Lloyd*, 3579.
- Kentucky: Crittenden, *C. G. Lloyd*, 1414 (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55556).
- Cuba: *C. G. Lloyd*, 435 (in Lloyd Herb., and in Mo. Bot. Gard. Herb., 55156).

SPECIES IMPERFECTLY KNOWN

37. *Hymenochaete pallida* Cooke & Masee, Linn. Soc. Bot. Jour. 27: 97. 1890; Sacc. Syll. Fung. 9: 227. 1891.

Type: in Kew Herb.

“Cartilagineo-coriacea; pileo reniformi v. subflabellato, applanato, spongioso-velutino, pallido, concentricè sulcato-zonato, margine sublobato, acuto; hymenio lineato-rugoso, velutino, umbrino, subrutillante; setis prominulis, subclavatis, 40–50×5 μ ; sporae ellipsoideae, 6×3–4 μ . (Type in Herb. Kew.)

“Mexico.

“Pilei thin, 1–2 in. across, densely velvety, the pile arranged in a porous, sponge-like manner, pallid, when old almost white.” —Original description.

I did not find the type of *H. pallida* in Kew Herbarium and can make no addition to the above description.

EXCLUDED SPECIES

Hymenochaete abnormis Peck, ***H. fimbriata*** Ell. & Ev., and ***H. rugispora*** Ell. & Ev. have colored paraphyses rather than cystidia and will receive consideration in *Stereum*.

Hymenochaete crassa (Lév.) Berk. is *Stereum umbrinum* or very near it.

Hymenochaete frustulosa Berk. & Curtis is *Septobasidium frustulosum*.

Hymenochaete multispinulosa Peck is *Stereum umbrinum*.

Hymenochaete musicola Berk. & Curtis is an *Asterostroma*.

Hymenochaete paupercula Berk. & Curtis is a *Peniophora*.

Hymenochaete purpurea Cooke & Morgan is *Stereum umbrinum*.

Hymenochaete setosa Berk. & Curtis is a *Hyphomycete*.

Hymenochaete siparia Berk. & Curtis is a *Septobasidium* in poor condition.

Hymenochaete tomentosa Berk. & Curtis is a *Hyphomycete*.

(To be continued.)

EXPLANATION OF PLATE

PLATE 16

The figures of this plate have been reproduced natural size from dried herbarium specimens.

Fig. 1. *Hymenochaete damacornis*. Figure on right, from specimen collected in Jamaica by L. M. Underwood, 1399; two on left, from collection in Cuba by J. A. Shafer, 3326.

Fig. 2. *H. formosa* stage. From collection in British Honduras by M. E. Peck.

Fig. 3. *H. aspera*. Upper figure, upper surface of reflexed portion of specimen collected in Cuba by F. S. Earle, 340; lower figure, hymenium of resupinate specimen collected in Cuba by Underwood and Earle, 1513.

Fig. 4. *H. badio-ferruginea*. Collected at East Galway, New York, by E. A. Burt.

Fig. 5. *H. Berkeleyana*. Upper figure, a rosette-like cluster viewed from above, collected in Jamaica by W. A. and E. L. Merrill, 371; lower figure, hymenium of a single pileus.

Fig. 6. *H. borealis*. Upper figure, a cluster of imbricated fructifications from the type collected at Abby Pond, Ripton, Vermont, by E. A. Burt; lower figure, hymenium of a single pileus.

Fig. 7. *H. corticolor*. Reflexed specimens collected at Gainesville, Florida, by N. L. T. Nelson.



BURT—THELEPHORACEAE OF NORTH AMERICA

1. *HYMENOCHAETE DAMAECORNIS*. 2. *H. FORMOSA* STAGE. 3. *H. ASPERA*. 4. *H. BADIO-FERRUGINEA*.—5. *H. BERKELEYANA*. 6. *H. BOREALIS*. 7. *H. CORTICOLOR*.

EXPLANATION OF PLATE

PLATE 17

The figures of this plate have been reproduced natural size from dried herbarium specimens.

Fig. 8. *Hymenochaete cubensis*. Figure on left, upper side of pileus, and figure on right, hymenium of two small pilei, from collection in Cuba by Underwood and Earle, 1565.

Fig. 9. *H. Curtisii*. Reflexed specimens on bark collected near St. Louis, Missouri, by L. O. Overholts; the lower figure shows upper surface of the narrowly reflexed part.

Fig. 10. *H. fuliginosa*. Collected at Middlebury, Vermont, by E. A. Burt.

Fig. 11. *H. luteo-badia*. Upper figure, upper surface, and lower figure, hymenium of specimen from type distribution in Weigelt Exs., 1827, collected in Dutch Guiana.

Fig. 12. *H. pinnatifida*. From collection at New Smyrna, Florida, by C. G. Lloyd, 2140.

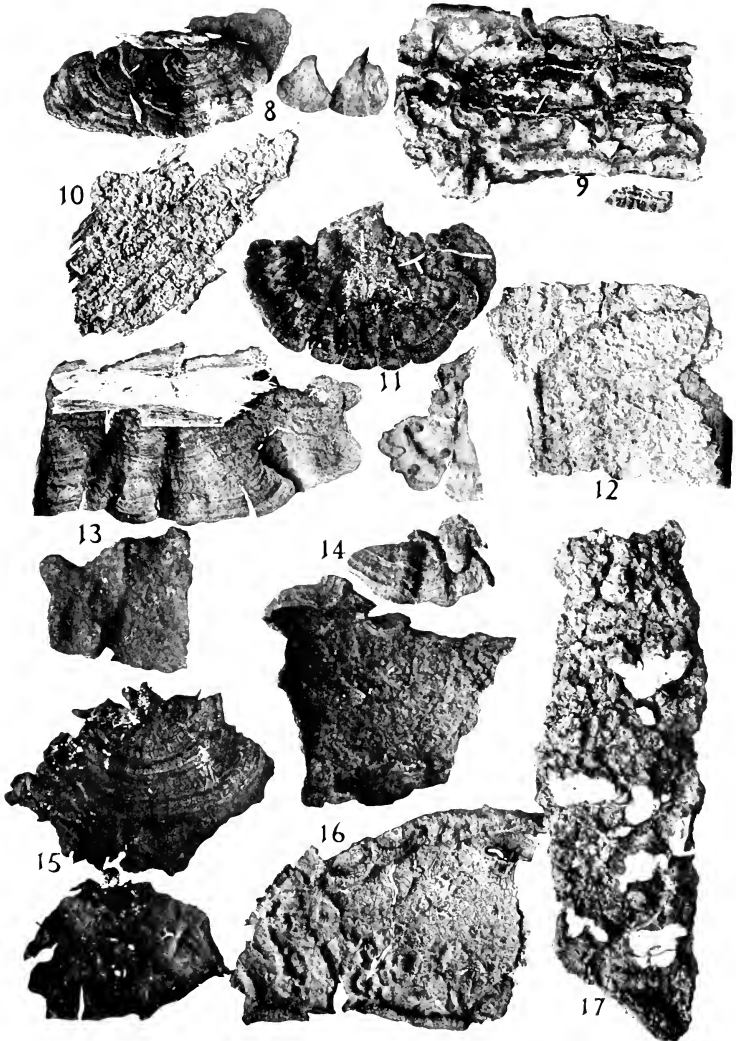
Fig. 13. *H. reflexa*. Upper figure, upper surface, and lower figure, hymenium of type collected in Jamaica by W. A. Murrill and W. Harris, 989.

Fig. 14. *H. rubiginosa*. Collected at Lake Dunmore, Vermont, by E. A. Burt.

Fig. 15. *H. Sallei*. Upper figure, upper surface, and lower figure, hymenium of specimen collected in Florida by C. G. Lloyd, 2071.

Fig. 16. *H. tabacina*. Collected at North Ferrisburg, Vermont, by E. A. Burt. The cross lines of half-tone reproduction render somewhat indistinct the systems of cracks of the hymenium which were hoped to be shown.

Fig. 17. *H. unguolata*. From the type, collected at Jalapa, Mexico, by W. A. and E. L. Murrill, 176.



BURT THELEPHORACEAE OF NORTH AMERICA

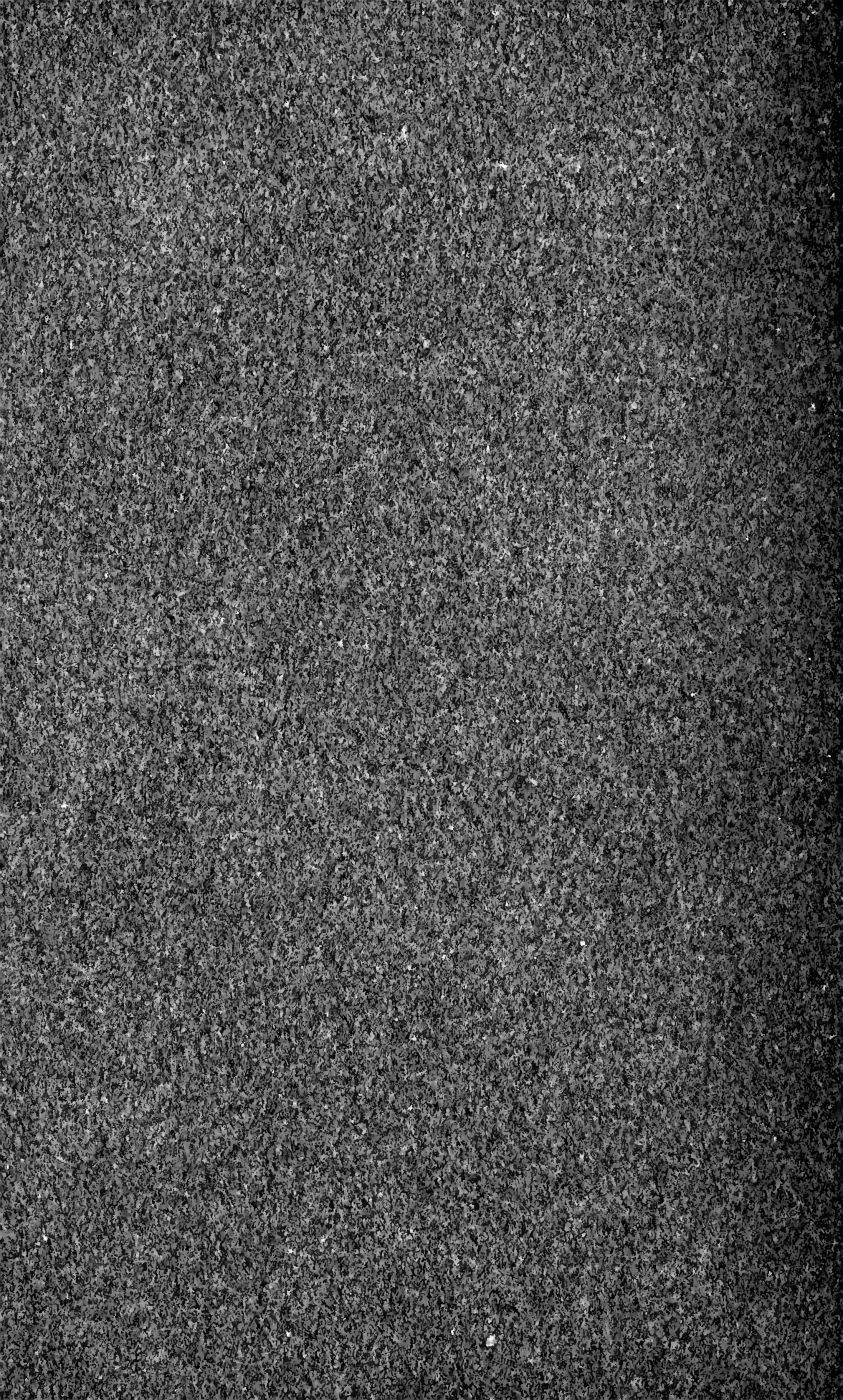
8. HYMENOCHAETE CUBENSIS. 9. H. CURTISII. 10. H. FULIGINOSA. 11. H. LUTEO-BADIA. —
 12. H. PINNATIFIDA. 13. H. REFLEXA. 14. H. RUBIGINOSA. 15. H. SALLEI.
 16. H. TABACINA. 17. H. UNGULATA.

The Thelephoraceae of North
America. XI

Tulasnella, Veluticeps, Mycobonia,
Epitele, and Lachnocladium

EDWARD ANGUS BURT

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THE THELEPHORACEAE OF NORTH AMERICA. XI¹

TULASNELLA, VELUTICEPS, MYCOBONIA, EPITHELE, and
LACHNOCLADIUM

EDWARD ANGUS BURT

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TULASNELLA

Tulasnella Schroeter, Krypt.-Fl. Schlesien **3**: 397. 1888; Juel, K. Svenska Vet.-Akad. Bihang till Handl. Afd. III. **23**¹²: 21. 1897; Arkiv för Bot. **14**¹: 8. 1915; Sacc. Syll. Fung. **14**: 234. 1899.—*Prototremella* Patouillard, Jour. de Bot. **2**: 267. 1888.—*Pachysterigma* Johan-Olsen in Brefeld, Untersuch. Myk. **8**: 5. 1889; Engl. & Prantl, Nat. Pflanzenfam. (**1**: 1**): 117. 1898.

Fungi with the aspect of *Corticium* and with simple ovoid to globose basidia but having very large sterigmata, each of which bears a spore.

The organs which have the position of sterigmata—and are so called in the original definition of *Tulasnella* which I have followed—are different from all other sterigmata which I have seen by their spore-like form and greatly constricted connection with the body of the basidium as compared with the diameter of the rest of the sterigma. These organs resemble usual sterigmata in being permanently attached to their basidia. Juel, *loc. cit.*, gives cytological reasons for regarding these organs as basidiospores rather than as sterigmata, but basidiospores not sep-

¹ Issued March 2, 1920.

arable at maturity from the basidia which produce them are not known elsewhere in *Basidiomycetes*, so far as I am aware. Juel's material for cytological study proved to be the hymenium of a *Poria* infested by two species of *Tulasnella*. For the present, it seems less confusing in a taxonomic paper to refer to the spore-shaped organs permanently attached to the basidia in species of *Tulasnella* as sterigmata.

The specimens of *Tulasnella* which I have seen in vegetative condition were slightly colored in such colors as livid pink, dull lavender, and ecru-drab of Ridgway; specimens of all species fade to pale olive-gray in the herbarium. The spores were colored in the mass like the fructifications from which they were obtained in the cases where I secured spore falls on glass from specimens of my collection, but are hyaline under high magnification with the microscope. The fructifications are not adnate, as this term is applied to *Peniophora cinerea*, but merely very thin and tender, for when they are moistened small portions sufficiently large for crushing under a cover glass may be lifted clean from the substratum with the point of a scalpel. Such portions spread out well under the cover glass upon application of pressure and are very satisfactory for observation of the spores and sterigmata.

The species of *Tulasnella* are so similar in aspect that one has to rely upon microscopic details—chiefly of the spores and sterigmata—for recognition of the species. Nineteen species of *Tulasnella* are listed for Europe, but upon such slight differences in dimensions of the spores that it seems probable that the number will be materially reduced when a revision can be made upon the basis of first-hand knowledge of these species.

Tulasnella has been collected in North America in northern United States and Canada only; these gatherings are arranged in three species.

KEY TO THE SPECIES

- Spores subglobose, $3\frac{1}{2}$ –6 × 3–4 μ 1. *T. Eichleriana*
 Spores subglobose, 5–9 × 4 $\frac{1}{2}$ –6 μ 2. *T. violacea*
 Spores more elongated, 10–15 × 3–5 μ 3. *T. fusco-violacea*

1. *Tulasnella Eichleriana* Bresadola, Ann. Myc. 1: 113. 1903; Sacc. Syll. Fung. 17: 209. 1905; Bourdot & Galzin, Soc. Myc. Fr. Bul. 25: 32. 1909; Juel, Arkiv för Bot. 14¹: 8. 1915.

Fructification effused, thin, pale lilac, finally fading to olive-buff; in structure 20–60 μ thick, composed of interwoven, hyaline hyphae 3 μ in diameter; sterigmata 7–10 \times 3½–4½ μ ; spores hyaline, even, 3½–6 \times 3–4 μ .

Fructifications 3–6 \times 1–1½ cm.

On rotting wood and bark of frondose species, rarely on coniferous substrata. Canada, New Hampshire, New York, Idaho, and Washington. July to November.

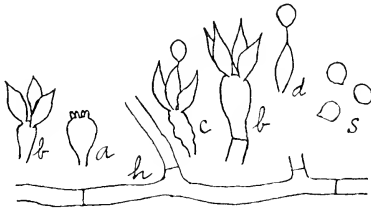


Fig. 1. *T. Eichleriana*. Young basidium, *a*, beginning formation of sterigmata; older basidium, *b*, having full-grown sterigmata; collapsed basidium, *c*, with spore attached to one sterigma; sterigma, *d*, bearing a spore; spores, *s*; hypha, *h*. \times 870.

T. Eichleriana is noteworthy by having the smallest spores and sterigmata which are known in the genus. In these details American collections agree so closely with those of European specimens of *T. Eichleriana* that one can hardly doubt their being this species although authentic specimens have not been at hand for verification.

Specimens examined:

Canada: *J. Macoun*, 21.

Ontario: Ottawa, *J. Macoun*, 13.

New Hampshire: Chocorua, *W. G. Farlow*, 1, 4, 6**, and two unnumbered specimens (the last three specimens in Mo. Bot. Gard. Herb., 55270, 55276, and 55597), and Nos. A and C (in Farlow Herb.).

Massachusetts: Sharon, *A. P. D. Piquet, B, E* (in Farlow Herb.).
New York: Ithaca, comm. by G. F. Atkinson, 2817.

Idaho: Priest River, *J. R. Weir, 391* (in Mo. Bot. Gard. Herb., 15657).

Washington: Chehalis *C. J. Humphrey, 6284*.

2. *T. violea* (Quelet) Bourdot & Galzin, Soc. Myc. Fr. Bul. **25**: 31. 1909.

Hypochnus violeus Quelet, Ass. Fr. Av. Sci. **1882**: 401. 1883.
—*Prototremella Tulasnei* Patouillard, Jour. de Bot. **2**: 270. text f. 1-3. 1888; Essai Taxon. Hym. 27. text f. 19. 1900; Sacc. Syll. Fung. **9**: 236. 1891.—*Tulasnella Tulasnei* (Patouillard) Juel, K. Svenska Vet.-Akad. Bihang till Handl. Afd. III. **23**¹²: 21. 1897; Arkiv för Bot. **14**¹: 8. 1915; Sacc. Syll. Fung. **14**: 234. 1899; Bresadola, Ann. Myc. **1**: 114. 1903.—*T. incarnata* Bourdot & Galzin, Soc. Myc. Fr. Bul. **25**: 31. 1909.—An *Corticium incarnatum* var. *pinicolum* Tulasne, Ann. Sci. Nat. Bot. V. **15**: 227. pl. 10. f. 3-5. 1872?—Not *Pachysterigmata incarnata* Johan-Olsen in Brefeld, Untersuch. Myk. **8**: 7. pl. 1. f. 1-2. 1889.—Not *Corticium roseolum* Karsten, Soc. pro Fauna et Fl. Fenn. Meddel. **16**: 2. 1888.

Illustrations: Patouillard, *loc. cit.*

Type: specimens determined by Quelet in Bourdot Herb. and a fragment in Burt Herb.

Fructification effused, thin, livid pink to dull lavender, fading in the herbarium to olive-buff; in structure 30-70 μ thick, composed of interwoven hyaline hyphae 3 μ in diameter; sterigmata 7-10 \times 5-6 μ , with the main portion nearly spherical; spores subglobose, even, 5-9 \times 4 $\frac{1}{2}$ -6 μ .

Fructifications 1 $\frac{1}{2}$ -6 cm. long, 1-3 cm. broad.

On wood and fallen branches of frondose species, rarely on pine. New England, New York, and Washington. March to November.

This species is distinguished from *T. Eichleriana* by larger spores and sterigmata. The spores are usually about 6 \times 5 μ , with a slight point of attachment at the base; the body portion of the sterigma has about the same dimensions as the spores. The fructifications are too thin and tender to permit of large

portions being separated from the substratum, but they are not adnate, for upon moistening the fructification small portions large enough for preparation under a cover glass may be lifted from the substratum with the point of a scalpel.

It seems probable that *Corticium incarnatum* var. *pinicolum* Tul. must have been either the present species or *T. Eichleriana*, on account of the subglobose spores which the Tulasnes figured, although unfortunately without stating spore dimensions or scale of magnification of their figures.

Von Höhnel & Litschauer have published¹ that *Corticium roseolum* Karst. is the same species as *Tulasnella Tulasnei*. I have studied an authentic specimen of *C. roseolum* communicated to me by Karsten; this species is not distinguishable in



Fig. 2. *T. violea*. Young basidium, *y*; young basidium, *a*, forming sterigmata; basidium, *b*, with nearly full-grown sterigmata; old, collapsed basidium, *c*, from whose sterigmata the spores have fallen; spores, *s*. $\times 870$. From specimen determined by Quelet.

coloration and aspect from several sendings of *T. Tulasnei* (= *T. violea*), also on *Betula*, received from Romell and cited below, but it is entirely different in microscopic characters. This specimen of *C. roseolum* agrees well with the description published by Karsten; its spores are hyaline, even, $4-6 \times 3-3\frac{1}{2} \mu$, borne 4 to a basidium on very slender sterigmata of the usual *Corticium* kind; the basidia are simple, cylindric or clavate, $9-10 \times 4-4\frac{1}{2} \mu$; the hyphae are sometimes nodose-septate, and some are incrustated in the region of the substratum. Karsten's publication of *Corticium roseolum* antedates that by Masseé and renders unnecessary *Corticium subroseum* Sacc. & Syd. in Sacc. Syll. Fung. 14: 223. 1899.

¹ K. Akad. Wiss. Wien, Sitzungsber. 115: 1557. 1906.

Specimens examined:

- Sweden: Stockholm, *L. Romell*, 125, 141, 142, 143, 149, 150, 184.
 Austria-Hungary: Sonntagberg, *Strasser*, comm. by Bresadola under the name *T. incarnata*.
 France: Aveyron, *A. Galzin*, comm. by H. Bourdot, 15423; Allier, *H. Bourdot*, 1798, determined by Quelet, and 3765 under the name *T. incarnata*.
 New Hampshire: Chocorua, *W. G. Farlow*.
 Vermont: Little Notch, Bristol, *E. A. Burt*; Middlebury, *E. A. Burt*; Chapman's Mill, Middlebury, *E. A. Burt*.
 Massachusetts: Magnolia, *W. G. Farlow* (in Farlow Herb.); Sharon, *A. P. D. Piguet*, comm. by W. G. Farlow, N (in Mo. Bot. Gard. Herb., 55002); Sherborn, *H. P. Morse*, comm. by W. G. Farlow; Waltham, *W. G. Farlow* (in Farlow Herb.).
 New York: East Galway, *E. A. Burt*.
 Washington: Bingen, *W. N. Suksdorf*, 906.

3. *T. fusco-violacea* Bresadola, *Fungi Tridentini* 2: 98. *pl.* 210. *f.* 1. 1900; *Sacc. Syll. Fung.* 16: 203. 1902; Bourdot & Galzin, *Soc. Myc. Fr. Bul.* 25: 31. 1909; Juel, *Arkiv för Bot.* 14¹: 8. 1915.

Illustrations: Bresadola, *Fungi Tridentini* 2: *pl.* 210. *f.* 1.

Type: authentic specimen in Burt Herb.

Fructification effused, thin, ecru-drab, fading to pale smoke-gray and pale olive-gray in the herbarium; in structure 40–60 μ thick, composed of hyaline, interwoven hyphae 4–5 μ in diameter; sterigmata 12–15 \times 4½–6 μ ; spores hyaline under the microscope, even, 10–15 \times 3–5 μ .

Fructifications 3–5 cm. in diameter.

On bark of *Abies* and sometimes of frondose species. New Hampshire to Pennsylvania. August to December. Rare.



Fig. 3. *T. fusco-violacea*. Basidium, *c*, with fully developed sterigmata; spores, *s*; hypha, *h*. \times 870. From authentic specimen from Bresadola. One spore shows a curious projection.

T. fusco-violacea is distinguished from the other species hitherto found in North America by having slender and elongated, rather than subglobose, spores. Bresadola described the color of the fructification as fusco-violaceous when in vegetative condition, drying lilacinus; I have seen dried specimens only, and that from Bresadola is now pale smoke-gray.

Specimens examined:

Sweden: Femsjö, *L. Romell*, 418.

Tyrol: Cavallente, *G. Bresadola*.

New Hampshire: Crawford Notch, *L. O. Overholts*, 4883 (in Mo. Bot. Gard. Herb., 56076).

Pennsylvania: Trexlertown, *W. Herbst*, 53.

VELUTICEPS

Veluticeps Cooke emend. Patouillard, Soc. Myc. Fr. Bul. 10: 78. pl. 3. f. 1. 1894; Cooke, *Grevillea* 8: 148. 1880 (in part).—*Veluticeps* as a section of *Hymenochaete* Masee, Linn. Soc. Bot. Jour. 27: 116. 1890; not of Sacc. Syll. Fung. 6: 600. 1888.

Hymenium velvety with fascicles of colored, flexuous hyphae.

The type species is *Veluticeps Berkeleyi* Cooke, which was published originally as *Hymenochaete veluticeps* Berk. & Curtis.

The fructifications are pileate in the species best known; either dimidiate in our single Cuban species or sessile and attached by the vertex in the species occurring on the opposite side of the world in New South Wales. In both species the fascicles of colored hyphae are 800 μ or more long, about 40–60 μ in diameter, and traverse the whole or a large part of the fructification perpendicular to the surface of the hymenium, beyond which they protrude up to 40–100 μ . The colored hyphae composing the fascicles are about 4½ μ in diameter, cylindric, sometimes granule-incrusted—especially in the deeper portions of the fructification—and are closely crowded together, perhaps 20 or more to a fascicle; they have the character of the colored cystidia, which are scattered between the basidia in the hymenium of *Stereum abietinum*, *S. glaucescens*, and *S. abnormis*, rather than of the conical, pointed setae characteristic of species of *Hymenochaete*. The genera *Mycobonia* and *Epithele* are closely related to *Veluticeps* by fascicles of hyphae protruding

from the hymenium, but have the fascicles composed of hyaline hyphae.

Veluticeps Berkeleyi Cooke, *Grevillea* **8**: 149. 1880; Patouillard, *Myc. Soc. Fr. Bul.* **10**: 77. *pl. 3. f. 1.* 1894.

Hymenochaete veluticeps Berk. & Curtis, *Linn. Soc. Bot. Jour.* **10**: 333. 1868; Sacc. *Syll. Fung.* **6**: 600. 1888; Masee, *Linn. Soc. Bot. Jour.* **27**: 116. 1890.

Illustrations: *Myc. Soc. Fr. Bul.* **10**: *pl. 3. f. 1.*

Type: in Kew Herb. and in Curtis Herb.

Fructification dimidiate, coriaceous, hard and brittle, on the upper side brown, sulcate-zonate, velutinous, becoming glabrous; hymenium pallid cinnamon, plane, thickly studded with pro-

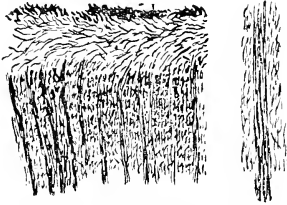


Fig. 4. *V. Berkeleyi*. Section of fructification at left, showing hyphal fascicles, $\times 19$; at right, a single fascicle, $\times 90$.

truding fascicles of very dark hyphae; in structure 1–2 mm. thick, composed throughout of colored hyphae arranged in three layers, a broad intermediate layer of longitudinally arranged hyphae which turn upward on the upper side to form the velutinous surface layer and turn downward on the opposite side and terminate in the hymenium; bister-colored hyphal fascicles 40–60 μ in diameter, 800 μ or more long, extend

through the under layer of tawny olive subhymenial hyphae and protrude up to 40–60 μ beyond the basidia; spores not found.

On logs in woods, often on the under side. May, July. Cuba.

V. Berkeleyi may be recognized by its aspect of a *Hydnum* which upon close examination shows its teeth-like projections on the hymenial side to be really hyphal fascicles not covered by the hymenium. The spores were found to be ovoid and hyaline by Patouillard. Six collections of this species by C. Wright are reported by Berkeley & Curtis in *Fungi Cubenses*, from which it would seem that the species is common, but I have been able to see no more recent collections from any source. It is possible

that my correspondents have roughly classified their collections of this species as a *Hydnum* and withheld specimens of it.

Specimens examined:

Cuba: *C. Wright*, 264 (in Curtis Herb.).

In working over the species of *Aleurodiscus* which have been described, I found that the *Aleurodiscus tabacinus* Cooke should be transferred to *Veluticeps*. Although the species is extra limital and not likely to be found in North America, I now make this transfer and add the following notes on structure:

Veluticeps tabacina (Cooke) Burt, n. comb.

Aleurodiscus tabacinus Cooke, Grevillea **14**: 11. 1885; Handb. Australian Fungi, 193. 1892.—*Corticium tabacinum* (Cooke) Sacc. Syll. Fung. **6**: 607. 1888.

Fructifications pileate, hemispherical or cup-shaped, sessile, apparently attached by the vertex, drying nearly black; in structure 800 μ thick, with a nearly black, crust-like zone on the upper side, from which a broad layer of hyaline hyphae extends to the hymenium and is traversed by brown hyphal fascicles; hymenium drying Verona brown, not covering the protruding fascicles; fascicles about 6 to a mm., 50–60 μ in diameter, up to 900 μ long, protruding up to 100 μ beyond the hymenium, composed of flexuous, colored hyphae 3 μ in diameter; basidia simple, 100 \times 9–10 μ , bearing the spores on 4 slender sterigmata; spores hyaline, even, flattened on one side, 16 \times 6 μ .

Fructifications 2–3 mm. in diameter, 1–1½ mm. thick.

On wood. New South Wales.

V. tabacina is distinct from *V. Berkeleyi* by attachment of its pileus by the center, and by its hyaline substance and sub-hymenial tissue; when a fertile specimen of *V. Berkeleyi* is available, a difference in spores may perhaps be found.

Specimens examined:

Australia: New South Wales, comm. by G. Masee (in N. Y. Bot. Gard. Herb.).

MYCOBONIA

Mycobonia Patouillard, Myc. Soc. Fr. Bul. **10**: 76. 1894 (with diagnosis under *Bonia* Patouillard, Myc. Soc. Fr. Bul. **8**:

48. 1892, but not *Bonia* Balansa).—*Grandinioides* Banker, Torr. Bot. Club Mem. **12**: 179. 1906.

Thelephoraceous fungi having the hymenium bristling with short cylindric fascicles of hyaline hyphae which arise from the subhymenial tissue.

The type species is *Mycobonia flava*.

Patouillard intended at first that this genus should include both resupinate and pileate species, but he soon transferred the known resupinate species to *Heterochaete* on account of the longitudinally septate basidia. A few years later he introduced *Epithele* in connection with resupinate species, having hyphal fascicles like those of *Mycobonia flava*.

KEY TO THE SPECIES

Fructification sessile	1. <i>M. flava</i>
Fructification stipitate	2. <i>M. brunneoleuca</i>

1. *Mycobonia flava* (Swartz) Patouillard, Myc. Soc. Fr. Bul. **10**: 76. *pl. 3. f. 2.* 1894; *Ibid.* **16**: 180. 1900.

Hydnum flavum Swartz ex Berkeley, Ann. & Mag. Nat. Hist. **1. 10**: 380. *pl. 10. f. 8.* 1842; Linn. Soc. Bot. Jour. **10**: 324. 1868; Sacc. Syll. Fung. **6**: 456. 1888.—*Peziza flava* Swartz, Prodr. 150. 1788; Fl. Ind. Oc. **3**: 1939. 1806.—*Bonia flava* (Berk.) Patouillard in Engl. & Prantl, Nat. Pflanzenfam. (**1. 1****): 123. *text f. 68G-H.* 1898.—*Grandinioides flavum* (Swartz) Banker, Torr. Bot. Club Mem. **12**: 179. 1906.

Illustrations: Ann. & Mag. Nat. Hist. **1. 10**: *pl. 10. f. 8*; Myc. Soc. Fr. Bul. **10**: *pl. 3. f. 2*; Engl. & Prantl, Nat. Pflanzenfam. (**1. 1****): *text f. 68 G-H*.

Type: in British Mus. Herb. according to Berkeley, *loc. cit.*

Fructification coriaceous, convex, somewhat orbicular to reniform, sessile, attached by a point on one side, even, glabrous, drying ochraceous buff to cinnamon; hymenium ochraceous buff, with numerous short hyphal fascicles suggesting the teeth of a *Hydnum*; fascicles cylindric, 5–6 to a mm., 60–120 × 40–60 μ, composed of hyaline or subhyaline hyphae; basidia simple, clavate, 30 × 6–7½ μ; spores hyaline, even, 10–16 × 6 μ, not seen attached to the basidia.

Fructifications 1–3 cm. long, 1½–3 cm. broad.

On fallen branches and old logs. Florida, Louisiana, Jamaica, West Indies, and Venezuela. August to November.

When examined by the naked eye or with a magnifying glass, *M. flava* is not distinguishable from a *Hydnum*, but when sections are examined with the compound microscope, the hymenium is found to be a plane surface pierced here and there by the protruding fascicles of hyphae. The spore dimensions are those of spores which were on the surface of the hymenium. A specimen in the collection from Florida has a stem 1 mm. long, but the spores are $13 \times 6\frac{1}{2} \mu$ and other characters such that I refer the collection to *M. flava*.

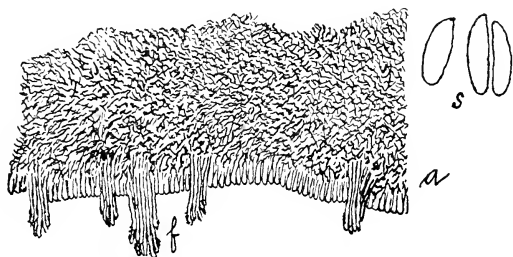


Fig. 5. *M. flava*. Section of fructification, *a*, showing hyphal fascicles, *f*, $\times 90$; spores, *s*, $\times 870$.

Specimens examined:

Florida: Cocconut Grove, *R. Thaxter* (in Mo. Bot. Gard. Herb., 43985).

Louisiana: St. Martinville, *A. B. Langlois*.

Cuba: *C. Wright* (in Curtis Herb.); Guantonamo (in Weir Herb., 10849); Pinar del Rio San Diego de los Baños, *N. L. Britton*, *F. S. Earle* & *C. S. Gager*, 6823 (in N. Y. Bot. Gard. Herb., Burt Herb., and Mo. Bot. Gard. Herb., 56075); Puerto Principe, *F. S. Earle*, 312.

2. *M. brunneoleuca* (Berk. & Curtis) Patouillard, Myc. Soc. Fr. Bul. 16: 181. 1900; Duss, Fl. Crypt. Antilles Fr. 233. 1903.

Hydnum brunneoleucum Berk. & Curtis, Linn. Soc. Trans. 22: 129. 1857; Linn. Soc. Bot. Jour. 10: 325. 1868; Sacc. Syll.

Fung. 6: 457. 1888.—*Grandinioides flavum* (Swartz) Banker, Torr. Bot. Club Mem. 12: 179. 1906 (in part).

Type: in Kew Herb. and Curtis Herb.

Pileus helmet-shaped to flabelliform, vaulted, thin, yellowish brown, slightly streaked behind, glabrous; stem very short, brownish; hymenium whitish, sprinkled with many scattered strong bristles.

Pileus $3\frac{1}{2}$ –4 cm. long, nearly as broad.

On dead wood. Martinique and Venezuela.

Patouillard has noted in the place cited that the pileus may attain a diameter of 15 cm., and that the stem is short, thick, and black at the base. Banker includes *M. brunneoleuca* in *M. flava* as a poorly developed form.

I have examined no specimens of *M. brunneoleuca*. The description of the species is that given by Berkeley & Curtis.

EPITHELE

Epithele (as a section of *Hypochnus*) Patouillard, Myc. Soc. Fr. Bul. 15: 202. 1899.—*Epithele* Patouillard, Essai Taxon. Hym. 59. 1900; Duss, Fl. Crypt. Antilles Fr. 226. 1903; v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 115: 1595. 1906; Bourdot & Galzin, Soc. Myc. Fr. Bul. 27: 264. 1911.

Resupinate thelephoraceous fungi lacking an intermediate layer and having the hymenium bristling with short cylindric fascicles of hyaline hyphae which arise from the subhymenial tissue.

The type species is *Epithele Dussii*.

The four species of *Epithele*, known at present, are very thin and delicate in structure and constitute a natural group which is not connected with *Mycobonia* by thick resupinate species with either an intermediate layer or with a doubtful intermediate layer—doubtful merely because the hyphae are interwoven rather than arranged longitudinally in the region of the intermediate layer. *Epithele Typhae* (Pers.) Pat. is a frequent species in Europe on dead leaf bases of *Typha*; if present in the United States, it may have been regarded as one of the *Hydnaceae* on account of the hyphal fascicles in the hymenium.

KEY TO THE SPECIES

Fructification elliptical, white; spores $6-7 \times 2\frac{1}{2}-3 \mu$; on tree fern 1. *E. Dussii*

Fructification interruptedly effused, sulphur-yellow; spores $9-12 \times 7-9 \mu$; on palmetto 2. *E. sulphurea*

1. *Epithele Dussii* Patouillard, Essai Taxon. Hym. 59. 1900; Duss, Fl. Crypt. Antilles Fr. 226. 1903.

Hypochnus Dussii Patouillard, Myc. Soc. Fr. Bul. 15: 202. 1899; Sacc. Syll. Fung. 16: 197. 1902.—*Peniophora Dussii* (Patouillard) v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 116: 749. text f. 2. 1907.

Fructification resupinate, very thin, strongly adhering, forming a coating well defined, white or whitish, $3-15 \times 3-4$ mm.; fascicles very numerous, erect, white, $20-25 \mu$ in diameter, protruding up to 100μ , composed of hyphae; basidia 2- or 4-spored, $13 \times 6 \mu$; spores hyaline, even, attenuated towards the apex, $6-7 \times 2\frac{1}{2}-3 \mu$; layer between hymenium and substratum about 20μ thick.

On dead trunks of tree ferns. Guadeloupe and Venezuela.

The type, which I have not seen, was collected on the dead trunk of *Alsophila aspera*. The collection from Venezuela, cited below, although lacking spores, has the characteristic hyphal fascicles of *Epithele Dussii* and agrees well with Patouillard's description except in being broadly effused. This specimen is 10 cm. long, $1\frac{1}{2}$ cm. wide, and broken off with the substratum along one side and at both ends; hence the fructifications probably become long and widely effused.

Specimens examined:

Venezuela: Mt. El Val, *A. F. Blakeslee*, J2, comm. by W. G. Farlow (in Mo. Bot. Gard. Herb., 13614).

2. *E. sulphurea* Burt, n. sp.

Type: in Farlow Herb. and Mo. Bot. Gard. Herb.

Fructifications resupinate, interruptedly effused, drying pale sulphur-yellow to marguerite-yellow; in structure 300μ thick, composed of loosely interwoven, thick-walled, hyaline hyphae $2-3 \mu$ in diameter; fascicles about 9 to a mm., $15-30 \mu$ in diameter, protruding up to 100μ , composed of hyaline hyphae; basidia

simple, 8–10 μ in diameter, 4-spored; spores hyaline, even, 9–12 \times 7–9 μ .

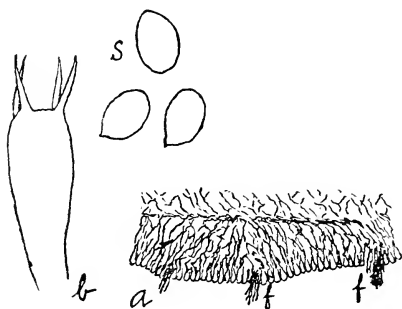


Fig. 6. *E. sulphurea*. Section of fructification, *a*, showing hyphal fascicles, *f*, $\times 19$; basidium, *b*, and spores, *s*, $\times 650$.

On palmetto. Florida. Autumn.

E. sulphurea is noteworthy by its greenish yellow color and spores much larger than those of other species of this genus. Collections of this species are likely to be included in *Hydnum* or *Odontia*, unless examination of sectional preparations is made with the microscope to show that teeth covered by the hymenium are not present.

Specimens examined:

Florida: Palm Beach, *R. Thaxter*, 52, type (in Farlow Herb. and in Mo. Bot. Gard. Herb., 43940).

LACHNOCLADIUM

Lachnocladium L veill  in d'Orbigny, Dict. Hist. Nat. **8**: 487. 1846; Morgan, Cincinnati Soc. Nat. Hist. Jour. **10**: 192. 1888; Sacc. Syll. Fung. **6**: 738. 1888; Patouillard, Jour. de Bot. **3**: 23. *pl. 1*. 1889; Engl. & Prantl, Nat. Pflanzenfam. (**1**: 1**): 137. 1898.—*Eriocladus* L veill , Ann. Sci. Nat. Bot. III. **5**: 158. 1846, but not of Lindley.

Fructifications coriaceous or somewhat coriaceous, branched, tomentose; branches compressed or terete; coralloid fungi growing on wood or on the ground.

This genus was founded upon a group of seven species, of which none was designated as the type species.

The distinctive characters of *Lachnocladium* are coriaceous consistency and more or less hairy covering of fructifications; by these characters the genus is distinguished from *Clavaria*. At the time of publication of *Lachnocladium* under the name *Eriocladus*, as first proposed, L veill  restricted the Persoonian genus *Merisma* to glabrous, coriaceous, branched species of the *Clavariaceae*. He had *Clavaria* include fleshy species only, *Merisma*, the glabrous coriaceous species, and *Lachnocladium*, tomentose species so tomentose that the branches were tomentose. Mycologists have not accepted *Merisma* as understood by L veill ; they have transferred to *Pterula* most of the species which L veill  had in *Merisma*, and have by their usage modified the idea of *Lachnocladium* by publishing as members of this genus many species which do not have their branches tomentose but differ from branched species of *Clavaria* by being coriaceous.

Lachnocladium comprises a series of species parallel with *Clavaria*; some of the species have hyaline spores, others have more or less ochraceous spores, some, even spores, and some, rough-walled to aculeate spores. Species with dark-colored, more or less rough-walled to muricate spores are better referable to *Thelephora*.

L veill  regarded *Lachnocladium* as one of the *Clavariaceae* and the genus is located there in Saccardo's 'Sylloge Fungorum' and by Hennings in Engler & Prantl's 'Nat. Pflanzenfam.' Berkeley & Curtis arranged the species of *Lachnocladium* between those of *Thelephora* and *Stereum* in their 'Notices of North American Fungi'¹ and 'Fungi Cubenses.'² Patouillard includes *Lachnocladium* in his series of *Thelephores*. In North America there are no species connecting, or intermediate between, *Lachnocladium* and *Thelephora*. While I have had no opportunity to study the various exotic species with dark-colored, echinulate spores which have been published as *Lachnocladium*, it seems very probable that the transfer of such species to *Thelephora* near *Thelephora anthocephala* would

¹ Grevillea 1: 161. 1873.

² Linn. Soc. Bot. Jour. 10: 330. 1868.

leave the remaining species of *Lachnocladium* clearly in the *Clavariaceae*.

I include *Lachnocladium* for reference by students of the *Thelephoraceae* because some authors have regarded it as a member of the latter family.

Collectors' field notes on whether the species are coriaceous or fleshy at the time of collecting are necessary for sharply separating *Lachnocladium* and *Clavaria*, for it is evident that these characters may not be well shown in the case of dried specimens of some species.

KEY TO THE SPECIES

- | | |
|--|----------------------------|
| Spores hyaline | 1 |
| Spores more or less ochraceous | 4 |
| Spores dark-colored; in Guadeloupe | 11. <i>L. guadelupense</i> |
| 1. Spores ovoid or cylindric | 2 |
| 1. Spores subglobose | 3 |
| 2. Spores even, $3-4\frac{1}{2} \times 2-2\frac{1}{2} \mu$; radiately branched organs like those of <i>Asterostroma</i> present; Cuba to Brazil | 1. <i>L. brasiliense</i> |
| 2. Spores even, $9 \times 6 \mu$; fructification somewhat cartilaginous; in Cuba | 2. <i>L. cartilagineum</i> |
| 2. Spores even, $6-12 \times 3-3\frac{1}{2} \mu$; fructification dry, $2\frac{1}{2}-4$ cm. high; on rotting leaves, Vermont to Ohio | 3. <i>L. Micheneri</i> |
| 2. Spores even, $12-15 \times 5-6 \mu$; fructification 3-4 cm. high, everywhere clothed with whitish down; in Pennsylvania | 4. <i>L. semivestitum</i> |
| 2. Spores $7-10 \times 2\frac{1}{2}-4\frac{1}{2} \mu$; fructifications 8 cm. high; on wood; Connecticut | 12. <i>L. odoratum</i> |
| 3. Spores even, $3-3\frac{1}{2} \times 2\frac{1}{2}-3 \mu$; fructification $2\frac{1}{2}$ cm. high; on the ground, New Jersey and Pennsylvania | 5. <i>L. subsimile</i> |
| 3. Spores even, $3\frac{3}{4}-4\frac{1}{2} \mu$ in diameter; fructification 4 cm. high; on wood, Cuba | 6. <i>L. cervinum</i> |
| 3. Spores even, $9\frac{1}{2} \times 8-9 \mu$; on the ground, New Hampshire, Massachusetts, and New York | 7. <i>L. bicolor</i> |
| 4. Spores even, $7-12 \times 4\frac{1}{2}-6 \mu$; fructification velvety, ochraceous-ferruginous, 7-12 cm. high; on rotten wood, South America | 8. <i>L. furcellatum</i> |
| 4. Spores even, $6-7 \times 3-3\frac{1}{2} \mu$; fructification drying drab, clothed with a gray down, 8 cm. high; on wood, West Virginia | 9. <i>L. erectum</i> |
| 4. Spores even, $9-10 \times 4\frac{1}{2}-5\frac{1}{2} \mu$; stem 1 cm. in diameter; branch portion 6-7 cm. high, 5-6 cm. broad; North Carolina | 10. <i>L. Atkinsonii</i> |

I. *Lachnocladium brasiliense* Léveillé, Ann. Sci. Nat. Bot. III. 5: 159. 1846 (*Eriocladus*); Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 330. 1868; Sacc. Syll. Fung. 6: 738. 1888; Patouillard, Jour. de Bot. 3: 26. pl. 1. f. 5. 1889. Plate 5, fig. 1. Illustrations: Patouillard, loc. cit.

Type: stated by Lévillé to be in De Candolle Herb.; Patouillard notes a specimen of original locality and collector—Bahia, *Blanchet*—in Museum of Paris Herb.

Fructification very short-stipitate, most highly branched, coriaceous, drying to tawny olive; branches solid, terete, dichotomous, with slender acute tips; spores hyaline, even, $3-4\frac{1}{2} \times 2-2\frac{1}{2} \mu$, borne on simple basidia; underneath the hymenium radiately branched organs like those of *Asterostroma*, pale-colored, with slender, flexuous rays up to $30 \times 3 \mu$, are abundant



Fig. 7. *L. brasiliense*. Antler-shaped and star-shaped organs, a; spores, s. $\times 870$.

and form the outer part of the medullary part of the branches and the somewhat spongy outer surface of the fructification where the hymenium is absent.

Fructifications 3–5 cm. high, about 3 cm. in diameter.

On rotting wood. Cuba to Brazil.

L. brasiliense is distinguished by its small, hyaline spores and by the brownish, antler-shaped and star-shaped organs, the latter suggestive of those of *Asterostroma*, which are abundant underneath the hymenium and form the sterile surface elsewhere.

Specimens examined:

Cuba: *C. Wright* (in Curtis Herb., under the name *Thelephora brasiliensis* Lév.); *C. Wright*, 831, under the name *Lachnocladium furcellatum* (in Curtis Herb. and in Mo. Bot. Gard. Herb., 43838).

2. *L. cartilagineum* Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 330. 1868; Sacc. Syll. Fung. 6: 739. 1888; Patouillard, Jour. de Bot. 3: 26. pl. 1. f. 4. 1889. Plate 5, fig. 2.

Illustrations: Patouillard, *loc. cit.*

Type: in Kew Herb. and Curtis Herb.

Fructifications somewhat cartilaginous, erect, drying honey-yellow to olive-brown, densely and repeatedly branched above; branches cylindric, very sharp-pointed; stem slender, cylindric, strigose-hairy at the base; spores hyaline, even, $9 \times 6 \mu$, slightly flattened on one side, apiculate.



Fig. 8.
L. cartilagineum.
Spores, $\times 870$.

Fructifications 4 cm. high, $1-2\frac{1}{2}$ cm. in diameter; stem $1\frac{1}{2}-2$ cm. long, $1\frac{1}{2}-2$ mm. in diameter. On the ground. October. Cuba.

Patouillard has noted the spores of this species as ochraceous and a little smaller than I find them. The spores are very abundant in preparations from the type specimen, but the basidia are not well enough preserved to demonstrate whether simple or longitudinally cruciately septate.

Specimens examined:

Cuba: *C. Wright*, 204, type (in Curtis Herb.).

3. *L. Micheneri* Berk. & Curtis, *Grevillea* 1: 161. 1873; Morgan, *Cincinnati Soc. Nat. Hist. Jour.* 10: 192. 1888; Sacc. *Syll. Fung.* 6: 739. 1888; Hard, *Mushrooms*, 476. *text f.* 401. 1908. Plate 5, fig. 3.

Clavaria fragrans Ell. & Ev. *N. Am. Fungi*, 2023. 1888. See Cooke, *Grevillea* 17: 59. 1889.—An *Lachnocladium odoratum* Atkinson, *Ann. Myc.* 6: 58; 1908?

Illustrations: Hard, *Mushrooms*, *text f.* 401.

Type: in Kew Herb. and Curtis Herb.

Fructifications gregarious, coriaceous, dry, repeatedly forked and branched and drying drab-gray above; stem cylindric, light buff, tomentose below, arising singly or in a few individuals from more or less effused, mycelial patches on decaying leaves; smaller branches filiform, flexuous, with paler tips; irregular, tomentose patches at various places on main trunk, branches, or axils of branches where hymenium has failed to develop; hymenium glabrous, no cystidia nor hairs present; spores hyaline, even, $6-12 \times 3-3\frac{1}{2} \mu$.



Fig. 9. *L. Micheneri*.
Spores, $\times 87$; a, from type;
b, from Burt coll.

Fructifications $2\frac{1}{2}$ –4 cm. high, $1-1\frac{1}{2}$ cm. broad; main stem 2–3 mm. in diameter.

On rotting leaves in groves. Canada to New Jersey and westward to Missouri.

This species forms an orbicular, villose or mycelial patch on the surface of leaves—very often beech leaves—and from these patches arise one or two stems, which are tomentose below. In the field notes of this species I have the record, “bitter to taste,” but the dried specimens are not bitter now.

Specimens examined:

Exsiccati: Ell. & Ev., *N. Am. Fungi*, 2023, type distribution of *Clavaria fragrans*; Ell. & Ev., *Fungi Col.*, 1022.

Canada: Ontario, London, *J. Dearness*, in Ell. & Ev., *Fungi Col.*, 1022.

Vermont: Newfane, *C. D. Howe*; Sudbury, *E. A. Burt*.

New York: Snyders, *C. H. Peck* (in *N. Y. State Mus. Herb.* and in *Mo. Bot. Gard. Herb.*, 56113).

New Jersey: Newfield, *J. B. Ellis*, in Ell. & Ev., *N. Am. Fungi*, 2023.

Pennsylvania: *E. Michener*, 479, type (in *Curtis Herb.*, 3534); Bethlehem, *Schweinitz*, the *Clavaria crispula* and *C. byssiseda* of *Schweinitz*, *Syn. N. Am. Fungi*, 1024 and 1034 respectively (in *Herb. Schweinitz*).

Ohio: *C. G. Lloyd*, 3817 (in *Lloyd Herb.*, *Burt Herb.*, *Farlow Herb.*, and *Mo. Bot. Gard. Herb.*, 44653); Oxford, *L. O. Overholts*, 1487 (in *Overholts Herb.*).

Missouri: Wickes, *E. A. Burt* (in *Mo. Bot. Gard. Herb.*, 43813.)

4. *L. semivestitum* Berk. & Curtis, *Grevillea* 1: 161. 1873; Morgan, *Cincinnati Soc. Nat. Hist. Jour.* 10: 192. 1888; Sacc. *Syll. Fung.* 6: 739. 1888. Plate 5, fig. 4.

Type: in *Kew Herb.* and *Curtis Herb.*

Fructifications coriaceous, erect, repeatedly furcate-branched, the branches terete, rather straight, rising rather close together, everywhere clothed with whitish down except on the final branchlets, drying between light brownish olive and buffy brown; spores of the type hyaline, even, $12-15 \times 5-6 \mu$.

Fructifications 3–4 cm. high, about 1 cm. in diameter across branches.

On the ground. Pennsylvania.

The fructifications of *L. semivestitum* probably occur solitary or gregarious on the ground. Distinguishing characters are slender, erect habit of growth, appressed branches, and large, hyaline, even spores. In the dried specimen the branches are pruinose rather than hairy. Cooke referred to *L. semivestitum* the specimens distributed by Ell. & Ev., N. Am. Fungi, 2024, under the name *Clavaria velutina* Ell. & Ev. without description, and Ellis & Everhart distributed in Fungi Col., 808, under the name *L. semivestitum* specimens growing on rotten wood in West Virginia, but neither of these distributions can be *L. semivestitum*, for their spores are much too small.



Fig. 10.
L. semivestitum.
Spores, $\times 870$;
from type.

Specimens examined:

Pennsylvania: *E. Michener*, 1184, type (in Curtis Herb., 4260).

5. *L. subsimile* Berk. *Grevillea* 1: 161. 1873; Sacc. *Syll. Fung.* 6: 739. 1888. Plate 5, fig. 5.

Type: in Kew Herb. and Curtis Herb.

Fructifications coriaceous, slender, delicately and repeatedly dichotomously branched, minutely tomentose except on the branchlets, drying between light brownish olive and buffy brown; spores hyaline, even, $3-3\frac{1}{2} \times 2\frac{1}{2}-3 \mu$.

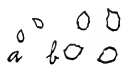


Fig. 11.
L. subsimile.
Spores, $\times 870$; *a*,
from type; *b*, from
Michener specimen
in Mo. Bot. Gard.
Herb.

Fructification $2\frac{1}{2}$ cm. high, $\frac{1}{2}$ cm. in diameter.

On ground in woods. New Jersey and Pennsylvania. September.

L. subsimile in its dried condition has coloration and general aspect very like *L. semivestitum* but the branches of the former curve rather more apart at the axils and are not as closely appressed above. Only three spores were found in a preparation from the specimen in Curtis Herb., which may be rather immature; these spores are very small in comparison with those of *L. semivestitum*. The specimen distributed in Ell. & Ev., N. Am. Fungi, 2024, under the name *Clavaria velutina* E. & E., without description, and the collection from Pennsylvania, both

of which are cited below as *L. subsimile*, have their spores somewhat rough and may be specifically distinct from this species. Nevertheless I am inclined to regard both collections as the fully mature *L. subsimile*. The type of *L. subsimile* was published as Curtis Herb. No. 4600, which appears to be an error for 4690, the number borne by the specimen to which other data point as the specimen referred to by the description. Ellis notes for his distribution, "Milk white when fresh. Spores white."

Specimens examined:

Exsiccati: Ell. & Ev., N. Am. Fungi, 2024, under the name *Clavaria velutina*.

New Jersey: *Laning*, 49, probable type (in Curtis Herb., 4690);

Newfield, *J. B. Ellis*, in Ell. & Ev., N. Am. Fungi, 2024.

Pennsylvania: *E. Michener* (in Mo. Bot. Gard. Herb., 56077).

6. *L. cervinum* (Berk. & Curtis) Patouillard, Jour. de Bot. **3**: 26. 1888. Plate 5, fig. 9.

Clavaria cervina Berk. & Curtis, Linn. Soc. Bot. Jour. **10**: 338. 1868; Sacc. Syll. Fung. **6**: 716. 1888.—*Clavaria pallida* Berk. & Curtis, Linn. Soc. Bot. Jour. **10**: 338. 1868; Sacc. Syll. Fung. **6**: 714. 1888.—*Lachnocladium pallidum* (Berk. & Curtis) Patouillard, Jour. de Bot. **3**: 26. 1888.

Type: in Kew Herb. and Curtis Herb.

Fructifications coriaceous, branched, becoming tawny olive in the herbarium, hairy with hyaline, thin-walled hairs $1\frac{1}{2}\ \mu$ in diameter which protrude $10\ \mu$ beyond the basidia and are longer on the stem; branches repeatedly forked, slender, with very acute tips; spores hyaline, even, subglobose, $3\frac{3}{4}$ – $4\frac{1}{2}\ \mu$.

Fructifications 4 cm. high.

On dead wood. Cuba. July.

The type of *C. pallida* is a little more densely branched than that of *C. cervina*, but the specimens are so similar in other respects that they can hardly be regarded as different species. Patouillard published the spores as pale ochraceous, but I find them hyaline as seen with the microscope.

Specimens examined:

Cuba: *C. Wright*, 235, type (in Curtis Herb.); *C. Wright*, 256, type of *Clavaria pallida* (in Curtis Herb.).



Fig. 12.
L. cervinum.
Spores, $\times 870$.

7. *L. bicolor* (Peck) Burt, n. comb. Plate 5, fig. 6.

Clavaria bicolor Peck, N. Y. State Mus. Bul. **54**: 954. 1902. Not *C. bicolor* Masee, Kew Bul. **1901**: 154. 1901.—*C. Peckii* Sacc. & D. Sacc. in Sacc. Syll. Fung. **17**: 196. 1905.—*C. vestipes* Peck, N. Y. State Mus. Bul. **116**: 35. 1907.

Type: in N. Y. State Mus. Herb.

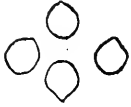


Fig. 13.
L. bicolor.
Spores, $\times 870$.

Fructifications small, 2–2½ cm. high, gregarious; stem slender, 1–2 mm. thick, straight or flexuous, solid, tomentose, pale yellow, divided above into two or more short, orange-colored, compressed branches which are themselves once or twice dichotomously divided; tips acute, concolorous.

Under pine trees. New Hampshire, Massachusetts, and New York. August and September.

The specimens which I have referred to this species are larger in the Massachusetts collection and range from 2½ to 5 cm. high; towards the base the stem is hirsute-tomentose and has dried tawny olive, honey-yellow in the upper portions; the basidia are $45 \times 8 \mu$, with two sterigmata; and the spores are hyaline, even, subglobose, $9\frac{1}{2} \times 8-9 \mu$. Verification by comparison with the type was overlooked.

Specimens examined:

New Hampshire: Chocorua, *W. G. Farlow* (in Farlow Herb.).
Massachusetts: Coolidge Point, Magnolia, *W. G. Farlow*.

8. *L. furcellatum* (Fries) Léveillé, as understood by Patouillard, Jour. de Bot. **3**: 26. *pl. 1. f. 3*. 1889; Léveillé, Ann. Sci. Nat. Bot. III. **5**: 159. 1846 (*Eriocladius*); Sacc. Syll. Fung. **6**: 738. 1888; Not of Berk. & Curtis, Linn. Soc. Bot. Jour. **10**: 330. 1868. Plate 5, fig. 7.

Clavaria furcellata Fries, Linnaea **5**: 531. 1830; Epier. 576. 1838.

Illustrations: Plumier, Filic. Am. *pl. 168. f. L*. 1705; Patouillard, Jour. de Bot. **3**: *pl. 1. f. 3*. 1889.

Fructifications ascending, somewhat ferruginous, with branches solid, repeatedly dichotomous, distant, rather tough, velvety, acuminate.

Fructifications 7–12 cm. high, pallid ferruginous to ochraceous ferruginous. On rotting wood.

The original description, of which the above is a translation, was based upon collections from Guiana by Roxburgh and Brazil by Beyrich, with reference to the same species of a collection from Bourbon Island by Bory, which differed from the South American specimens by decumbent habit, etc.

At the time of publication of *L. furcellatum*, Fries gave only characters sufficient to distinguish this species from an earlier species, *L. tubulosum*, occurring in the same region and having hollow branches. In the course of time several species of



Fig. 14. *L. furcellatum*. Portion of hymenium showing basidia and a hair, *a*; spores, *s*. \times S70. From Colombia coll.

South American *Lachnocladium* with solid stems have been recognized, but I have so far failed to find any study upon the original specimens of *Clavaria furcellata* Fries—if these specimens still exist—which gives their microscopical characters and will decide whether *L. furcellatum* as understood by Patouillard or some other *Lachnocladium* with solid branches, is the true *L. furcellatum* (Fries) Lév. The collection from Santa Marta, Colombia, by C. F. Baker, which he distributed under the name *L. brasiliense* upon my determination, I now regard as agreeing more closely with the original description of *L. furcellatum* than

other specimens which I have seen and it has the additional characters published for *L. furcellatum* by Patouillard.

These specimens are tough and certainly coriaceous rather than fleshy, have dried hair-brown below, with final branchlets pinkish buff, everywhere hairy with weak, hyaline hairs $1\ \mu$ in diameter, which protrude beyond the basidia except along the tips of the branchlets; spores becoming pale ochraceous, even, $7-12 \times 4\frac{1}{2}-6\ \mu$, apiculate.

The specimens of *L. furcellatum* of Berk. & Curtis, Fungi Cubenses, are of two species. That collected in Cuba by C. Wright, 831, is *L. brasiliense*; the other by C. Wright, 839, has small hyaline, even spores $3-4 \times 3\ \mu$ but lacks the radiately branched organs characteristic of *L. brasiliense*.

Specimens examined:

Colombia: Bonda, C. F. Baker, 14, distributed under the name *Lachnocladium brasiliense*.

9. *L. erectum* Burt, n. sp.

Plate 5, fig. 8.

Type: in Ell. & Ev., Fungi Col., 808, copy in Burt Herb.

Fructifications of the type arise in a cluster of three from a common point, soon repeatedly dichotomously branched, with branches erect, close together, coriaceous, compressed, drying drab, clothed with a gray down whose hyphae are $50-200\ \mu$ long; fertile tips of the branches cylindric, flexuous, solid, $\frac{1}{2}-1$ cm. long, bearing the hymenium on all sides; spores very pale yellowish under the microscope, even, $6-7 \times 3-3\frac{1}{2}\ \mu$.



Fig. 15.

L. erectum.

Spores, $\times 870$.

Cluster of fructifications 8 cm. high, $2\frac{1}{2}$ cm. in diameter in the branched portion; individual stems 1 cm. high, about 2 mm. in diameter; branches about 1 mm. in diameter.

On rotten frondose wood. West Virginia. September.

L. erectum may be distinguished from the other species of its genus in the eastern United States by occurrence on a woody substratum, by its slender, erect habit of growth and appressed branches, by the soft, downy pubescence of weak hyaline hyphae which stand out at right angles from the stem and branches, and by the small, oblong, apparently slightly colored spores.

Specimens examined:

Exsiccati: Ell. & Ev., Fungi Col., 808, type distribution under the name *Lachnocladium semivestitum*.

West Virginia: Nuttallburg, L. W. Nuttall, in Ell. & Ev., Fungi Col., 808.

10. *L. Atkinsonii* Bresadola in Atkinson, Jour. Myc. 8: 119. 1902; Sacc. Syll. Fung. 17: 198. 1905.

Type: in Cornell Univ. Herb., 4216.

Fructifications somewhat coriaceous; stem elongated, compressed-caniculate, pallid, tomentose, 5-6 cm. long, 1 cm. thick, somewhat quadrifid at the apex; branches compressed, sulcate, repeatedly verticillate-, or dichotomo-, divided, tomentose on the sterile side, lurid ochraceous; branchlets somewhat terete, furcate at the apex, straw-yellow; spores hyaline or somewhat straw-colored, even, amygdaliform-oblong or somewhat cylindric, $9-10 \times 4\frac{1}{2}-5\frac{1}{2} \mu$; basidia clavate.

Dimensions of the branched portion 6-7 cm. high, 5-6 cm. broad. Blowing Rock, North Carolina. August.

A beautiful species approaching the *Clavariae* but included in *Lachnocladium* on account of having the hymenium unilateral and the stem evidently somewhat waxy.

The above is a translation of the original description of this species of which I have seen no specimens.

11. *L. guadelupense* (Léveillé) Patouillard, Jour. de Bot. 3: 33. pl. 1. f. 7. 1889.

Merisma guadelupense Léveillé, Ann. Sci. Nat. Bot. III. 5: 157. 1846.—*Pterula guadalupensis* (Léveillé) Sacc. Syll. Fung. 6: 742. 1888.

Illustration: Patouillard, *loc. cit.*

Type: in Museum of Paris Herb., according to Léveillé.

Fructification with very short stem, coriaceous, branched; branches very thin, elongated, fastigiata, compressed, dichotomous, becoming fuscous; terminal branchlets very short, naked, acute; spores brown, warty, apiculate at base, $12 \times 6 \mu$.

Stem hardly 1 cm. long.

Guadeloupe.

The above description is a translation of the original description with addition of the spore characters as given by Patouillard. Perhaps the species could be transferred to *Thelephora* with advantage on account of the dark spores; I have seen no specimens. Bresadola includes this species in *Pterula*, in Ann. Myc. 14: 233. 1916, and gives *Pterula aurantiaca* P. Henn. and *P. squarrosa* P. Henn. as synonyms.

12. *L. odoratum* Atkinson, Ann. Myc. 6: 58. 1908; Sacc. Syll. Fung. 21: 436. 1912.

Type: in Cornell Univ. Herb., 18618.

“Plants 8 cm. high, bases clustered and covered with white mycelium, branches yellowish or grayish, becoming brownish where bruised, branching several times dichotomously, ultimate branches tapering, branched at very tip to make short acute points, branches faintly tinged lemon-yellow, brownish red at very tip, all of larger branches suffused with a reddish tinge, and here and there laterally tomentose, and sterile. Spores transparent, $7-10 \times 3\frac{1}{2}-4\frac{1}{2} \mu$.

“C. U. Herb., No. 18618, growing on very much decayed wood, showing long white cords of mycelium. Connecticut, E. A. White.”

The above is the original description. I have seen no authentic specimens but think that they should be compared with *L. Micheneri* and *L. erectum*.

EXCLUDED SPECIES

Pterula setosa Peck, N. Y. State Mus. Rept. 27: 105. 1875, was transferred to *Lachnocladium* by Sacc. Syll. Fung. 6: 740. 1888. Patouillard in Jour. de Bot. 3: 35. 1888, excluded this species from *Lachnocladium*, because its hairiness is due to the elongated sterigmata of the basidia.

(To be continued.)

EXPLANATION OF PLATE

PLATE 5

The figures of this plate have been reproduced natural size from dried herbarium specimens.

Fig. 1. *Lachnocladium brasiliense*. Collected in Cuba by C. Wright, in Curtis Herb.

Fig. 2. *L. cartilagineum*. From the type in Curtis Herb., collected in Cuba by C. Wright, 204.

Fig. 3. *L. Micheneri*. Collected at Newfane, Vermont, by C. D. Howe.

Fig. 4. *L. semivestitum*. From the type in Curtis Herb., collected in Pennsylvania by E. Michener, 1184.

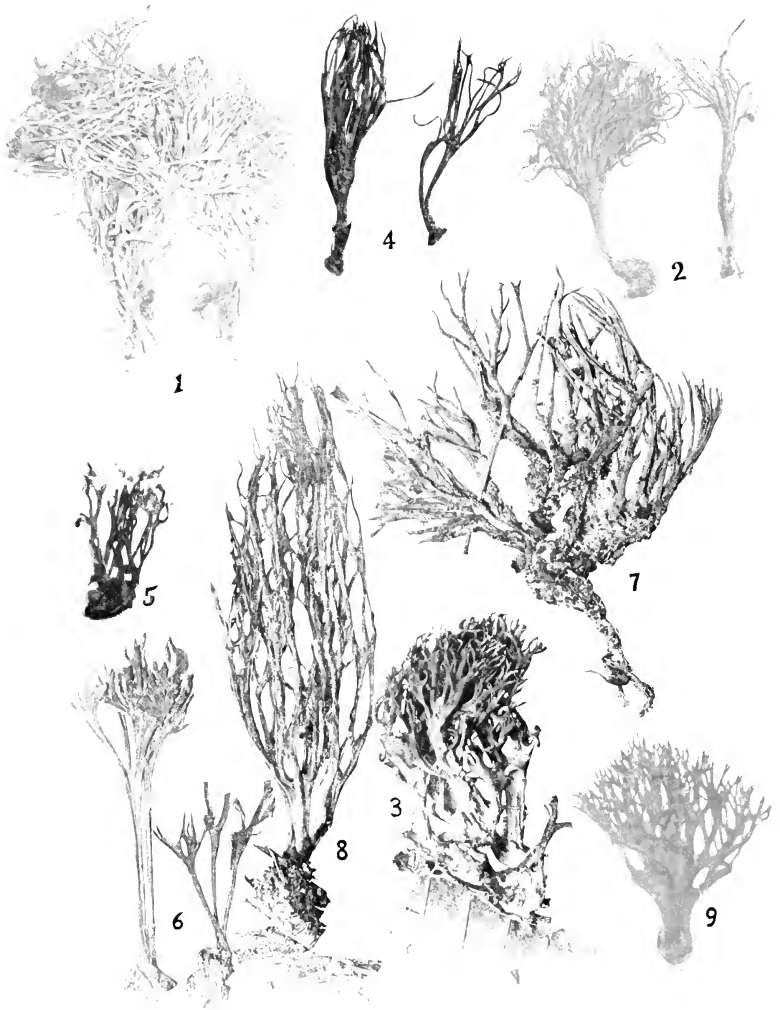
Fig. 5. *L. subsimile*. From the type in Curtis Herb., collected in New Jersey by Laning, 49.

Fig. 6. *L. bicolor*. Collected at Magnolia, Massachusetts, by W. G. Farlow.

Fig. 7. *L. furcellatum*. Collected at Bonda, Colombia, by C. F. Baker, 14.

Fig. 8. *L. erectum*. From the type in Burt Herb., collected at Nuttallburg, West Virginia, by L. W. Nuttall.

Fig. 9. *L. cervinum*. From the type of *Clavaria pallida* in Curtis Herb., collected in Cuba by C. Wright, 256.



BURT—THELEPORACEAE OF NORTH AMERICA

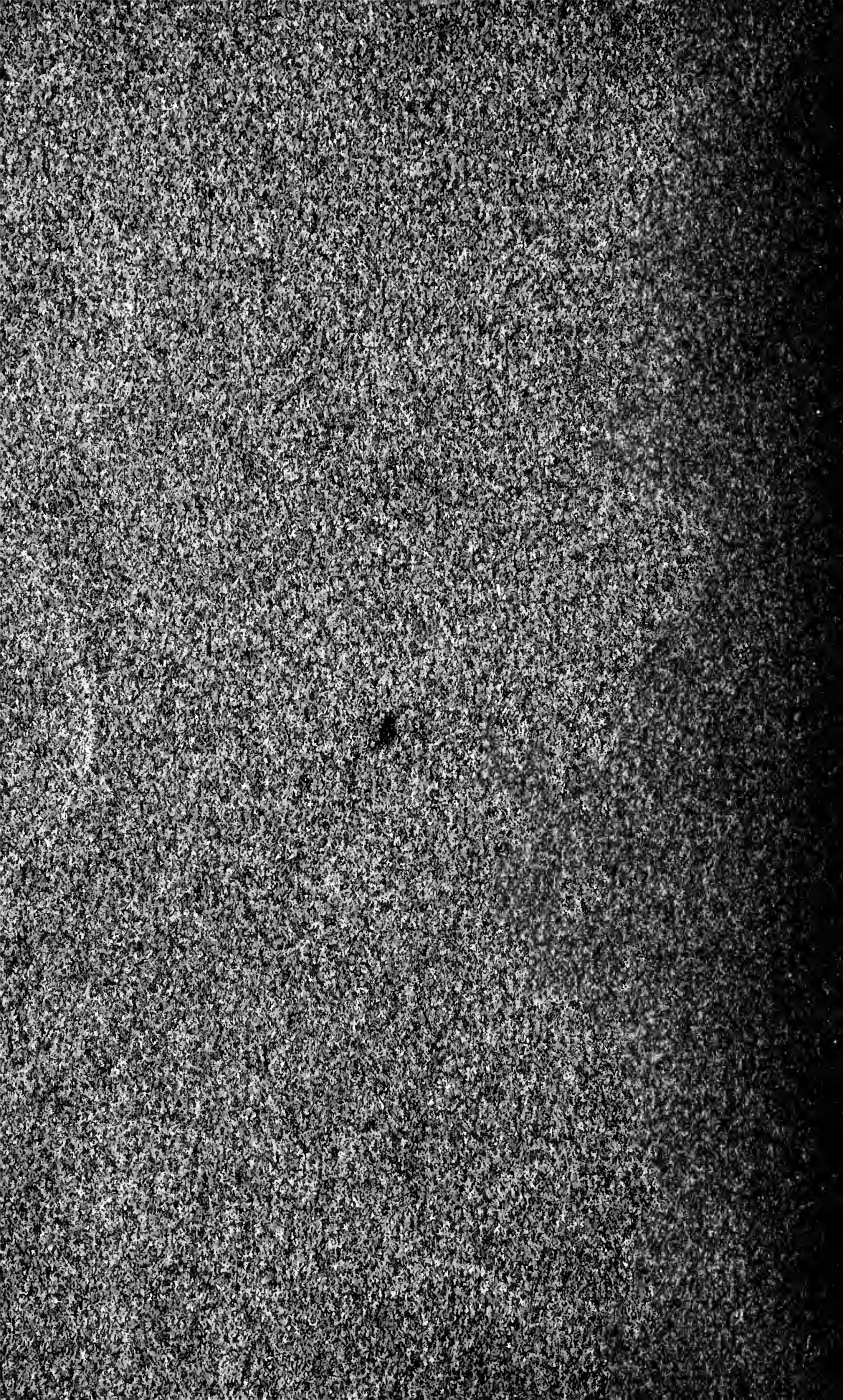
1. LACHNOCLADIUM BRASILIENSE. 2. L. CARTILAGINEUM.—3. L. MICHENERI.—
4. L. SEMIVESTITUM. 5. L. SUBSIMILE. 6. L. BICOLOR.—7. L. FURCELLATUM.—
8. L. ERECTUM.—9. L. CERVINUM.

The Thelephoraceae of North
America. XII

Stereum

EDWARD ANGLIS SUBT

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THE THELEPHORACEAE OF NORTH AMERICA. XII¹

STEREUM

EDWARD ANGUS BURT

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Washington University*

STEREUM

Stereum Persoon, Roemer Neues Mag. Bot. 1:110. 1794; Obs. Myc. 1:35. 1797, and 2:90. 1799; Fries, Obs. Myc. 1:274. 1815, Gen. Hym. 14. 1836, Epicr. 545. 1838; Hym. Eur. 638. 1874; Berkeley, Brit. Fung. 270. 1860; Morgan, Cincinnati Soc. Nat. Hist. Jour. 10:193. 1888; Sacc. Syll. Fung. 6:551. 1888; Masee, Linn. Soc. Bot. Jour. 27:158. 1890; Engl. & Prantl, Nat. Pflanzenfam. (1:1**): 123. 1898.—*B. Sterea* of *Thelephora*, Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1:105. 1822.—*****Stereum* of *Thelephora*, Persoon, Myc. Eur. 1:116. 1822.—Includes *Podoscypha* Patouillard in Duss, Fl. Crypt. Antilles Fr. 230. 1904.—Includes *Lloydella* Bresadola in Lloyd, Myc. Writ. 1. Myc. Notes 6:51. 1901; Sacc. Syll. Fung. 16:1116. 1902.—Includes *Bresadolina* Brinkmann, Ann. Myc. 7:289. 1909.

Fructifications coriaceous to hard, stipitate, dimidiate or effuso-reflexed; hymenium inferior, not containing setae; intermediate layer of longitudinally arranged hyphae normally present; basidia simple; spores white, even—rough in but few instances.

The species mentioned or described as belonging in *Stereum*

¹ Issued Dec. 8, 1920.

upon its publication are *Stereum hirsutum*, *S. striatum*, *S. purpureum*, *S. nitidum*, and *S. rugosum*, no one of which was designated as the type species.

The species of *Stereum* are here arranged in the usual sections of central-stemmed, lateral-stemmed, merismatoid, and dimidiate and effuso-reflexed species; these sections are convenient for locating species approximately, but one should bear in mind that some species are ambiguous with regard to sectional characters; all the species are probably so variable that individuals may be selected from most gatherings which will prove very misleading for study. For example, *Stereum fasciatum* is properly included in the section of effuso-reflexed species, yet fructifications of this species do occur now and then with elongation of the umbo so great as to lead one to regard such a fructification as lateral-stemmed.

While *Stereum* is a large genus in the number of its North American species, its difficulty is not proportional to the number of species, for the species of each of its several sections differ among themselves microscopically in the absence or presence of definite recognizable organs or combinations of organs, such as conducting organs containing latex (milk), vesicular organs, gloeocystidia, cystidia of various kinds, and noteworthy paraphyses. In the determination of any species, one's effort is soon concentrated upon a small group of four or five species of common structure, some of which may be eliminated by geographic range, spore dimensions, etc. The structural features have been very important in working out the extensive multiplication of species which had arisen in this genus through disregard of the work of earlier mycologists.

As heretofore noted in the case of *Hymenochaete*, the east and west range of the species of *Stereum* is marked in comparison with north and south range; of our 77 species, only 7 range over both north temperate and tropical areas; the other 70 may be arranged in two groups, of which the 29 species comprising the northern group are in the region from Canada to the Gulf states; the other 41 species range from the Gulf states southward. The Gulf states are a region in which northern and southern species overlap in range. The excess of tropical and subtropical species over northern species is due to the small number of northern

stipitate and merismatoid species, of which we have only 5 as against 23 in the warmer southern region. The stipitate and merismatoid species grow sometimes on dead wood and sometimes on the ground; all 49 dimidiate and effuso-reflexed species grow on dead wood, causing its decay, and are distributed 24 in the northern and 18 in the southern area, while 7 others are the species already mentioned as ranging over both north temperate and tropical areas.

KEY TO THE SPECIES

- §I. Central-stemmed species.—Pileus more or less infundibuliform, sometimes deeply split on one side, usually stipitate; stem typically central or eccentric but lateral-stemmed forms are also present in many of the species 1
- §II. Lateral-stemmed species.—Pileus dimidiate, flabelliform, or wedge-shaped—never infundibuliform—attenuated at the base into a more or less distinct stem 9
- §III. Merismatoid species.—Pileoli several, somewhat infundibuliform, wedge-shaped, or strap-shaped, borne on or along a common stem 12
- §IV. Sessile species, wholly lacking stem or stem-like base.—Pileus dimidiate-sessile, umbonate-sessile, or reflexed, all growing on wood—many typically reflexed species may sometimes occur wholly resupinate 13

§I. CENTRAL-STEMMED SPECIES

1. Fructifications solitary or gregarious 2
1. Fructifications cespitose 8
2. Species with pileus always more or less infundibuliform, lacking dimidiate or other lateral-stemmed forms 3
2. Species having lateral-stemmed forms occurring more or less frequently in collections 5
3. Neither cystidia nor gloecystidia present; stem not radicated 4
3. Gloecystidia present; growing on the ground, 1½–3 cm. high, 3 mm.–2 cm. in diameter; in South Carolina to Brazil 3. *S. Ravenelii*
3. Gloecystidia present; growing on wood; in West Indies to Dutch Guiana 4. *S. surinamense*
3. Hair-like cystidia present; pileus white, 2–4 cm. high; in New York to Missouri, and in Alabama, Washington and California 10. *S. diaphanum*
3. Hair-like cystidia present; pileus slightly darker than *S. diaphanum*, 3–5 mm. high; in New York 11. *S. exiguum*
3. Hymenial organs unknown; growing on the ground, with stem continued by a long radicated portion which penetrates deeply; in French Guiana 5. *S. macrorrhiza*
4. Growing on wood, 2–15 cm. high and in diameter; upper surface with raised, radial ridges; in Gulf states to Bolivia 1. *S. caperatum*
4. Growing on wood, 6–11 cm. high and in diameter; upper surface not ridged; pileus and stem velvety; in South America 2. *S. hydrophorum*
5. Neither cystidia nor gloecystidia present; pileus cartridge-buff to pinard-yellow when fresh; in New Hampshire to North Carolina and Tennessee, and in Japan 6. *S. Burtianum*
5. Hymenial organs unknown; pileus "straw-colored," 1½ mm. in diameter; stem 4 mm. high; growing on wet ground among moss in Cuba 7. *S. rivulorum*
5. Cystidia present 6
5. Gloecystidia present; no cystidia 7
6. Pileus white, of soft, bibulous texture, 3–5 mm. broad, 5–7 mm. long; on bark and mosses in Cuba 8. *S. quisquiliare*

6. Pileus drying bright yellow, finally fading in the herbarium, of bibulous texture; in West Indies to Paraguay 9. *S. aurantiacum*
6. Pileus drying tawny olive to Saccardo's umber, not of bibulous texture but coriaceous-hard instead; lateral-stemmed forms are the more common; 5 mm.-2½ cm. high, 2-10 mm. broad; in New York to Cuba, and in Wisconsin 12. *S. tenerimum*
7. Somewhat cespitose, obscurely zonate, not bearing a cluster of coarse processes near base of the pileus, 1½-4 cm. high, 8 mm.-3 cm. in diameter; in Ohio and North Carolina to Mexico and West Indies 13. *S. pergamenum*
7. With a crest of coarse hairs or processes towards base of the pileus; pileus 6-10 mm. across; on dead *Vitis* in South Carolina 14. *S. cristatum*
8. Hair-like cystidia more or less numerous but no gloeocystidia; pileus cartridge-buff, strigose-squamose; on the ground, Vermont to North Carolina, and in Europe 15. *S. pallidum*
8. Gloeocystidia barely distinguishable, but no cystidia; pileus plicate on both surfaces, with the upper diamine-brown and the hymenium white; on the ground, Porto Rico to British Guiana 16. *S. elegans*
8. Gloeocystidia present but no cystidia; pileus drying pale cinnamon; on dead wood, Jamaica to Trinidad 17. *S. decolorans*

§II. LATERAL-STEMMED SPECIES

9. Fructifications not cespitose 10
9. Fructifications cespitose; pileate segments pectinate along their margins; on decaying wood, Carolina to Bolivia 24. *S. Hartmanni*
9. Fructifications rarely cespitose, usually gregarious; margin of pileus thick and entire; spores $6 \times 5\mu$, becoming subangular; in Jamaica to Dutch Guiana 18. *S. radicans*
10. Growing on ground; pileus white when fresh, drying smoke-gray, not zonate; spores $4-5\frac{1}{2} \times 3-5\mu$; in West Indies 19. *S. pustolomum*
10. Growing on dead wood; pileus of soft bibulous texture, drying pinkish buff, 3-6 mm. wide, 5-7 mm. long; in Cuba and Porto Rico 23. *S. cyphelloides*
10. Growing on dead wood; pileus not of soft bibulous texture 11
11. Pileus drying Verona-brown to chestnut, minutely velvety; stem velvety; spores $4-5 \times 3-4\mu$; in the West Indies 20. *S. glabrescens*
11. Pileus whitish when living, livid and pellucid upon drying, 4-6 cm. high, with stem ½-1 cm. long; in Guadeloupe 21. *S. flabellatum*
11. Pileus white when fresh, drying "reddish brown," 8-15 mm. long, 3-15 mm. broad, often deeply split into segments; in Brazil 22. *S. fissum*

§III. MERISMATOID SPECIES

12. Densely cespitose and conerescent throughout into a cluster 7 cm. in diameter, with color and aspect of *Tremellodendron pallidum*; in Mexico and Dutch Guiana 25. *S. craspedium*
12. Fructification a sessile, rosette-shaped mass of reddish brown pileate flaps; in San Domingo 26. *S. petalodes*
12. Fructification stipitate, white, with many pileate divisions extending out from a common stem; with aspect of doubled forms of *Thelephora caryophyllea* but white; in Cuba 27. *S. anastomosans*
12. Fructifications cespitose, somewhat creeping by tips of branches becoming attached to the matrix by disks; pileate branches 1-1½ cm. long, 1-2 mm. broad; in Brazil 28. *S. proliferum*

§IV. EFFUSO-REFLEXED SPECIES

13. Hyaline, flexuous gloeocystidia conspicuous in the subhymenium and hymenium 15
13. Pyriform, vesicular organs present in trama, subhymenium, or hymenium 16
13. Colored conducting organs in trama, subhymenium, or hymenium; cystidia absent; hymenium bleeds when wounded, if in vegetative condition. *S. hirsutum* and *S. rameale* sometimes have occasional colored conducting organs in the hymenium 17

13. Not having gloecystidia, vesicular organs, nor colored conducting organs. . . 14
14. Hymenium lacking cystidia and paraphyses of noteworthy form or color. 18
14. Cystidia present, incrustated or without incrustation and hair-like, hyaline, or colored. 22
14. Paraphyses noteworthy by bottle-brush form, branching, or color. For species having cystidia in addition to noteworthy paraphyses, see 27. 28
15. Coriaceous, dense, tawny, zonate, not sulcate, thin, 5-10 mm. in diameter; in Jamaica. 29. *S. caespitosum*
15. Soft, spongy, snuff-brown to bistre, concentrically sulcate, reflexed 1-4 cm.; of wide range. 30. *S. fuscum*
15. Coriaceous-fleshy, bursting out from the bark, wart-like, peltate, vinaceous-brown, 2-4 mm. in diameter; no cystidia; on poplar. 31. *S. rufum*
15. Coriaceous-cartilaginous, shield-shaped, wood-brown, 1-4 mm. in diameter; cystidia present; on pine. 32. *S. Pini*
16. Coriaceous-soft, tomentose, lacking cystidia. 33. *S. purpureum*
16. Coriaceous-soft, tomentose, often with hairs becoming agglutinate into a rugose surface; hair-like cystidia present. 34. *S. rugosiusculum*
16. Corky, usually resupinate, sometimes reflexed and with the upper side a horny crust; vesicular bodies very numerous. 35. *S. Murrayi*
16. Stony hard throughout, the cut surface with a horn-like luster, 1-5 mm. thick; vesicular bodies few; in Mexico and Jamaica. 36. *S. saxitza*
17. Exuding a yellow milk, conducting organs of pale color; narrowly reflexed, tomentose; on *Liquidambar* and *Carpinus* in North Carolina and Alabama. 37. *S. styracifluum*
17. Milk red, conducting organs dark, numerous; fructifications cespitose-imbriated, villose to hirsute, tobacco-colored; on oak, Canada to Alabama and westward. 38. *S. gausapatum*
17. Milk red, conducting organs few; fructifications tomentose, concentrically sulcate, not cespitose; Florida to Brazil. 39. *S. australe*
17. Milk red, conducting organs dark, numerous; fructifications narrowly reflexed; hymenium multizonate; on frondose species, Newfoundland to North Carolina. 40. *S. rugosum*
17. Milk red, conducting organs numerous; on pine, spruce, and hemlock, Canada to Pennsylvania and westward to the Pacific coast. 41. *S. sanguinolentum*
18. Fructifications sulphur-colored, fading to cartridge-buff; intermediate layer not bordered by a golden, denser zone; Georgia to Brazil, and in Germany. 42. *S. sulphuratum*
18. Fructifications at first some shade of buff by reason of the hairy covering, becoming grayish with age, and at length often zonate and shining where disappearance of the hairy covering reveals the hardened, colored surface of the intermediate layer. 19
18. Fructifications white or whitish to cartridge-buff. 20
18. Fructifications snuff-brown or black above. 21
19. Effuso-reflexed, cream-buff at first, strigose-hirsute; hymenium warm buff, sometimes pale smoke-gray; intermediate layer bordered by a narrow golden zone; colored conducting organs rarely present in the hymenium; Newfoundland to South Carolina and westward to the Pacific coast. 43. *S. hirsutum*
19. Effuso-reflexed at first, becoming umbonate-sessile, tomentose, sometimes with the tomentum becoming torn into narrow concentric bands and showing the bared surface chestnut in the furrows; margin not normally lobate; fructifications 2-7 cm. in diameter; common throughout North America. 44. *S. fasciatum*
19. Wedge-shaped to umbonate-sessile, with a thinner covering of tomentum than *S. fasciatum*, becoming more bared and zonate than the latter, thinner and flexible, and with the margin normally cut into 2 or 3 large lobes; New York and Wisconsin southward to Brazil. 45. *S. lobatum*
19. Covering of silky, villous fascicles arranged radially, becoming glabrous, shining, and radially ridged, not lobed nor folded together laterally, nor crisped; Florida to Dutch Guiana. 46. *S. versicolor*
19. Pilei 2-10 mm. long and broad, crowded together and folded or crisped, strigose-hairy towards the base; marginal portion shining and zoned,

- cinnamon-buff to hazel; colored conducting organs occasionally present
47. *S. rameale*
20. Fructifications 1-1½ cm. in diameter, plane, thin, papery, silvery to pale gray and with a silky luster; common on *Carpinus*, Canada, eastern United States to Mexico.48. *S. sericeum*
20. Fructifications 3-10 mm. in diameter, pubescent, white.49. *S. pubescens*
20. *S. ochroleucum*, an imperfectly known species of Europe, formerly reported in America, belongs here. For description of authentic specimen, see "species imperfectly known."
20. Fructifications 2-4 mm. in diameter, conical, attached by the vertex and pendant, villose; Cuba50. *S. conicum*
21. Tobacco-colored, velvety-hirsute, becoming glabrous towards the margin and exposing the blackish, horny crust of the intermediate layer; hymenium pruinose; spores 4-5×2½-3μ; West Indies51. *S. vibrans*
21. Villose, blackening; intermediate layer not bordered by a crust; spores 9×4μ; Mexico52. *S. crassum*
21. Velutinous and black above; coloring matter of intermediate layer dissolved by KHO solution; hymenium ferruginous, radiately ridged; on coniferous wood, in northern United States53. *S. radiatum*
22. Cystidia hyaline, non-incrusted, hair-like 23
22. Cystidia dark, or becoming dark, cylindric, obtuse, distinguishable from colored conducting organs by more or less granule-incrustation; on conifers only 24
22. Cystidia rough-walled or incrusted, somewhat colored either wholly or under the incrustation, pointed, not resembling conducting organs 25
22. Cystidia incrusted, not at all colored except in *S. cinerascens* at times; paraphyses not noteworthy 26
22. Cystidia incrusted, not colored; paraphyses noteworthy by color or form 27
23. Cinnamon to bone-brown, hoary; hair-like cystidia very few; spores 9-10×3-4μ; Washington to New Mexico54. *S. patelliforme*
23. White, villose-tomentose; hymenium bright yellow; hair-like cystidia obtuse, 20-25×4-6μ, numerous55. *S. ochraceo-flavum*
24. Coriaceous-spongy, dry, usually resupinate; hymenium pruinose, multizonate; cystidia colored, cylindric, 90-150×6-8μ; spores 9-13×4-5μ; northern United States56. *S. abietinum*
24. Very thick, felty, concentrically sulcate, drying with odor of anise; cystidia and basidiospores like those of *S. abietinum*; colored imbedded spores often present; Rocky Mountain states57. *S. rugisporum*
24. Narrowly reflexed, tomentose, Prout's brown; hymenium amber; cystidia and spores as in *S. abietinum*; Vermont and New York58. *S. ambiguum*
25. Vinaceous-lilac when young, becoming snuff-brown; cystidia colored, even, rough-walled or incrusted, 100-200×6-10μ; from North Carolina and Ohio southward59. *S. umbrinum*
25. Coriaceous-papery, thin, pliant, tomentose, concentrically sulcate, snuff-brown; hymenium velvety, snuff-brown, not multizonate; cystidia colored under the incrustation, conical, 30-75×12-25μ; Florida to Brazil.60. *S. papyrinum*
25. With aspect of *S. papyrinum* but thinner; cystidia 45-60×5-12μ; hymenial layer 200μ thick; Jamaica61. *S. Earlei*
25. Coriaceous, tomentose, concentrically sulcate, hair-brown; cystidia slightly colored, roughened above, 50-120×4½μ; on conifers, northern United States and Canada, and in Rocky Mountains62. *S. Chailletii*
25. Corky, usually resupinate, 1100μ thick; hymenium drab, 600μ thick, containing innumerable, colored, rough cystidia 20-25×5-7μ; West Indies63. *S. ferreum*
26. Strigose-hairy, concentrically sulcate, buff, weathering gray; hymenium pinkish buff to drab, bristling with cystidia 100-150×12-20μ, sometimes brownish at the base; spores 10-12×6μ.64. *S. cinerascens*
26. Coriaceous-gelatinous, small, whitish; cystidia 45-90×12-15μ; spores 15-20×12-14μ; Jamaica65. *S. magnisporum*

26. Spongy-soft, tomentose; cystidia 36-60×9-12 μ ; spores 5-9×3-4 μ ; New York to Mexico. 66. *S. spumeum*
26. Bursting out from the bark, forming a gray hymenium and becoming reflexed, 1-2½ mm. in diameter. 67. *S. erumpens*
26. Corky, rigid, concentrically sulcate, bister; hymenium ruddy, becoming zonate; cystidia 30-50×8-12 μ ; spores 4-6×3-5 μ ; on hemlock and other conifers, Canada to Texas and westward to the Pacific coast. 68. *S. sulcatum*
26. Tobacco-colored and sulcate above, with a horn-like crust under the tomentum; hymenium whitish; cystidia 30-36×7 μ ; on oak, North Carolina and Ohio to Mexico. 69. *S. subpileatum*
27. With aspect of *S. subpileatum* as given above, but hymenium contains numerous and conspicuous bottle-brush paraphyses in addition to cystidia; Pennsylvania to Colombia. 70. *S. sepium*
27. With brown, velvety hymenium and a white margin; paraphyses filiform, colored; spores hyaline, 6-11×3-4½ μ 71. *S. albobadium*
27. With aspect of dark specimens of *S. albobadium*, but with thicker, zonate hymenium and imbedded spores colored; Oregon to Mexico. 72. *S. heterosporum*
27. Becoming narrowly reflexed, fuscous, 2-10 mm. in diameter; hymenium velvety, bister; paraphyses colored, with bushy-branched tips; Canada to Alabama and Arkansas. 73. *S. versiforme*
28. Snuff-brown and sulcate above, tomentose; hymenium pruinose, zoned, containing bottle-brush paraphyses; on oak, Florida and Venezuela. 74. *S. insigne*
28. Fuscous, sulcate, not tomentose but with upper surface a horn-like crust, 2-3 mm. thick; Mexico. 75. *S. durum*
28. Woody, resupinate, crowded as if confluent and then broken into frustules, 2-4 mm. in diameter, above black and crust-like; hymenium pinkish buff to whitish and pruinose; on oak. 76. *S. frustulosum*
28. Usually resupinate, coriaceous-soft; hymenium light vinaceous-purple when young, becoming avellaneous, containing filiform paraphyses with short lateral prongs; aspect of *Corticium evolvens*; Canada to North Carolina. 77. *S. roseo-carneum*

1. *Stereum caperatum* (Berk. & Mont.) Masee, Linn. Soc. Bot. Jour. 27: 161. 1890; Lloyd, Myc. Writ. 4. Stip. Stereums, 17. text f. 531. 1913. Plate 2, fig. 1.

Thelephora caperata Berkeley & Montagne, Ann. Sci. Nat. Bot. III. 11: 241. 1849; Montagne, Syll. Crypt. 175. 1856; Sacc. Syll. Fung. 6: 523. 1888.

Illustrations: Lloyd, *loc. cit.*; Engl. & Prantl, Nat. Pflanzenfam. (1: 1**): 124. f. H-J.

Type: in Kew Herb.

Pileus coracelous, infundibuliform, drying pinkish buff, the upper side with elevated radial ridges and usually densely tomentose with coarse fibers; in structure 600-700 μ thick, composed of densely, longitudinally arranged, thick-walled, hyaline hyphae 3 μ in diameter; stem central or sometimes absent, with attachment by a tomentose disk; hymenium pale pinkish buff, somewhat radially rugose, glabrous; hair-like cystidia not incrustated, 3-4½ μ in diameter. flexuous, often constricted near the outer end,

protruding up to 12 μ , are sometimes present; spores hyaline, even, 8-10 \times 3-4 $\frac{1}{2}$ μ .

Fructifications 2-10 cm. high, 2-15 cm. in diameter; stem, when present, 5 mm. - 2 cm. long, 2-5 mm. thick, often sessile.

On decaying wood of frondose species. Florida, Louisiana, and West Indies to Bolivia. June to April, probably throughout the year. Common.

S. caperatum is the largest infundibuliform *Stereum* of the Gulf states and the West Indies. Its large size, upper surface with elevated, radial ridges and usually heavy tomentum of coarse fibers, occurrence on wood to which it is attached by a villose or tomentose disk, constitute a group of characters by which the *S. caperatum* is readily recognized. Lloyd has published in his account of this species that it has true metuloids (incrusted cystidia) projecting 20-30 μ , but I have found none whatever in either the type or in other collections referable to this species.

Thelephora lamellata Berk. & Curtis, a species of *Stereum* related to *S. caperatum* and of rather similar aspect, occurring on islands of the Pacific, shows in the type specimen from Fiji Islands conical incrusted cystidia 6-12 μ in diameter, protruding 12-25 μ , and subglobose spores 3-3 $\frac{1}{2}$ \times 3 μ . Since Lloyd cited *S. caperatum* as occurring in Samoa, the Philippines, and Australia, it is possible that his observations on incrusted cystidia of *S. caperatum* were based on specimens from the Pacific region really referable to *Stereum lamellatum* rather than on the true *S. caperatum* from the American continent. In Hedwigia 53:75, 1913, Bresadola gives *T. lamellata* as a synonym of *Cladoderris infundibuliformis* (Kl.) Fries. I have seen no American specimens referable to *S. lamellatum*.

Specimens examined:

Florida: New Smyrna, A. S. Bertolet; Ocala, W. H. Long, 12373 (in Mo. Bot. Gard. Herb., 55125).

Louisiana: A. B. Langlois, comm. by C. G. Lloyd, 2740; St. Martinville, A. B. Langlois, 2896 and an unnumbered specimen, C. J. Humphrey, 2518 (in Mo. Bot. Gard. Herb., 5111).

Cuba: C. Wright, 290, 509 (in Kew Herb.); Candelaria, Earle & Wilson, 201; Guantanamo (in Weir Herb., 10858);

Havana Province, *P. Wilson*, 1172, comm. by F. S. Earle; Herradura, *Earle & Murrill*, 180, comm. by N. Y. Bot. Gard. Herb.

Porto Rico: Manati, *Johnston & Stevenson*, 2006 (in Mo. Bot. Gard. Herb., 3396).

San Domingo: 259 (in Kew Herb.).

Jamaica: Cinchona, *L. M. Underwood*, 3172 (in N. Y. Bot. Gard. Herb. and in Mo. Bot. Gard. Herb., 56271); Cockpit Country, *E. G. Britton & D. W. Marble*, 338 (in N. Y. Bot. Gard. Herb.).

St. Kitts: Lambert Estate, *N. L. Britton & J. F. Cowell*, 672 (in N. Y. Bot. Gard. Herb.).

Brazil: Bahia, *Blanchet*, 19 (in Kew Herb.).

Bolivia: Yungas, *A. Miguel Bang*, 295 (in Mo. Bot. Gard. Herb.).

2. *S. hydrophorum* Berkeley, Ann. & Mag. Nat. Hist. I. 14: 327. *pl. 9. f. 2.* 1844; Hooker's Jour. Bot. 8: 273. *pl. 6.* 1856; Sacc. Syll. Fung. 6: 555. 1888; Masee, Linn. Soc. Bot. Jour. 27: 159. 1890; Lloyd, Myc. Writ. 4. Stip. Stereums, 29. *text f. 547, 548.* 1913. Plate 2, fig. 2.

Hymenochaete crateriformis P. Hennings, Hedwigia 43: 172. 1904; Sacc. Syll. Fung. 17: 166. 1905.

Illustrations: Ann. & Mag. Nat. Hist. I. 14: *pl. 9. f. 2;* Hooker's Jour. Bot. 8: *pl. 6;* Lloyd, *loc. cit.*

Type: in Kew Herb.

Pileus stipitate, coriaceous, infundibuliform, drying Prout's brown, obscurely zonate, velvety, sometimes bearing large, branched hairs at the center and bottom of the cups, the margin entire; stem central, cylindric, solid, velvety, colored like the pileus, enlarged at the base and attached by disk; hymenium even, drying snuff-brown, not setulose; in structure 600 μ thick, composed of intermixed and interwoven hyaline and slightly colored hyphae, the latter of which give their color to the pileus and hymenium and curve into the hymenium as cylindric, obtuse, slightly colored paraphyses 3 μ in diameter, not emergent above its surface; no cystidia, gloeocystidia, nor setae; spores hyaline, globose, even, 3 μ in diameter.

Pileus 4–10 cm. in diameter, 3–6 cm. deep; stem 3–5 cm. long, 4–5 mm. thick.

On wood on the ground. Venezuela, British Guiana, and Brazil. November.

This South American species ranges so far to the north that it may possibly occur also in the West Indies or Central America. The fructifications have dimensions and general aspect of those of *S. caperatum* but are distinguishable by darker color of pileus, stem and hymenium, by velvety covering of pileus and stem, and by absence of elevated longitudinal ridges on the surface of the pileus.

Specimens examined:

Exsiccati: Ule, Myc. Brasil., 40, type distribution of *Hymenochaete crateriformis*.

Venezuela: Maripa, *M. A. Carriker*, comm. by W. G. Farlow, III; Rio Mato, *M. A. Carriker*, comm. by W. G. Farlow, IV.

Brazil: *Spruce* (in Curtis Herb.); Amazonas, Marmellos, *E. Ule*, in Ule, Myc. Brasil., 40.

3. *S. Ravenelii* Berk. & Curtis, *Grevillea* 1: 162. 1873; *Sacc. Syll. Fung.* 6: 552. 1888; *Massee, Linn. Soc. Bot. Jour.* 27: 164. *pl. 7. f. 2.* 1890; *Lloyd, Myc. Writ.* 4. *Stip. Stereums*, 25. *text f. 543.* 1913. Plate 2, fig. 3.

Illustrations: *Lloyd, loc. cit.*; *Massee, loc. cit.*

Type: type distribution in *Ravenel, Fungi Car.* 4: 13.

Fructifications gregarious, coriaceous, thin, often growing from a common mycelium; pileus infundibuliform, sometimes split on one side, even, drying cinnamon-buff to bay, often shining and zonate; stem slender, equal, minutely tomentose, drying pale olive-buff to pinkish buff; hymenium even, glabrous, colored like the stem; pileus in section 300–500 μ thick, composed of densely and longitudinally arranged hyaline hyphae 3 μ in diameter; flexuous gloeocystidia 30–60 \times 4½–7 μ curve into the hymenium but do not protrude above its surface; no cystidia; spores hyaline, even, 3–4 \times 2½–3 μ .



Fig. 1.
S. Ravenelii.
Gloeocystidia \times
665.
From authentic
specimen.

Fructifications 1½–5 cm. high, 3 mm.–3 cm. in diameter; stem 5–10 mm. long, ½–1½ mm. thick.

On the ground, rarely on wood humus. South Carolina to Mexico, West Indies, and Brazil. July to April.

S. Ravenelii is near *S. pergamenum* in microscopic characters but is constantly infundibuliform, with slender, more conspicuous stem, and occurs on the ground except very rarely, and is gregarious rather than cespitose. The range of *S. Ravenelii* southward to Brazil is so much greater than has been noted heretofore that it would be well to compare with it authentic specimens of some of the imperfectly described South American species of central-stemmed *Stereums*

Specimens examined:

Exsiccati: Ravenel, Fungi Car. 4: 13.

South Carolina: *H. W. Ravenel*, in Ravenel, Fungi Car. 4: 13, type distribution.

Alabama: *Beaumont*, 207 in part (the small specimens on right of the card in Curtis Herb., 4629); *Montgomery*, *R. P. Burke*, 26, 181 (in Mo. Bot. Gard. Herb., 10305, 57059).

Louisiana: *Baton Rouge*, *C. W. Edgerton*, 1544, and *C. J. Humphrey* & *C. W. Edgerton*, comm. by *C. J. Humphrey*, 2523, 2522 (in Mo. Bot. Gard. Herb., 42921 and 42939 respectively); *St. Martinville*, *A. B. Langlois*, 1847.

Mexico: *San Luis Potosi*, *C. G. Pringle* (in Farlow Herb.).

Cuba: *C. Wright*, 255 (under the name *Stereum elegans* in Curtis Herb.); *Candelaria*, *Earle & Wilson*, 205, 207; *Herradura*, *N. L. Britton*, *E. G. Britton*, *F. S. Earle* & *C. S. Gager*, 6397 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56303).

Trinidad: *Carrengo*, *Carriker* (in Farlow Herb., 1).

Brazil: *Blumenau*, *A. Möller*, the *Stereum elegans* of *Hedwigia* 35: 288. 1896, comm. by *G. Bresadola*.

4. *S. surinamense* *Léveillé*, Ann. Sci. Nat. Bot. III. 2: 209. 1844; *Sacc. Syll. Fung.* 6: 556. 1888; *Massee*, Linn. Soc. Bot. Jour. 27: 161. 1890; *Lloyd*, Myc. Writ. 4. Stip. Stereums, 26. text f. 544. 1913. Plate 2, fig. 4.

Stereum fulvo-nitens *Berkeley*, Ann. & Mag. Nat. Hist. II. 9: 198. 1852; *Sacc. Syll. Fung.* 6: 556. 1888; *Massee*, Linn. Soc. Bot. Jour. 27: 162. 1890.

Illustrations: *Lloyd*, loc. cit.

Type: in Museum of Paris Herb. presumably.

Pileus coriaceous, infundibuliform, sometimes more elongated on one side, glabrous, shining, lineate or striate, drying tawny to hazel, faintly zonate with numerous very narrow zones; stem central or eccentric, cylindric, drying avellaneous to burnt umber, fibrillose to minutely tomentose, attached at the base by a mycelial pad; hymenium glabrous, even, avellaneous to cinnamon; pileus in section $400\ \mu$ thick, composed of a broad layer of densely and longitudinally arranged, thick-walled, hyaline hyphae $3\ \mu$ in diameter and of a hymenial layer $45\text{--}90\ \mu$ thick, the subhymenial portion of which may become thicker than the palisade layer of basidia and gloeocystidia and appears granular and composed of very fine hyphae; gloeocystidia $15\text{--}30\ \mu$ long, with ventricose base $6\text{--}9\ \mu$ in diameter, sometimes barely emergent above the basidia; spores hyaline, even, $3\text{--}4 \times 2\text{--}3\ \mu$.

Fructifications $1\frac{1}{2}\text{--}4$ cm. high, $1\text{--}2\frac{1}{2}$ cm. in diameter; stem $3\text{--}7$ mm. long, about $1\frac{1}{2}$ mm. in diameter.

On dead wood. West Indies, Honduras, and Dutch Guiana. November.

Lloyd's account and figures have made possible the reference to *S. surinamense* of the collections cited below, for the original description by Léveillé is fragmentary and does not even note whether the specimens were growing on the ground or on wood. I have not seen the types of either *S. surinamense* or *S. fulvomitens*. The specimens cited below are characterized by the attachment to the wood by a conspicuous mycelial pad, by rich hazel and shining upper surface of the large, narrowly zonate pileus, by the gloeocystidia, and by the minutely granular subhymenial region in which the hyphae are much finer than in the main hyphal layer and run at right angles to the latter.

Specimens examined:

San Domingo: Consuelo, *N. Taylor*, 176 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56293).

Trinidad: *R. Thaxter*, comm. by W. G. Farlow (in Mo. Bot. Gard. Herb., 44304).

British Honduras: *M. E. Peck* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56326).

5. ***S. macrorrhizum*** (Léveillé) Lloyd, Myc. Writ. 4. Stip. Stereums, 28. 1913.

Thelephora macrorrhiza Lévillé, Ann. Sci. Nat. Bot. III. 5: 146. 1846; Sacc. Syll. Fung. 6: 524. 1888.

Type: in Museum of Paris Herb., according to Lévillé and Lloyd.

Pileus infundibuliform, coriaceous, somewhat membranaceous, rufescent, striatulate, the margin erect, possibly lacinate; hymenium sulcate, rather pallid; stem rather long, radicated.

On ground, French Guiana. Coll. *Melinon*.

Pileus coriaceous, nearly membranaceous, infundibuliform, russet, with rugosity from base to margin, the latter thin, lacinate; hymenium glabrous, rugose like upper surface of pileus; stem 1–2 decimeters long, glabrous, continued by a long radicated portion which extends perpendicularly into the ground. This character and also the absence of hairy covering of the stem afford a great difference between this species and *Stereum surinamense*.

The above is a translation of the original description. I have not seen authentic specimens; Lloyd notes, *loc. cit.*, that they are, "*Stereum elegans*, of an unusually regular growth. Not so confluent as ordinary."

6. S. Burtianum Peck, N. Y. State Mus. Bul. 75: 21. *pl. O. f. 30–34*. 1904; Sacc. Syll. Fung. 17: 163. 1905; Lloyd, *Myc. Writ.* 4. *Stip. Stereums*, 21. *text f. 537*. 1913. Plate 2, fig. 5.

Illustrations: Peck, *loc. cit.*; Lloyd, *loc. cit.*

Type: in N. Y. State Mus. Herb. and in Burt Herb.

Fructifications gregarious, coriaceous, thin, infundibuliform, sometimes split to the stem on one side, sometimes dimidiate, the upper surface slightly uneven with radiating fibrils and fibrillose ridges, cartridge-buff when fresh, drying Sayal-brown to hazel, the margin lobed or incised; stem solid, minutely tomentose, Sayal-brown in the herbarium; hymenium even or radiately uneven, glabrous, yellow ocher to pinard-yellow when fresh, becoming pinkish buff to Sayal-brown in the herbarium; pileus in section 600 μ thick, composed of densely and longitudinally arranged hyphae 2 μ in diameter; no cystidia nor gloeocystidia; spores hyaline, even, subglobose, 3–4 μ in diameter, or 4 \times 3 μ .

Fructifications usually 12–20 mm. high, 5–15 mm. in diameter; stem 3–8 mm. long, $\frac{2}{3}$ –1 $\frac{1}{2}$ mm. thick.

On the ground in frondose woods. New Hampshire to North Carolina and Tennessee, and in Japan. July to October.

Distinguishing characters of this species are the radially arranged fibrils and fibrillose ridges of the upper surface of the pileus, bright yellow hymenium of fresh specimens, small subglobose spores, and absence of zonation, cystidia, and gloeocystidia. These characters separate the species from *S. aurantiacum* and *S. Ravenelii* and from specimens of *S. diaphanum* which have become discolored in the herbarium. The sections crush out and tissues spread apart when slight pressure is applied to the cover glass—a character unusual in stipitate Stereums. The specimen from Tennessee consists of two dimidiate pilei $2 \times 2\frac{1}{2}$ cm. At Amherst, Massachusetts, Professor Anderson saw perhaps a thousand fructifications of this growing in an area of a square rod; to him I am indebted for the color observations on fresh specimens and for specimens in growing condition showing the colors and also the fact that the consistency of the pileus is not fleshy enough for inclusion of this species in *Craterellus*.

Specimens examined:

New Hampshire: Chocorua, *W. G. Farlow*, three collections (two of which are in Mo. Bot. Gard. Herb., 55242 and 55571, and the third in Farlow Herb.).

Vermont: Lake Dunmore, *W. G. Farlow* (in Farlow Herb.).

Massachusetts: Amherst, *P. J. Anderson* (in Mo. Bot. Gard. Herb., 56364, 56365).

New York: Shokan, Ulster Co., *C. H. Peck*, type.

North Carolina: Asheville, *H. C. Beardslee*, 2.

Tennessee: Elkmont, *C. H. Kauffman*, 80 (in Mo. Bot. Gard. Herb., 44994).

Japan: Sendai, *A. Yasuda*, 21 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56290).

7. *S. rivulorum* Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 330. 1868; Sacc. Syll. Fung. 6: 552. 1888; Masee, Linn. Soc. Bot. Jour. 27: 167. 1890; Lloyd, Myc. Writ. 4. Stip. Stereums, 21. 1913.

Type: in Kew Herb. and probably in Curtis Herb.

I failed to take any notes of the type specimens of this species

when there was opportunity and have seen no collections which seem referable here. The translation of the original description follows:

Minute, straw-colored; pileus cyathiform, decurrent into a stem dilated above, the margin undulate; hymenium glabrous.

On wet ground amongst moss. Cuba, *C. Wright*, 533.

Pileus $1\frac{1}{2}$ mm. across; stem 4 mm. high, oblique but not really lateral. Habit of a small stipitate *Peziza*. Spores globose, $2-2\frac{1}{2}$ μ according to Masee.

8. *S. quisquiliare* (Berk. & Curtis) Lloyd, Myc. Writ. 4. Stip. Stereums, 36. *text f.* 567. 1913. Plate 2, fig. 6.

Thelephora quisquiliaris Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 329. 1868; Sacc. Syll. Fung. 6: 524. 1888.

Illustrations: Lloyd, *loc. cit.*

Type: in Kew Herb. and Curtis Herb.

Pileus very small, flabellate or rarely cyathiform, tomentose, shining white; stem lateral, short, thickened above; pileus in section composed of loosely arranged hyphae 3-4 μ in diameter; cystidia hair-like, not incrustated, 6 μ in diameter, protruding up to 40 μ beyond the basidia; spores hyaline, even, $4 \times 3-4$ μ .

Pileus 3-5 mm. broad, and 5-7 mm. long including the stem-like base.

On particles of bark among moss and on mosses. Cuba.

The fructifications of *S. quisquiliare* are small and of soft bibulous texture and resemble in aspect those of *S. cyphelloides* and *Cyphella muscigena*, but are distinguished from both these species by the hair-like cystidia, of which I noted the presence upon examination of the type but which no longer show well in the permanent microscopical preparation. I had hoped that recent collections would confirm the note as to hair-like cystidia and enable me to be more confident that *Thelephora quisquiliaris* should not be transferred to *Cyphella*.

Specimens examined:

Cuba: *C. Wright*, 519, type (in Curtis Herb.).

9. *S. aurantiacum* (Pers.) Lloyd, Myc. Writ. 4. Stip. Stereums, 22. *text f.* 538. 1913. Plate 6, fig. 7.

Thelephora aurantiaca Persoon in Gaudichaud, Voy. Urania Bot. 176. 1827; Fries, Epier. 536. 1838; R. Soc. Sci. Up-

sal. Actis III. 1: 108. 1851; Montagne in d'Orbigny, Voy. Am. Merid. Bot. 2: 48. 1839; in Ramon de la Sagra, Fl. Cub. 4: 228. *pl. 14. f. 1.* 1853; Berkeley & Curtis, Linn. Soc. Bot. Jour. 10: 328. 1868; Sacc. Syll. Fung. 6: 526. 1888.—*T. sericella* Berkeley & Curtis, Linn. Soc. Bot. Jour. 10: 328. 1868; Sacc. Syll. Fung. 6: 522. 1888.—*T. affinis* Berkeley & Curtis, Linn. Soc. Bot. Jour. 10: 329. 1868 (not *T. affinis* Pers.); Sacc. Syll. Fung. 6: 530. 1888.—*Podoscypha aurantiaca* (Pers.) Patouillard in Duss, Fl. Crypt. Antilles Fr. 230. 1904.—An *T. spectabilis* Lévillé, Ann. Sci. Nat. Bot. III. 2: 206. 1844?—An *Stereum xanthellum* Cooke, Grevillea 9: 12. 1880?

Illustrations: Lloyd, *loc. cit.*; Montagne, *loc. cit.*

Fructifications coriaceous, soft, everywhere drying Naples-yellow, losing the bright color in the herbarium; upper surface sericeous, lineate-striate, the margin variable, often somewhat fimbriate; stem thin, with yellowish tomentum at the base and sometimes with tomentose mycelial strands; hymenium even, or nearly so, setulose with hyaline hairs under a lens; cystidia hair-like, not incrustated, cylindric, obtuse, 6–8 μ in diameter, protruding up to 40 μ ; spores hyaline, even, 5–8 \times 3–4 μ .



Fig. 2.
S. aurantiacum.
Cystidium, basidia, and spores,
 $\times 665$.

Fructifications 2–3 cm. high; pileus 1–2 cm. in diameter when infundibuliform and 5 mm.–4 cm. when flabelliform; stem 1 cm. long, about 1 mm. thick.

On ground and dead wood. West Indies to Paraguay. June to February. Apparently frequent.

S. aurantiacum is unique among the stipitate Stereums by its bright yellow color. Lloyd states that old specimens may lose their bright yellow color and become brown, and the figures by Montagne indicate this also. I have seen only one gathering in which some of the specimens have discolored brownish; this gathering from Porto Rico, by Prof. Stevenson, bears the field note: "nearly pure white when collected; became yellow in drying; no yellow showed until partly dried." The extensive synonymy of this species is due to its occurrence sometimes on the ground, sometimes on wood, sometimes being wholly infundi-

buliform and sometimes wholly flabelliform, but occasionally a gathering shows both infundibuliform and flabelliform specimens. The soft texture of the pilei—like filter-paper or like wash leather—the large, cylindric, non-incrusted cystidia, and large elongated spores are a good combination of characters for the recognition of *S. aurantiacum* independently of the yellow color. Lloyd gives *Thelephora spectabilis* and *Stereum xanthelium* as synonyms of *S. aurantiacum*, and this seems quite probable according to the original descriptions of these species, but he does not state that he has studied the authentic specimens; I have not been able to examine them.

Unless there is more than one edition of Gaudichaud's 'Voy. Urania Bot.,' there is an error, as noted by Lloyd, in the citation by Fries in 'Epicrisis,' followed by later authors, of a figure of *T. aurantiaca* by Persoon. Dr. Farlow kindly searched for me for such a figure in his copy but without success.

Specimens examined:

Jamaica: Port Antonio, *F. S. Earle*, 600, comm. by N. Y. Bot. Gard. Herb.; *A. E. Wight*, comm. by W. G. Farlow; Troy and Tyre, *W. A. Murrill & W. Harris*, 1112, comm. by N. Y. Bot. Gard. Herb.

Cuba: *C. Wright*, 237, type of *Thelephora sericella* (in Curtis Herb.); *C. Wright*, 198, 263, type of *Thelephora affinis* B. & C. (in Curtis Herb.); Banao Mts., *Leon & Clement*, 5570 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56262); Ceballos, *C. J. Humphrey*, 2683 (in Mo. Bot. Gard. Herb., 8267); Guantanamo, *Hioram* (in J. R. Weir Herb., 10583, and Mo. Bot. Gard. Herb., 56217); Omaja, *C. J. Humphrey*, 3025 (in Mo. Bot. Gard. Herb., 8632); Nipe Bay, *F. S. Earle*, No. A.

Porto Rico: Rio Piedras, *J. R. Johnston*, comm. by J. A. Stevenson, 1987 (in Mo. Bot. Gard. Herb., 10660); *J. A. Stevenson*, 3354, 5585 (in Mo. Bot. Gard. Herb., 17720 and 6908).

San Domingo: Consuelo, *N. Taylor*, 178 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56304).

10. *S. diaphanum* (Schw.) Cooke in Sacc. Syll. Fung. 6: 558. 1888; Masee, Linn. Soc. Bot. Jour. 27: 162. 1890; Lloyd, Myc. Writ. 4. Stip. Stereums, 19. text f. 534. 1913.

Plate 2, figs. 8 and 9.

Thelephora diaphana Schweinitz in Berk. & Curtis, Acad. Nat. Sci. Phila. Jour. 2: 278. 1853.—*T. Willeyi* Clinton in Peck, N. Y. State Mus. Rept. 26: 71. 1874; Sacc. Syll. Fung. 6: 524. 1888.—An *T. Sullivantii* Montagne, Syll. Crypt. 176. 1856?

Type: in Herb. Schweinitz, in Curtis Herb., and in Kew Herb.

Fructifications coriaceous, thin, deeply infundibuliform, sometimes deeply split, white, drying diaphanous, sericeous, fibrillose, striate, sometimes with slightly elevated ridges, sometimes obscurely zoned, the margin thin, entire or laciniately toothed; stem slender, cylindric, more or less clothed with white matted down which is usually present at the base and binds the earth together in a ball; pileus of type in section $200\ \mu$ thick, composed of longitudinally arranged, thin-walled hyaline hyphae $3\ \mu$ in diameter, densely crowded together; hymenium white, setulose with hyaline hairs under a lens; cystidia hair-like, not incrustated, cylindric, obtuse, $6-9\ \mu$ in diameter, protruding $20-60\ \mu$; spores hyaline, even, $4-5 \times 2\frac{1}{2}-3\ \mu$.



Fig. 3.
S. diaphanum.
Cystidium,
basidia, and
spores, $\times 665$.

Fructifications 2-4 cm. high, 8 mm.-2 cm. in diameter; stem 1-3 mm. in diameter.

On the ground in moist woods of frondose species. New York to Missouri, and in Alabama, Washington, and California.

S. diaphanum, as collected by Schweinitz and shown in pl. 2, fig. 8, differs from *S. aurantiacum* in absence of bright yellow color, in shorter spores, and in stem and ground at base of stem being merely white-downy. In western New York, this species attains a more luxuriant growth than the small specimens collected by Schweinitz, has a larger and rather thicker pileus and thicker stem as shown in pl. 2, fig. 9; such larger specimens were published as *Thelephora Willeyi*, but the intergradations with *S. diaphanum* are so numerous and close that it should be kept with the latter in my opinion.

Specimens examined:

New York: Buffalo, *Clinton*, type of *Thelephora Willeyi* (in N. Y. State Mus. Herb.); Chappaqua, *Mrs. C. E. Ryder & Mrs. W. A. Murrill* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56289); Freeville, *V. B. Walker*, 15

(in Mo. Bot. Gard. Herb., 8407); Geddes, *G. E. Morris, G.*; Ithaca, *C. Thom* (in Cornell Univ. Herb., 9992); Jamesville, *H. D. House* (in N. Y. State Mus. Herb. and in Mo. Bot. Gard. Herb., 55498), and *L. M. Underwood*; Lowville, *C. H. Peck* (in N. Y. State Mus. Herb.); Orville, *G. E. Morris, G.*

Ohio: Gnadenhutten, *Schweinitz*, type (in Herb. Schweinitz and in Curtis Herb.).

Missouri: Valley Park, *E. A. Burt & L. O. Overholts* (in Mo. Bot. Gard. Herb., 44059).

Alabama: Montgomery, *R. P. Burke, 25* (in Mo. Bot. Gard. Herb., 13146).

Washington: Seattle, *W. A. Murrill, 128, 143, 144* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 55745, 55729, 55726).

California: Tamalpais, *H. W. Harkness* (under the herbarium name *Thelephora Harknessii* Peck in N. Y. State Mus. Herb. and Mo. Bot. Gard. Herb., 55925).

11. *S. exiguum* (Peck) Burt, n. comb. Plate 2, fig. 10. *Thelephora exigua* Peck, N. Y. State Mus. Bul. 54: 953. 1902; Sacc. Syll. Fung. 17: 161. 1905.

Type: in N. Y. State Mus. Herb. and in Burt Herb.

Pileus coriaceous-membranaceous, very thin, diaphanous, infundibuliform, radiately fibrous-striate, becoming bister in the herbarium, originally "pale alutaceous" according to Peck, the margin lacerate; stem slender, solid, pruinose, and bearing a few whitish hairs which are present also on the ground about the base; pileus in section 100 μ thick, composed of longitudinally arranged, hyaline hyphae 2½–3 μ in diameter, closely crowded together; cystidia hair-like, not incrustated, cylindric, obtuse, 7 μ in diameter, protruding 25 μ beyond the basidia; spores hyaline, even, 4½ × 2 μ , borne 4 to a basidium.

Fructifications 1–3 mm. in diameter, 3–5 mm. high; stem 2 mm. long, ¼–⅓ mm. in diameter; pileus ⅓ mm. thick.

On the ground, Westport, New York. October.

S. exiguum is miniature *S. diaphanum* of slightly darker color. It is known from the original collection only. The smallest specimens of *S. diaphanum* are many times larger than

the largest specimen of *S. exiguum*. While differences in size are not generally a good criterion for specific distinction, I am inclined to think that they will prove so in this instance.

Specimens examined:

New York: Westport, *C. H. Peck*, type (in N. Y. State Mus. Herb. and in Burt Herb.).

12. *S. tenerrimum* Berk. & Ravenel, *Grevillea* 1: 162. 1873; *Sacc. Syll. Fung.* 6: 551. 1888; Masee, *Linn. Soc. Bot. Jour.* 27: 165. 1890. Plate 2, fig. 11.

Type: in Kew Herb. and Curtis Herb.

Pileus coriaceous, thin, infundibuliform or flabelliform, soon lobed and split, upper surface slightly rough, fibrillose-striate, not zonate or only very indistinctly "pale tan" when collected, becoming tawny olive to Saccardo's umber in the herbarium; stem filiform, whitish, bearing some fibrils towards the base; hymenium even, concolorous, setulose with hyaline hairs under a lens; pileus in section 300 μ thick, composed of longitudinally and densely arranged hyaline hyphae 3 μ in diameter; cystidia hair-like, not incrustated, 4-8 μ in diameter, protruding 30-50 μ ; spores hyaline, even, subglobose, 4-5 \times 3-4 μ .

Fructifications 2-10 mm. broad, 5mm.-2½ cm. high; stem 3-7 mm. long, ¼-½ mm. thick.

On ground among mosses. New York, Wisconsin, South Carolina, and Cuba. July to November. Rare.

The collections which I have referred to *S. tenerrimum* are from the widely separated localities stated above and only a single gathering of several fructifications at each locality. There are slight differences between the specimens of the several gatherings, but not great enough to preclude their reference to a single species, although doing so has required some generalization from the original description.

S. tenerrimum is related to *S. undulatum* of northern Europe as known to me by the specimens distributed in Karsten, *Fungi Fennicae*, 912, and by the extended account by Maire, *Ann. Myc.* 7: 426-431, *text f.* 1, 2. 1909, but the latter species attains much larger size, has a coarser stem, and is infundibuliform with central stem. None of the collections of *S. tenerrimum* are composed wholly of specimens with infundibuliform

pilei and the stem central; the original collections have some specimens with pileus longer on one side than the other and stem eccentric; in more recent gatherings some specimens are even flabelliform. *S. tenerrimum* appears to be a distinct species.

Specimens examined:

New York: Croghan, *C. H. Peck* (in N. Y. State Mus. Herb.).

South Carolina: Society Hill, *H. W. Ravenel*, type (in Curtis Herb., 5029, and in Kew Herb.).

Wisconsin: Afton, *R. A. Harper*.

Cuba: Havana Province, *Huo Leon*, 1456 (in N. Y. Bot. Gard. Herb. and in Mo. Bot. Gard. Herb., 56307).

13. *S. pergamenum* Berk. & Curtis, *Grevillea* 1: 161. 1873; *Sacc. Syll. Fung.* 6: 552. 1888; *Massee, Linn. Soc. Bot. Jour.* 27: 161. 1890; *Lloyd, Myc. Writ.* 4. *Stip. Stereums*, 27. *text f.* 545. 1913. Plate 2, fig. 12.

An *Stereum nitidulum* Berkeley, *Hooker's London Jour. Bot.* 2: 638. 1843?

Type: type distribution in *Ravenel, Fungi Car.* 3: 25.

Fructifications somewhat caespitose and grown together, stipitate; pileus coriaceous, infundibuliform, sometimes split and petaloid, minutely lineate, drying hazel, obscurely zoned, the margin thin, often toothed or lacinate; stem cylindric, drying pinkish buff, very minutely tomentose; hymenium drying pinkish buff, glabrous; pileus in section 500 μ thick, composed of densely and longitudinally arranged hyaline hyphae 3 μ in diameter; flexuous, clavate, curved gloecystidia, 50 \times 6 μ , extend into the hymenium but do not rise to its surface; cystidia none; spores hyaline, even, slightly flattened on one side, 4-4 $\frac{1}{2}$ \times 3-3 $\frac{1}{2}$ μ .

Fructifications 1 $\frac{1}{2}$ -4 cm. high, 8 mm.-3 cm. in diameter; stem 2-10 mm. long, 1-3 mm. in diameter.

On stumps or buried wood, perhaps rarely on the ground. Ohio and North Carolina to Mexico and in the West Indies. September to January.



Fig. 4.
S. pergamenum.
Gloecystidia
 \times 665.

S. pergamenum may be recognized by its occurrence in small clusters on wood at or near the surface of the ground, by small and nearly globose spores, and by the presence of gloeocystidia. It is probably more frequent in the West Indies than in the United States. When studying the specimens of this species in Kew Herbarium I compared with them the type of *Stereum nitidulum* Berk., collected by Gardner in Goyaz, Brazil, and concluded that it is probably the same species as *S. pergamenum*. In that early stage of my work I did not record the presence of gloeocystidia in the types of either *S. pergamenum* or *S. nitidulum*, and since I have no permanent preparation from the type of the latter, further, more critical study may show that it is a distinct species. The collection from Cuba, referred by Berkeley to *S. nitidulum*, has gloeocystidia and is referable to *S. pergamenum*.

Specimens examined:

Exsiccati: Ravenel, Fungi Car. 3: 25.

Ohio: Preston, *T. G. Gentry* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56301).

North Carolina: Blowing Rock, *G. F. Atkinson*, from Bot. Dept. of Cornell Univ., 4182.

Alabama: *J. M. Peters*, in Ravenel, Fungi Car. 3: 25, type distribution; *J. M. Peters*, 601 and another specimen (in Curtis Herb., the latter, Curtis Herb., 3814); *Beaumont*, 207 in part, the large zonate specimen mounted on left side of card with specimens of *S. Ravenelii* (in Curtis Herb., 4629 in part); Auburn, *F. S. Earle* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56306).

Louisiana: Ville Platte, *A. B. Langlois*, 2897.

Mexico: Motzorongo, near Cordoba, *W. A. & Edna L. Murrill*, 994 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 54596).

Cuba: *C. Wright*, 836 (in Curtis Herb., under the name *S. nitidulum* Berk.); Herradura, *F. S. Earle*, 545, and *N. L. Britton*, *E. G. Britton*, *F. S. Earle & C. S. Gager*, 6326 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56305 and 56263 respectively); Sumidero, *J. A. Shafer*, 13905 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56264).

San Domingo: Bonao, *J. A. Stevenson*, 7010 (in Mo. Bot. Gard. Herb., 55656).

14. *S. cristatum* Berk & Curtis, *Grevillea* 1: 163. 1873; Sacc. Syll. Fung. 6: 556. 1888; Massee, Linn. Soc. Bot. Jour. 27: 167. 1890; Lloyd, Myc. Writ. 4. Stip. Stereums, 38. 1913.

Type: in Kew Herb., not found by me in Curtis Herb. although sought for.

Pileus coriaceous, flabelliform or obliquely cyathiform, pallid to light bay-brown, somewhat zoned, glabrous and shining towards the margin, bearing a cluster of coarse hairs towards the base; stem, when present, cylindrical, scarcely 2 mm. long; hymenium even, paler than the upper surface; in structure 200–250 μ thick, composed of longitudinally arranged and somewhat interwoven hyaline hyphae 3 μ in diameter; no cystidia; gloeocystidia pyriform, 9–12 \times 7½ μ ; spores, as found in a crushed preparation, hyaline, even, 4 \times 2½ μ , few found—noted by Massee as subglobose, 5–6 μ in diameter.

Pileus 6–10 mm. across.

On dead *Vitis* in swamps. South Carolina.

Reexamination of my preparation of the type of *S. cristatum* fails to demonstrate that the pyriform organs in its hymenium are longitudinally septate; furthermore some of these organs are more elongated than stated above and irregular in form. For these reasons I regard the bodies as pyriform gloeocystidia rather than possibly miniature basidia of the longitudinally septate type, the demonstrated presence of which would require transfer of this species to *Eichleriella*. The occurrence of *S. cristatum* on dead grape vines, the crest of coarse hairs towards the base of the pileus, the small size of the latter, and the pyriform organs in the hymenium are a good group of characters for identification of this species, although known so far only from the original collections.

Specimens examined:

South Carolina: Santee Swamp, *H. W. Ravenel*, Curtis Herb.



Fig. 5.
S. cristatum.
Gloeocystidia \times
665. From type.

No. 2038, type and an *unnumbered specimen* (both in Kew Herb.).

15. *S. pallidum* (Pers.) Lloyd, Myc. Writ. 4. Stip. Stereums, 31. *text f. 536, 550.* 1913. Plate 3, fig. 13, 14.

Craterella pallida Persoon, Ic. et Descr. Fung. 1: 3. *pl. 1. f. 3.* 1798.—*Thelephora pallida* Persoon, Syn. Fung. 565. 1801; Myc. Eur. 1: 111. 1822; Fries, Hym. Eur. 633. 1874; Sacc. Syll. Fung. 6: 527. 1888.—*Helvella pannosa* Sowerby, Col. Figs. Eng. Fungi, *pl. 155.* 1788, in part.—*Thelephora pannosa* Sowerby ex Fries, in part, and *T. pannosa* var. *pallida* (Pers.) Fries, Syst. Myc. 1: 430. 1821.—*T. Sowerbeyi* Berkeley, Outlines Brit. Fungi, 266. 1860; Ann. & Mag. Nat. Hist. III. 15: 320. 1865; Fries, Hym. Eur. 633. 1874; Sacc. Syll. Fung. 6: 522. 1888.—*Stereum Sowerbeyi* (Berk.) Masee, Linn. Soc. Bot. Jour. 27: 164. 1890.—*Bresadolina pallida* (Pers.) Brinkmann, Ann. Myc. 7: 289. 1909.

Illustrations: Persoon, Ic. et Descr. Fung. 1: *pl. 1. f. 3;* Sowerby, Col. Figs. Eng. Fungi, *pl. 155;* Lloyd, Myc. Writ. 4. Stip. Stereums, *text f. 536, 550.*



Fig. 6.
S. pallidum.
Cystidium, basidium, and spores,
× 665. From
Bresadola.

Fructifications cespitose, laterally confluent, infundibuliform, coriaceous-spongy, rather thick, becoming cartridge-buff to cream-color in the herbarium, the upper side strigose-squamose; stem short, villose at the base; hymenium with slight, very obtuse, radial folds, under a lens more or less setulose with hyaline hairs; cystidia hair-like, not incrustated, cylindric, 6–8 μ in diameter, protruding 10–50 μ beyond the basidia, usually very numerous but sometimes only few found; spores hyaline, even, flattened on one side, 6–8 × 4–5 μ .

Fructifications 1–3 cm. in diameter, 2–3 cm. high.

On the ground in woods. Vermont to North Carolina. July to November. Rare.

American specimens of *S. pallidum* agree well with the European specimen received from Bresadola, and, like the latter, are paler than the otherwise excellent figures of *Thelephora*

pallida in Persoon's 'Icones et Descriptiones Fungorum' already cited. Our specimens and that from Bresadola have the hymenium distinctly setulose with hair-like cystidia. Some of the specimens in Kew Herbarium under the name of *Thelephora Sowerbeyi* have hair-like cystidia, but these organs are few or absent in whole sections from other specimens. The original specimen of *Helvella pannosa* from Sowerby in Berkeley Herbarium at Kew has hair-like cystidia. I concluded that these cystidia are variable in abundance in English specimens and that *Thelephora Sowerbeyi* and *Helvella pannosa* as represented by the specimen from Sowerby should be kept with *Thelephora pallida*. Although the specific name *pannosa* of Sowerby was at first adopted by Fries, this was dropped later when Berkeley found this species, as understood by Sowerby, to be based upon a mixture of two species which were separated as *Thelephora Sowerbeyi* and *T. multizonata*; *T. pallida* has priority over *T. Sowerbeyi*.

S. pallidum may be distinguished from *T. Willeyi* forms of *S. diaphanum* by its occurrence in small conerescent clusters, by short villose or tomentose stem, and by thicker pileus with upper surface split radially into stiff straight fibrils.

Specimens examined:

Austria: *G. Bresadola*.

England: from Sowerby, under the name *Helvella pannosa* (in Kew Herb.); Cornwall, *C. Rea*, 1 (in Mo. Bot. Gard. Herb., 56241); Hereford, *Mrs. Wynne* (in Kew Herb., under the name *Thelephora Sowerbeyi*).

Vermont: Brattleboro, *C. C. Frost* (in Univ. Vermont Herb.); Grand View Mountain, *E. A. Burt*.

Connecticut: Waterbury, *C. C. Hanmer*, 1191.

North Carolina: Blowing Rock, *G. F. Atkinson*, comm. by Cornell Univ. Herb., 4192.

16. *S. elegans* (Meyer) Lloyd, Myc. Writ. 4. Stip. Stereums, 24. text f. 539. 1913. (Not *S. elegans* of earlier authors.)

Plate 3, fig. 15.

Thelephora elegans Meyer, Fl. Essequiboensis, 305. 1818; Fries, Syst. Myc. 1: 430. 1821; Epier. 545. 1838. (But here abridged in an important respect so that following authors modified the description to apply to more common species).

An *T. macrorrhiza* Lévillé, Ann. Sci. Nat. Bot. III. 5: 146. 1818? See Lloyd, *loc. cit.*, p. 28.

Illustrations: Lloyd, *loc. cit.* Not by the figures under this name in other works, as Engl. & Prantl, Nat. Pflanzenfam., for example.

Fructifications cespitose, coriaceous, confluent, infundibuliform and deeply split on one side, or little developed on one side and prolonged and petaloid on the other; upper surface of pilei glabrous, radially plicate, drying diamine-brown, the margin paler and more or less lobed; stems solid, buffy brown, short, tomentose, branched above; hymenium radially plicate, nearly white, pruinose, often cracked; pileus in section $400\ \mu$ thick, composed of densely and longitudinally arranged, hyaline hyphae $3\ \mu$ in diameter; no cystidia; gloeocystidia $4\frac{1}{2}\ \mu$ in diameter, barely distinguishable from the basidia; spores hyaline, even, subglobose, $3\frac{1}{2}$ – $4\frac{1}{2}\ \mu$ in diameter.



Fig. 7.
S. elegans.
Gloeocystidia
 $\times 665$.

Fructifications 4–5 cm. high; pilei 1–2 cm. in diameter; stems about 1 cm. long, 1–2 mm. in diameter.

In a dense cluster of about 16 fructifications springing from an area of 2 square centimeters on the ground. Porto Rico to British Guiana. Summer.

I have not seen the type of *Stereum elegans* from Dutch Guiana nor reference to its existence; a collection from Porto Rico on which the preceding description is based has fructifications growing on the ground closely together and conrescent where in contact; the pilei are plicate on both surfaces and contrast so greatly in color that it seems as though fuscous in connection with the upper side and whitish flesh-color and pruinose for the under side might have been used for the color difference. The specimens of this collection are not zonate; infundibuliform without any qualification of this character does not seem accurate; hence it may be that this Porto Rican collection is merely near, rather than the true, *Stereum elegans*. However, solitary fructifications growing on wood, as figured in Engl. & Prantl, Pflanzenfam., are certainly a very different species from *S. elegans*, the original description of which is as follows:

"1. *Thelephora elegans*. nob.

"*T. subcaespitosa infundibuliformis carnosu-coriacea plicata utrinque glabra, superne dilute fusco-fasciata, inferne albescenti-carnea pruinosa.*

"Ad terram argillosam.

"Viget Junio.

"*Adumbr.* Pulchra species. Gregarie crescens, subcarnosa, tenuis, glabra. Pileus substipitatus, 1-2 uncialis, infundibuliformis, subcompressus, undulato-plicatus, margine irregulariter crenatus, interne rufescens, et fasciis dilute fuscis eleganter variegatus, nitens, externe albescenti-carneus, opacus, pruinusus."

Specimens examined:

Porto Rico: Mayaguez, *B. Lopez Santiago*, 17 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56265).

17. *S. decolorans* (Berk. & Curtis) Lloyd, Myc. Writ. 4. Stip. Stereums, 36. 1913. Plate 3, fig. 234.

Thelephora decolorans Berkeley & Curtis, Linn. Soc. Bot. Jour. 10: 328. 1868; Sacc. Syll. Fung. 6: 530. 1888.—*Podoscypha decolorans* (Berk. & Curtis) Patouillard in Duss, Fl. Crypt. Antilles Fr. 231. 1904.

Type: in Kew Herb. and Curtis Herb.

Fructifications coriaceous, gregarious or somewhat cespitose, stipitate; pileus split on one side quite, or nearly, to the stem, usually wedge-shaped to broadly flabelliform, sometimes radially lineate, drying cinnamon; stem cylindric, colored like the pileus, tomentose, attached by a mycelium common to several fructifications; hymenium colored like the pileus and stem, sometimes lineate; pileus in section 200-400 μ thick, composed of densely and longitudinally arranged hyaline hyphae 3-3½ μ in diameter; no cystidia; gloeocystidia flexuous, 45-90 \times 3-6 μ , between the basidia or curving into the hymenium; spores hyaline, even, subglobose, 4-4½ \times 3-4 μ .

Fructifications 1-3 cm. long, 5-13 mm. broad; stem 2-10 mm. long, ½-1 mm. thick.

On dead wood. Jamaica to Trinidad. May to January.

S. decolorans is stated in the original description to have been white, drying ochraceous; I have seen only dried specimens which are pale cinnamon throughout. The occurrence of the

fan-shaped fructifications in clusters on dead wood, pale cinnamon color when dry, presence of gloeocystidia, and small subglobose spores constitute a group of characters by which dried specimens of *S. decolorans* may be distinguished from other species in our region.

Specimens examined:

Jamaica: *W. A. Merrill*, 1181 (in N. Y. Bot. Gard. Herb.).

Cuba: *C. Wright* 234, 248, type (in Kew Herb. and Curtis Herb.); Santiago de las Vegas, *Van Herman*, comm. by *F. S. Earle*, 257.

Trinidad: Carengo, *M. A. Carriker*, comm. by *W. G. Farlow*, 1.

18. *S. radicans* (Berk.) Burt, n. comb. Plate 3, fig. 16.

Thelephora radicans Berkeley, Hooker's London Jour. Bot. 3: 190. 1844; Berkeley & Curtis, Linn. Soc. Bot. Jour. 10: 329. 1868; Sacc. Syll. Fung. 6: 525. 1888.—*Podoscypha radicans* (Berk. & Curtis) Patouillard in Duss, Fl. Crypt. Antilles Fr. 230. 1904.

Type: in Kew Herb. probably.

"Plant $1\frac{1}{2}$ inch high, $\frac{3}{4}$ of an inch broad, spathulate or subinfundibuliform, split on one side and slightly lobed, minutely striate, with raised lines, tawny, coriaceous. Stem $\frac{3}{4}$ of an inch high, $1\frac{1}{2}$ line thick, incrassated at the base, and sending off strong branched roots. Hymenium nearly even, fuliginous; spores apparently fuliginous."

The above is the original description of the type specimens, collected in Surinam, Guiana, by Hostmann, 489. My knowledge of the species is based upon a later collection made in Cuba by *C. Wright* and determined by Berkeley. This specimen and the others cited below show well the longitudinal raised lines on the upper surface of the pileus, which is thicker than in related species, being $1-1\frac{1}{4}$ mm. thick, and the hymenium 100–200 μ thick; some specimens have dried with the upper surface pinkish buff and others from wood-brown to Verona-brown; hymenium even, wood-brown to fuscous; stem 10–15 mm. long, 3–4 mm. in diameter, sometimes radicated to reach buried wood; no cystidia nor gloeocystidia; spores hyaline, even, becoming minutely rough-walled and sometimes slightly angular, $6 \times 5 \mu$.

Specimens examined:

Cuba: *C. Wright*, 209, authentic (in Curtis Herb.).

Jamaica: Castleton Gardens, *W. A. & Edna L. Murrill*, 66, comm. by N. Y. Bot. Gard. Herb.

Trinidad: *R. Thaxter* (in Farlow Herb.).

Grenada: *W. E. Broadway*, September collection (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56316); St. George's, *W. E. Broadway* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56317).

British Honduras: *M. E. Peck* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56321).

19. *S. pusiolum* Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 330. 1868; Sacc. Syll. Fung. 6: 558. 1888; Masee, Linn. Soc. Bot. Jour. 27: 168. 1890; Lloyd, Myc. Writ. 4: Stip. Stereums, 39. 1913. Plate 3, fig. 17.

Type: in Kew Herb. and Curtis Herb.

Fructifications gregarious, stipitate, coriaceous, curling in drying; pileus flabelliform or wedge-shaped, tapering to the stem, more or less split when large, minutely tomentose or hoary, white at first, drying smoke-gray, the margin thick and entire; stem short, solid, a little larger towards the base, colored like the pileus; hymenium even, mouse-gray, thick, contracting and sometimes cracking in drying; pileus in section 400–800 μ thick, composed of closely and longitudinally arranged hyaline hyphae $2\frac{1}{2}$ μ in diameter; no cystidia, gloeocystidia, nor conducting hyphae; spores hyaline, even, apiculate at base, $4-5\frac{1}{2} \times 3-5$ μ .

Fructifications 1–2 cm. high, 1–15 mm. broad; stem 5–8 mm. long, $\frac{1}{2}-1\frac{1}{2}$ mm. thick.

On clay ground. West Indies. November to March.

The white pileus, drying gray of nearly the shade of *Polyporus adustus*, minutely hairy, wedge-shaped, and without zonation, the much darker hymenium—dark as in *P. adustus*—the rather large spores, and the absence of gloeocystidia afford a group of characters highly distinctive for *Stereum pusiolum*, the description of which I have changed materially from that published by the authors of the species. They disregarded Wright's note that the specimens were white and were collected on banks by roadside and published instead "rufobrunneum" and "on rootlets." The recent collections, cited below, which I have compared with the type, show also that the dimensions of the fructifications are usually much larger than those of the type collection.

Specimens examined:

Cuba: *C. Wright*, 510, type (in Curtis Herb.); El Yunque, Baracoa, *L. M. Underwood & F. S. Earle*, 1087, 1141, comm. by N. Y. Bot. Gard. Herb., 1141 (in Mo. Bot. Gard. Herb., 56588).

Porto Rico: Rio Piedras, *J. R. Johnston*, 89 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56284).

20. *S. glabrescens* Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 330. 1868; Sacc. Syll. Fung. 6: 558. 1888; Masee, Linn. Soc. Bot. Jour. 27: 169. 1890; Lloyd, Myc. Writ. 4. Stip. Stereums, 37. *text f. 558*. 1913. Plate 3, fig. 18.

Illustrations: Lloyd, *loc. cit.*

Type: in Kew Herb. and Curtis Herb.

Fructifications scattered, sometimes two from a common mycelial pad, stipitate; pileus flabelliform, zonate, minutely velvety, sometimes nearly glabrous, drying Verona-brown to chestnut, the margin paler, tapering behind into a short stem; stem lateral, nearly equal, velvety; hymenium even, concave, drying pinkish buff; no cystidia nor gloecystidia; spores hyaline, even, $4-5 \times 3-4 \mu$.

Pileus 5–20 mm. long, 5–20 mm. broad; stem 2–10 mm. long, $\frac{1}{2}$ – $1\frac{1}{2}$ mm. thick.

On fallen twigs and mossy rotten wood. West Indies. May to September.

S. glabrescens has small, rather scattered fructifications, with firm, coriaceous, minutely velvety pileus and stem, small subglobose spores, and no cystidia, and it occurs on wood. Some collections are nearly glabrous. A mycelial pad is usually present at base of stem.

Specimens examined:

Cuba: *C. Wright*, 520, type (in Curtis Herb.); Pinar del Rio, *J. A. Shafer*, 13906 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56298).

Porto Rico: Ponce, *F. S. Earle*, 163, comm. by N. Y. Bot. Gard. Herb.

Jamaica: Hollymount, *L. M. Underwood*, 3427 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56299).

Dominica: Landat, *F. E. Lloyd*, 380, comm. by N. Y. Bot. Gard. Herb.

21. *S. flabellatum* Patouillard, Soc. Myc. Fr. Bul. **16**: 179. 1900; Sacc. Syll. Fung. **16**: 187. 1902; Lloyd, Myc. Writ. **4**. Stip. Stereums, 39. 1913.

Podoscypha flabellata Patouillard in Duss, Fl. Crypt. Antilles Fr. 231. 1904.

Pileus membranaceous, thin, expanded anteriorly, regularly attenuated posteriorly into a lateral stipe which is compressed; margin papyraceous, deeply incised or lobed; dorsal surface marked by slight puberulence of projecting hairs or crests which are slightly diverging or fan-shaped, not zonate; hymenium inferior, glabrous, even; stem becoming pubescent, short, enlarged at the base into a disk for attachment.

Fructification 4-6 cm. high; stem $\frac{1}{2}$ -1 cm. long, 1-2 mm. thick. Fructification erect, spathulate, often confluent by the margin with neighbors, whitish when living, livid and pellucid upon drying.

On rotting wood on the ground. Guadeloupe.

The above is a translation of Patouillard's description. Lloyd saw a specimen in the museum at Berlin and states that the dried specimens are dark reddish bay.

22. *S. fissum* Berkeley, Hooker's Jour. Bot. **8**: 273. 1856; Masee, Linn. Soc. Bot. Jour. **27**: 169. 1890; Sacc. Syll. Fung. **11**: 120. 1895; Lloyd, Myc. Writ. **4**. Stip. Stereums, 37. *text f. 559*. 1913. Plate 3, fig. 19.

S. Huberianum P. Hennings, Hedwigia **41**: (15). 1902; **43**: 173. 1904.

Illustrations: Lloyd, *loc. cit.*

Type: in Kew Herb. and in Curtis Herb.

Pilei gregarious, occurring singly, sessile or short-stipitate, coriaceous, flabelliform or wedge-shaped, often divided into wedge-shaped segments, glabrous, even, not shining nor zonate, white when fresh, now reddish brown in the herbarium, attached by a flat mycelial pad; hymenium even; in structure 300-400 μ thick, composed of densely and longitudinally arranged hyaline hyphae 3 μ , or some 4 μ , in diameter; no cystidia nor gloeocystidia; the few detached spores found are hyaline, even, $6 \times 4 \mu$.

Pileus 8-15 mm. long, 3-15 mm. broad.

On dead twigs, Brazil.

S. fissum may yet be found as far north as the West Indies and Central America. The species is noteworthy by its occurrence on dead twigs in scattered, solitary, azonate fructifications which are often deeply split into segments, and by absence of cystidia and gloeocystidia.

Specimens examined:

Exsiccati: Ule, Myc. Brasil., 42, under the name *Stereum Huberianum*.

Brazil: Panure, *Spruce*, 27, type (in Curtis Herb.); Amazonas, Marmellos, and Jurná, *E. Ule*, in Ule, Myc. Brasil., 42.

23. *S. cyphelloides* Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 331. 1868; Sacc. Syll. Fung. 6: 558. 1888; Masee, Linn. Soc. Bot. Jour. 27: 172. 1890; Lloyd, Myc. Writ. 4. Stip. Stereums, 35. 1913. Plate 3, fig. 20.

Type: in Kew Herb. and Curtis Herb.

Pileus small, flabelliform or spatulate, drying pinkish buff, longitudinally fibrillose, bibulous, the margin entire, narrowed behind into a short stem-like base; in structure up to 600 μ thick, composed of thin-walled, hyaline hyphae $2\frac{1}{2}$ –3 μ in diameter, interwoven in the subhymenium; hymenium even, drying of same color as upper surface of pileus; no conducting organs, gloeocystidia, nor cystidia; spores hyaline, even, 4 – 5×3 – $3\frac{1}{2}$ μ .

Pileus 3–6 mm. wide, 5–7 mm. long.

On a bank among moss. West Indies. February and March.

S. cyphelloides differs from most *Stereums* in not having a hard compact structure, as in *S. rameale*, for example; it is of soft and bibulous texture but rather too thick for a *Cyphella*. The stem-like base is flattened in the same plane with the pileus and has the hymenium continued along its whole length, hence it is merely a narrowed portion of the pileus.

Specimens examined:

Cuba: *C. Wright*, 511, type (in Curtis Herb.).

Porto Rico: Monte Cerrote, near Adjuntas, *N. L. Britton & Stewardson Brown*, 5449 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56261).

24. *S. Hartmanni* (Mont.) Lloyd, Myc. Writ. 4. Stip. Stereums, 34. text f. 553. 1913. Plate 3, fig. 21.

Thelephora Hartmanni Montagne, Ann. Sci. Nat. Bot. II. 20: 366. 1843; Syll. Crypt. 176. 1856; Sacc. Syll. Fung. 6: 535. 1888.—*T. dissecta* Lévillé, Ann. Sci. Nat. Bot. III. 5: 146. 1846; Sacc. Syll. Fung. 6: 531. 1888; Lloyd, *loc. cit.*, 39.

Illustrations: Lloyd, *loc. cit.*

Type: authentic specimen from Montagne in Kew Herb.

Pilei solitary or cespitose, sessile or barely stipitate, coriaceous, thin, white, wedge-shaped, deeply cleft into narrow segments which are more or less pectinate along their margins and apex and have these teeth-like portions incurved; no cystidia; no gloeocystidia; spores hyaline, even, subglobose, $4-5 \times 3\frac{1}{2}-4 \mu$.

Pileus 7-50 mm. long, 5-40 mm. broad.

On decaying wood and bark and dead herbaceous stems. Carolina to Bolivia. July to September in West Indies and February in Bolivia.

The pilei of *S. Hartmanni* occur in small tufts of two or three in the specimens which have been seen; they are very dainty and unique by the narrow pectinate margins and tips which are more or less incurved; rarely these teeth occur on the lower surface of segments of the pileus in a manner suggestive of teeth of an *Irpea* but they are in most cases marginal. The maximum dimensions of the pileus are from the Porto Rican collection; the other specimens do not have pilei more than 2-3 cm. long. I have not seen the type of *Thelephora dissecta* Lév., which was collected in Guadeloupe; the description agrees so well with *S. Hartmanni* that I have followed Lloyd's conclusion that *T. dissecta* is a synonym of *S. Hartmanni*.

Specimens examined:

Carolina: *Hartmann*, authentic, from Montagne (in Kew Herb.).

Porto Rico: Luquillo Mountain, *P. Wilson*, 313 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56302).

St. Kitt's: *N. L. Britton & J. F. Cowell*, 706, comm. by N. Y. Bot. Gard. Herb.

Bolivia: *R. E. Fries*, 272, comm. by L. Romell, 447 (in Mo. Bot. Gard. Herb., 54780).

25. *S. craspedium* (Fries) Burt, n. comb. Plate 3, fig. 22.

Thelephora (Merisma) craspedia Fries, R. Soc. Sci. Upsal. Actis III. 1: 108. 1851; Sacc. Syll. Fung. 6: 533. 1888; Lloyd, Myc. Writ. 4. Stip. Stereums, 34. 1913.

Type: a fragment in Kew Herb., according to Lloyd.

Erect, cespitose, membranaceous-soft, fragile when dry, palmately branched, complanate, ribbed, dilated above, lacerate-fimbriate at the apex; hymenium definitely inferior, pallid gilvus; spores white.

In pine woods, Pico de Orizaba, 10,000 ft. altitude, Mexico. Collected by Liebman.

An extraordinary species, similar to *Thelephora tuberosa* and *Tremellodendron pallidum* but with the substance thin, somewhat membranaceous, fragile when dry, and with the pileus foliaceous-complanate, ribbed (ribs commonly simple as in *Alaria*), very distinct. More than an inch high. Hymenium occupying the whole lower surface, at length floccose-collapsing and often foveolate, almost porose; basidia evidently 4-spored.

The above is a translation of the original description. I did not find the type in Herb. Fries at Upsala nor see the fragment which Lloyd has reported as preserved at Kew.

The specimen from Dutch Guiana, which is cited below, is so similar in aspect to *Tremellodendron pallidum* that it is probably *S. craspedium*. This cluster is 7 cm. in diameter and 3-4 cm. high, and agrees well with details of the original description. The basidia are simple, only detached spores found. These are hyaline, even, globose, 3 μ in diameter.

Specimens examined:

Dutch Guiana: *Jacob Samuels* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56300).

26. *S. petalodes* Berkeley, Ann. & Mag. Nat. Hist. II. 9: 198. 1852; Sacc. Syll. Fung. 6: 557. 1888; Masee, Linn. Soc. Bot. Jour. 27: 165. 1890; Lloyd, Myc. Writ. 4. Stip. Stereums, 32. text f. 551. 1913. Plate 3, fig. 23.

Illustrations: Lloyd, *loc. cit.*

Type: in Kew Herb. according to Lloyd.

Pileus coriaceous, sessile, at first infundibuliform, soon split into numerous lobes which are again more or less divided, dull reddish brown, marked with long grooves or striae; hymenium pale, much cracked, sometimes so much so as to be nearly granulated.

San Domingo. Coll., *Salle*, 52.

The above is the original description of *S. petalodes*, a species of which I have seen no specimen. Lloyd's figure of the type shows the fructification to be a rosette-shaped mass 4 cm. high and 6 mm. in diameter, composed of many elongated pileate flaps, each of which is flattened and up to 7 mm. broad. No record was published by Berkeley as to whether *S. petalodes* grows on ground or on wood.

27. *S. anastomosans* (Berk. & Curtis) Lloyd, Myc. Writ. 4. Stip. Stereums, 35. 1913.

Thelephora anastomosans Berkeley & Curtis, Linn. Soc. Bot. Jour. 10: 329. 1868; Sacc. Syll. Fung. 6: 534. 1888.

Type: in Curtis Herb. and Kew Herb.

Fructification stipitate, white, with the pileus divided into many segments; pileate branches and branchlets more or less laterally grown together above, somewhat flabeliform and fimbriate, below more or less distinct or confluent into the common stem; hymenium even, inferior; no cystidia nor gloecystidia; spores copious, hyaline, even, subglobose, $4-4\frac{1}{2} \times 3\frac{1}{2}-4 \mu$.

Fructifications about $2\frac{1}{2}$ cm. high.

On stump. Cuba. October.

It was noted by the authors of the species that *S. anastomosans* is allied to *S. craspedium*, but the divisions of its pileus are narrower than I understand them to be in the latter. *S. anastomosans* is somewhat suggestive of *S. Hartmanni* and *S. proliferum* but differs in having many pileate divisions grow out from a common trunk so as to form a rosette-like mass, as in doubled forms of *Thelephora caryophyllea*.

Specimens examined:

Cuba: *C. Wright*, 280, type (in Curtis Herb.).

28. *S. proliferum* (Berk.) Lloyd, Myc. Writ. 4. Stip. Stereums, 34. text f. 554. 1913. Plate 4, fig. 24.

Thelephora proliferum Berkeley, Hooker's Jour. Bot. 8: 272. 1856; Sacc. Syll. Fung. 6: 542. 1888.

Illustrations: Lloyd, loc. cit.

Type: in Kew Herb. and Curtis Herb.



Fig. 8.

S. anastomosans.
Spores $\times 665$.
From type.

Fructifications caespitose, stipitate, coriaceous, erect, white, now between light buff and cartridge-buff throughout; stem cylindrical, branched above, the branches either slender, cylindrical, sterile bodies, or flattened, membranous pilei 1–2 mm. broad, 1–1½ cm. long; hymenium on the lower side, even; a few detached spores hyaline, even, $3\frac{1}{2} \times 3 \mu$, none found on basidia.

Fructifications about 3 cm. high; stems $\frac{1}{2}$ mm. in diam.; pileate branches 1–1½ cm. long, 1–2 mm. broad.

On roots of trees. Brazil.

Berkeley described *S. proliferum* as somewhat creeping and having the branches with tips attached again to the matrix by means of large, orbicular, radiated and lacinated disks. These characters should render this species easy for the collector to recognize, but the herbarium specimen which I studied did not show the above feature noticeably; it had somewhat the aspect of *S. Hartmanni* but without the pectinate margins of the latter. The hymenium of the specimen studied is in poor condition and the spore characters, as given above, are uncertain. I studied for N. Y. Bot. Gard. Herb., No. 508, a fungus collected at Church Cove, Bermuda, which has the general aspect of *S. proliferum* but with spores hyaline, even, $13\text{--}16 \times 6\text{--}7 \mu$, and is probably a distinct species. Still it is well to keep *S. proliferum* in mind in connection with species of the West Indies.

Specimens examined:

Brazil: Rio Negro, *Spruce, 17*, type (in Curtis Herb.).

29. *S. caespitosum* Burt, n. sp.

Plate 4, fig. 25.

Type: in Burt Herb.

Fructifications coriaceous, thin, caespitose, effuso-reflexed, with the resupinate portion small and bearing a cluster of broader and longer, imbricate, pileate lobes which are somewhat furfureaceous or with minute tomentum on the upper side, glabrate towards the margin, drying tawny and zonate with ochraceous, tawny zones, the margin entire; hymenium even, whitish to light buff; in structure 500–700 μ thick, with the intermediate layer bordered above by a narrow, slightly colored zone and composed of densely longitudinally arranged, hyaline, thick-walled hyphae $3\frac{1}{2} \mu$ in diameter; hymenial layer up to $120\frac{3}{4} \mu$ thick, containing numerous slender, flexuous gloeocystidia

$3\frac{1}{2}$ – $5\ \mu$ in diameter near the base, tapering outward; no colored conducting organs nor noteworthy paraphyses; spores hyaline, even, 4 – $4\frac{1}{2} \times 3$ – $3\frac{1}{2}\ \mu$, copious.

Resupinate portion covers area 6×5 mm., reflexed lobes 5–10 mm. in diameter—about 10 in the cluster.

On broken lateral stub of dead limb of a frondose species. Jamaica. January. Probably rare.

Viewed from above, *S. caespitosum* has the general aspect and coloration of species of *Stereum* in sections having stems, as *S. pergamenum* and *S. decolorans*, but is excluded from these sections by attachment to the substratum by a distinctly resupinate portion. The species is unique in the effuso-reflexed section in the above resemblance, and with additional characters of clustered, imbricated habit of growth and presence of gloeocystidia, should be readily recognized.

Specimens examined:

Jamaica: Moneague to Union Hill, *W. A. Murrill*, 1181, type, comm. by N. Y. Bot. Gard. Herb.

30. *S. fuscum* Schrader ex Quelet, Fl. Myc. France, 14. 1888; Bresadola, I. R. Accad. Agiati Atti III. 3: 106. 1897.

Plate 4, fig. 26.

Thelephora fusca Schrader, Spic. Fl. Germ. 184. 1794; Persoon, Syn. Fung. 568. 1801, and Myc. Eur. 1: 122. 1822 (in both places renaming the species *T. bicolor*); Fries, Syst. Myc. 1: 438. 1821 (following Persoon).—*T. bicolor* Persoon, Syn. Fung. 568. 1801; Fries, Syst. Myc. 1: 438. 1821.—*Stereum bicolor* Persoon, Myc. Eur. 1: 122. 1822 (under **** *Stereum* of *Thelephora*); Fries, Epicr. 549. 1838; Hym. Eur. 640. 1874; Morgan, Cincinnati Soc. Nat. Hist. Jour. 10: 195. 1888; Sacc. Syll. Fung. 6: 565. 1888; Masee, Linn. Soc. Bot. Jour. 27: 177. 1890.—*S. coffeatum* Berk. & Curtis, Grevillea 1: 164. 1873; Sacc. Syll. Fung. 6: 568. 1888; Masee, Linn. Soc. Bot. Jour. 27: 190. 1890.

Illustrations: Fries, Icones Hym. pl. 197. f. 2; Karsten, Icones Hym. pl. 2. f. 9.

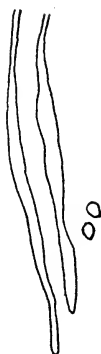


Fig. 9.
S. caespitosum.
Gloeocystidia
and spores \times
665.
From type.

Fructifications somewhat membranaceous, soft, spongy, sometimes resupinate, usually becoming conchate-reflexed, often imbricated, villose, becoming glabrous, somewhat concentrically sulcate, drying snuff-brown to bister; hymenium even, glabrous, white, drying cream-color to pallid mouse-gray; in structure 1000 μ thick, composed of longitudinally and loosely interwoven hyphae 3 μ in diameter, colored towards the upper surface, hyaline towards the hymenium; hymenium not zonate, containing flexuous gloeocystidia 20–60 \times 5–7 μ , rarely 90 μ , long; spores hyaline, 3–4½ \times 2–3 μ .

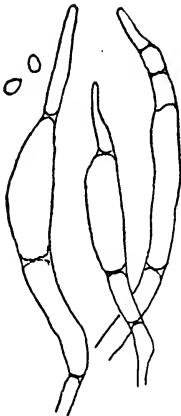


Fig. 10. *S. fuscum*.
Gloeocystidia and spores
 \times 665.

Reflexed pileus 1–4 cm. long, 2–5 cm. wide; resupinate specimens 3–10 \times 1–3 cm.

On rotting frondose limbs usually, but sometimes on pine. Canada to Texas, westward to Oregon, in the West Indies, and also in Europe. April to December. Not rare.

Reflexed specimens of *S. fuscum* may be recognized at sight by the soft, pliant pileus, brown and felt-like above, with a white hymenium. Gloeocystidia are so rare in the hymenium of a *Stereum* that their presence in abundance in this species affords a decisive specific character. Wholly resupinate specimens have the color of the hymenium of reflexed fructifications and have similar consistency and gloeocystidia. So many reflexed species occur resupinate that one should be sure to gather the more or less reflexed fructifications which can usually be secured associated with the resupinate specimens. Since both Persoon and Fries recognized the priority of Schrader's specific name *fuscum* and substituted *bicolor*, presumably because highly distinctive and appropriate for the species, the restoration of the original name by recent mycologists seems just.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 1207; Ell. & Ev., Fungi Col., 1019; Rabenhorst, Fungi Eur., 3233; Ravenel, Fungi Am., 9; Ravenel, Fungi Car. 2: 33; de Thümen, Myc. Univ., 1704.

- Finland: Mustiala, *P. A. Karsten*, in de Thümen, Myc. Univ., 1704.
- Sweden: Femsjö, *L. Romell*, 402.
- England: Selby, *E. A. Burt*.
- France: Allier, *H. Bourdot*, 16141.
- Hungary: *Kmet*, comm. by G. Bresadola.
- Canada: *J. Macoun*, 76, 280.
- Ontario: Ottawa, *J. Macoun*, 21, 59; Toronto, *J. H. Faull*, Univ. Toronto Herb., 361 (in Mo. Bot. Gard. Herb., 44863).
- Vermont: Middlebury, *E. A. Burt*; North Ferrisburg, *E. A. Burt*.
- New York: Bronx Park, New York, *H. D. House* (in N. Y. State Mus. Herb. and Mo. Bot. Gard. Herb., 54392), and *W. A. Merrill* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56773); Staten Island, *W. H. Ballou* (in Burt Herb., N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 56774); Syracuse, *D. C. Mills* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56281).
- Pennsylvania: Kittanning, *D. R. Sumstine*; West Chester, *Everhart & Haines*, in Ellis, N. Am. Fungi, 1207.
- District of Columbia: *C. L. Shear*, 1039; Takoma Park, *C. L. Shear*, 954.
- South Carolina: *H. W. Ravenel*, in Ravenel, Fungi Car. 2: 33; Santee Canal, *H. W. Ravenel*, 910 (in Curtis Herb.), and Curtis Herb., 2923, type of *Stereum coffeatum* (in Kew Herb.); Salem, *Schweinitz* (in Herb. Schweinitz).
- Georgia: Atlanta, *E. Bartholomew*, 5680 (in Mo. Bot. Gard. Herb., 44219); Tipton, *C. J. Humphrey*, 156.
- Florida: Gainesville, *H. W. Ravenel*, in Ravenel, Fungi Am., 9; Lake City, *P. L. Ricker*, 898; New Smyrna, *C. G. Lloyd*, 2118.
- Alabama: Auburn, *L. M. Underwood*, comm. by U. S. Dept. Agr. Herb., *F. S. Earle* (in Mo. Bot. Gard. Herb., 5058), and *F. S. Earle & C. F. Baker*; Fayette Co., *P. V. Siggers*, comm. by A. H. W. Povah, 15 (in Mo. Bot. Gard. Herb., 9226); Montgomery Co., *R. P. Burke*, 33 (in Mo. Bot. Gard. Herb., 15763).
- Mississippi: Chicou (in Mo. Bot. Gard. Herb., 43014).
- Louisiana: Abita Springs, *A. B. Langlois*; New Orleans, *F. S.*

- Earle* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56775); St. Martinville, *A. B. Langlois*, *bz*, 2095, and a specimen comm. by Lloyd Herb., 2737.
- Texas: San Antonio, *W. H. Long*, 21703 (in Mo. Bot. Gard. Herb., 55164).
- Ohio: *A. P. Morgan* (in Lloyd Herb.) and *C. G. Lloyd*, in Ell. & Ev., Fungi Col., 1019; Linwood, *C. G. Lloyd*, 1154, 1326; Norwood, *C. G. Lloyd*, V.
- Indiana: Greencastle, *L. M. Underwood* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56276, 56278); Hibernian Mills, *Whetzel & Reddick*, comm. by D. Reddick, 3.
- Wisconsin: Madeline Island, *V. B. Walker*, 6a (in Mo. Bot. Gard. Herb., 8359); Madison, *Miss A. O. Stucki*, 26.
- Missouri: Marianna, *H. von Schrenk* (in Burt Herb. and Mo. Bot. Gard. Herb., 42836); Oran, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 42835); Perryville, *C. H. Demetrio*, in Rabenhorst, Fungi Eur., 3233; Williamsville, *B. M. Duggar*, 482.
- Arkansas: Cass, *W. H. Long*, 19923 (in Mo. Bot. Gard. Herb., 13266); Levisque, *P. Spaulding* (in Mo. Bot. Gard. Herb., 5057).
- Idaho: Kooskia, *J. R. Weir*, 589 (in Mo. Bot. Gard. Herb., 56776).
- British Columbia: Agassiz, *J. R. Weir*, 603 (in Mo. Bot. Gard. Herb., 36748).
- Oregon: Corvallis, *C. E. Owens*, 2037 (in Mo. Bot. Gard. Herb., 43871).
- Cuba: Alto Cedro, *L. M. Underwood & F. S. Earle*, 1571, 1581, comm. by N. Y. Bot. Gard. Herb.; Baracoa, *L. M. Underwood & F. S. Earle*, 504, comm. by N. Y. Bot. Gard. Herb.
- Jamaica: Cinchona, *W. A. & E. L. Murrill*, 462, comm. by N. Y. Bot. Gard. Herb.; Hope Gardens, *F. S. Earle*, 500, comm. by N. Y. Bot. Gard. Herb.; Mandeville, *A. E. Wight*, comm. by W. G. Farlow; Troy and Tyre, *W. A. Murrill & W. Harris*, 1073, comm. by N. Y. Bot. Gard. Herb.

31. *S. rufum* Fries, Epier. 553. 1838; Hym. Eur. 644. 1874; Sacc. Syll. Fung. 6: 575. 1888; Romell, Bot. Not. 1895: 71. 1895. Plate 4, fig. 27.

Thelephora rufum Fries, Elenchus Fung. 1:187. 1828.—*Cryptochaete rufa* (Fries) Karsten, Finska Vet.-Soc. Bidrag Natur och Folk 48:408. 1889.—*Tubercularia pezizoidea* Schweinitz, Am. Phil. Soc. Trans. N. S. 4:301. 1832; Sacc. Syll. Fung. 4:644. 1886.—*Hypocrea Richardsonii* Berkeley & Montagne, Grevillea 4:14. 1875; Sacc. Syll. Fung. 2:528. 1883; Ellis & Everhart, N. Am. Pyrenomycetes, 86. 1892.—*Corticium pezizoideum* (Schw.) von Schrenk, Torr. Bot. Club Bul. 21:385. pl. 218. 1894.

Illustrations: von Schrenk, Torr. Bot. Club Bul. 21:pl. 218. 1894.

Type: in Herb. Fries.

Fructifications scattered or gregarious, coriaceous-fleshy, bursting out from the bark, verruciform, plicate-tuberculose,

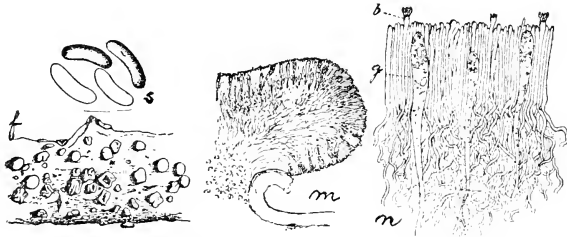


Fig. 11. *S. rufum*. Fructifications, *f*; section of fructification, *m*; section of hymenial region, *n*; spores, *s*. After von Schrenk.

peltate, vinaceous-brown to hematite-red, under side glabrous, the margin free all around; hymenium becoming coarsely wrinkled, vinaceous-brown, often grayish pruinose; in structure 1–2 mm. thick at the center, 600–800 μ thick in the marginal portion, composed of ascending, loosely interwoven, incrustated, hyaline hyphae 4–4½ μ in diameter over the incrustation; flexuous gloeocystidia 50–90 \times 7–10 μ are scattered in or near the hymenium but not protruding; spores white in spore collection, even, curved, 6–8 \times 1½–2 μ .

Fructifications 2–4 mm. in diameter.

On dead fallen *Populus tremuloides*. Newfoundland to Massachusetts and westward to North Dakota and Colorado. March to December. Common. Occurs in Scandinavia also.

S. rufum may be recognized at sight by its occurrence on prostrate poplar limbs and logs in the form of small vinaceous fructifications with the hymenium gyrosely wrinkled. The fructifications become peltate when full grown, attached by the center, and with the marginal portions free and turned outward.

Specimens examined:

- Exsiccati: Bartholomew, *Fungi Col.*, 1817, under the name *Corticium rufo-marginatum*, and 2716; Ellis, *N. Am. Fungi*, 1329; Romell, *Fungi Scand. Exs.*, 123; Shear, *N. Y. Fungi*, 88.
- Norway: Christiania, *M. N. Blytt*, authentic specimen (in *Herb. Fries*).
- Sweden: Stockholm, *L. Romell*, in *Romell, Fungi Scand. Exs.*, 123; Upsala, *L. Romell*, 39.
- Newfoundland: *B. L. Robinson & H. von Schrenk* (in *Mo. Bot. Gard. Herb.*, 42944); Bay of Islands, *A. C. Waghorne* (in *Mo. Bot. Gard. Herb.*, 17692).
- Ontario: Toronto, *T. Langton*, *Univ. Toronto Herb.*, 595 (in *Mo. Bot. Gard. Herb.*).
- Maine: Orono, *F. L. Harvey*, 6 (in *Mo. Bot. Gard. Herb.*, 16620); Portage, *L. W. Riddle*, 10.
- New Hampshire: Shelburne, *W. G. Farlow* (in *Mo. Bot. Gard. Herb.*, 14796).
- Vermont: Middlebury, *E. A. Burt*, two collections; North Ferrisburg, *E. A. Burt*.
- Massachusetts: Peabody, *A. R. Sweetser*; Waverley, *H. von Schrenk* (in *Mo. Bot. Gard. Herb.*, 16623).
- New York: Alcove, *C. L. Shear*, in *Shear, N. Y. Fungi*, 88; East Galway, *E. A. Burt*; Ithaca, *G. F. Atkinson* (in *Mo. Bot. Gard. Herb.*, 4775); Willsboro Point, *C. O. Smith*, in *Bartholomew, Fungi Col.*, 1817.
- Pennsylvania: Trexlertown, *W. Herbst*.
- Michigan: Mackinac Island, *E. T. & S. A. Harper*, 707; Northport, *H. von Schrenk* (in *Mo. Bot. Gard. Herb.*, 22481).
- Wisconsin: La Crosse, *W. Trelease* (in *Mo. Bot. Gard. Herb.*, 14794); Madison, *W. Trelease*, in *Ellis, N. Am. Fungi*, 1329, and (in *Mo. Bot. Gard. Herb.*, 14794, 16621); Palmyra, *Miss A. O. Stucki*, 27; Syene, *W. Trelease*, 3022 (in *Mo. Bot. Gard. Herb.*, 14793).

Nebraska: Lincoln, *Miss L. B. Walker*, 7 (in Mo. Bot. Gard. Herb., 44818).

North Dakota: Fargo, *F. J. Seaver*, 25, 54 (in Mo. Bot. Gard. Herb., 16222, 16637).

Montana: Helena, *F. W. Anderson*, 202 (in Mo. Bot. Gard. Herb., 21165).

Colorado: Blind Cañon Placer, *C. L. Shear*, 1021; Golden, *E. Bartholomew & E. Bethel*, in Bartholomew, Fungi Col., 2716, and *E. Bethel & L. O. Overholts*, comm. by L. O. Overholts, 1754 (in Mo. Bot. Gard. Herb., 54875); Ouray, *C. L. Shear*, 1187.

32. *S. Pini* Fries, *Epier.* 553. 1838; *Hym. Eur.* 643. 1874; *Sacc. Syll. Fung.* 6: 574. 1888. Plate 4, fig. 28.

Thelephora Pini Fries, *Syst. Myc.* 1: 443. 1821; *Elenchus Fung.* 1: 187. 1828.—*Sterellum Pini* (Schleich.) Karsten, *Finska Vet.-Soc. Bidrag Natur och Folk* 48: 405. 1889.

Illustrations: Smith, *Brit. Basidiomycetes*, text f. 98 E, F.

Fructifications gregarious, coriaceous-cartilaginous, orbicular, resupinate, with the margin free and attached by the center, shield-shaped, finally bullate, drying rigid, Benzo-brown; hymenium wood-brown to Benzo-brown, somewhat pruinose, becoming somewhat tuberculose; in structure 500 μ thick, thinning out towards the margin, with the intermediate layer bordered on each side by a narrow, colored zone and composed of longitudinally arranged, densely interwoven, hyaline hyphae with walls gelatinously modified, the subhymenium olivaceous-colored; cystidia incrusted, $24 \times 8 \mu$, sometimes very few to be found; fusoid or irregular gloeocystidia, $30-40 \times 10-15 \mu$, are sparingly present in or near the hymenium; spores hyaline, even, curved, $5-6 \times 2-2\frac{1}{2} \mu$.

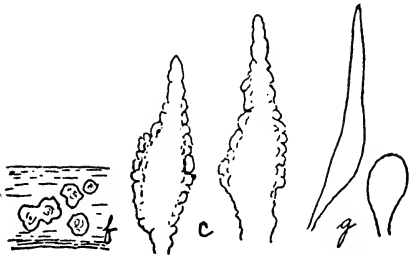


Fig. 12. *S. Pini*. Fructifications, *f*, natural size; cystidia, *c*, and gloeocystidia, *g*, $\times 665$.

Fructifications 1-4 mm. in diameter.

On bark of fallen limbs of *Pinus resinosa*. Maine and New Hampshire. August. Rare.

The fructifications are so near the color of the bark of the dead pine limbs upon which they grow that they are likely to be overlooked, or, if collected, roughly classed among the *Discomycetes* on account of their resemblance to these fungi in aspect. The occurrence on pine bark, small, shield-shaped fructifications Benzo-brown in color, and showing in section both cystidia and gloecystidia are a combination of characters which should not fail to identify this species.

Specimens examined:

Exsiccati: Krieger, Fungi Sax., 364; Rabenhorst, Herb. Myc., 213.

Finland: Mustiala, *P. A. Karsten*.

Sweden: Stockholm, *L. Romell*, 32.

Germany: Dresden, in Rabenhorst, Herb. Myc., 213; Königs-
tein, Saxony, *W. Krieger*, in Krieger, Fungi Sax., 364.

France: St. Priest, Allier, *H. Bourdot*, 15067.

Maine: *J. Blake*, 659 (in Curtis Herb.).

New Hampshire: Chocorua, *W. G. Farlow*, 37.

33. *S. purpureum* Persoon, Roemer Neues Mag. Bot. **1**: 110. 1794; Obs. Myc. **2**: 92. 1799; Fries, Epicr. 548. 1838; Hym. Eur. 639. 1874; Berkeley, Brit. Fung. 270. 1860; Morgan, Cincinnati Soc. Nat. Hist. Jour. **10**: 194. 1888; Sacc. Syll. Fung. **6**: 563. 1888; Masee, Linn. Soc. Bot. Jour. **27**: 186. 1890. Plate 4, fig. 29.

Thelephora purpurea Persoon, Syn. Fung. 571. 1801; Myc. Eur. **1**: 121. 1822; Fries, Syst. Myc. **1**: 440. 1821.—*Stereum vorticosum* Fries, Obs. Myc. **2**: 275. 1818; Epicr. 548. 1838; Hym. Eur. 639. 1874; Sacc. Syll. Fung. **6**: 563. 1888.

Illustrations: Fl. Danica **3**: pl. 534. f. 4; Hussey, Ill. Br. Myc. pl. 20. f. A; Istvanffi, Jahrbüch. f. wiss. Bot. **29**: pl. 6. f. 37-39; Lanzi, Fungi di Roma, pl. 11. f. 2; Sowerby, Col. Figs. Eng. Fungi, pl. 388. f. 1.

Type: authentic specimen from Persoon in Kew Herb.

Fructifications coriaceous-soft, drying rigid, sometimes resupinate, usually more or less reflexed, often imbricated, the

upper side villose-tomentose, light buff to cartridge-buff, the margin entire; hymenium even, glabrous, light purple-drab to dark vinaceous-drab; in structure about 500–800 μ thick excluding the tomentum, with the intermediate layer more loosely arranged on its under side in the subhymenial region and containing pyriform, or subglobose, vesicular organs 15–30 \times 12–25 μ ; no cystidia; spores hyaline, even, flattened on one side, 5–7 \times 2½–3 μ .

Fruifications with resupinate portion about 1–2 cm. in diameter; reflexed portion 5–20 mm. broad, and sometimes crisped or lobed with lobes 5 mm. in diameter.

On dead stumps and logs of *Populus*, *Betula*, and other frondose species. Newfoundland to Delaware and westward to British Columbia and Oregon, also in Uruguay and in Europe. June to April. Common but not ranging into torrid regions.

S. purpureum is usually recognized by its buff, tomentose pileus, purplish hymenium which does not bleed when wounded, and occurrence on poplar. Sectional preparations show characteristic vesicular organs in the subhymenial region, such as are present in the closely related *S. rugosiusculum*, but no hair-like cystidia in the hymenium, by the absence of which *S. purpureum* is distinguished from the latter.

The authentic specimen of *S. vorticolum* in Herb. Fries at Upsala is 2–3 \times 1½ cm., narrowly reflexed, with dark purplish hymenium, and with the usual microscopic structure and spores of *S. purpureum*.

Specimens examined:

Exsiccati: Bartholomew, Fungi Col., 3489; Berkeley, Brit. Fungi, 147; Cooke, Fungi Brit., 12; Ell. & Ev., N. Am. Fungi, 2018, 2601; Klotzsch, Fungi Germ., 50; Krieger, Fungi Sax., 1852; Rabenhorst, Herb. Myc., 504; Romell, Fungi Scand. Exs., 27; Shear, N. Y. Fungi, 311.

Europe: authentic specimen of *Thelephora purpurea* from Persoon (in Herb. Hooker in Kew Herb.).

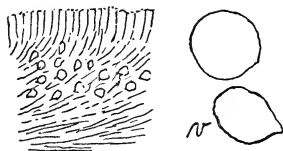


Fig. 13. *S. purpureum*. Section of hymenial region \times 90, and vesicular bodies \times 665. From authentic specimen.

- Sweden: *E. Fries* (in Kew Herb.); Femsjö, authentic specimen of *Stereum vorticosum* (in Herb. Fries); Stockholm, *L. Romell*, 34, 288, and in Romell, *Fungi Scand. Exs.*, 27.
- England: *M. J. Berkeley*, in Berkeley, *Brit. Fungi*, 147; Hampstead, *M. C. Cooke*, in Cooke, *Fungi Brit.*, 12.
- France: Corrombles, comm. by Lloyd Herb., 3355; St. Priest, Allier, *H. Bourdot*, 12459, 12461.
- Germany: *Klotzsch*, in Klotzsch, *Fungi Germ.*, 50; Dresden, in Rabenhorst, *Herb. Myc.*, 504; Winterberge, *Wagner & Krieger*, in Krieger, *Fungi Sax.*, 1852.
- Austria: *Stapf*, *Fl. Exs. Austro-Hungarica*, 3543 (in Mo. Bot. Gard. Herb., 5125, 715171).
- Italy: Trento, *G. Bresadola*.
- Newfoundland: Bay of Islands, *A. C. Waghorne*, 20, 86 (in Mo. Bot. Gard. Herb., 5091, 5092).
- Ontario: Harraby, *E. T. & S. A. Harper*, 641; Ottawa, *J. Macoun*, 17, 39; *J. M. Macoun*, comm. by N. Y. State Mus. Herb. (in Mo. Bot. Gard. Herb., 56085); Port Credit, *J. H. Faull*, Univ. Toronto Herb., 646 (in Mo. Bot. Gard. Herb., 44944); Toronto, *R. P. Wodehouse*, *J. H. Faull*, *G. H. Graham*, Univ. Toronto Herb., 310, 311, 677, respectively (in Mo. Bot. Gard. Herb., 44887, 44889, 44920); Wilcox Lake, *J. H. Faull*, Univ. Toronto Herb., 377 (in Mo. Bot. Gard. Herb., 44929).
- Maine: Manchester, *F. L. Scribner*, comm. by U. S. Dept. Agr. Herb.; Orono, *F. L. Harvey*, 3 (in Mo. Bot. Gard. Herb., 43850) and in Ell. & Ev., *N. Am. Fungi*, 2018; Portage, *L. W. Riddle*, 6.
- Vermont: Brattleboro, *E. A. Burt*; Little Notch, *E. A. Burt*; Middlebury, *E. A. Burt*, three collections; North Ferrisburg, *E. A. Burt*; Ripton, *E. A. Burt*, three collections; Walden, *L. S. Orton*, 4 (in Mo. Bot. Gard. Herb., 44081).
- Massachusetts: Cambridge (in Mo. Bot. Gard. Herb., 5094).
- Connecticut: *C. C. Hanmer*, 2326, 2061 (in Mo. Bot. Gard. Herb., 43847/8).
- New York: *Sartwell* (in Mo. Bot. Gard. Herb., 5151, 5156); Alcove, *C. L. Shear*, 1120, 1122, and in Shear, *N. Y. Fungi*, 311; East Galway, *E. A. Burt*; Ithaca, *G. F. Atkinson*, 2093, 2141, *C. J. Humphrey*, 307, *H. S. Jackson & C. Lewis*,

19396; Long Lake, *A. H. W. Povah* (in Mo. Bot. Gard. Herb., 9227); North Elba, *C. H. Kauffman*, 8 (in Mo. Bot. Gard. Herb., 16701); Rome, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 55022, 55024/5).

Pennsylvania: Bethlehem, *Schweinitz* (in Herb. Schweinitz); Trexlertown, *W. Herbst*, 16, 28, and comm. by Lloyd Herb., 3603.

Delaware: Wilmington, *A. Commons*, in Ell. & Ev., N. Am. Fungi, 2601.

Ohio: Norwood, *C. G. Lloyd*, 1787, and (in Mo. Bot. Gard. Herb., 5093).

Indiana: Indianapolis, *J. B. Demaree*, comm. by G. W. Hoffer (in Mo. Bot. Gard. Herb., 54790); Lafayette, *C. R. Orton*, 5 (in Mo. Bot. Gard. Herb., 44082).

Wisconsin: Madison, *W. Trelease* (in Mo. Bot. Gard. Herb., 5043); Star Lake, *Miss A. O. Stucki*, Univ. Wis. Herb., 59.

Minnesota: Park Rapids, comm. by E. L. Jensen, 10 (in Mo. Bot. Gard. Herb., 11100).

Montana: Helena, Monarch, *J. R. Weir*, 587, 598 (in Mo. Bot. Gard. Herb., 56738, 56739).

Wyoming: Boulder, *F. S. Wolpert*, comm. by J. R. Weir, 7949 (in Mo. Bot. Gard. Herb., 56219).

Idaho: Priest River, *J. R. Weir*, 10.

British Columbia: Sidney, *J. Macoun*, 74 (in Mo. Bot. Gard. Herb., 55352); Vancouver Island, *J. Macoun*, 51 (in Mo. Bot. Gard. Herb., 5737), and comm. by J. Demaree, V88 (in Mo. Bot. Gard. Herb., 22752).

Washington: Bingen, *W. N. Suksdorf*, 766, 767; Easton, *C. J. Humphrey*, 6449; Olympia, *C. J. Humphrey*, 6292; Seattle, *S. M. Zeller*, 108 (in Mo. Bot. Gard. Herb., 44140).

Oregon: Corvallis, *C. E. Owens*, 2076 (in Mo. Bot. Gard. Herb., 44038).

Uruguay: Montevideo, *W. Mitten* Herb., 1325 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56691).

34. *S. rugosiusculum* Berk. & Curtis, *Grevillea* 1: 162. 1873; Morgan, *Cincinnati Soc. Nat. Hist. Jour.* 10: 193. 1888; Sacc. *Syll. Fung.* 6: 567. 1888; Masee, *Linn. Soc. Bot. Jour.* 27: 187. 1890. Plate 4, fig. 30.

Stereum Micheneri Berk. & Curtis emend. Masee, Linn. Soc. Bot. Jour. 27: 183. 1890.—*S. Micheneri* Berk. & Curtis, Grevillea 1: 162. 1873 (in part). See Ann. Mo. Bot. Gard. 1: 214. 1914.—*Corticium Nyssae* Berk. & Curtis, Grevillea 1: 166. 1873; Sacc. Syll. Fung. 6: 609. 1888; Masee, Linn. Soc. Bot. Jour. 27: 120. 1890.—*C. siparium* Berk. & Curtis, Grevillea 1: 177. 1873; Sacc. Syll. Fung. 6: 636. 1888; Masee, Linn. Soc. Bot. Jour. 27: 139. 1890.

Illustrations: Berkeley, Ann. & Mag. Nat. Hist. I. 1: 94. pl. 5. f. 45.

Type: in Kew Herb. and Curtis Herb.

Fructifications coriaceous-soft, rarely resupinate, usually more or less broadly reflexed, upper surface tomentose, spongy, some-

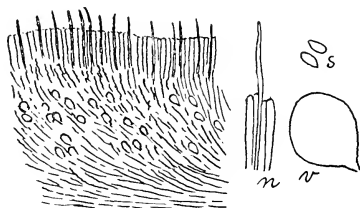


Fig. 14. *S. rugosiusculum*. Section of hymenial region $\times 90$; cystidium and basidia, *n*, vesicular body, *v*, and spores, *s*, $\times 665$.

times with projecting hairs collapsed together into a plane or wrinkled surface, drying cartridge-buff to cinnamon-buff, the margin entire; hymenium even, drying vinaceous-buff to fawn color; in structure up to $1-1\frac{1}{2}$ mm. thick inclusive of the tomentum, with the intermediate layer on its under side in the subhymenial region, loosely interwoven, and containing more or less numerous, pyriform vesicular bodies $15-30 \times 10-20 \mu$; cystidia slender, thin-walled, tapering hairs, not incrustated, $4-5 \mu$ in diameter, protruding up to 25μ beyond the basidia; spores white in spore collection, even, flattened on one side, $4\frac{1}{2}-6 \times 2-3 \mu$.

Resupinate specimens up to 6 cm. in diameter; reflexed portion 1-2 cm. broad, 2-6 cm. laterally along substratum.

On logs and stumps of *Salix* and other frondose species. Ontario to Alabama, in Missouri, and in British Columbia to Mexico; occurs also in Sweden, France, Italy, England, and Japan. August to April.

Stereum rugosiusculum is probably more frequent and more widely distributed than shown by the specimens received, for

the general aspect and microscopic structure of specimens are usually so similar to *S. purpureum* that it is distinguishable from the latter only by the presence of weak flexuous hairs in the hymenium which are not visible until sectional preparations are examined with the compound microscope. Such hymenial hairs were in 1839 figured by Berkeley, *loc. cit.*, in illustrating the hymenium of what he regarded as *Thelephora purpurea* but which now appears to have been *S. rugosiusculum*. All specimens in which these hair-like cystidia have been demonstrated have been either resupinate or with simple, reflexed portion not narrowly lobed or complicate. It has not been possible to observe a specimen throughout its whole season of growth to determine whether the hair-like cystidia are a constant character. In forming the glabrous, rugulose surface upon which the specific name is based, the specimens do not become denuded of their original tomentose covering, for sectional preparations of such specimens, mounted in liquid medium, show this hairy covering to be of the original thickness and with the tips of the hairs no longer adhering together into a plane surface but now floating free. Probably the gluing together of the hairs into a glabrous surface is a weather phenomenon.

Specimens examined:

Exsiccati: *Bartholomew*, Fungi Col., 3489, under the name *Stereum purpureum*; *Cavara*, Fungi Longobardiae, 60, under the name *Stereum purpureum*; *Ellis*, N. Am. Fungi, 323, under the name *Stereum purpureum*.

Sweden: *Stockholm*, *L. Romell*, 33.

England: *M. J. Berkeley*, under the name *Stereum vorticosum* (in *Kew Herb.*).

France: *Fautrey*, determined by *Patouillard* as *S. purpureum*, comm. by *Lloyd Herb.*, 4339, 4363.

Italy: *F. Cavara*, in *Cavara*, Fungi Longobardiae, 60.

Ontario: *London*, *J. Dearness*, in *Bartholomew*, Fungi Col., 3489.

Maine: *Morse*, comm. by *Sprague* (in *Curtis Herb.*, 5413, type of *Stereum Micheneri* as emended by *Massee*); *Harrison*, *J. Blake*, comm. by *P. L. Ricker*; *Piscataquis Co.*, *W. A. Murrill*, 1850, 2153 (in *N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.*, 56692, 56693).

- Vermont: Ripton, *E. A. Burt*.
- Massachusetts: *Sprague*, 492, type (in Kew Herb. and Curtis Herb., 5412); Cambridge, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 4774), and *A. B. Seymour*, *T* 19 (in Mo. Bot. Gard. Herb., 43886).
- New York: Ithaca, *G. F. Atkinson*, *K*, 2818a; Lake Placid, *W. A. & E. L. Murrill*, 445 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56694); White Plains, *L. M. Underwood* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56268).
- New Jersey: *J. B. Ellis*, in Ellis, N. Am. Fungi, 323.
- Pennsylvania: *E. Michener*, 509, type of *Corticium Nyssae* (in Curtis Herb., 3486); Ohiopyle, *W. A. Murrill*, 1043 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56695); Trexlertown, *W. Herbst*.
- Virginia: Blacksburg, *W. A. Murrill*, 351 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56710).
- Alabama: *Peters*, 858, type of *Corticium siparium* (in Curtis Herb., 5239); Montgomery Co., *R. P. Burke* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56792).
- Missouri: Creve Coeur Lake, *E. A. Burt* (in Mo. Bot. Gard. Herb., 13031).
- Idaho: Priest River, *J. R. Weir*, 595 (in Mo. Bot. Gard. Herb., 36740).
- British Columbia: *J. Macoun*, 62 (in Mo. Bot. Gard. Herb., 5740).
- Washington: Bellingham, *J. R. Weir*, 604 (in Mo. Bot. Gard. Herb., 36741); Seattle, *W. A. Murrill*, 129, 139, 147, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55743, 55732, 55728); *W. A. Murrill*, 136, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55735), and *S. M. Zeller*, 129 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 129).
- Oregon: Corvallis, *W. A. Murrill*, 892a, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55724); Kiger Island, *S. M. Zeller*, 1788 (in Mo. Bot. Gard. Herb., 56653).
- California: *R. A. Harper*, 36 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56697); Sierra Nevada Mts., *Harkness*, 1060 (in Herb. Cooke in Kew Herb., under the name *Stereum muscigenum*).

Mexico: Guernavaca, *W. A. & E. L. Merrill*, 410, 546, 547 (in *N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.*, 54535, 54581, 54582).

Japan: Kushiro, *A. Yasuda*, 64 (in *Mo. Bot. Gard. Herb.*, 56136).

35. *S. Murrayi* (Berk. & Curtis) Burt, n. comb.

Plate 4, figs. 31, 32.

Thelephora Murrayi Berk. & Curtis, *Linn. Soc. Bot. Jour.* 10: 329. 1868; *Grevillea* 1: 150. 1873; spelling of specific name changed to *Murrayi* in *Sacc. Syll. Fung.* 6: 546. 1888.—*Stereum tuberosum* Fries, *Hym. Eur.* 644. 1874; *Sacc. Syll. Fung.* 6: 586. 1888; *Massee*, *Linn. Soc. Bot. Jour.* 27: 204. 1890; *Romell*, *Bot. Not.* 1895: 70. 1895.—*S. pulverulentum* Peck, *Torr. Bot. Club Bul.* 27: 20. 1900; *Sacc. Syll. Fung.* 16: 187. 1902.

Illustrations: *Lloyd, Myc. Writ.* 5. *Myc. Notes* 62: pl. 148. f. 1690. 1920.

Type: in *Kew Herb.* and *Curtis Herb.*

Fructifications corky, adnate, usually resupinate and broadly effused, sometimes reflexed, the reflexed upper surface a hard, horny crust, not shining, concentrically sulcate, fuscous-black or aniline-black, the margin entire; hymenium drying from pale olive-buff to avellaneous, tubercular, deeply cracking; in structure 300 μ thick at first, then becoming stratose and thickening to 800–2000 μ , composed of densely interwoven, rather suberect hyaline hyphae 2½–4 μ in diameter and of very numerous, hyaline, pyriform vesicular organs 15–20×12–15 μ which are distributed throughout the whole fructification; no colored conducting organs nor cystidia; spores white in spore collection, even, flattened on one side, 4½–5×2½ μ .

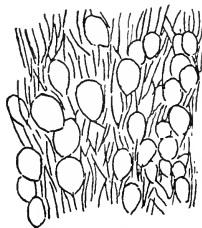


Fig. 15. *S. Murrayi*. Section of hymenial region × 488, showing vesicular bodies.

Resupinate specimens 1–10 cm. in diameter, becoming confluent, reflexed part 3–10 mm. broad.

On rotting logs and limbs of frondose species such as *Acer*, *Betula*, *Fagus*, *Quercus*, and *Tilia*. Canada to West Indies and westward to British Columbia. April to October in the north and October to March in the West Indies. Common. Occurs in Scandinavia also.

The specimens upon which were based the original descriptions of *S. Murrayi* and its synonyms were resupinate; in each instance the species was included in *Stereum* or *Thelephora*, although longitudinally arranged hyphae are not present and do not constitute an intermediate layer. The distinguishing characters of the resupinate specimens are their thickness, pallid to pale avellaneous color, tubercular and deeply cracked hymenium, abundance of vesicular organs throughout the whole thickness of the fructification, and occurrence on a frondose substratum. The horny crust forming the upper side of the pileus is similar to that of some species of *Fomes* and is unique among our *Stereums*, but the reflexed stage is so rare that this character does not often afford help in recognizing the species. The geographical distribution in three widely separated areas is remarkable; it seems probable that the European stations in Norway and Sweden should be regarded as merely outlying stations of a common North American species; it is very strange that a species presumably northern should be well established in Cuba and Jamaica and absent from Florida and the Carolinas, yet specimens from all three isolated regions are identical in aspect and microscopical structure.

Specimens examined:

Exsiccati: Ell. & Ev., *Fungi Col.*, 704, under the name *Stereum rugosum*; Ell. & Ev., *N. Am. Fungi*, 2903, under the name *Corticium colliculosum*; Shear, *N. Y. Fungi*, 51, under the name *Stereum rugosum*.

Norway: *M. N. Blytt*, type of *Stereum tuberculosum* (in *Herb. Fries*).

Sweden: Island of Gotland, on *Abies excelsa*, *L. Romell*, 135.

Canada: *J. Macoun*, 18, 43, 60; Billings Bridge, *J. Macoun*, 44; Lower St. Lawrence Valley, *J. Macoun*, 69, 72.

Ontario: *J. Dearness*, 1022 (in *Mo. Bot. Gard. Herb.*, 22682); Blackwater, *J. McFarlane*, *Univ. Toronto Herb.*, 330 (in *Mo. Bot. Gard. Herb.*, 44865); Harraby, Lake Rosseau,

E. T. & *S. A. Harper*, 730; London, *J. Dearness*, two collections, and in *Ell. & Ev.*, *Fungi Col.*, 704; Ottawa, *J. Macoun*, 12, and 676—the latter comm. by *W. G. Farlow* (in *Mo. Bot. Gard. Herb.*, 56757); Toronto, Algonquin Park and Lorne Park, *J. H. Faull*, Univ. Toronto Herb., 500 and 333 respectively (in *Mo. Bot. Gard. Herb.*, 44854 and 44873).

Maine: *F. L. Harvey*, comm. by *P. L. Ricker*, and *F. L. Harvey*, type of *Stereum pulverulentum* (in *N. Y. State Mus. Herb.*) and cotype comm. by *P. L. Ricker*; Portage, *L. W. Riddle*, 19; Sebec Lake, *W. A. Murrill*, 2304 (in *N. Y. Bot. Gard. Herb.* and *Mo. Bot. Gard. Herb.*, 56755).

New Hampshire: Chocorua, *W. G. Farlow*; Crawford Notch, *L. O. Overholts*, 4582 (in *Mo. Bot. Gard. Herb.*, 55640); Groton, *J. Blake*, comm. by *P. L. Ricker*; Hebron, *P. Wilson* (in *N. Y. Bot. Gard. Herb.* and *Mo. Bot. Gard. Herb.*, 56756); Shelburne, *W. G. Farlow* (in *Farlow Herb.*).

Vermont: Bristol, *E. A. Burt*; Grand View Mt., *E. A. Burt*, two collections; Middlebury, *E. A. Burt*, two collections; Ripton, *E. A. Burt*, two collections and also near Abby Pond and Lost Pleiad Lake.

Massachusetts: *Murray*, comm. by *Sprague*, 546, authentic specimen of *Thelephora Murrayi* (in *Curtis Herb.*, 5809).

New York: Alcove, *C. L. Shear*, 1206, 1311, and in *Shear*, *N. Y. Fungi*, 51; Altamont, *E. A. Burt*; Floodwood, *E. A. Burt*; Fulton Center, *L. M. Underwood* (in *N. Y. Bot. Gard. Herb.* and *Mo. Bot. Gard. Herb.*, 56274); Horicon, *C. H. Peck* (in *N. Y. State Mus. Herb.* and *Mo. Bot. Gard. Herb.*, 56107); Ithaca, *C. J. Humphrey*, 549; Lake Placid, *W. A. & E. L. Murrill*, 194 (in *N. Y. Bot. Gard. Herb.* and *Mo. Bot. Gard. Herb.*, 56756); North Elba, *C. H. Peck*, 1; Seventh Lake, Adirondack Mts., *B. M. Duggar & F. C. Stewart*; West Ann, *S. H. Burnham*, 4 (in *Mo. Bot. Gard. Herb.*, 43997).

West Virginia: Nuttallburg, *L. W. Nuttall*, in *Ell. & Ev.*, *Fungi Col.*, 704.

Michigan: Houghton, *C. H. Kauffman*, comm. by *N. Y. State Mus. Herb.* (in *Mo. Bot. Gard. Herb.*, 55812); Sailors' Encampment, *Miss A. O. Stucki*, 5; Vermilion, *A. H. W. Povah*, 190 (in *Mo. Bot. Gard. Herb.*, 17615).

- Wisconsin: Ladysmith, *C. J. Humphrey*, 1914 (in Mo. Bot. Gard. Herb., 42916).
- Idaho: Priest River, *J. R. Weir*, 362, 379 (in Mo. Bot. Gard. Herb., 16533, 17115).
- British Columbia: Agassiz, *J. R. Weir*, 351 (in Mo. Bot. Gard. Herb., 8066).
- Cuba: *C. Wright*, 269, type (in Kew Herb. and Curtis Herb.); Alto Cedro, *Earle & Murrill*, 491, comm. by N. Y. Bot. Gard. Herb.; Ciego de Avila, *Earle & Murrill*, 590, comm. by N. Y. Bot. Gard. Herb.; Herradura, *Earle & Murrill*, 188, comm. by N. Y. Bot. Gard. Herb.
- Porto Rico: Rio Piedras, *J. A. Stevenson*, 3360 (in Mo. Bot. Gard. Herb., 7584).
- Jamaica: Constant Spring Hotel grounds, *W. A. & E. L. Murrill*, 34, comm. by N. Y. Bot. Gard. Herb.; New Haven Gap, *W. A. & E. L. Murrill*, 771, comm. by N. Y. Bot. Gard. Herb.; Port Antonio, *F. S. Earle*, 575, comm. by N. Y. Bot. Gard. Herb.

36. *S. saxitas* Burt, n. sp.

Plate 4, fig. 33.

Type: in Mo. Bot. Gard. Herb. and N. Y. Bot. Gard. Herb.

Fructification thick, stratose, stony-hard throughout, resupinate, effused, becoming narrowly reflexed, the reflexed portion

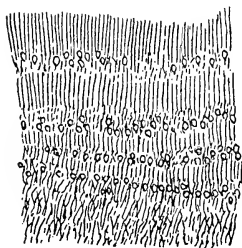


Fig. 16. *S. saxitas*. Section of hymenial region $\times 90$, showing vesicular bodies; spores, s, $\times 665$.

black above, irregular, stony; hymenium even or tubercular, not shining, drying cartridge-buff to whitish; in structure 1–5 mm. thick, stratose, composed of alternating pale and darker layers but with a horn-like translucent luster throughout when cut; a few vesicular organs $20\text{--}25 \times 12\text{--}15 \mu$ present along the under portion of each stratum; no cystidia; spores hyaline, even, $4\text{--}5 \times 3\text{--}4 \mu$.

Resupinate portion 3–6 cm. in diameter; reflexed margin 2–4 mm. broad.

On bark of apparently a frondose species. Mexico and Jamaica. December and May.

S. saxitas resembles in aspect *S. Murrayi*, and relationship to this species is further shown by the presence of vesicular organs; however, it is thicker than *S. Murrayi*, stony-hard throughout, contains but few vesicular cells, and has subglobose spores. Its structure is so extremely hard that it has been possible to cut sections for microscopic details of only the hymenium and nearly adjacent regions even after prolonged soaking in water.

Specimens examined:

Mexico: Guernavaca, *W. A. & E. L. Merrill*, 419, type, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54552).

Jamaica: John Crow Peak, *D. S. Johnson* (in N. Y. Bot. Gard. Herb., Mo. Bot. Gard. Herb., 56758, and Burt Herb.).

37. *S. styracifluum* Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1: 105. 1822 (under *B. Sterea* of *Thelephora*); Fries, Epicr. 549. 1838; Sacc. Syll. Fung. 6: 569. 1888.

Plate 4, figs. 34, 35.

Thelephora styraciflua Schweinitz in Fries, Elenchus Fung. 1: 177. 1828; Schweinitz, Am. Phil. Soc. Trans. N. S. 4: 167. 1832.

Type: in Herb. Schweinitz and portions in Herb. Fries and Curtis Herb.

Fructification coriaceous, resupinate and effused, with a narrow, free marginal portion, or slightly reflexed, tomentose, drying pinkish buff to cinnamon-buff; hymenium dull, pruinose, not multizonate, drying pinkish buff, exuding a yellow milk when compressed and becoming dark-discolored, contracting in drying and splitting; in structure 700–800 μ thick, with the intermediate layer bordered on its upper side by a pale golden zone not denser than the rest of the layer, composed of very densely arranged hyphae $2\frac{1}{2}$ –3 μ in diameter, with pale-colored conducting organs 3–3 $\frac{1}{2}$ μ in diameter which curve into the hymenium; no cystidia; spores hyaline, even, slightly curved, $5\text{--}8 \times 2\frac{1}{2}\text{--}3$ μ .

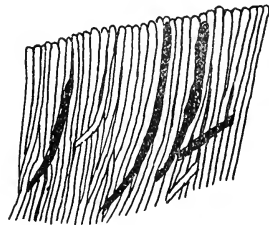


Fig. 17. *S. styracifluum*. Section of hymenial region $\times 488$, showing conducting organs. From type.

Resupinate portion 3×2 cm.; the free margin up to 5 mm. broad.

On under side of dead, fallen limbs of *Liquidambar* and mossy dead trunk of *Carpinus*. North Carolina and Alabama. January. Rare.

S. styracifluum is intermediate between *S. rameale* and *S. rugosum*; in the region where it occurs it is likely to be regarded as a resupinate form of *S. rameale*, from which it differs in darker and more irregular hymenial surface, greater thickness of fructification, margin sometimes with a black edge, and reflexed part tomentose to the margin; the pale-colored conducting organs are similar in the two species but rather more abundant in *S. styracifluum*. The general aspect is so similar to that of *S. rugosum*, very common in Europe, that the yellow milk of *S. styracifluum* was properly regarded by Schweinitz as an important distinctive character of the American species; other differences are that the intermediate layer is much broader and denser than that of *S. rugosum*, that the hymenium is only 20–30 μ broad, never zonate, and that the conducting organs are much less numerous and paler than in *S. rugosum*.

Specimens examined:

North Carolina: Salem, *Schweinitz*, type (in Schweinitz Herb., Fries Herb., and Curtis Herb.).

Alabama: Auburn, on *Carpinus*, *F. S. Earle & C. F. Baker* (in Burt Herb. and Mo. Bot. Gard. Herb., 5061).

38. *S. gausapatum* Fries, Hym. Eur. 638. 1874; Sacc. Syll. Fung. 6: 560. 1888; Masee, Linn. Soc. Bot. Jour. 27: 180. 1890. Plate 4, fig. 36.

Thelephora gausapata Fries, Elenchus Fung. 1: 171. 1828; Epicr. 538. 1838.—*T. spadicea* Fries, Elenchus Fung. 1: 176. 1828 (not *T. spadicea* Persoon, Syn. Fung. 568. 1801. See Bresadola, I. R. Accad. Agiati Atti III. 3: 106. 1897).—*Stereum spadiceum* Fries, Epicr. 549. 1838; Hym. Eur. 640. 1874; Berkeley, Outlines Brit. Fung. 270. 1860; also of more recent English authors.—*S. spadiceum* var. *plicatum* Peck, N. Y. State Mus. Rept. 50: 132. 1897.—*S. cristulatum* Quelet, Champ. Jura et Vosges 3: 15. pl. 1. f. 15. 1875.—*S. occidentale* Lloyd, Myc. Writ. 5. Letter 69:12. 1919.

Type: specimen from Fries in Kew Herb.

Fructifications coriaceous, effuso-reflexed or somewhat dimidiate, usually cespitose-imbricated, confluent, varying from villose to hirsute, buckthorn-brown, more or less radially plicate; hymenium bleeding when fresh if cut or bruised, drying snuff-brown and more or less darker discolored; in structure 600–700 μ thick exclusive of the hairy covering, composed of densely and longitudinally arranged hyphae, with flexuous, colored conducting organs 75–120 \times 5 μ , very numerous in the hymenium; no cystidia; spores hyaline, even, 5–8 \times 2 $\frac{1}{2}$ –3 $\frac{1}{2}$ μ .

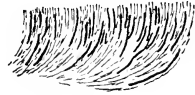


Fig. 18. *S. gausapatum*. Section of hymenial region \times 68, showing distribution of conducting organs.

Singly or covering areas up to 10 cm. and more in diameter; reflexed portion about 1 cm. broad, 1–2 $\frac{1}{2}$ cm. long or more, or with small pilei or lobes 1–1 $\frac{1}{2}$ cm. in diameter.

On stumps of *Quercus* usually. Canada to Alabama and westward to Washington and California. August to March. Common.

S. gausapatum is usually recognizable at sight by its clustered fructifications tobacco-colored above and clothed with a heavy villose or strigose coat, by the rather dark hymenium which bleeds when cut and becomes somewhat darker discolored in drying, and by the occurrence on oak. Sectional preparations show very numerous, colored conducting organs in the hymenium. *S. australe* of the Gulf states bleeds and has colored conducting organs, although fewer, but its fructifications do not form dense clusters and are not radially plicate. *S. sanguinolentum* has the same geographical distribution as *S. gausapatum* and bleeds when fresh and has colored conducting organs, but has small fructifications occurring on conifers only. The hairy covering of the pileus is greedily devoured by herbarium insects, leaving the pilei bare of their normal covering if specimens are not protected against their depredations, but, except for insect depredation, this covering is a persistent character.

Fries described the effuso-reflexed stage of *S. gausapatum* under the name *T. spadicea*, confusing this stage with the more southern and specifically different *Thelephora spadicea* of Persoon, which does not occur in America. It seems preferable

to use the name *S. gausapatum* for our species, although unfortunately the other name is in general use in England, and leave the name *S. spadiceum* available for use in its original sense as continental mycologists do. It is surprising that specimens of *S. gausapatum* do not occur in Herb. Schweinitz under some name or other.

Specimens examined:

Exsiccati: Bartholomew, Fungi Col., 2883, 4292; Berkeley, Brit. Fungi, 144; Cooke, Fungi Brit., 107; Ellis, N. Am. Fungi, 325; Ell. & Ev., N. Am. Fungi, 3413, under name *Stereum hirsutum*; Ell. & Ev., Fungi Col., 218; Ravenel, Fungi Car. 2: 32; Fungi Am., 447; Romell, Fungi Scand. Exs., 28, 122.

Sweden: Stockholm, *L. Romell*, 45, 46, 238, and in Romell, Fungi Scand. Exs., 28, 122.

England: *M. J. Berkeley*, in Berkeley, Brit. Fungi, 144; Epping, *M. C. Cooke*, in Cooke, Fungi Brit., 107.

Holland: Amsterdam, *C. A. J. A. Oudemans*, in Oudemans, Fungi Neerland., 239 (in Mo. Bot. Gard. Herb.).

France: authentic specimen of *Stereum cristulatum* from Quelet (in Herb. Fries); wall of German trench, *Lieut. G. W. Martin*, comm. by P. J. Anderson, 3 (in Mo. Bot. Gard. Herb., 55848); St. Sernin, Aveyron, *A. Galzin*, 1265, comm. by H. Bourdot, 16234; Corrombles, *F. Fautrey*, from Lloyd Herb., 3312.

Italy: Trentino, *G. Bresadola*.

Canada: Carleton Place, *J. Macoun*, 419.

Ontario: Lake Joseph, *T. Langton*, Univ. Toronto Herb., 590 (in Mo. Bot. Gard. Herb., 44846); London, *J. Dearness*; Swansea, *J. H. Faull*, Univ. Toronto Herb., 375 (in Mo. Bot. Gard. Herb., 44931); Toronto, *J. H. Faull*, *G. H. Graham*, *T. Langton*, *R. P. Wodehouse*, Univ. Toronto Herb., 372, 376, 676, 679, 591, 597, 368 (in Mo. Bot. Gard. Herb., 44946, 44932, 44923, 44935, 44849, 44840, 44855, respectively).

Vermont: Lake Dunmore, *E. A. Burt*, three collections; Middlebury, *E. A. Burt*.

Massachusetts: Mt. Auburn, *E. A. Burt*; Stoneham, *C. L. Shear*, 1233; Wayland, *A. B. Seymour*, T36 (in Mo. Bot.

- Gard. Herb., 13939); Waverly, *G. R. Lyman*, 121; Weston, *A. B. Seymour*, T10 (in Mo. Bot. Gard. Herb., 19621).
- Connecticut: West Hartford, *C. C. Hanmer*, 2670 (in Mo. Bot. Gard. Herb., 42605).
- New York: *Sartwell* (in Mo. Bot. Gard. Herb., 5046, 5102); Cold Spring Harbor, *H. J. Banker* (in Mo. Bot. Gard. Herb., 54434); Green Lake, *P. Wilson*, 52 (in Mo. Bot. Gard. Herb., 54745); Ithaca, *G. F. Atkinson*, 223 *O. S.*, 2140, 7986, 7986b, *H. H.*, 5088, *C. J. Humphrey*, *F. A. Wolf*, 22943; N. Greenbush, *C. H. Peck*, in *Ellis*, *N. Am. Fungi*, 325; Poughkeepsie, *W. R. Gerard*, 271 (in *N. Y. Bot. Gard. Herb.*); Shakers, *S. H. Burnham*, 16 (in Mo. Bot. Gard. Herb., 44010); St. Regis Falls, *L. A. Zimm*, 94 (in Mo. Bot. Gard. Herb., 21941); Williamsbridge, *P. Wilson*, 2 (in Mo. Bot. Gard. Herb., 54746); White Plains, *L. M. Underwood* (in *N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.*, 56700).
- New Jersey: Newfield, *J. B. Ellis*, in *Ell. & Ev.*, *Fungi Col.*, 218.
- Pennsylvania: Kittanning, *D. R. Sumstine*, 5, 6, 8; Spruce Creek, *J. H. Faull*, *Univ. Toronto Herb.*, 371, 672 (in Mo. Bot. Gard. Herb., 44925, 44938); Trexlertown, *C. G. Lloyd*, 0054.
- Delaware: Newark, *H. S. Jackson*.
- Maryland: Takoma Park, *C. L. Shear*, 1018, 1201, 1270, 1273.
- Virginia: Clarendon, *W. H. Long*, 12617 (in Mo. Bot. Gard. Herb., 55103); Park Lane, *W. H. Long*, 12860 (in Mo. Bot. Gard. Herb., 55109).
- North Carolina: Biltmore, *C. Harrison*, comm. by *P. L. Ricker*, *E. Bartholomew*, 5663 (in Mo. Bot. Gard. Herb., 44262); Blowing Rock, *G. F. Atkinson*, 4318, 4328; Chapel Hill, *W. C. Coker*, 334, 3821 (in Mo. Bot. Gard. Herb., 56670, 56671).
- South Carolina: Aiken, *H. W. Ravenel*, in *Ravenel*, *Fungi Am.*, 447; Black Oak, *H. W. Ravenel*, in *Ravenel*, *Fungi Car.* 2: 32.
- Georgia: Tallulah Falls, *A. B. Seymour*, comm. by *W. G. Farlow*, *C. C.* (in Mo. Bot. Gard. Herb., 44604).
- Alabama: Auburn, *F. S. Earle* (in *N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.*, 56287, 56703), and *C. F. Baker*,

- 50 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56702); Montgomery Co., *R. P. Burke*, 24, 38 (in Mo. Bot. Gard. Herb., 17651, 4925).
- Louisiana: St. Martinville, *A. B. Langlois*, 165.
- Michigan: *Beal*, 57, comm. by N. Y. State Mus. Herb. (in Mo. Bot. Gard. Herb., 55810); Ann Arbor, *C. H. Kauffman*, 37 (in Mo. Bot. Gard. Herb., 18995); Glen Lake, *C. G. Lloyd*, 02551.
- Ohio: Cincinnati, *C. G. Lloyd*, 02820; College Hill, *W. Holden*, comm. by Lloyd Herb.
- Indiana: Millers, *E. T. & S. A. Harper*, 678.
- Illinois: River Forest, *E. T. & S. A. Harper*, 708; Riverside, *E. T. & S. A. Harper*, 686.
- West Virginia: Nuttallburg, *L. W. Nuttall*, in Ell. & Ev., N. Am. Fungi, 3413.
- Kentucky: *S. A. Price* (in Mo. Bot. Gard. Herb., 5136).
- Wisconsin: Madison, *E. T. & S. A. Harper*, 942, *Miss A. D. Stucki*, 32, and *W. Trelease*, 84 (in Mo. Bot. Gard. Herb., 5101).
- Iowa: Webster Co., *O. M. Oleson*, 2, 3, 5.
- Missouri: Columbia, *B. M. Duggar*, 358, 392, 573; St. Louis, *C. R. Ball & H. H. Hume*, and *E. A. Burt* (in Mo. Bot. Gard. Herb., 5023, 21989).
- Arkansas: Fayetteville, *E. Bartholomew*, in Bartholomew, Fungi Col., 2883; Womble, *W. H. Long*, 19849 in part (in Mo. Bot. Gard. Herb., 20271).
- Texas: Joaquin, *E. Bartholomew*, in Bartholomew, Fungi Col., 4292.
- Nebraska: Lincoln, *C. L. Shear*, 1017; Roco, *C. L. Shear*, 1012.
- Kansas: Bourbon Co., *A. G. Garrett*, 86, 129.
- British Columbia: Kootenai Mts., near Salmo, *J. R. Weir*, 502 (in Mo. Bot. Gard. Herb., 21630).
- Washington: Seattle, *S. M. Zeller*, 109 (in Mo. Bot. Gard. Herb., 44142); *T. C. Frye*, 2007 (in N. Y. Bot. Gard. Herb.); Whidley Is., *N. L. Gardner*, Univ. Calif. Herb., 1033 (in Mo. Bot. Gard. Herb., 44151).
- Oregon: Corvallis, *C. E. Owens*, 2085 (in Mo. Bot. Gard. Herb., 44247), *W. A. Murrill*, 903, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55720); Portland, *J. R. Weir*, 396 (in Mo. Bot. Gard. Herb., 14094).

California: *I. M. Johnston*, comm. by C. G. Lloyd, part of type of *Stereum occidentale* (in Mo. Bot. Gard. Herb., 56762); Alameda Co., *L. S. Smith*, Univ. Calif. Herb., 403 (in Mo. Bot. Gard. Herb., 44150); Preston's Ravine, Palo Alto, *W. A. Merrill & L. S. Abrams*, 1190, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55711); Redwood Park, *W. H. Long*, 12604 (in Mo. Bot. Gard. Herb., 55100); Santa Barbara, *O. M. Oleson*, 7, 15.

Arizona: C. G. Pringle, comm. by W. G. Farlow.

Mexico: San Luis Potosi, comm. by U. S. Dept. Agr. Herb.

39. *S. australe* Lloyd, Myc. Writ. 4. Letter 48: 10. 1913; and *ibid.* Letter 60: 15. 1916. Plate 4, fig. 37.

An *Thelephora mytilina* Fries, Elenchus Fung. 1: 175. 1828? Type: in Lloyd Herb. and Mo. Bot. Gard. Herb.

Fructification coriaceous, attached by the resupinate side and umbo, broadly reflexed, sometimes laterally confluent, densely tomentose, becoming concentrically furrowed and very rarely glabrous and showing the shining chestnut surface of the pileus in one or more of the furrows, the margin entire, sometimes becoming blackish; hymenium even, glabrous, drab-gray to avel-laneous, becoming red-discolored where cut or bruised, and sometimes bleeding; in structure 900 μ thick, composed of densely, longitudinally arranged hyphae, among which are a few colored conducting organs $3\frac{1}{2}$ - $4\frac{1}{2}$ μ in diameter which curve into the hymenium between the basidia; no cystidia nor gloeocystidia present; spores hyaline, even, flattened on one side, $4-4\frac{1}{2} \times 2\frac{1}{2}-3$ μ , few found.

Fructifications with resupinate portion 1-3 cm. broad, reflexed portion 1-4 cm. broad, 1-5 cm. long and sometimes more by lateral confluence.

On hardwood logs. Florida and Mississippi to Brazil. August to December in the north and in July in Brazil. Apparently rare.

Stereum australe combines the characters of *S. fasciatum* and *S. gausapatum*. Its general aspect resembles that of specimens of *S. fasciatum* in a middle period of development when they are effuso-reflexed and have the umbo developed, but the specimens of *S. australe* have a broader resupinate portion than those of *S.*

fasciatum and are not wedge-shaped and attached merely by the umbo in any specimens which I have seen; the bleeding or red-discoloration of the hymenium when cut or bruised and the presence of colored conducting organs are additional characters which separate *S. australe* from *S. fasciatum*. *S. australe* may be distinguished from *S. gausapatum* by not having its reflexed portion crisped nor consisting of small pilei which stand out near together and in imbricate arrangement from a common resupinate portion.

In case of the collection from Mississippi, it was noted that the substratum was badly sap-rotted.

If original specimens of *Thelephora mytilina*, collected by Lund in Brazil, are still in existence, I believe that they will be found cospecific with *S. australe*. The geographical range of *S. australe* and the description of *T. mytilina* favor this belief. Fries's description was probably based on dried specimens, and it does not mention bleeding of the hymenium nor such a microscopical character as colored conducting organs, for such a microscopic detail was not noted in those days, but the blackening of the edge of the pileus which was observed by Fries is an indication of a bleeding hymenium and colored conducting organs.

Specimens examined:

Florida: type comm. by C. G. Lloyd (in Mo. Bot. Gard. Herb., 56608); Kissimme, *C. J. Humphrey*, 3532 (in Mo. Bot. Gard. Herb., 3370).

Mississippi: Laurel, *C. J. Humphrey*, 5434.

Mexico: Jalapa, *W. A. & E. L. Merrill*, 189, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54446).

Canal Zone: Gatun, *M. A. H.* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56707).

Grenada: *W. E. Broadway* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56625, 56626).

Venezuela: Caracas, *Mr. & Mrs. J. N. Rose*, 22038 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56657).

Brazil: Rio de Janeiro, *J. N. Rose & P. G. Russell*, 21480 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56627).

40. *S. rugosum* Persoon, Roemer Neues Mag. Bot. 1: 110. 1794; Fries, Epicr. 552. 1838; Myc. Eur. 643. 1874; Berk-

eley, Brit. Fungi, 271. 1860; Sacc. Syll. Fung. 6: 572. 1888; Massee, Linn. Soc. Bot. Jour. 27: 191. 1890.

Plate 4, figs. 38, 39.

Thelephora rugosa Persoon, Syn. Fung. 569. 1801; Myc. Eur. 1: 127. 1822; Albertini & Schweinitz, Cons. Fung. 274. 1805; Fries, Syst. Myc. 1: 439. 1821; Elenchus Fung. 1: 177. 1828.

Illustrations: Istvanffi, Jahrbuch. f. wiss. Bot. 29: pl. 4. f. 11; pl. 5. f. 19.

Fructifications coriaceous-corky, usually resupinate and effused, with a narrow, free, marginal portion, or sometimes reflexed, silky at first and pinkish buff, at length concentrically furrowed, radially pitted and weathering gray, the margin thick, entire; hymenium dull, pruinose, drying pinkish buff to drab-gray, when fresh bleeding where wounded; in structure 500–1800 μ thick, with the intermediate layer bordered on the upper side by a dense golden zone and on the lower side by a two- to many-zoned hymenial layer 120–1200 μ thick, hyphae of intermediate layer $2\frac{1}{2}$ –3 μ in diameter; dark-colored conducting organs very numerous, 3–6 μ in diameter; no cystidia; spores hyaline, even, flattened on one side, 7–10 \times 3–4 μ .

Resupinate on areas 2–6 cm. in diameter; free or reflexed margin 2–12 mm. broad.

On stumps of *Alnus*, *Corylus*, *Quercus*, *Betula*, and other frondose species. Newfoundland, Ontario, New York, and mountains of North Carolina. July to October. Rare in North America, common in Europe.

Although usually resupinate and likely to be regarded as a *Corticium* by collectors, nevertheless sectional preparations show the highly developed characteristic structure of a *Stereum*, with intermediate layer of longitudinally arranged hyphae, golden crust, etc. The bleeding of the hymenium and the abundant colored conducting organs locate the species among the *Stereums* in the group with *S. gausapatum*, *S. australe*, and *S.*

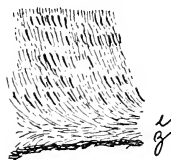


Fig. 19. *S. rugosum*. Section \times 19; intermediate layer, *i*; dense golden zone, *z*; the scattered darker lines in hymenial zones show distribution of conducting organs.

sanguinolentum, from each of which *S. rugosum* is sharply distinct by its two- to several-zoned hymenium—a character by which the species is also separable in dried herbarium condition from *S. styracifluum* when no observations have been recorded as to the color of the milk of specimens in fresh condition.

Specimens examined:

Exsiccati: Berkeley, Brit. Fungi, 145; Krieger, Fungi Sax., 1853, 1853b; Rabenhorst, Herb. Myc., 503; Romell, Fungi Scand. Exs., 30; de Thümen, Myc. Univ., 1009.—All specimens distributed as *S. rugosum* in American exsiccati were misdetermined.

England: *M. J. Berkeley*, in Berkeley, Brit. Fungi, 145; Epping Forest, *E. A. Burt*; Kew Garden, *G. Masee*.

Sweden: *L. Romell*, 40-42; Femsjö, *E. A. Burt*; Stockholm, *L. Romell*, in Romell, Fungi Scand. Exs., 30; Upsala, *E. P. Fries* (in Curtis Herb.).

Finland: Mustiala, *P. A. Karsten*, in de Thümen, Myc. Univ., 1007.

Germany: Dresden, in Rabenhorst, Herb. Myc., 503; Saxony, Uttewalder Grunde, *W. Krieger*, in Krieger, Fungi Sax., 1853, 1853b.

Hungary: Tatra Magna, *Löcse*, *V. Greschik*, comm. by *G. Bresadola*.

Italy: Trentino, *G. Bresadola*, two collections.

France: Allier, St. Priest, *H. Bourdot*, 15023.

Newfoundland: Bay of Islands, *A. C. Waghorne*, 160 (in Mo. Bot. Gard. Herb., 5096); Trinity Bay, *A. C. Waghorne*, 1 (in Mo. Bot. Gard. Herb., 5098).

Quebec: Gaspé, *J. Macoun*, and 254 (in N. Y. State Mus. Herb. and Mo. Bot. Gard. Herb., 56094).

Ontario: Ottawa, *J. Macoun*, 38.

New York: Fall Creek, *G. F. Atkinson*, 949.

North Carolina: Blowing Rock, *G. F. Atkinson*, 4189.

41. *S. sanguinolentum* Albertini & Schweinitz, Consp. Fung 274. 1805 (under *B. Sterea* of *Thelephora*); Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1: 106. 1822; Fries, Epicr. 549. 1838; Hym. Eur. 640. 1874; Berkeley, Brit. Fungi, 271. 1860; Sacc. Syll. Fung. 6: 564. 1888; Masee, Linn. Soc. Bot. Jour. 27: 189. 1890.

Plate 5, fig. 40.

Thelephora sanguinolenta Alb. & Schw. in Fries, Syst. Myc. 1: 440. 1821; Elenchus Fung. 1: 178. 1828.—*Stereum balsameum* Peck, N. Y. State Mus. Rept. 27: 99. 1875; *ibid.* 30: 75. 1879; Sacc. Syll. Fung. 6: 584. 1888; Masee, Linn. Soc. Bot. Jour. 27: 196. 1890.—*S. balsameum* form *reflexum* Peck, N. Y. State Mus. Rept. 47: 152. 1894.—*S. rigens* Karsten, Finska Vet.-Soc. Bidrag Natur och Folk 37: 243. 1882; *ibid.* 48: 396. 1889; Sacc. Syll. Fung. 11: 121. 1895.

Illustrations: Gillet, Hymenomyces; Greville, Crypt. Fl. 4: pl. 225; Istvanffi, Jahrbüch. f. wiss. Bot. 29: pl. 4. f. 7-10; Klotzsch in Dietrich, Fl. Reg. Borussici, pl. 381; Nees, Syst. 2nd ed. pl. 28. f. 1-3; Patouillard, Tab. Anal. f. 28.

Fructifications coriaceous, thin, effused, and reflexed, with upper surface villose to silky and the hairs appressed and somewhat radiately arranged, drying pinkish buff to pale olive-buff, the margin thin; hymenium glabrous, bleeding where wounded, contracting in drying and cracking to the substratum in the resupinate portion, drying avellaneous to wood-brown; in structure 400-600 μ thick, with intermediate layer bordered on



Fig. 20. *S. sanguinolentum*. Section of hymenial region $\times 68$, showing distribution of conducting organs; spores, *s*, $\times 488$.

the upper side by a narrow, dense golden zone, and composed of densely arranged hyaline hyphae 3 μ in diameter and of colored conducting organs 3-4 μ in diameter which curve into the hymenium and are usually numerous there; no cystidia; spores white in spore collection, even, slightly curved, 6-7 \times 2 $\frac{1}{2}$ μ .

Resupinate portions 1-5 cm. in diameter, reflexed margins 2-10 mm. broad.

On stumps and logs of *Pinus*, *Abies*, and *Tsuga*. Ontario to Pennsylvania and westward to British Columbia and California. July to March. Frequent.

S. sanguinolentum is commonly resupinate or barely reflexed, so that it is best recognized by its occurrence on conifers and bleeding of the hymenium where wounded, or becoming merely red-discolored along the edges of the wound if the wound is

made during dry weather. The somewhat drab color the hymenium assumes in drying and its deep cracks are highly characteristic of dried specimens. Colored conducting organs are abundant in the hymenium and subhymenium and should be demonstrated if other characters leave the determination doubtful.

Specimens examined:

Exsiccati: Krieger, Fungi Sax., 160; Romell, Fungi Scand. Exs., 29; de Thümen, Myc. Univ., 2010, and 2111, under the name *Stereum rigens*.

Sweden: *L. Romell*, 43, 44; Lapland, *L. Romell*, 401 bis; Stockholm, *L. Romell*, in Romell, Fungi Scand. Exs., 29; Upsala, *E. A. Burt*.

Finland: Mustiala, *P. A. Karsten*, in de Thümen, Myc. Univ. 2010, 2111.

France: Allier, *H. Bourdot*, 5586, 7591.

Italy: *G. Bresadola*; Florence, *G. Arcangeli* (in Mo. Bot. Gard. Herb., 44565).

Newfoundland: Bay of Islands, *A. C. Waghorne*, 337, 350, the latter determined by Peck as *S. balsameum* (in Mo. Bot. Gard. Herb., 5099, 5056).

Canada: comm. by *J. B. Ellis*, 5070 (in Kew Herb., under the name *Stereum triste* as determined by Cooke).

Quebec: Montreal, *R. J. Blair*, comm. by *L. O. Overholts*, 3787, 4107 (in Mo. Bot. Gard. Herb., 55097, 55638).

Ontario: Bond Lake, *J. H. Faull*, Univ. Toronto Herb., 320 (in Mo. Bot. Gard. Herb., 44875); Casselman, *J. Macoun*, 359; Lake Nipigon, *J. Macoun*, 103; Ottawa, *J. Macoun*, 11; Toronto, *R. P. Wodehouse*, Univ. Toronto Herb., 369 (in Mo. Bot. Gard. Herb., 44850); York Mills, *J. H. Faull*, Univ. Toronto Herb., 318 (in Mo. Bot. Gard. Herb., 44877).

Maine: Piscataquis Co., *W. A. Murrill*, 2029 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56705); Portage, *L. W. Riddle*, 18.

New Hampshire: Chocorua, *W. G. Farlow*, 4; Tuckerman's Ravine, Mt. Washington, *L. O. Overholts*, 4949 (in Mo. Bot. Gard. Herb., 56343).

Vermont: Little Notch, Middlebury, and Ripton, *E. A. Burt*.

Massachusetts: *R. J. Blair*, 327, comm. by *L. O. Overholts*,

4118 (in Mo. Bot. Gard. Herb., 55641), and *D. W. Weis*, comm. by C. G. Lloyd, 129 (in Mo. Bot. Gard. Herb., 56708).

New York: Adirondack Mts., *C. H. Peck*, type of *Stereum balsameum* (in N. Y. State Mus. Herb.); Alcove, *C. L. Shear*, 1136; Cayuga Lake Basin, *G. F. Atkinson*, f, 3028, 8271, and *H. Hasselbring*, 3408; Glasco, *P. Wilson*, 38 (in Mo. Bot. Gard. Herb., 54743); Ithaca, *C. J. Humphrey*, 305.

Pennsylvania: Shingleton Gap, *A. S. Rhoads*, 9 (in Mo. Bot. Gard. Herb., 44086).

North Carolina: Salem, *Schweinitz* (in Herb. Schweinitz).

Michigan: Gogebic Co., *E. A. Bessey*, 224 (in Mo. Bot. Gard. Herb., 56563).

Montana: Anaconda, *J. R. Weir*, 11973 (in Mo. Bot. Gard. Herb., 56727); Elkhorn, *J. R. Weir*, 9749 (in Mo. Bot. Gard. Herb., 56224); Evaro, *J. R. Weir*, 413 (in Mo. Bot. Gard. Herb., 14773).

Colorado: Ouray, *C. L. Shear*, 1186.

New Mexico: Sandia Mts., *W. H. Long*, 21576, 21597 (in Mo. Bot. Gard. Herb., 55154, 55116); Tyom Experiment Station, *W. H. Long*, 21554 (in Mo. Bot. Gard. Herb., 55115).

Idaho: Priest River, *J. R. Weir*, 47, 347 (the latter in Mo. Bot. Gard. Herb., 9989); Sandpoint, *E. E. Hubert*, comm. by *J. R. Weir*, 11612 (in Mo. Bot. Gard. Herb., 56726).

British Columbia: Agassiz, *J. R. Weir*, 387 (in Mo. Bot. Gard. Herb., 20887); Hastings, *J. Macoun*, 27; Kootenai Mts., near Salmo, *J. R. Weir*, 507 (in Mo. Bot. Gard. Herb., 22700); Sidney, *J. Macoun*, 411 (in Mo. Bot. Gard. Herb., 55311).

Washington: Bingen, *W. N. Suksdorf*, 871; Falcon Valley, *W. N. Suksdorf*, 723; Hoquiom, *C. J. Humphrey*, 6383; Olympia, *C. J. Humphrey*, 6306; Renton, *C. J. Humphrey*, 6439.

California: Muir Woods, *W. A. Murrill*, 1153 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 55705); Olema, *M. A. H.* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56590); Sutro Woods, *R. A. Harper* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56704).

Arizona: Coronada Nat. Forest, Santa Catalina Mts., *G. G.*

Hedgcock & W. H. Long, comm. by C. G. Humphrey, 2561 (in Mo. Bot. Gard. Herb., 9438).

42. *S. sulphuratum* Berkeley & Ravenel, Linn. Soc. Bot. Jour. 10: 331. 1868; Grevillea 1: 163. 1873; Sacc. Syll. Fung. 6: 566. 1888; Masee, Linn. Soc. Bot. Jour. 27: 192. 1890.

Plate 5, fig. 41.

Stereum ochroleucum Bresadola, Ann. Myc. 1: 91. 1903. Not *Stereum ochroleucum* Fries, Hym. Eur. 639. 1874, nor *Corticium ochroleucum* Fries, Epicr. 557. 1838.

Type: in Kew Herb. and Curtis Herb.

Fructifications coriaceous, stiff, effuso-reflexed, finally umbonate along the line of attachment to the substratum, and lobed,

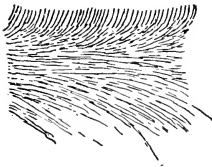


Fig. 21. *S. sulphuratum*. Section of type $\times 68$. The outer border of intermediate layer not a colored, crust-like zone.

upper surface tomentose-hirsute, concentrically furrowed, "sulphur colored" when fresh, becoming cartridge-buff to gray in the herbarium, the surface not hardened and crust-like under the hairy covering; hymenium even, glabrous, becoming pinkish buff to dirty tulle-buff in the herbarium; in structure 200–400 μ thick under the hairy covering, with the intermediate layer not differentiated on its upper side into a dense golden zone but hyaline throughout and with the longitudinally arranged

hyphae 3–3½ μ in diameter, curving outward on the upper side to form the hirsute covering and curving downward on the under side to form the hymenium; no colored conducting organs, gloeocystidia, nor cystidia; spores hyaline, even, 6–8 \times 2–3 μ .

Fructifications with resupinate portion ½–2 cm. broad, 10 cm. and more long on under side of limbs; reflexed lobes ½–1½ cm. broad, ½–2½ cm. long.

On dead limbs of *Betula* and other frondose species. Georgia to Mexico, West Indies, Venezuela, and Brazil. September to January. Not common.

In growing condition, the sulphur color attributed to specimens of *S. sulphuratum* and the heavy, hirsute covering of the pilei, taken in connection with geographic range wholly south

of that of *S. hirsutum*, should render specimens of the former species easily distinguishable. All gatherings of *S. sulphuratum* which I have seen had already faded to the gray color of old, weathered *S. hirsutum* and in this condition are best distinguished by not having underneath the hairy covering a thin hardened crust as the upper surface of the intermediate layer, nor a dense, somewhat golden zone on the upper border of the intermediate layer when sectional preparations are examined with the microscope.

S. sulphuratum occurs also in Westphalia, Germany, apparently an isolated station, and has been confused there with *Stereum ochroleucum* Fries, a species of thicker and softer structure having hyphae interwoven instead of densely and longitudinally arranged—for which reason Fries was doubtful about its being a true *Stereum* and published the species originally as a *Corticium*. Collections from Sweden and France communicated to me as cospecific with the Westphalian gatherings have the upper surface of the intermediate layers with a crust-like golden zone and are referable to *S. hirsutum* instead.

Specimens examined:

Exsiccati: Brinkmann, Westfälische Pilze, 49, under name of *Stereum ochroleucum*; Rick, Fungi Austro-Am., 260, under name of *Stereum ochroleucum*.

Germany: Westphalia, Lengerich, *W. Brinkmann*, comm. by G. Bresadola, and in Brinkmann, Westfälische Pilze, 49.

Georgia: Catoosa Springs, *H. W. Ravenel* (in Kew Herb. and in Curtis Herb., 1731).

Florida: *C. G. Lloyd*, 2131.

Alabama: Auburn, *Ala. Biol. Surv.*, comm. by F. S. Earle; Montgomery, *R. P. Burke*, 4 (in Mo. Bot. Gard. Herb., 22017).

Mexico: Jalapa, *W. A. & E. L. Murrill*, 316, 343, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54438, 55477).

Cuba: *C. Wright*, 292, type (in Kew Herb.).

Jamaica: *Farr* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56667); Cinchona, *W. A. & E. L. Murrill*, 480, 546, comm. by N. Y. Bot. Gard. Herb.; Morce's Gap, *W. A. & E. L. Murrill*, 723, comm. by N. Y. Bot. Gard.

Herb.; Monkey Hill, *W. A. & E. L. Merrill*, 784, comm. by N. Y. Bot. Gard. Herb.; Sir John Peak, *L. M. Underwood*, 3182 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56668).

Venezuela: *Fendler*, 169 (in Curtis Herb.).

Brazil: Sao Leopoldo, *Rick*, in *Rick*, Fungi Austro-Am., 260.

43. *S. hirsutum* Willdenow ex Fries, *Epier.* 549. 1838; *Hym. Eur.* 639. 1874; *Persoon*, *Roemer Neues Mag. Bot.* 1: 110. 1794; *Obs. Myc.* 2: 90. 1799; *Berkeley*, *Outlines Brit. Fung.* 270. *pl. 17. f. 7.* 1860; *Sacc. Syll. Fung.* 6: 563. 1888.

Plate 5, fig. 42.

Thelephora hirsuta Willdenow, *Fl. Berol. Prod.* 397. 1787; *Fries*, *Syst. Myc.* 1: 439. 1821; *Persoon*, *Syn. Fung.* 570. 1801; *Myc. Eur.* 1: 116. 1822.—*Auricularia reflexa* Bulliard, *Herb. de la France* 1: 281. *pl. 274.* 1785.—*Thelephora ochracea* Schweinitz, *Naturforsch. Ges. Leipzig Schrift.* 1: 106. 1822, but not of Fries.—*T. subzonata* Fries, *Elenchus Fung.* 1: 181. 1828; *Schweinitz*, *Am. Phil. Soc. Trans. N. S.* 4: 167. 1832.—*Corticium subzonatum* Fries, *Epier.* 557. 1838; *Sacc. Syll. Fung.* 6: 608. 1888.—*Stereum varicolor* Lloyd, *Myc. Writ.* 4. Letter 53: 10. 1914.

Illustrations: *Berkeley*, *Outl. Brit. Fung. pl. 17. f. 7*; *Bolton*, *Hist. Fung. pl. 82*; *Bulliard*, *Herb. de la France, pl. 274*; *Hussey*, *Ill. Brit. Myc.* 1: *pl. 58*; *Sowerby*, *Col. Figs. Brit. Fung. pl. 27*; *Stevenson*, *Brit. Fungi* 2: 267. *text f. 86.* See *Sacc. Syll. Fung.* 20: 890, for reference to other illustrations.

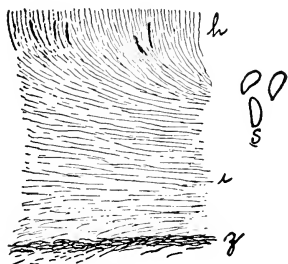


Fig. 22. *S. hirsutum*. Section $\times 68$; intermediate layer, *i*; golden, crust-like zone, *z*; hymenium containing very few conducting organs, *h*; spores, *s*, $\times 488$.

Fructifications coriaceous, stiff, effuso-reflexed, rarely wholly resupinate, strigose-hirsute, somewhat concentrically furrowed, not complicate, cream-buff at first, becoming grayish when old and weathered, with a thin, hardened, crust-like surface bearing the hairy covering, the margin entire;

hymenium even, warm buff at first, sometimes becoming pale smoke-gray, unchanged when cut or bruised; in structure 500–700 μ thick under the hairy covering, with the intermediate layer bordered next to the hairy covering by a very dense, narrow, golden zone, the rest of the intermediate layer composed of densely and longitudinally arranged hyaline hyphae 3–4 μ in diameter, some of which in the subhymenium are thick-walled, up to 5–6 μ in diameter, and very rarely have golden-brown contents as seen between the basidia; no colored conducting organs, cystidia, nor gloecystidia; spores white in spore collection, even, flattened on one side, $5-7\frac{1}{2} \times 2-2\frac{3}{4} \mu$.

Reflexed portion varying from barely reflexed up to 2 cm. broad, 1–2 cm. long; fructifications merely gregarious or confluent, and imbricated.

On logs and stumps of birch, beech, and other frondose species. Newfoundland to South Carolina and westward to British Columbia and California, and in Mexico. July to November in the east and to February in the Pacific states. Common.

Stereum hirsutum is characterized by its strigose-hirsute, buff-colored pileus, weathering more or less gray, and by its warm buff hymenium, sometimes smoke-gray, which does not exude a red juice when wounded; as in *S. rameale*, *S. versicolor*, *S. fasciatum*, *S. lobatum*, *S. australe*, and *S. gausapatum*, the upper surface of the intermediate layer is differentiated into a thin, golden, somewhat horny crust from which the hairy covering springs. This golden zone shows well under the microscope, and its presence is a decisive character for separating *S. hirsutum* from the southern *S. sulphuratum*, a species of somewhat similar aspect.

Specimens examined:

Exsiccati: Berkeley, *Brit. Fungi*, 146; Cavara, *Fungi Longobardiae*, 61; Cooke, *Fungi Brit.*, 108; Ellis, *N. Am. Fungi*, 1204; Krieger, *Fungi Sax.*, 118; Rabenhorst, *Herb. Myc.*, 211; Romell, *Fungi Scand. Exs.*, 26.

Sweden: Femsjö, *L. Romell*, two collections, and *E. A. Burt*; Mauritzberg, *W. A. & E. L. Murrill*, 4078 (in *N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.*, 56671); Stockholm, *L. Romell*, 30, 401, and in Romell, *Fungi Scand. Exs.*, 26.

- England: *M. J. Berkeley*, in Berkeley, Brit. Fungi, 146; Epping, *M. C. Cooke*, in Cooke, Fungi Brit., 108; Kew Gardens, *G. Massee*; Selby, *E. A. Burt*.
- France: *Fautrey*, comm. by Lloyd Herb., 3326; Aveyron, *A. Galzin*, 8459, comm. by H. Bourdot, 7813; St. Priest, Allier, *H. Bourdot*, 19770.
- Germany: Nossen, Saxony, *W. Krieger*, in Krieger, Fungi Sax., 118.
- Italy: *A. Carestia*, 784, 1215, comm. by G. Bresadola; Pavia, *F. Cavara*, in Cavara, Fungi Longobardiae, 61.
- Newfoundland: *A. C. Waghorne*, 118 (in Mo. Bot. Gard. Herb., 5082).
- Canada: *J. Macoun*, 69.
- Ontario: Ottawa, *J. Macoun*, 16, 466a; Port Credit, *J. H. Faull*, Univ. Toronto Herb., 353 (in Mo. Bot. Gard. Herb., 44858); Toronto, *G. H. Graham*, Univ. Toronto Herb., 678 (in Mo. Bot. Gard. Herb., 44919).
- Maine: Milo, *W. A. Merrill*, 2024 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56682).
- New Hampshire: North Conway, *L. O. Overholts*, 5009 (in Mo. Bot. Gard. Herb., 56346).
- Vermont: Middlebury, *E. A. Burt*; Ripton, *E. A. Burt*; Smugglers Notch, *E. A. Burt*, two gatherings.
- Massachusetts: Boston, *L. C. Monahan* (in Mo. Bot. Gard. Herb., 15309); Cambridge, *E. A. Burt*; Mt. Auburn, *E. A. Burt*; Nahant, *A. B. Seymour*, T 31 (in Mo. Bot. Gard. Herb., 12954); Waverly, *A. B. Seymour*, T 25, T 26 (in Mo. Bot. Gard. Herb., 16364, 18372); Waltham, *A. B. Seymour*, T 16 (in Mo. Bot. Gard. Herb., 17912).
- Connecticut: Broad Brook, *C. C. Hanmer*, 2682 (in Mo. Bot. Gard. Herb., 42606); Mansfield, *P. W. Graff*, 13 (in Mo. Bot. Gard. Herb., 44817); Storrs, *P. W. Graff*, 29 (in Mo. Bot. Gard. Herb., 44804).
- New York: *G. F. Atkinson*, 8026, and *W. H. Wright*, comm. by G. F. Atkinson, 7990; Alcove, *C. L. Shear*, 995; Fall Creek, *W. H. Wright*, 7992; Floodwood, *E. A. Burt*.
- Pennsylvania: Spruce Creek, *J. H. Faull*, Univ. Toronto Herb., 337 (in Mo. Bot. Gard. Herb., 44883); West Chester, *Everhart & Haines*, in Ellis, N. Am. Fungi, 1204.

- North Carolina: *Schweinitz*, types of *T. ochracea* and *T. subzonata* (in Herb. Schweinitz); Blowing Rock, *G. F. Atkinson*, 4308.
- South Carolina: Clemson College, *P. H. Rolfs*.
- Michigan: Cadillac, *H. D. House*, 1225 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56673); Isle Royale, *Miss A. D. Stucki*, Univ. Wis. Herb., 23; Vermilion, *A. H. W. Povah*, 199 (in Mo. Bot. Gard. Herb., 15145).
- Indiana: Crawfordsville, *D. Reddick*, 5, 7, and another specimen, comm. by *H. H. Whetzel*.
- West Virginia: Paw Paw, *C. L. Shear*, 1173.
- Tennessee: Elkmont, *C. H. Kauffman*, 62 (in Mo. Bot. Gard. Herb., 3972).
- Wisconsin: Blue Mounds, *Miss A. D. Stucki*, Univ. Wis. Herb., 8, 9; Madison, *Miss A. D. Stucki*, Univ. Wis. Herb., 34, and *W. Trelease*, 5, 26 (in Mo. Bot. Gard. Herb., 56683, 56684); Palmyra, *Miss A. D. Stucki*, Univ. Wis. Herb., 33.
- Minnesota: Lake Itaska, comm. by *E. L. Jensen*, 9 (in Mo. Bot. Gard. Herb., 11088).
- Missouri: *B. M. Duggar*, 95; Meramec, *P. Spaulding* (in Mo. Bot. Gard. Herb., 5025).
- Arkansas: Womble, *W. H. Long*, 19844, 19883 (in Mo. Bot. Gard. Herb., 8963, 14651).
- Nebraska: Lincoln, *C. L. Shear*, 1023.
- Montana: Evaro, *J. R. Weir*, 431 (in Mo. Bot. Gard. Herb., 22515); Mystic Lake, *C. L. Shear*, 1102.
- Colorado: Steamboat Springs, *E. Bartholomew*, 5578 (in Mo. Bot. Gard. Herb., 9185, 44584); Tolland, *F. J. Seaver & E. Bethel* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56674).
- New Mexico: Albuquerque, *W. H. Long*, 21153 (in Mo. Bot. Gard. Herb., 55112); Cloudcroft, *F. S. Earle*, 495, comm. by N. Y. Bot. Gard. Herb., and *W. H. Long*, 19542 (in Mo. Bot. Gard. Herb., 55111); Tejano Exp. Station, *W. H. Long*, 21875, 21894, 21907 (in Mo. Bot. Gard. Herb., 55161-55163); Tyom Exp. Station, *W. H. Long*, 21365, 21366, 21426 (in Mo. Bot. Gard. Herb., 55113, 55114, 55160); Ute Park, *P. C. Standley*, 14197, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 44953); Weeds,

- L. Wymans*, comm. by W. H. Long, 12969 (in Mo. Bot. Gard. Herb., 55110).
- Idaho: Priest River, *J. R. Weir*, 19, 31, 48.
- British Columbia: New Westminster, *A. I. Hill* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56675); Oak Bay, *J. Macoun*, 579a (in Mo. Bot. Gard. Herb., 55310); Sidney, *J. Macoun*, 46, 47, 49, 52, 52 bis, 53, 54, 84 (in Mo. Bot. Gard. Herb., 5736, 6674, 6694, 6682, 55361, 6698, 6697, 6704 respectively).
- Washington: Bingen, *W. N. Suksdorf*, 692, 693, 709, 874, 891, 893, 916, 953; Kalama, *C. J. Humphrey*, 6140; Chehalis, *C. J. Humphrey*, 6254 (in Mo. Bot. Gard. Herb., 16677); Olympia, *C. J. Humphrey*, 6310; Seattle, *S. M. Zeller*, 119 (in Mo. Bot. Gard. Herb., 44139); Tacoma, *W. A. Merrill*, 127, 142, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55744, 55730).
- Oregon: Corvallis, *C. E. Owens*, 2036, 2054, 2057, 2084, 2135, 2136, 2139, 2142, 2143 (in Mo. Bot. Gard. Herb., 43872, 43878, 43877, 44249, 44695, 44694, 44693, 44699, 44702 respectively), and *S. M. Zeller*, 1814 (in Mo. Bot. Gard. Herb., 56332); Eugene, *C. J. Humphrey*, 6050, 6063, 6076 (in Mo. Bot. Gard. Herb., 17175); Mt. Hood, *G. G. Hedgcock*, comm. by *C. J. Humphrey*, 2569 (in Mo. Bot. Gard. Herb., 16418); Granite Pass, *J. R. Weir*, 8680, 8681 (in Mo. Bot. Gard. Herb., 36752, 36753).
- California: *R. A. Harper*, 8, 109, 141, 143 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56678-56681), and *Miss E. Hyatt*, comm. by *C. L. Shear*, 1089; Berkeley, *C. J. Humphrey*, 5970, 5982, *H. A. Lee*, Univ. Calif. Herb., 1015, 1016, 1019, 1021, 1022 (in Mo. Bot. Gard. Herb., 44154-44156, 44152, 44157 respectively), *W. A. Setchell*, Univ. Calif. Herb., 1023, 1024 (in Mo. Bot. Gard. Herb., 44153, 44245), and *G. Courvoisier*, Univ. Calif. Herb., 1025 (in Mo. Bot. Gard. Herb., 44149); Claremont, *D. L. Crawford*, D 12, comm. by *L. O. Overholts*, 3280 (in Mo. Bot. Gard. Herb., 10479); Coast Range, *C. F. Baker*, 82, 101, comm. by N. Y. Bot. Gard. Herb.; Fair Oaks, *R. A. Harper* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56676); Julian, *E. Bethel*, 28272 (in Mo. Bot. Gard. Herb., 55439); North-

brae, *L. S. Smith*, Univ. Calif. Herb., 416 (in Mo. Bot. Gard. Herb., 44148); Muir Woods, *W. A. Murrill*, 1133 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 55713); Pinehurst, *E. Bethel*, 26269, 26274 (in Mo. Bot. Gard. Herb., 55438, 55440); Preston's Ravine, *W. A. Murrill & L. S. Abrams*, 1171, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55707); San Francisco, *W. A. Setchell & C. C. Dolier*, *W. A. Murrill*, 1111, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55702); Santa Barbara, *O. M. Oleson*, 6, 9, 16; Santa Cruz, *G. J. Streater* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56677); Sutro Forest, *A. S. Rhoads*, 1 (in Mo. Bot. Gard. Herb., 56045).

Mexico: Coyoacan, *Roldan*, comm. by J. R. Weir, 14937, 14999 (in Mo. Bot. Gard. Herb., 56795, 56796).

44. *S. fasciatum* Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1: 106. 1832 (under *B. Sterea* of *Thelephora*); Fries, Epicr. 546. 1838 Sacc. Syll. Fung. 6: 560. 1888; Masee, Linn. Soc. Bot. Jour. 27: 180. 1890.

Plate 5, figs. 43-45.

Thelephora versicolor β *fasciata* (Schw.) Fries, Elenchus Fung. 1: 175. 1828; Schweinitz, Am. Phil. Soc. Trans. N. S. 4: 167. 1832.—*T. ostrea* Blume & Nees, Acad. Leop.-Carol. Nov. Acta 13¹: 13. pl. 2. 1826.—*Stereum ostrea* (Bl. & Nees) Fries, Epicr. 547. 1838; Sacc. Syll. Fung. 6: 571. 1888; Bresadola, Hedwigia 51: 321. 1912.—*Thelephora* (*Stereum*) *mollis* L  veill  , Ann. Sci. Nat. Bot. III. 5: 147. 1846.—*Stereum molle* L  veill   in Sacc. Syll. Fung. 6: 577. 1888; Masee, Linn. Soc. Bot. Jour. 27: 175. 1890.—*S. arcticum* Fries, Hym. Eur. 639. 1874.

Type: in Herb. Schweinitz and in Curtis Herb.

Fructifications coriaceous, rigid, in the north at first broadly effuso-reflexed with the resupinate portion narrow, soon umbonate sessile—perhaps so from the first in the tropics—often laterally confluent, sometimes pseudo-stipitate by prolongation



Fig. 23. *S. fasciatum*. Section of reflexed stage, natural size; spores, s, \times 665.

of the umbo, at first densely tomentose and drying warm buff to tawny olive, at length weathering to pale smoke-gray to neutral gray and sometimes with the tomentum torn apart in narrow zones and showing the hazel or chestnut surface of the bared areas, the margin normally entire; in structure 400–700 μ thick, with the intermediate layer composed of very densely arranged, hyaline hyphae 4 μ in diameter and bordered on the upper side by a broad dark zone which bears the tomentum of the upper surface; hymenium glabrous, usually warm buff to cinnamon-buff, sometimes assuming violaceous tints; no cystidia, gloeocystidia, nor conducting organs; spores from spore collections white, even, flattened on one side, $5\frac{1}{2}$ – $7\frac{1}{2} \times 2\frac{1}{2}$ –3 μ .

Fructifications 2–7 cm. in diameter, often laterally confluent.

On logs and stumps of *Quercus* and other hardwood species. Common throughout North America from Canada southward, in the West Indies, and in South America; occurs also in Norway, Sweden, Formosa, and Java, although apparently rare in the Old World. In vegetative condition from June onward in the north, persisting throughout the year.

Specimens of *S. fasciatum* may be distinguished from those of the less common *S. lobatum* by the thicker tomentose covering of the former, which may continue unbroken throughout the year or become torn apart so as to show rather few and narrow, bared chestnut zones; the pileus of *S. fasciatum* is thicker than that of *S. lobatum*, and the margin has a lobate tendency but rarely. Towards the northern part of its range where I have observed the development of fructifications throughout the season, the fructifications are at first effuso-reflexed with the resupinate portion up to 1 cm. broad, the reflexed portion $1\frac{1}{2}$ cm. from base to margin, and with a lateral extent along the substratum of 2–8 cm.; umbos soon form at points 1–2 cm. apart along line of intersection of the plane of reflexed portion with the substratum; by further growth outward of the laterally confluent pilei these umbos become the final points of attachment of the pilei with the substratum. In Washington and California the fructifications may continue broadly reflexed when old and are difficult to distinguish from luxuriantly grown *S. hirsutum*.

The specimens from Formosa, cited below, are in the stage in

which the fructifications are still with a resupinate portion but with the umbos distinctly outlined, and exactly agree in all respects, even including spore dimensions, with my Vermont collections of the same stage. The authentic specimen of *Thelephora ostrea* from Java is in the final stage with attachment by umbo only and is clothed over its whole upper surface with a thick coat of tomentum, and matches well most of the specimens of the type collection of *Stereum fasciatum* in Herb. Schweinitz. I infer from the lack of specimens of *S. fasciatum* from the East Indies and the Philippines in published exsiccati, that this species is very rare there and that what frequently has been listed as *S. ostrea* is really the very common *S. concolor* instead.

Schweinitz's original description of *S. fasciatum* presents at such length the disappearance of tomentum from the upper surface of the pileus and the broad, glabrous, shining surface with many vari-colored zones, that it seems probable he may have intended the description to comprehend not only *S. fasciatum* as treated by me but also *S. lobatum*, which he must have seen about him in North Carolina; nevertheless, the ample collection of specimens in Herb. Schweinitz which were preserved as the type of *S. fasciatum* contains no fructifications referable to *S. lobatum*.

Specimens examined:

Exsiccati: Bartholomew, Fungi Col., 2590, under the name *S. versicolor*, 2884, under the name *S. versicolor*, 2985, 3985, 4291, and 4986; Ellis, N. Am. Fungi, 18, under the name *S. versicolor* v. *fasciata*, 514a, and c, both under the name *S. versicolor*; Ell. & Ev., N. Am. Fungi, 1714, under the name *S. purpureum*; Ellis & Ev., Fungi Col., 306, under the name *S. versicolor*; Ravenel, Fungi Am., 220, under the name *S. versicolor*, and 721; Smith, Central Am. Fungi, 145, under the name *S. versicolor*; de Thümen, Myc. Univ., 2011, mixed with *S. lobatum*.

Norway: Bosekon, Finmark, *M. N. Blytt*, type of *Stereum arcticum* (in Herb. Fries).

Sweden: on *Alnus*, North Sweden, comm. by L. Romell, 400.

Canada: *J. Macoun*, 12.

Prince Edward Island: *J. Macoun*, 346 (in Macoun Herb.).

Quebec: *J. Macoun*, 77, 239, 249, 464 (all in Macoun Herb.)

- Ontario: Bond Lake, *J. H. Faull*, Univ. Toronto Herb., 319 (in Mo. Bot. Gard. Herb., 44874); Ottawa, *J. Macoun*, 50; Port Credit, *J. H. Faull*, Univ. Toronto Herb., 352, 354 (in Mo. Bot. Gard. Herb., 44857, 44856); Rondeau Park, *J. H. Faull*, Univ. Toronto Herb., 358 (in Mo. Bot. Gard. Herb., 44870); Toronto, *J. H. Faull*, Univ. Toronto Herb., 356 (in Mo. Bot. Gard. Herb., 44868), *T. Langton*, Univ. Toronto Herb., 501 (in Mo. Bot. Gard. Herb., 44853), *G. H. Graham*, Univ. Toronto Herb., 680 (in Mo. Bot. Gard. Herb., 44937).
- Maine: Harrison, *J. Blake*, comm. by P. L. Ricker; Orono, *F. L. Harvey*, comm. by P. L. Ricker; Portage, *L. W. Riddle*, 2, 17.
- Vermont: Middlebury, *E. Brainerd*, *E. A. Burt*, nine collections; Ripton, *E. A. Burt*.
- Massachusetts: Amherst, *P. J. Anderson*, 2, 4 (in Mo. Bot. Gard. Herb., 55846, 55845 respectively).
- Connecticut: Mansfield, *P. W. Graff*, 30 (in Mo. Bot. Gard. Herb., 44803); New Haven, *W. A. Setchell*; Norwich, *W. A. Setchell*.
- New York: *Sartwell*, 19 (in Mo. Bot. Gard. Herb., 5076); Alcove, *C. L. Shear*, 1327; Canandaigua, *L. M. Underwood*, 21, distributed under the name *S. versicolor* (in Mo. Bot. Gard. Herb., 5117); East Galway, *E. A. Burt*; Floodwood, *E. A. Burt*; Freeville, *G. F. Atkinson*, 2821; Glasco, *P. Wilson*, 48, 43 (in Mo. Bot. Gard. Herb., 54752, 54754); Grand View, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 42811, 43025); Ithaca, *G. F. Atkinson*, 2819, 2820, 8027, Bot. Dept. Cornell Univ., 133 O. S., 2871, *H. S. Jackson*, comm. by Bot. Dept. Cornell Univ., 14397-14399, *Van Hook*, comm. by Bot. Dept. Cornell Univ., 8084, *W. C. Muenscher*, 147, 205, 211 (in Mo. Bot. Gard. Herb., 56602-56604); Palisades, *P. Wilson*, 20, 18, 12 (in Mo. Bot. Gard. Herb., 54755, 54756, 54759); Yonkers, *P. Wilson*, 61 (in Mo. Bot. Gard. Herb., 54753).
- New Jersey: Alpine, *P. Wilson*, 17, 13, 7 (in Mo. Bot. Gard. Herb., 54757, 54758, and 54760 respectively); Belleplain, *C. L. Shear*, 1250; Newfield, *J. B. Ellis*, in *Ellis*, N. Am. Fungi, 18, 514c, and *Ell. & Ev.*, Fungi Col., 306.

- Pennsylvania: *E. Michener*, 88 (in Mo. Bot. Gard. Herb., 5044); Germantown, *E. A. Burt*; Huntington Co., *A. S. Rhoads*, 7 (in Mo. Bot. Gard. Herb., 44084); Lancaster City, *Mrs. A. F. Eby* (in Mo. Bot. Gard. Herb., 5083); Kittanning, *D. R. Sumstine*, 4, 7, 7; Philadelphia, *A. S. Rhoads*, 19 (in Mo. Bot. Gard. Herb., 44096); in coal mine, Pottsville, *C. J. Humphrey*, 310; Spruce Creek, *J. H. Faull*, Univ. Toronto Herb., 357, 359, 334, 670, 355, 667 (in Mo. Bot. Gard. Herb., 44869, 44871, 44888, 44917, 44926, and 44934 respectively); Shingleton Gap, *A. S. Rhoads*, 15 (in Mo. Bot. Gard. Herb., 44093); State College, *C. R. Orton*, 1, 18 (in Mo. Bot. Gard. Herb., 44079, 44095), comm. by *L. O. Overholts*, 2658, 5003 (in Mo. Bot. Gard. Herb., 5721, 56345), *A. S. Rhoads*, 16 (in Mo. Bot. Gard. Herb., 44094); Trexlertown, *C. G. Lloyd*, 0084; in coal mine, Wadesville Colliery, *C. J. Humphrey*, 21583.
- Maryland: Glen Sligo, *C. L. Shear*, 1133.
- District of Columbia: Takoma Park, *P. L. Ricker*, 820, *C. L. Shear*, 956.
- Virginia: Great Falls, *O. F. Cook*, comm. by *P. L. Ricker*; Mt. Vernon, *P. L. Ricker*, 1121 in part; Mountain Lake, *W. A. Murrill*, 408 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56618); Norton, *A. B. Seymour* (in Mo. Bot. Gard. Herb., 16405).
- North Carolina: *Schweinitz*, type (in Herb. Schweinitz and Curtis Herb.); Blowing Rock, *G. F. Atkinson*, 4178, 4180, 4315; Chapel Hill, *W. C. Coker*, 938 (in Mo. Bot. Gard. Herb., 56665); Leicester, *B. B. Higgins*, in Bartholomew, Fungi Col., 2985.
- South Carolina: Clemson College, *P. H. Rolfs*, 1613, 1616, 1619, 1620, 1624, 1629, 1631, 1635.
- Georgia: Darien, *H. W. Ravenel*, in Ravenel, Fungi Am., 220, 721; Dixie, *R. M. Harper*, 1633b, comm. by N. Y. Bot. Gard. Herb.; Tallulah Falls, *A. B. Seymour*, comm. by *W. G. Farlow*, 6 (in Mo. Bot. Gard. Herb., 55290).
- Florida: *C. G. Lloyd* (in Mo. Bot. Gard. Herb., 44068); Coconut Grove, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 43097); Eustis, *L. M. Underwood*, 1368, 1801 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56616, 56617).

- Alabama: Adger, *C. J. Humphrey*; Montgomery Co., *R. P. Burke*, 34 (in Mo. Bot. Gard. Herb., 4273); Maplesville, *C. S. Hill*, comm. by *C. J. Humphrey*, 251.
- Mississippi: Laurel, *C. J. Humphrey*, 5431, 5435; Ocean Springs, *F. S. Earle* (in Mo. Bot. Gard. Herb., 5118).
- Louisiana: Baton Rouge, *C. W. Edgerton*, 848, comm. by *C. J. Humphrey*; St. Martinville, *A. B. Langlois*, 2902, *bf*.
- Ohio: Cincinnati, *D. L. James*, in Ellis, *N. Am. Fungi*, 514c, *C. G. Lloyd*, 1579, 4499, 4501, 4506; Columbus, *W. A. Kellerman*, in Kellerman, *Ohio Fungi*, 33, under the name *S. versicolor*; Granville, *H. L. Jones*; Linwood, *C. G. Lloyd*, 2436, 02821, 02830; Penfield, *F. D. Kelsey* (in Mo. Bot. Gard. Herb., 5075); Worthington, *Dr. Paddock* (in Mo. Bot. Gard. Herb., 5114, 5157).
- Kentucky: Bowling Green, *Miss S. F. Price* (in Mo. Bot. Gard. Herb., 5038, 5112, 56604); Mammoth Cave, *C. G. Lloyd*.
- Tennessee: Algood, *C. J. Humphrey*, 308.
- Michigan: Isle Royale, *Allen & Stuntz*, 22, 60; Sailor's Encampment, *E. T. & S. A. Harper*, 710; Vermilion, *A. H. W. Povah*, 142 (in Mo. Bot. Gard. Herb., 15144).
- Wisconsin: Bayfield, *V. B. Walker*, 6b (in Mo. Bot. Gard. Herb., 9733); Blanchardville, *Miss A. O. Stucki*, 47; Blue Mounds, *Miss A. O. Stucki*, 49; Ithaca, *W. Trelease*, 89 (in Mo. Bot. Gard. Herb., 56606); Madison, *E. T. Bartholomew*, in Bartholomew, *Fungi Col.*, 3985, *Miss A. O. Stucki*, 31, 35, 36, 50, *W. Trelease* (in Mo. Bot. Gard. Herb., 56605); Syene, *W. Trelease*, 90 (in Mo. Bot. Gard. Herb., 5072).
- Indiana: Greencastle, *L. M. Underwood*, 2 (in Mo. Bot. Gard. Herb., 44101); Hibernian Mills, *Whetzel & Reddick*, comm. by *D. Reddick*, 6, 8; Ladoga, *P. J. Anderson*, 1 (in Mo. Bot. Gard. Herb., 55838); Wabash "bottom", *W. Trelease* (in Mo. Bot. Gard. Herb., 5073).
- Illinois: Brownsville, *E. T. & S. A. Harper*, 951; Cobden (in Mo. Bot. Gard. Herb., 44102); Grand Pass Club, *W. Trelease* (in Mo. Bot. Gard. Herb., 5053); Jacksonville, *E. Bartholomew*, in Bartholomew, *Fungi Col.*, 2590.
- Missouri: Bismarck, *L. O. Overholts* (in Mo. Bot. Gard. Herb., 43702); Clayton, *A. M. Ferguson* (in Mo. Bot. Gard. Herb., 5131); Columbia, *B. M. Duggar*, 346a, 562, 580; Creve

Coeur, *E. A. Burt* (in Mo. Bot. Gard. Herb., 8727); Lincoln Co., *C. Trenning* (in Mo. Bot. Gard. Herb., 4098); Meramec, *P. Spaulding*, 1, and (in Mo. Bot. Gard. Herb., 5020), *Spaulding & Johnson* (in Mo. Bot. Gard. Herb., 5013-5015); Meramec Highlands, *N. M. Glatfelter* (in Mo. Bot. Gard. Herb., 42583); Old Orchard, *L. H. Pammel* (in Mo. Bot. Gard. Herb., 5020, 5041); Piedmont (in Mo. Bot. Gard. Herb., 4783); Upper Creve Coeur, *E. A. Burt* (in Mo. Bot. Gard. Herb., 44057); Valley Park, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 42859); White House, *E. A. Burt* (in Mo. Bot. Gard. Herb., 43808), contains mesopod specimen; Willow Springs, *H. von Schrenk*, 1, 2 (in Burt Herb. and Mo. Bot. Gard. Herb., 42886, 42851).

Arkansas: Bertig, *W. Trelease* (in Mo. Bot. Gard. Herb., 5148); Big Flat, *W. H. Long*, 19859 (in Mo. Bot. Gard. Herb., 8268); Fayetteville, *E. Bartholomew*, in Bartholomew, Fungi Col., 2884; Womble, *W. H. Long*, 19866 (in Mo. Bot. Gard. Herb., 8889); Wynne, *W. Trelease* (in Mo. Bot. Gard. Herb., 5147, 5152).

Oklahoma: Poteau, *W. Trelease* (in Mo. Bot. Gard. Herb., 5052); Spiro, *E. Bartholomew*, in Bartholomew, Fungi Col., 4291.

Texas: *L. H. Pammel* (in Mo. Bot. Gard. Herb., 56607); Austin, *W. H. Long, Jr.*, 739; Gillespie County, *G. Jermy* (in Mo. Bot. Gard. Herb., 5048-5050) and 443, comm. by U. S. Dept. Agr. Herb.; Joaquin, *E. Bartholomew*, in Bartholomew, Fungi Col., 4986; Quitman, *W. H. Long*, 12099 (in Mo. Bot. Gard. Herb., 55126); Waco, *W. H. Long, Jr.*, 508.

South Dakota: Black Hills, *J. R. Weir*, 10012 (in Mo. Bot. Gard. Herb., 55793).

Nebraska: Memphis, *T. A. Williams*, comm. by C. L. Shear, 1059; Nebraska City, *V. B. Walker*, 10 (in Mo. Bot. Gard. Herb., 12963).

Kansas: Bourbon County, *A. G. Barrett*, 112, 115, 126, 127; Topeka, *E. T. & S. A. Harper*, 753.

Colorado: Golden, *Bethel & Overholts*, comm. by L. O. Overholts, 1758 (in Mo. Bot. Gard. Herb., 54871).

New Mexico: Clouderoft, *F. S. Earle*, 495 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 1546).

- Montana: Moeville, *J. A. Hughes*, comm. by J. R. Weir, 9750 (in Mo. Bot. Gard. Herb., 56225).
- Idaho: Moscow, *J. R. Weir*, 7946 (in Mo. Bot. Gard. Herb., 56218); Priest River, *J. R. Weir*, 6, 11, 49.
- British Columbia: Secamons, *J. Macoun*, 166; Sidney, *J. Macoun*, 57, 70, 71 (in Mo. Bot. Gard. Herb., 5739, 5746, 5747).
- Washington: Bingen, *W. N. Suksdorf*, 694; Friday Harbor, *V. B. Walker*, 2 (in Mo. Bot. Gard. Herb., 8359); Lake Waldemen, *C. H. Kauffman* (in Mo. Bot. Gard. Herb., 20763); Seattle, *S. M. Zeller*, 63, 118 (in Mo. Bot. Gard. Herb., 44137, 44143); Tacoma, *E. Bartholomew*, 4929 (in Mo. Bot. Gard. Herb., 20810).
- Oregon: Corvallis, *C. E. Owens*, 2032, 2026, 2055, 2140, 2141 (in Mo. Bot. Gard. Herb., 43874-43876, 44700, 44701); Granite Pass, *J. R. Weir*, 8675 (in Mo. Bot. Gard. Herb., 36750); Wallowa, *C. J. Humphrey*, 265; Siskiyou National Forest, *J. R. Weir*, 8678 (in Mo. Bot. Gard. Herb., 36751).
- California: *R. A. Harper*, 39, 108, 142 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56610-12); *C. R. Orcutt*, in Ell. & Ev., N. Am. Fungi, 714; La Honda, *Edna Hyatt*, comm. by C. L. Shear, 1088, 1091; Muir Woods, *W. A. Murrill*, 1158, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55715); Redding, *C. J. Humphrey*, 1035; San Francisco, *A. S. Rhoads*, 2 (in Mo. Bot. Gard. Herb., 56046); Saratoga, *E. B. Copeland*, 1806.
- Arizona: Crown King, *G. G. Hedgcock*, comm. by C. J. Humphrey, 2564 (in Mo. Bot. Gard. Herb., 10752).
- Mexico: Cordoba, *W. A. & E. L. Murrill*, 996, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54609); Guernavaca, *W. A. & E. L. Murrill*, 415, 416, 412, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54518, 54519, 54543); Jalapa, *W. A. & E. L. Murrill*, 75, 148, 193, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 11275, 10360, 54436), *C. L. Smith*, in Smith, Central Am. Fungi, 145; Oaxaca, *E. W. D. Holway*; Orizaba, *W. A. & E. L. Murrill*, 758, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54632); Parral, *E. O. Matthews* (in Mo. Bot. Gard. Herb., 5722, 10459).
- Guatemala: *Maxon & Hay*, 3250, comm. by U. S. Bur. Pl. Ind.

- Honduras: *P. Wilson*, 138, comm. by N. Y. Bot. Gard. Herb.
- Cuba: Ciego de Avila, *Earle & Murrill*, 568, comm. by N. Y. Bot. Gard. Herb.; Fecha, *F. S. Earle*, 146, *Earle & Wilson*, 224; Guantanamo, *J. R. Weir*, 10644 (in Mo. Bot. Gard. Herb., 56237); Oriente, *J. A. Shafer*, 3392, 8468 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56613, 56614); San Diego de los Baños, *Earle & Murrill*, 331, comm. by N. Y. Bot. Gard. Herb.
- Porto Rico: Bayamon, *J. A. Stevenson*, 5427 (in Mo. Bot. Gard. Herb., 8180); Mayaguez, *F. S. Earle*, 89, comm. by N. Y. Bot. Gard. Herb.; Rio Piedras, *Johnston & Stevenson*, comm. by J. A. Stevenson, 1764, 1937, 2005 (in Mo. Bot. Gard. Herb., 9824, 14220, 14270); San Jaun, *Mr. & Mrs. A. S. Heller*, 700, comm. by N. Y. Bot. Gard. Herb.
- Jamaica: Cinchona, *W. A. & E. L. Murrill*, 450, 499, 521, comm. by N. Y. Bot. Gard. Herb., *H. von Schrenk* (in Mo. Bot. Gard. Herb., 43630); Chester Vale, *W. A. & E. L. Murrill*, 282, 316, comm. by N. Y. Bot. Gard. Herb.; Monkey Hill, *W. A. Murrill*, 817, comm. by N. Y. Bot. Gard. Herb.; Moore Town, *W. A. & E. L. Murrill*, 160, comm. by N. Y. Bot. Gard. Herb.
- Brazil: *Malme* (in Romell Herb.).
- Formosa: Urai, *S. Kusano*, II.16 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56587).
- Java: *Junghuhn*, authentic specimen of *Thelephora ostrea*, comm. by G. Bresadola.
- Philippine Islands: Luzon, *H. M. Curran*, Forestry Bureau, 9665 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56583); Mindanao, *A. D. E. Elmer*, 10556, Philippine Is. Pl. (in Mo. Bot. Gard. Herb., 705743).

45. *S. lobatum* (Kunze) Fries, *Epier.* 547. 1838; *Sacc. Syll. Fung.* 6: 568. 1888; *Massee, Linn. Soc. Bot. Jour.* 27: 175. 1890. Plate 5, fig. 46.

Thelephora lobata Kunze in *Weigelt Exsiccati*, 1827; Fries, *Linnaea* 5: 527. 1830.—*Stereum Sprucei* Berk. & Curtis, *Linn. Soc. Bot. Jour.* 10: 331. 1868; *Sacc. Syll. Fung.* 6: 567. 1888.—An *S. concolor* *Junghuhn*, *Crypt. Java*, 38. 1838? See *Sacc. Syll. Fung.* 6: 561. 1888; *Bresadola, Hedwigia* 51: 321. 1912.

Illustrations: Engl. & Prantl, Nat. Pflanzenfam. (1: 1**): 124. text f. 69, A-B; Hard, Mushrooms, 455. text f. 382, as *S. versicolor*.

Type: type distribution in Weigel Exs.

Fructifications coriaceous, rigid, thin, wedge-shaped to umbonate, sessile, often laterally concrescent, at first tomentose and drying tawny olive, at length with the tomentum becoming pale smoke-gray to whitish, disappearing more or less near the margin and in narrow zones and showing the glabrous, shining, hazel surface of the bared areas, the margin undulate and usually more or less lobed; in structure 300 μ thick, with the intermediate layer composed of densely arranged, thick-walled, hyaline hyphae 4-4½ μ in diameter; hymenium glabrous, even, usually drying pinkish buff; no setae, gloeocystidia, nor conducting organs; spores hyaline, even, flattened on one side, 4-5 × 1½-2 μ , but few seen.

Pileus usually 3-7 cm. long, 2-6 cm. broad, sometimes much larger by lateral confluence.

On dead branches, logs, and stumps of frondose species in the cases noted. A tropical species ranging northward to New York and Wisconsin and southward to Brazil. Occurs in the Philippine Islands and East Indies also, if *S. concolor* is a synonym.

S. lobatum may be distinguished from the related *S. fasciatum*, *S. versicolor*, and *S. radians* by having a more or less lobate pileus which is also very thin, somewhat flexible, zonate on the upper side, with glabrous, shining hazel zones alternating with whitish tomentose zones of soft, matted hairs. No specimens of this species which I have examined have the pileus effuso-reflexed when young. Specimens of *S. fasciatum* occasionally have a somewhat lobate margin but the pileus is thicker, more heavily clothed with a tomentum which is more persistent than that of *S. lobatum*, and in its more northern stations where I have been able to observe the development, the young fructifications are often effuso-reflexed at first.

S. lobatum is primarily an American species described from collections made in Surinam, Dutch Guiana, but it seems probable that this species has a more extended geographical range through the tropical lands of the Eastern Hemisphere also. The recent collections in Philippine Islands, determined by

Bresadola as *S. concolor* (Jungh.) and distributed in Elmer, Philippine Islands Plants, show that this species is but slightly, if at all, different from *S. lobatum*. The general aspect is the same but the Philippine specimens are the larger; none of them have their tomentum as soft and whitish as in *S. lobatum*. Some of these specimens have shown in crushed preparations spore-like bodies $3\ \mu$ in diameter; spore collections of oriental specimens should be made.

Specimens examined:

Exsiccati: Bartholomew, Fungi Col., 4586, under the name *S. fasciatum*; Ellis, N. Am. Fungi, 514b, under the name *S. versicolor* v. *fasciata*, 514d, under the name *S. versicolor* v. *petaliforme*; Ravenel, Fungi Car. 1: 28, mixed with *S. fasciatum*; de Thümen, Myc. Univ., 2011, mixed with *S. fasciatum*.

New York: Alcove, C. L. Shear, 1019; Ithaca, L. A. Zinn, 82a (in Mo. Bot. Gard. Herb., 43074).

Pennsylvania: West Chester, J. B. Gray, in Ellis, N. Am. Fungi, 514b.

North Carolina: Black Oak, H. W. Ravenel, in Ravenel, Fungi Car. 1: 28; Blowing Rock, G. F. Atkinson, 4311, 4314; Chapel Hill, W. C. Coker, 331 (in Mo. Bot. Gard. Herb., 56663); Transylvania County, W. A. Merrill & H. D. House, 425 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56602).

Georgia: Flint River, R. M. Harper, 1401a, comm. by N. Y. Bot. Gard. Herb. (also in Mo. Bot. Gard. Herb., 5087); Dixie, R. M. Harper, 1633 (in Mo. Bot. Gard. Herb., 56603).

Florida: C. G. Lloyd, 4833; Crescent City, Dr. G. Martin, in Ellis, N. Am. Fungi, 514d; Eustis, G. V. Nash, 2128 (in Mo. Bot. Gard. Herb., 5118), and L. M. Underwood, 1371 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56601); Lake City, P. L. Ricker, 893; New Smyrna, C. G. Lloyd, 183; Tallahassee, E. Bartholomew, in Bartholomew, Fungi Col., 4586.

Alabama: Auburn, F. S. Earle, from Lloyd Herb., 3459; Chehaw, E. A. Burt, two collections; Fayette Co., P. V. Siggers, comm. by A. H. W. Povah, 14 (in Mo. Bot. Gard. Herb., 9229).

- Louisiana: Natchitoches, *G. F. Atkinson*, 5118, 5119; St. Martinville, *A. B. Langlois*, *be*.
- Ohio: Cincinnati, *C. G. Lloyd*, 1677, 4495, 4502.
- Wisconsin: Madison, *C. J. Humphrey*, 2508 (in *Mo. Bot. Gard. Herb.*, 42927).
- Kentucky: Mammoth Cave, *C. G. Lloyd*.
- Missouri: Kennett, *H. von Schrenk* (in *Mo. Bot. Gard. Herb.*, 42996); Neeleyville, *F. C. Dewart* (in *Mo. Bot. Gard. Herb.*, 5132, 5135).
- Mexico: *W. Trelease* (in *Mo. Bot. Gard. Herb.*, 5123); Guernavaca, *E. W. D. Holway*.
- Honduras: *P. Wilson*, 180, 671, comm. by N. Y. Bot. Gard. Herb.
- Cuba: *C. Wright*, 197, 271 (in *Curtis Herb.*), and 521, the type of *S. Sprucci* (in *Kew Herb.*); Baracoa, *L. M. Underwood* & *F. S. Earle*, 796, 1068, comm. by N. Y. Bot. Gard. Herb.; Ceballos, *C. J. Humphrey*, 2722 (in *Mo. Bot. Gard. Herb.*, 8638).
- Porto Rico: Sauerce, *Mr. & Mrs. A. A. Heller*, 843, 882, comm. by N. Y. Bot. Gard. Herb.; Luquillo Mts., *P. Wilson*, 203 (in *N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.*, 56600).
- Guadeloupe: in de Thümen, *Myc. Univ.*, 2001.
- St. Kitts: *N. L. Britton* & *J. F. Cowell*, 502, comm. by N. Y. Bot. Gard. Herb.
- Jamaica: *A. E. Wight*, comm. by *W. G. Farlow*; Castleton Gardens, *W. A. & E. L. Murrill*, 113, comm. by N. Y. Bot. Gard. Herb.; Cinchona, *W. A. & E. L. Murrill*, 530, comm. by N. Y. Bot. Gard. Herb.; Moneague, *W. A. Murrill*, 1140, comm. by N. Y. Bot. Gard. Herb.; Troy and Tyre, *W. A. Murrill* & *W. Harris*, 996, 1037, comm. by N. Y. Bot. Gard. Herb.
- Trinidad: Carengo, *M. A. Carriker*, comm. by *W. G. Farlow*, II.
- Grenada: Grand Etang, *R. Thaxter*, comm. by *W. G. Farlow*, 3.
- Venezuela: Margarita, *A. F. Blakeslee*, comm. by *W. G. Farlow*.

46. *S. versicolor* (Swartz) Fries, *Epicr.* 547. 1838; Berkeley, *Ann. & Mag. Nat. Hist. I.* 10: 382. *pl. 11. f. 13.* 1842; Sacc.

Syll. Fung. 6: 561. 1888; Masee, Linn. Soc. Bot. Jour. 27: 172. 1890; Lloyd, Myc. Writ. 4. Letter 46:3. 1913.

Plate 5, fig. 47.

Helvella versicolor Swartz, Prodr. 149. 1788.—*Thelephora versicolor* Swartz, Fl. Ind. Oc. 3: 1934. 1806; Fries, Syst. Myc. 1: 438. 1821.—*Stereum radians* Fries, R. Soc. Sci. Upsal. Actis III. 1: 110. 1851; Sacc. Syll. Fung. 6: 573. 1888; Masee, Linn. Soc. Bot. Jour. 27: 188. pl. 7. f. 5. 1900.

Illustrations: Berkeley, *loc. cit.*; Masee, *loc. cit.*

Type: authentic specimen in Herb. of Brit. Mus. according to Berkeley.

Fructification coriaceous-rigid, very thin, sometimes buff-yellow, clothed with silky, villous fascicles all lying in a radiating direction, becoming glabrous and shining and minutely radially ridged or lineate, wood-brown to cinnamon-brown, the margin entire, not complicate; in structure 300–400 μ thick, composed of densely, longitudinally arranged hyphae 3–3½ μ in diameter; hymenium even, glabrous, cream-color to avellaneous; no colored conducting organs, gloecystidia, nor cystidia; spores hyaline, even, 4–5 \times 2–2½ μ .

Fructifications 1–2½ cm. broad, 1½–4 cm. long, often laterally confluent.

On dead wood. Florida, West Indies, Mexico, Dutch Guiana. September to February. Probably common in Jamaica.

S. versicolor is a species intermediate between *S. lobatum* and *S. rameale*; its fructifications are smaller than those of *S. lobatum*, thinner, more completely glabrous at length, with margin not normally lobed, and usually retaining attachment by a narrow, resupinate side of the pileus as well as by the umbo, in which respect there is resemblance to the middle stage of development of *S. fasciatum*; the radial arrangement of the hairs and villous fascicles on the upper surface of the pileus is a highly distinctive character, as first pointed out by Berkeley. The coloration and hairy covering of fructifications of *S. versicolor* are somewhat similar to these characters in *S. rameale*, but the fructifications of the former are not lobed and folded together laterally and crisped nor as slender as those of *S. rameale*, as pointed out by Fries in his description of his *S. radians*. *S. versicolor* was formerly confused with *S. fasciatum*, especially in American

literature; it is doubtful whether *S. versicolor* occurs in the United States except very rarely in Florida.

Specimens examined:

- Florida: Dade County, *J. K. Small*, 7089, 7122 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56650, 56651); Eustis, Lake County, *L. M. Underwood*, 1377 (in N. Y. Bot. Gard. Herb., Burt Herb., and Mo. Bot. Gard. Herb., 42764).
- Cuba: *C. Wright*, 291 (in Curtis Herb.); Ceballos, *C. J. Humphrey*, 2740 (in Mo. Bot. Gard. Herb., 15720); San Diego de los Baños, *Bro. Leon*, 4861 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56647).
- Porto Rico: Maricao, *N. L. Britton*, *J. F. Cowell* & *S. Brown*, 4420 (in N. Y. Bot. Gard. Herb., Burt Herb., and Mo. Bot. Gard. Herb., 56574); Rio Piedras, *J. R. Johnston*, 129, 282 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56648, 56641); Sierra de Naguabo, *J. A. Shafer*, 3211, 3692, 3693 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56653-56655).
- Jamaica: *Farr* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56640); Cinchona, *L. M. Underwood*, 3239 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56595), *N. L. Britton*, 295, 296 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56642, 56643), *F. S. Earle*, 409, comm. by N. Y. Bot. Gard. Herb., *W. A. & E. L. Murrill*, 526, 539, comm. by N. Y. Bot. Gard. Herb. and 473 (in N. Y. Bot. Gard. Herb., Burt Herb., and Mo. Bot. Gard. Herb., 56644); John Crow Peak, *L. M. Underwood*, 2433, comm. by N. Y. Bot. Gard. Herb.; Monkey Hill, *W. A. Murrill*, 814, comm. by N. Y. Bot. Gard. Herb.; Rose Hill, *F. S. Earle*, 50, 282, 305, comm. by N. Y. Bot. Gard. Herb.; Sir John Peak, *E. G. Britton*, 1212 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56641); Troy and Tyre, *W. A. Murrill* & *W. Harris*, 853, 856, 1036, 1048, comm. by N. Y. Bot. Gard. Herb.
- Montserrat: Soufriere, *J. A. Shafer*, 919 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56645).
- Grenada: Annandale, *W. E. Broadway* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56656); Grand Etang, *R. Thaxter*, comm. by W. G. Farlow, 10.

Mexico: Trap. de la Concepcion, *Liebman*, type of *Stereum radians* (in Herb. Fries); Jalapa, *W. A. & E. L. Murrill*, 343, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55477).

47. *S. rameale* Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1: 106. 1822 (under *B. Sterea* of *Thelephora*). Plate 5, fig. 48. *Thelephora hirsuta* Fries, Elenchus Fung. 1: 178. 1828, but not of Syst. Myc. 1: 439. 1821.—*T. hirsuta* β *ramealis* Schweinitz, Am. Phil. Soc. Trans. N. S. 4: 167. 1832.—*Stereum complicatum* Fries, Epier. 548. 1838; Sacc. Syll. Fung. 6: 579. 1888; Masee, Linn. Soc. Bot. Jour. 27: 178. 1890.—*S. radians* of Morgan, Cincinnati Soc. Nat. Hist. Jour. 10: 194. 1888, but not *S. radians* Fries.—*Telephora lobata* Bertolonii, Accad. Sci. Bologna Mem. I. 7: 360. pl. 19. f. e-g. 1856; Underwood & Earle, Ala. Agr. Exp. Sta. Bul. 80: 232. 1897.—*Stereum Bertolonii* Saccardo, Sacc. Syll. Fung. 11: 120. 1895. Illustrations: Berkeley & Broome, Linn. Soc. Bot. Trans. 2: pl. 14. f. 12-14. 1883; Bertolonii, loc. cit.

Type: in Herb. Schweinitz and in Herb. Fries.

Fructifications coriaceous, thin, rigid, effuso-reflexed, rarely resupinate, with the reflexed portion consisting of small, umbonate pilei, which are sometimes subdivided into lobes, the pilei or lobes drying folded together or crisped, fibrose-strigose, becoming glabrous on the marginal portion, shining, with innate fibers radiating from the base, cinnamon-buff to hazel, more or less zoned; hymenium even, glabrous, light buff to cream-buff; in structure 300-450 μ thick, composed of densely, longitudinally arranged, hyaline hyphae 3-3 $\frac{1}{2}$ μ in diameter, colored conducting organs 3-3 $\frac{1}{2}$ μ in diameter occasionally present; no cystidia nor gloeocystidia; spores white in spore collection, even, slightly curved, 6 \times 2-2 $\frac{1}{2}$ μ .



Fig. 24.
S. rameale.
Spores \times 650.

Fructifications sometimes covering areas only 5-10 mm. in diameter, and gregarious, at other times irregularly confluent over areas up to 3 cm. broad and 10 cm. and more long; individual pilei 2-10 mm. broad, 3-10 mm. long.

On dead twigs and stumps of oak and other frondose species.

Canada, throughout the United States, except in the Rocky Mountain region, in Mexico and the West Indies. July to January. Common in the United States.

S. rameale varies somewhat under the different conditions as to climate and substratum in the great extent of North America where it is our commonest species of *Stereum*. In the United States and Canada one will hardly go amiss in referring to *S. rameale* any *Stereum* with numerous small pilei densely crowded together imbricately or laterally, strigose hairy near the region of attachment, and with marginal side shining, somewhat zonate, and pinkish buff to hazel in color, and with these pilei drying folded together along the sides, or radially plicate in a laterally confluent form. The pileus of *S. rameale* is thinner than that of *S. hirsutum*, only partially covered with hairs, which do not form as heavy a covering where present, and the pilei are folded together laterally and are smaller than those of *S. hirsutum*. *S. sericeum* has small, shining, very thin pilei between whitish and pale drab-gray on both surfaces—wholly lacking ruddy ochraceous coloration—and almost always growing on *Carpinus caroliniana*.

Schweinitz communicated to Fries specimens of *S. rameale* which are still preserved in the herbarium at Upsala; Fries published the species as a synonym of *S. hirsutum* in Elenchus Fung.; Schweinitz yielded to the authority of Fries but protested that *S. rameale* was a distinct variety, at least. Other American specimens of this species were received by Fries, who described and published them in 1838 as *S. complicatum*, overlooking the earlier and nearly identical specimens from Schweinitz and the earlier, appropriate name for the species.

Specimens examined:

- Exsiccati: Bartholomew, Fungi Col., 2881, 4289, 4689, 4985; Ellis, N. Am. Fungi, 324; Ell. & Ev., Fungi Col., 307; Ravenel, Fungi Car. 2: 30; Fungi Am., 117; Smith, Cent. Am. Fungi, 96, 97—the latter under the name *S. sericeum*; de Thümen, Myc. Univ., 1404.
- Canada, Ontario: Belleville, *J. Macoun*, 240; Port Credit, *J. H. Faull*, Univ. Toronto Herb., 317 (in Mo. Bot. Gard. Herb., 44878); Toronto, *R. P. Wodehouse*, Univ. Toronto Herb., 316 (in Mo. Bot. Gard. Herb., 44879).

Maine: Oldtown, *P. L. Ricker*.

Vermont: Brattleboro, Grand View Mt., Lake Dunmore, Middlebury, and Ripton, *E. A. Burt*.

Massachusetts: Arlington, *E. A. Burt*; Amherst, *P. J. Anderson*, 6 (in Mo. Bot. Gard. Herb., 55850); Cambridge, *W. Trelease*, 81 (in Mo. Bot. Gard. Herb., 5062); Stony Brook, *E. A. Burt*; Waltham, *A. B. Seymour*, 12 (in Mo. Bot. Gard. Herb., 22096); Wellesley, *L. W. Riddle*, 12; Worcester, *G. E. Francis*.

Connecticut: *C. C. Hanmer*, 2075 (in Mo. Bot. Gard. Herb., 43849); Mansfield, *P. W. Graff*, 12 (in Mo. Bot. Gard. Herb., 9854); New Canaan, *P. Wilson*, 63 (in Mo. Bot. Gard. Herb., 54739); South Windsor, *C. C. Hanmer*.

New York: *Sartwell* (in Mo. Bot. Gard. Herb., 5062, 44235); Albany, *H. D. House* (in N. Y. State Mus. Herb. and Mo. Bot. Gard. Herb., 15954); Alcove, *C. L. Shear*, 1137, 1320, 1323, 1331; Catskill Mts., *C. H. Peck*, in Ellis, N. Am. Fungi, 324; East Galway, *E. A. Burt*, three collections; Glasco, *P. Wilson*, 34, 37, 41, 57 (in Mo. Bot. Gard. Herb., 54728, 54741, 54742, 54727); Ithaca, *G. F. Atkinson*, 190 *O. S.*, 2121, 7989, 22969, 22973-22975, *C. J. Humphrey*, 227, *H. S. Jackson*, Cornell Univ. Herb., 14375, 14376, *W. A. Murrill*, Cornell Univ. Herb., 3058, *Van Hook*, Cornell Univ. Herb., 7991, *K. M. Wiegand*, Cornell Univ. Herb., 3258, *L. A. Zimm*, 83 (in Mo. Bot. Gard. Herb., 9064); Palisades, *P. Wilson*, 16, 21 (in Mo. Bot. Gard. Herb., 54732, 54731); Scarsdale, *Livingston & Crane*, comm. by N. Y. Bot. Gard. Herb., *P. Wilson*, 1, 25 (in Mo. Bot. Gard. Herb., 54737, 54730); West Fort Ann, *S. H. Burnham*, 15 (in Mo. Bot. Gard. Herb., 44011); Williams Bridge, *P. Wilson*, 3, 31 (in Mo. Bot. Gard. Herb., 54740, 54729); Yonkers, *P. Wilson*, 1 (in Mo. Bot. Gard. Herb., 54727).

New Jersey: *Laning* (in Mo. Bot. Gard. Herb., 5051, 44236, 44238); Alpine, *P. Wilson*, 15, 9, 14, 5, 4 (in Mo. Bot. Gard. Herb., 54733-54736, 54738); Newfield, *J. B. Ellis*, in Ellis, Fungi Col., 307, and in de Thümen, Myc. Univ., 1404; New Brunswick, *H. D. House* (in N. Y. State Mus. Herb. and Mo. Bot. Gard. Herb., 54353).

Pennsylvania: Bear Meadow, *C. R. Orton & A. S. Rhoads*, 13,

- 14 (in Mo. Bot. Gard. Herb., 44090, 44091); Bellefonte, *L. O. Overholts*, 3715 (in Mo. Bot. Gard. Herb., 54996); Kittanning, *D. R. Sumstine*, 3, 9, 12; North Garden, *E. Michener*, 437 (in Mo. Bot. Gard. Herb., 44237); Shingleton Gap, *A. S. Rhoads*, 11 (in Mo. Bot. Gard. Herb., 44089); Spruce Creek, *J. H. Faull*, Univ. Toronto Herb., 313 (in Mo. Bot. Gard. Herb., 44885).
- Delaware: Newark, *H. S. Jackson*, B9.
- Maryland: Cabin John Bridge, *C. L. Shear*, 1045; Cabin John Creek, *A. S. Rhoads*, comm. by *L. O. Overholts* (in Mo. Bot. Gard. Herb., 55069); Chevy Chase, comm. by Mrs. *F. W. Patterson* (in Mo. Bot. Gard. Herb., 43730); Takoma Park, *A. S. Rhoads*, comm. by *L. O. Overholts* (in Mo. Bot. Gard. Herb., 55049), *C. L. Shear*, 1160.
- District of Columbia: Takoma Park, *P. L. Ricker*, 818.
- Virginia: Mt. Vernon, *P. L. Ricker*, 1121 in part.
- North Carolina: *Schweinitz*, type (in Herb. Schweinitz and Herb. Fries); Chapel Hill, *W. C. Coker*, 3802, 2026, 1047, 362, 333 (in Mo. Bot. Gard. Herb., 56657-56661); Salem, *Schweinitz*, the *Thelephora ochroleuca* of Schweinitz, Syn. N. Am. Fungi, 644 (in Herb. Schweinitz).
- South Carolina: *H. W. Ravenel*, in Ravenel, Fungi Car. 2: 30; Clemson College, *P. H. Rolfs*, 1614, 1628; Davidson River, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 42964); Society Hill, *H. W. Ravenel* (in Curtis Herb., 1439, under the name *Stereum plicatum*).
- Georgia: Atlanta, *E. Bartholomew*, 5674 (in Mo. Bot. Gard. Herb., 44217); Glenbrook Ravine, *A. B. Seymour*, from Farlow Herb., J (in Mo. Bot. Gard. Herb., 44649); Thomson, *H. H. Bartlett*, comm. by *W. G. Farlow*.
- Florida: *C. G. Lloyd*, 4851, 4852; Camp Pinchot, *W. H. Long*, 12212 (in Mo. Bot. Gard. Herb., 55143); Daytona, *D. L. James*, comm. by U. S. Dept. Agr. Herb.; Gainesville, *H. W. Ravenel*, in Ravenel, Fungi Am., 117; New Smyrna, *C. G. Lloyd*, 2112.
- Alabama: *Dr. Gates*, probably from the type collection of *Telephora lobata Bertolonii*, from Torrey Herb. (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56295); Auburn, *F. S. Earle*, four specimens in Burt Herb., and two

- others (in Mo. Bot. Gard. Herb., 5107, 56619—the last in N. Y. Bot. Gard. Herb. also); Montgomery Co., *R. P. Burke*, 28 (in Mo. Bot. Gard. Herb., 17856).
- Mississippi: Biloxi, *F. S. Earle*, 29; Hattiesburg, *C. J. Humphrey*, 5451; Jackson, *E. Bartholomew*, 5779, 5797, 5784 (in Mo. Bot. Gard. Herb., 44223–44225) and Bartholomew, Fungi Col., 4689; Laurel, *C. J. Humphrey*, 5430; Ocean Springs, *F. S. Earle*, 177 (in Mo. Bot. Gard. Herb., 5065).
- Louisiana: *A. B. Langlois*, 2906; Alden Bridge, *W. Trelease* (in Mo. Bot. Gard. Herb., 5047); Baton Rouge, *C. J. Humphrey*, 5699 (in Mo. Bot. Gard. Herb., 14102); New Orleans, *E. Bartholomew*, 5764 (in Mo. Bot. Gard. Herb., 5440, 44222), *E. A. Burt*; St. Martinville, *A. B. Langlois*, bc (in Burt Herb.), 1101 (in Mo. Bot. Gard. Herb., 5063); Shreveport, *E. Bartholomew*, in Bartholomew, Fungi Col., 4689.
- Ohio: Cincinnati, *A. P. Morgan*, comm. by Lloyd Herb., 2633; College Hill, *C. G. Lloyd*, 1457; Linwood, *C. G. Lloyd*, 02833.
- Indiana: Avilla, *W. H. Rankin* (in Mo. Bot. Gard. Herb., 9183); Crawfordsville, *D. Reddick*, 12; Greencastle, *L. M. Underwood* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56277).
- Illinois: Bowmansville, comm. by Univ. Wis. Herb., 4, and *E. T. & S. A. Harper*, 436; River Forest, *E. T. & S. A. Harper*, 709.
- Kentucky: Bowling Green, *S. F. Price* (in Mo. Bot. Gard. Herb., 5036).
- Tennessee: Elkmont, *C. H. Kauffman*, 58, 61, 63 (in Mo. Bot. Gard. Herb., 16384, 3993, 1678); Nashville, *E. Bartholomew*, 5634 (in Mo. Bot. Gard. Herb., 44214).
- Michigan: Chelsea, *C. H. Kauffman*, 23; New Richmond, *C. H. Kauffman*, 44, 43 (in Mo. Bot. Gard. Herb., 22507, 22856).
- Minnesota: *E. L. Jensen*, 2 (in Mo. Bot. Gard. Herb., 3939).
- Wisconsin: *Miss A. D. Stucki*, Univ. Wis. Herb., 7; Blue Mounds, *Miss A. D. Stucki*, Univ. Wis. Herb., 6; Madison, *Miss A. D. Stucki*, Univ. Wis. Herb., 10.
- Iowa: *E. W. D. Holway*.
- Missouri: *B. M. Duggar*, 568; Bismarck, *L. O. Overholts* (in Mo. Bot. Gard. Herb., 43701); Cox's Switch, *H. von*

- Schrenk* (in Mo. Bot. Gard. Herb., 42892); Creve Coeur, *E. A. Burt* (in Mo. Bot. Gard. Herb., 44757); Columbia, *L. E. Cline*, comm. by B. M. Duggar, A555; Gasconade Co., *W. Trelease* (in Mo. Bot. Gard. Herb., 5128); Meramec, *P. Spaulding* (in Mo. Bot. Gard. Herb., 5019); Neeleyville, *Dewart* (in Mo. Bot. Gard. Herb., 5127, 5130); St. Francis River, *W. Trelease* (in Mo. Bot. Gard. Herb., 5129); St. Louis, *E. A. Burt* (in Mo. Bot. Gard. Herb., 8724, 44757), and *H. von Schrenk* (in Mo. Bot. Gard. Herb., 42873); Williamsville, *B. M. Duggar & H. S. Reed*, 47.
- Arkansas: Arkadelphia, *L. M. Underwood* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56620); Batesville, *E. Bartholomew*, in *Bartholomew, Fungi Col.*, 2881; Cass, *W. H. Long*, 19835 (in Mo. Bot. Gard. Herb., 6384); Womble, *W. H. Long*, 19671, 19649, 19865 (in Mo. Bot. Gard. Herb., 6386, 6385, 8887); Wynne, *W. Trelease* (in Mo. Bot. Gard. Herb., 5039).
- Texas: *H. W. Ravenel*, 40 (in U. S. Dept. Agr. Herb.); Joaquin, *E. Bartholomew*, in *Bartholomew, Fungi Col.*, 4985; Somerville, *H. von Schrenk*, 1.
- Colorado: Tolland, *L. O. Overholts*, 2000 (in Mo. Bot. Gard. Herb., 54872).
- British Columbia: Hastings, *J. Macoun*; Sidney, *J. Macoun*, 14, 382 (in *Macoun Herb.*) and 56, 72 (in Mo. Bot. Gard. Herb., 5738, 5748).
- Washington: Bellingham, *J. R. Weir*, 543, 547, 593 (in Mo. Bot. Gard. Herb., 18629, 18712, 36745); Metaline Falls, *J. R. Weir*, 5245, 590 (in Mo. Bot. Gard. Herb., 55650, 36744); Seattle, *W. A. Murrill*, 137, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55736).
- Oregon: Corvallis, *W. A. Murrill*, 892b, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55719), and *C. E. Owens*, 2033, 2134, 2147 (in Mo. Bot. Gard. Herb., 43873, 44697, 9186).
- California: *R. A. Harper*, 121, 128 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56621, 56622); Palo Alto, *W. A. Murrill & L. S. Abrams*, 1170, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 55710).
- Mexico: Jalapa, *W. A. & E. L. Murrill*, 57, 70, 348, comm. by

N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 23108, 3732, 54475), and *C. L. Smith*, in *Smith*, Central Am. Fungi, 96, 97; Orizaba, *W. A. & E. L. Murrill*, 799, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54624); Trap. de la Conception, *Liebman*, authentic specimen of *Stereum complicatum* (in Herb. Fries).

Porto Rico: Indiera Fria, *N. L. Britton*, *J. F. Cowell & S. Brown*, 4483 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56623).

Jamaica: Abbey Green, *W. Harris*, 1022; Cinchona, *F. S. Earle*, 360, and *W. A. & E. L. Murrill*, 600, both numbers comm. by N. Y. Bot. Gard. Herb.; Hope, *F. S. Earle*, 119, comm. by N. Y. Bot. Gard. Herb.; New Haven Gap, *W. A. & E. L. Murrill*, 770, comm. by N. Y. Bot. Gard. Herb.; Monkey Hill, *W. A. Murrill*, 790, 802, comm. by N. Y. Bot. Gard. Herb.; Rose Hill, *F. S. Earle*, 309, 312, comm. by N. Y. Bot. Gard. Herb.

48. *S. sericeum* Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1: 106. 1822 (in *B. Sterea* of *Thelephora*); Morgan, Cincinnati Soc. Nat. Hist. Jour. 10: 195. 1888; Sacc. Syll. Fung. 6: 579. 1888. Plate 5, fig. 49.

Thelephora striata Fries, Elenchus Fung. 1: 178. 1828; Schweinitz, Am. Phil. Soc. Trans. N. S. 4: 167. 1832.—*Stereum striatum* Fries, Epicr. 548. 1838, but not of p. 551 nor of Hym. Eur. 641. 1874.

Illustrations: Hard, Mushrooms, 456. text f. 383.

Type: not found by me in Herb. Schweinitz although studied by Berkeley & Curtis, Acad. Nat. Sci. Phila. Jour. 3: 220. 1856.

Fructifications coriaceous, small, very thin and papery, effuso-reflexed, laterally confluent, with reflexed portion divided into small pilei, sometimes orbicular and attached by a central point with margin free all around, the upper side whitish to cartridge-buff, shining, silky, with minute radiate fibrils, the margin entire, thinning to subfimbriate, not complicate; hymenium even, wood-brown when most deeply colored, becoming bleached; in structure 250–300 μ thick, composed of densely and longitudinally arranged hyaline



Fig. 25.
S. sericeum.
Spores \times 665.

hyphae $3-3\frac{1}{2}$ μ in diameter; no colored conducting organs, gloeocystidia, nor cystidia present; spores hyaline, even, flattened on one side, $6-7\frac{1}{2} \times 3-3\frac{1}{2}$ μ .

Fructifications $1-1\frac{1}{2}$ cm. in diameter, confluent along limbs 10 cm. and more, the reflexed portion 5-10 mm. broad, 3-10 mm. long.

In swampy woods on under side of dead twigs of *Carpinus caroliniana*, recorded rarely on *Liquidambar* and *Nyssa*. Canada to Louisiana and westward to Missouri and in Mexico. Throughout the year. Infrequent.

Stereum sericeum is very appropriately named, for its silvery to pale gray pilei are noteworthy by their silky or satiny luster; they are smaller, thinner, and more flexible than those of *S. rameale* and with innate rather than fibrose-strigose fibrils; these pilei lack the ruddy and ochraceous hues characteristic of *S. rameale*; furthermore the pilei of *S. sericeum* are plane, while those of *S. rameale* are folded laterally or crisped. Nevertheless I have received some scanty specimens of *S. rameale* from the West and South which were sparsely developed and bleached out so as to simulate *S. sericeum*. In New England and New York, *S. sericeum* has been invariably on *Carpinus caroliniana* when the substratum has been recorded, but elsewhere *S. rameale* has sometimes been recorded on other substrata.

The concept of *S. sericeum* is that held by all American mycologists and is in conformity with the specimens in Curtis Herbarium determined by Berkeley and Curtis who studied the authentic specimen.

Specimens examined:

- Exsiccati: Ellis, N. Am. Fung., 19; Ell. & Ev., Fungi Col., 705; Ravenel, Fungi Car. 1: 21; Shear, N. Y. Fungi, 312.
 Ontario: London, *J. Dearness*; Ottawa, *J. Macoun*, 20, 30, 277; Toronto, *G. H. Graham*, Univ. Toronto Herb., 675 (in Mo. Bot. Gard. Herb., 44918), and *T. Langton*, Univ. Toronto Herb., 518, 594 (in Mo. Bot. Gard. Herb., 44842, 44848).
 Vermont: Middlebury, *E. A. Burt*, five collections.
 Massachusetts: Wayland, *A. B. Scymour*, T23 (in Mo. Bot. Gard. Herb., 22097).
 Connecticut: Goshen, *L. M. Underwood*, 224 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56658).

New York: *Sartwell* (in Mo. Bot. Gard. Herb., 5045); Alcove, *C. L. Shear*, 1047, 1124, 1211, 1314, 1325, 1332, and in *Shear*, N. Y. Fungi, 312; *Glasco*, *P. Wilson*, 36 (in Mo. Bot. Gard. Herb., 54744); Grand View, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 42795); Ithaca, *G. F. Atkinson*, 178 O. S., 2827, 22968, and *W. C. Muenscher*, 4 (in Mo. Bot. Gard. Herb., 56594); McLean, *W. C. Muenscher*, 98 (in Mo. Bot. Gard. Herb., 56596); Taughannock Gorge, *W. C. Muenscher*, 199 (in Mo. Bot. Gard. Herb., 56595).

New Jersey: Newfield, *J. B. Ellis*, in *Ellis*, N. Am. Fungi, 19, *Ell. & Ev.*, Fungi Col., 705, and (in Mo. Bot. Gard. Herb., 5103).

Pennsylvania: *E. Michener*, 399 (in Mo. Bot. Gard. Herb., 5104); State College, *L. O. Overholts*, 3054 (in Mo. Bot. Gard. Herb., 5688).

District of Columbia: Takoma Park, *C. L. Shear*, 957.

North Carolina: Chapel Hill, *W. C. Coker*, 1043 (in Mo. Bot. Gard. Herb., 56668).

South Carolina: Black Oak, *H. W. Ravenel*, in *Ravenel*, Fungi Car. 1: 31.

Florida: Tallahassee, comm. by *W. G. Farlow*.

Alabama: Auburn, *F. S. Earle* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56661-56663); Fayette Co., *P. V. Diggers*, comm. by *A. H. W. Povah*, 17 (in Mo. Bot. Gard. Herb., 20803); Montgomery Co., *R. P. Burke*, 32, 137 (in Mo. Bot. Gard. Herb., 15929, 10934); Tuskegee, *C. W. Carver*, 369 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56664).

Mississippi: Biloxi, *F. S. Earle*, 27.

Louisiana: New Orleans, *F. S. Earle* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56660).

Ohio: Cleveland, *H. C. Beardslee*; Columbus, *W. A. Kellerman*, in *Kellerman*, Ohio Fungi, 139 (in Mo. Bot. Gard. Herb., 5042); Norwood, *C. G. Lloyd*, 2270; Oberlin, and also Penfield, *F. D. Kelsey* (in Mo. Bot. Gard. Herb., 56665 and 56666 respectively).

Indiana: Scottsburg, *J. R. Weir*, 5803 (in Mo. Bot. Gard. Herb., 55643).

Michigan: Agricultural College, *Hicks*, comm. by *W. G. Farlow*.

Missouri: Columbia, *B. M. Duggar*, 553.

Mexico: Jalapa, *W. A. & E. L. Merrill*, 343 in part, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 56672).

49. *S. pubescens* Burt, n. sp. Plate 5, fig. 50.

Type: in Mo. Bot. Gard. Herb., N. Y. Bot. Gard. Herb., and Burt. Herb.

Fructification coriaceous, thin, orbicular, conchate-reflexed, attached by one side and the center, reflexed all around but more broadly on the upper side, white, pubescent with soft matted hairs, not zonate nor sulcate; hymenium drying even or somewhat radiately rugose, sorghum-brown to dusky drab, shining; in structure 600 μ thick exclusive of the tomentum, with the occasional hymenial wrinkles standing out up to 120 μ further; intermediate layer bordered next to the tomentum by a narrow, dense, colored zone and composed of longitudinally arranged and somewhat loosely interwoven hyaline, thick-walled hyphae 3½ μ in diameter; no vesicular organs, conducting organs, gloeocystidia, nor cystidia present; hymenium composed of a single layer of simple basidia with 4 sterigmata; spores hyaline, even, oval, 6×4 μ .

Fructifications 3–10 mm. in diameter, reflexed 1–3 mm.

On dead limbs of a frondose species. Montana. April. Probably rare.

S. pubescens has small fructifications with some resemblance in aspect to those of *Cenangium furfuraceum* but white and pubescent with soft matted hairs. Specimens from this gathering were communicated by Ellis, No. 7014, to Cooke and were regarded by Cooke as a young *Stereum*, related to *Stereum purpureum* and, perhaps, young specimens of this species. *S. pubescens* differs sharply from *S. purpureum* in having no pyriform, vesicular organs. The specimens are so mature that many basidia bearing sterigmata are present and occasionally spores. In the smaller specimens the hymenium is even but in those 1 cm. in diameter some broad, obtuse, radiating wrinkles are present, which may necessitate the transfer of this species from *Stereum* when better known from future collections.

Specimens examined:

Montana: Sheridan, *Mrs. L. A. Fitch*, in Ellis Collection, 7014, type (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56784).

50. *S. conicum* Burt, n. sp. Plate 5, fig. 51.

Type: in Farlow Herb. and in Mo. Bot. Gard. Herb.

Pileus coriaceous, small, rather thick, conical, sessile, attached by the vertex, villose, with some specimens whitish to pale olive-buff and others between wood-brown and Sayal-brown; intermediate layer not bordered by a dark zone, nearly colorless, containing many thick-walled and somewhat incrustated hyphal ends $15-25 \times 6 \mu$ but no colored conducting organs; hymenium even, drab, without cystidia; spores hyaline, even, $4-4\frac{1}{2} \times 2\frac{1}{2} \mu$.

Pileus 2-4 mm. in diameter, 2-4 mm. high, about $\frac{2}{5}-\frac{1}{2}$ mm. thick.

Singly on small, dead, frondose twigs. Cuba.

If carelessly glanced at, specimens of this species might be referred to *S. ochraceo-flavum*, but in *S. conicum* each of the eight fructifications which I have seen is truly conical, pendant, and attached by its vertex, while the pilei of *S. ochraceo-flavum*, *S. ochroleucum*, etc., are reflexed; the hymenium of *S. conicum* is glabrous, while that of *S. ochraceo-flavum* contains even-walled, non-incrustated cystidia $20-25 \times 4-6 \mu$, protruding 15μ . *S. conicum* is noteworthy by the very numerous thick-walled and somewhat incrustated hyphal ends which are present in its intermediate layer. On the hymenial side these bodies curve towards the hymenium but do not reach its surface; on the opposite side they curve to the upper surface of the pileus and protrude as incrustated hairs forming a part of the villose covering of the pileus, a structural feature suggestive of *Cyphella*. The specimens of *S. conicum* were collected by Charles Wright during his last trip to Cuba in about 1860 but were not sent to Berkeley and Curtis for study.

Specimens examined:

Cuba: Fungi Cubensis Wrightiani, 842, *C. Wright*, type, comm. by W. G. Farlow (in Mo. Bot. Gard. Herb., 43906 and in Farlow Herb.).

51. *S. vibrans* Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 332. 1868; Sacc. Syll. Fung. 6: 577. 1888. Plate 5, fig. 52.

An *Stereum cupulatum* Patouillard in Duss, Fl. Crypt. Antilles Fr. 233. 1904?

Type: in Curtis Herb. and Kew Herb.

Fructifications coriaceous, orbicular, and attached by the center, or fan-shaped and laterally confluent, lobed, the upper surface velvety hirsute on the region of recent growth, becoming somewhat glabrous in the older region near place of attachment, narrowly concentrically sulcate, somewhat zonate, snuff-brown, becoming Saccardo's umber; hymenium even, Saccardo's umber to drab, somewhat pruinose; in structure 600–800 μ thick, with the intermediate layer connected with the hairy covering by a blackish dense crust; hyphae of intermediate layer snuff-brown, blackening by action of dilute potassium hydrate, longitudinally arranged, thick-walled, $3\frac{1}{2}$ –4 μ in diameter; hymenial layer simple; no colored conducting organs, cystidia, nor aculeate paraphyses; spores hyaline, even, $4\text{--}5 \times 2\frac{1}{2}\text{--}3$ μ .

Pileus 2–5 cm. in diameter.

On logs. Cuba and Jamaica. October and November. Rare.

S. vibrans is related to *S. crassum* but seems distinct by having smaller spores and a thin, blackish, horn-like crust under the hairy covering; the other histological details are very similar however. *S. vibrans* may be distinguished from the other species of the West Indies by its tobacco color, pruinose hymenium, and lack of cystidia, gloeocystidia, conducting organs, and bottle-brush paraphyses. *S. papyrinum* is of similar coloration, but is more spongy, has incrustated cystidia, and does not have its intermediate layer bordered above by a crust.

Specimens examined:

Cuba: *C. Wright*, 530, type (in Curtis Herb.).

Jamaica: Rose Hill, *F. S. Earle*, 299, 303, comm. by N. Y. Bot. Gard. Herb.

52. *S. crassum* Fries, R. Soc. Sci. Upsal. Actis III. 1: 111. 1851 (not *Thelephora crassa* Léveillé); Sacc. Syll. Fung. 6: 582. 1888.

Type: in Herb. Fries.

Fructification coriaceous, resupinate, effused, sometimes reflexed, villose, blackening, the margin obtuse, determinate, paler; hymenium even, dark chestnut-brown; in structure 1000 μ thick, with intermediate layer not bordered by a darker denser zone or crust, composed of longitudinally and rather loosely

arranged, dark-colored, thick-walled, stiff hyphae $3\frac{1}{2}$ – $4\frac{1}{2}$ μ in diameter, not incrusted, which give their color to the fructification; no colored conducting organs, gloeocystidia, nor cystidia; spores hyaline, 9×4 μ .

According to the original collection of *S. crassum* in Herb. Fries, this is a very distinct species, characterized by very dark color throughout and by absence of colored conducting organs, cystidia, and gloeocystidia. It is probably of local distribution, for I have seen but one collection which is even doubtfully referable to *S. crassum*. This specimen, collected at Motzorongo, is wholly resupinate, with hyphae dark-colored and ascending obliquely from the substratum instead of running longitudinally, and the hymenium has dried pinkish buff.

Specimens examined:

Mexico: Mirador, *Liebman*, type (in Herb. Fries); Motzorongo, near Cordoba, *W. A. & E. L. Murrill*, 985 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 54648).

53. *S. radiatum* Peck, Buffalo Soc. Nat. Hist. Bul. 1: 62. 1873; N. Y. State Mus. Rept. 26: 72. 1874; Sacc. Syll. Fung. 6: 571. 1888; Masee, Linn. Soc. Bot. Jour. 27: 195. 1890. Plate 5, fig. 53.

S. radiatum var. *reflexum* Peck, N. Y. State Mus. Rept. 49: 45. 1896; Sacc. Syll. Fung. 14: 217. 1900.—An *Thelephora* (*Stereum*) *corrugata* Lévillé, Ann. Sci. Nat. Bot. III. 5: 150. 1846?

Type: in N. Y. State Mus. Herb.

Fructification coriaceous, resupinate, with the margin free all around, sometimes reflexed on the upper side, the reflexed portion becoming black above, velutinous, crisped, and somewhat lobed; hymenium uneven, not polished, marked with thick ridges radiating from the center, Sudan-brown, rarely black when turned upward and exposed to direct sunlight and weather; in structure 1000 μ thick, composed of densely and longitudinally arranged, colored hyphae $3\frac{1}{2}$ – 4 μ in diameter, whose color is dissolved by dilute potassium hydrate solution; no cystidia; spores from spore collections white, even, slightly curved, 9 – $10 \times 3\frac{1}{2}$ – 4 μ .



Fig. 26. *S. radiatum*.
Spores $\times 665$.

Fruetifications 2 cm. in diameter up to 10×3 cm.; reflexed portion 2–8 mm. broad.

Under side of hemlock, spruce, and pine boards and logs and charred wood. Canada to Pennsylvania and westward to Montana; received also from Russia where growing on rotten wood in greenhouse.

S. radiatum is readily recognized by its bright, ferruginous hymenium with shallow broad ridges radiating from the center to the margin, and by the black upper side of the pileus when reflexed. The general aspect, coloration, and color changes with KHO solution are suggestive of some species of *Hymenochaete* but no setae are present. I endeavored to have comparison made with the type of *Thelephora corrugata* in Museum of Paris Herbarium but Patouillard could not find the specimen there.

Specimens examined:

Exsiccati: Ellis, *N. Am. Fungi*, 407.

Russia: on rotting wood in a greenhouse, *Janczewsky* (in *N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.*, 6173).

Ontario: Harraby, *E. T. & S. A. Harper*, 636.

Vermont: *Howe* (in *N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.*, 5962); Lake Willoughby, *W. G. Farlow*; Middlebury, *E. A. Burt*, four collections.

Massachusetts: Cambridge, *W. G. Farlow*; Sharon, *A. P. D. Piquet*, comm. by *W. G. Farlow*, O (in *Mo. Bot. Gard. Herb.*, 55002).

New York: Albany, *C. H. Peck*, in Ellis, *N. Am. Fungi*, 407; Alcove, *C. L. Shear*, 1301; Freeville, *G. F. Atkinson*, Cornell Univ. Herb., 18185; Ithaca, *C. O. Smith*, *H. H. Whetzel*, *L. M. Wiegand*, Cornell Univ. Herb., 8029, 13809, and 3254 respectively.

Pennsylvania: State College, *L. O. Overholts*, 2653 (in *Mo. Bot. Gard. Herb.*, 5917); Trexlertown, *W. Herbst*.

Michigan: Seney, *C. J. Humphrey*, 1843 (in *Mo. Bot. Gard. Herb.*, 17766).

Montana: Darby, *J. R. Weir*, 363 (in *Mo. Bot. Gard. Herb.*, 16472).

54. *S. patelliforme* Burt, n. sp.
Type: In Burt Herb.

Plate 5, fig. 54.

Fructification coriaceous-fleshy, resupinate, the margin becoming free or narrowly reflexed, hoary with a few short hairs, drying cinnamon to bone-brown, the margin entire; hymenium even, waxy, cracking in drying, drying cinnamon to bone-brown; in structure 500–800 μ thick, composed of longitudinally and densely arranged, hyaline hyphae 3–3½ μ in diameter, with the intermediate layer not bordered on the upper side by a denser, darker zone; hair-like cystidia hyaline, cylindric, flexuous, 50–60×5–6 μ , emerging up to 40 μ , but rarely present; basidia simple, with 4 sterigmata, often protruded; spores hyaline, even, 9–10×3–4 μ , somewhat curved.

Fructifications 3×2 mm., up to 25×3 mm., the margin free all around and rolled up 1–2 mm.

On fallen branches of *Acer*, *Quercus*, and other frondose species. Washington, California, and New Mexico. August to April. Rare.

S. patelliforme differs from our other *Stereums* by being of more fleshy consistency and with a waxy hymenium. In these characters it approaches *Corticium*, but it has the longitudinal arrangement of hyphae characteristic of *Stereum* and the margin becomes narrowly reflexed. These characters separate *S. patelliforme* from our other *Stereums* with the exception of *S. pubescens*, which is snow-white on the upper side with a thick covering of fine soft hairs, is more broadly reflexed, and has a somewhat radiately rugose hymenium.

Specimens examined:

Washington: Bingen, *W. N. Suksdorf*, 713, type, 752, 753, 884, 917.

California: Campo Mts., *C. D. Orcutt*, 2005, comm. by U. S. Dept. Agr. Herb.

New Mexico: Ute Park, Colfax Co., *P. C. Standley*, 14735, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 44951).

55. *S. ochraceo-flavum* Schweinitz in Peck, N. Y. State Mus. Rept. **22**: 86. 1869; Morgan, Cincinnati Soc. Nat. Hist. Jour. **10**: 195. 1888; Sacc. Syll. Fung. **6**: 576. 1888; Massee, Linn. Soc. Bot. Jour. **27**: 184. 1890. Plate 5, fig. 55.

Thelephora ochraceo-flava Schweinitz, Am. Phil. Soc. Trans. N. S. **4**: 167. 1832.

Type: in Herb. Schweinitz and Curtis Herb.

Fructification coriaceous, thin, small, effuso-reflexed, sometimes confluent along branches, often conical and attached by



Fig. 27. *S. ochraceo-flavum*.
Hymenium showing three cystidia, $\times 488$.

one side and the umbo and sometimes only by the umbo, the upper side villose-tomentose, somewhat furrowed, white, weathering gray; in structure 200–300 μ thick below the hairy covering, with intermediate layer becoming bordered on the upper side by a denser or colored zone when old and weathered, composed of densely and longitudinally arranged, hyaline hyphae 3–4 μ in

diameter; no colored conducting organs; hymenium even, "yellow," becoming cream-buff in the herbarium; cystidia not incrusted, obtuse, 20–25 \times 4–6 μ , protruding up to 15 μ ; spores not found.

Reflexed portion 3–5 mm. broad, and about as long; scattered conical pilei 3–5 mm. in diameter.

On dead branches of frondose species. Canada to Mississippi and westward to Missouri, and in California and Mexico. July to May.

S. ochraceo-flavum may be recognized at sight by its small, white, conical fructifications heavily clothed with long, soft hairs and by its bright yellow hymenium. The non-incrusted cystidia afford a good distinctive microscopical character for separation of this species from very small specimens of *S. sulphuratum*. In specimens which have persisted beyond their normal season of active growth, the upper side of the intermediate layer becomes hardened and pale golden.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 17; Ell. & Ev., Fungi Col., 6; Ravenel, Fungi Am., 787; Ravenel, Fungi Car. 2: 31; de Thümen, Myc. Univ., 10.

Ontario: Ottawa, *J. Macoun*, 242.

Vermont: Middlebury, *E. A. Burt*.

Massachusetts: *D. W. Weis*, comm. by C. G. Lloyd, 145 (in Mo. Bot. Gard. Herb., 56687); Cambridge, *E. A. Burt*; Magnolia, *W. G. Farlow*.

- Connecticut: Storrs, *A. E. Moss*, comm. by P. W. Graff, 38 (in Mo. Bot. Gard. Herb., 44792).
- New York: Albany, *H. D. House* (in N. Y. State Mus. Herb., and Mo. Bot. Gard. Herb., 55209); East Galway, *E. A. Burt*; Ithaca, Cornell Univ. Herb., 219; Poughkeepsie, *W. R. Gerard*, 228, 261 (in N. Y. Bot. Gard. Herb.); Staten Island, *L. M. Underwood* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56701).
- New Jersey: Newfield, *J. B. Ellis*, in Ellis, N. Am. Fungi, 17, Ell. & Ev., Fungi Col., 6, and de Thümen, Myc. Univ., 10.
- Pennsylvania: Bethlehem, *Schweinitz*, type (in Herb. Schweinitz and in Curtis Herb.); State College, *J. F. Adams*, 8 (in Mo. Bot. Gard. Herb., 44085).
- Maryland: Seven Locks, *P. L. Ricker*, 1005; Takoma Park, *C. L. Shear*, 1119, 1240.
- Virginia: Park Lane, *W. H. Long*, 18463 (in Mo. Bot. Gard. Herb., 55101).
- North Carolina: Blowing Rock, *G. F. Atkinson*, 4316.
- South Carolina: *H. W. Ravenel*, in Ravenel, Fungi Car. 2: 31; Summerville, *C. L. Shear*, 1228.
- Georgia: Darien, *H. W. Ravenel*, in Ravenel, Fungi Am., 787; Fullerton, *P. L. Ricker*, 918.
- Florida: *C. G. Lloyd*, 4859; Hanosassa (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56688); New Smyrna, *C. G. Lloyd*, 2089; Tampa, *N. L. & E. G. Britton & J. A. Shafer*, 46 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56689).
- Alabama: Auburn, *F. S. Earle & C. F. Baker* (in Burt Herb. and Mo. Bot. Gard. Herb., 5089); Montgomery Co., *R. P. Burke*, 22 (in Mo. Bot. Gard. Herb., 12291).
- Mississippi: Ocean Springs, *F. S. Earle*, 180 (in Mo. Bot. Gard. Herb., 5090).
- Michigan: New Richmond, *C. H. Kauffman*, 87 (in Mo. Bot. Gard. Herb., 44995).
- Wisconsin: Palmyra, *Miss A. O. Stucki*, Univ. Wis. Herb., 40.
- Indiana: Millers, *E. T. & S. A. Harper*, 938.
- Tennessee: Elkmont, *C. H. Kauffman*, 59 (in Mo. Bot. Gard. Herb., 44971).
- Iowa: Decorah, *E. W. D. Holway*.

- Missouri: Allenton, *Letterman*, 48 (in Mo. Bot. Gard. Herb., 5041).
 Arkansas: Cass, *W. H. Long*, 19833 (in Mo. Bot. Gard. Herb., 17807).
 California: Campo Seco, *W. H. Thomas*, 3 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 86690).
 Mexico: Jalapa, *W. A. & E. L. Merrill*, 347, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54468); Orizaba, *J. G. Smith*, 511 (in Mo. Bot. Gard. Herb., 437).

56. *S. abietinum* Persoon, *Myc. Eur.* 1: 122. 1822 (under **** *Stereum* of *Thelephora*); Fries, *Obs. Myc.* 1: 274. 1815, and ed. 2, 1824; *Epier.* 552. 1838; *Hym. Eur.* 643. 1874; *Sacc. Syll. Fung.* 6: 574. 1888. Plate 5, fig. 56.

Thelephora abietina Persoon, *Syn. Fung.* 573. 1801; Fries, *Syst. Myc.* 1: 442. 1821.—*Hymenochaete abietina* (Pers.) Masee, *Linn. Soc. Bot. Jour.* 27: 115. 1890.—*Thelephora striata* Schrader, *Spic. Fl. Germ.* 186. 1794.—*Stereum striatum* Schrader ex Fries, *Epier.* 551. 1838; *Hym. Eur.* 641. 1874; *Sacc. Syll. Fung.* 6: 565. 1888.—*Lloydella striata* (Schrader) Bresadola in Lloyd, *Myc. Writ.* 1. *Myc. Notes* 6: 51. 1901.—*Stereum glaucescens* Fries, *Hym. Eur.* 644. 1874; *Sacc. Syll. Fung.* 6: 575. 1888.—*Hymenochaete fimbriata* Ellis & Everhart, *Jour. Myc.* 1: 149. 1885; *Sacc. Syll. Fung.* 6: 599. 1888; Masee, *Linn. Soc. Bot. Jour.* 27: 113. 1890.—*Hymenochaete abnormis* Peck, *N. Y. State Mus. Rept.* 42: 126. *pl. 1. f. 13-16.* 1889; *Sacc. Syll. Fung.* 9: 227. 1891.

Illustrations: Istvanffi, *Jahrb. f. wiss. Bot.* 29: *pl. 5. f. 16, 17*; Patouillard, *Essai Tax. Hym.* 72; Peck, *N. Y. State Mus. Rept.* 42: *pl. 1. f. 13-16.*

Fructification coriaceous-spongy, dry, thick, resupinate, effused, rarely reflexed, with upper side tomentose, obscurely zonate, burnt umber, tuberculate or uneven; hymenium varying from light drab to cinereous or glaucous; in structure 400-900 μ thick, of which the intermediate layer and the hymenium together constitute 300-600 μ ; intermediate layer composed of longitudinally arranged and interwoven colored hyphae 3-3½ μ in diameter and bordered on its outer side by a darker, denser zone which connects it with the tomentose covering; hymenial

layer becoming zonate and containing numerous colored cystidia having more or less the appearance of colored conducting organs; cystidia colored, cylindric, obtuse, even, rough-walled or more or less incrustated, $90-150 \times 6-8 \mu$, protruding up to 60μ ; spores hyaline, even, flattened on one side, $9-13 \times 4-5 \mu$.

Resupinate specimens $2-8 \times 2-5$ cm., reflexed margin $3-8$ mm. broad.

On wood and logs of *Abies* and *Pinus*. New Hampshire to Washington and in Europe. June to October. Rare.

S. abietinum usually occurs resupinate, but its thick, separable, felted fructifications are suggestive of a resupinate *Stereum*, and this view is confirmed by the presence of the intermediate layer when radial, vertical sections are examined. The cinereous, pruinose surface of the hymenium due, however, to whitish, cobwebby filaments rather than powdery grains, is highly characteristic and shared only by the western *S. rugisporum*, as are also the colored cylindric cystidia. *S. rugisporum* is separated by its odor of anise, much thicker and more broadly reflexed pilei, and presence in occasional collections of colored spores imbedded in the deeper zones of the hymenium.

I have included *Hymenochaete fimbriata* among the synonyms of *S. abietinum*, but it may prove to belong with *S. rugisporum* instead.

Specimens examined:

Exsiccati: de Thümen, Myc. Univ., 1107.

Norway: Christiania, *M. N. Blytt*, type of *Stereum glaucescens* (in Herb. Fries).

Sweden: Stockholm, *L. Romell*, 29; Upsala, *C. G. Lloyd*, 08521 (in Lloyd Herb. and Mo. Bot. Gard. Herb., 55497).

Finland: Mustiala, *P. A. Karsten*, in de Thümen, Myc. Univ., 1107.

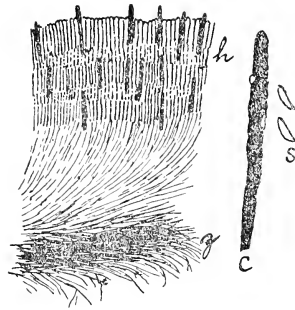


Fig. 28. *S. abietinum*. Section $\times 68$; crust-like zone, *z*; hymenium containing colored cystidia, *h*; cystidium, *c*, and spores, *s*, $\times 488$.

Italy (?): locality not stated, *G. Bresadola*.

New Hampshire: Crawford Notch, *L. O. Overholts* & *A. S. Rhoads* (in Mo. Bot. Gard. Herb., 56342); North Conway, *L. O. Overholts*, 4553 (in Mo. Bot. Gard. Herb., 55633).

Vermont: Smugglers Notch, Mt. Mansfield, *E. A. Burt*.

New York: Cascadeville, Adirondack Mts., *C. H. Peck*, type of *Hymenochaete abnormis* (in N. Y. State Mus. Herb.).

Wisconsin: Madison, *M. C. Jensen*, comm. by *C. J. Humphrey*, 618.

Montana: Yellowstone Park, part of type of *Hymenochaete fimbriata* from *J. B. Ellis* (in Kew Herb.).

Canada: Rocky Mts., Lake O'Hara, *J. Macoun*, 2.

Washington: Mt. Paddo, *W. N. Suksdorf*, 731.

57. *S. rugisporum* (Ell. & Ev.) Burt, n. comb.

Plate 6, fig. 58.

Hymenochaete rugispora Ellis & Everhart, Acad. Nat. Sci. Phila. Proc. 1890: 219. 1890; Sacc. Syll. Fung. 9: 228. 1891.

Type: in N. Y. Bot. Gard. Herb.

Fructification coriaceous-spongy, dry, thick, effuso-reflexed, finally umbonate along line of attachment to substratum, the upper side tomentose, concentrically sulcate, snuff-brown when young and remaining so on the obtuse margin, elsewhere weathering neutral gray, with an anise-like odor in the herbarium; hymenium even, light mouse-gray, becoming light drab; in structure 2-3 mm. thick, with intermediate layer and hymenium together 800-1200 μ thick and the intermediate layer connected with the loosely interwoven tomentose surface layer by a dark dense zone, the hyphae of the intermediate layer colored, 2-4 μ in diameter, longitudinally arranged and loosely interwoven, curving outward into the hymenial



Fig. 29. *S. rugisporum*. Portion of section $\times 488$, showing colored imbedded spores.

layer; hymenial layer becoming up to 1000 μ thick, zonate, containing colored cystidia and sometimes colored spores $7\frac{1}{2}$ -9 \times 3-3 $\frac{1}{2}$ μ , even or rough-walled; cystidia colored, cylindric, obtuse, even, rough or granule-incrusted, 100-150 \times 7-9 μ , pro-

truding up to 120 μ , starting from all parts of the hymenial layer and subhymenium; basidiospores as seen on basidia, hyaline, even, $9-13 \times 3-4\frac{1}{2}$ μ , borne 4 to a basidium.

Reflexed portions 1-4 cm. long and wide, sometimes laterally confluent for 6-8 cm.; resupinate parts of about the same dimensions.

On dead *Abies*, *Picea*, *Pinus*, and *Larix*. In Rocky Mt. states and British Columbia to Arizona. July to September.

Reflexed specimens of *S. rugisporum* may be recognized by their thick, felted, or spongy pilei, deeply concentrically sulcate, and snuff-brown or partly gray in color, with a whitish, pruinose hymenium, and an odor of anise; collections so far made indicate that this species is restricted to conifers of mountainous regions. Microscopic examination of sections shows characteristic cylindrical, colored cystidia, which in the subhymenium and the deeper zones of the hymenium are not readily distinguishable from such colored conducting organs as occur in many species of *Stereum*. There is, however, no record of bleeding from wounds of the hymenium of *S. rugisporum* and *S. abietinum*. The type specimen of *S. rugisporum* contains colored spores, usually even, but occasionally rough-walled, imbedded in the deeper zones of the hymenium; similar spores occur in some, but not all, of the collections cited below, but the collections are so similar in other characters that I regard these colored imbedded spores as an important, occasional character of the species, which will positively identify some collections.

The type of *Hymenochaete fimbriata* was collected in Yellowstone Park, Montana, on *Pinus Murrayana*; the specimen is wholly resupinate and does not show colored, imbedded spores in the preparations which I preserved. I regarded this specimen as not specifically distinct from *S. abietinum*, but the type station of *H. fimbriata* makes me uncertain as to whether the latter may not yet be demonstrated to be resupinate *S. rugisporum* instead. When so demonstrated, the specific name *fimbriatum* should be used for the species because of earlier publication.

Specimens examined:

Wyoming: Fox Park, *J. R. Weir*, 10009 (in Mo. Bot. Gard. Herb., 55788).

- Colorado: Silverton, *E. R. Hodson*, comm. by C. J. Humphrey, 1551; Tolland, *L. O. Overholts*, 1781, 2336 (in Mo. Bot. Gard. Herb., 56042, 56761); Yankee Doodle Lake, *F. J. Seaver & E. Bethel* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56729).
- Idaho: Bonanza, *G. G. Hedgcock*, comm. by C. J. Humphrey, 2168 (in Mo. Bot. Gard. Herb., 10377); Coolin, *J. R. Weir*, 11476 (in Mo. Bot. Gard. Herb., 56724); Leesburg, *F. S. Wolpert*, comm. by J. R. Weir, 7033 (in Mo. Bot. Gard. Herb., 55463); Priest River, *E. E. Hubert*, comm. by J. R. Weir, 11655 (in Mo. Bot. Gard. Herb., 56725).
- British Columbia: *J. Macoun*, 94, type (in N. Y. Bot. Gard. Herb.).
- Washington: Olympic Mts., *T. C. Frye*, 1 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56730); Seattle, *W. A. Murrill*, 130, 146 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56731, 56732) and *J. M. Grant*, 2066, comm. by C. G. Lloyd (in N. Y. Bot. Gard. Herb., 56728).
- Arizona: Agassiz, *W. H. Long*, 19445 (in Mo. Bot. Gard. Herb., 44734); Mt. Humphrey, Flagstaff, *W. H. Long*, 21306–21308, 21310 (in Mo. Bot. Gard. Herb., 54897–54899, 54901); Interior Basin, San Francisco Peaks, *W. H. Long*, 21309, 21311 (in Mo. Bot. Gard. Herb., 54900, 54902).

58. *S. ambiguum* Peck, N. Y. State Mus. Rept. **47**: 145. 1894; Sacc. Syll. Fung. **11**: 122. 1895. Plate 5, fig. 57.
Type: in N. Y. State Mus. Herb.

Fructifications coriaceous, dry, resupinate, effused, rarely narrowly reflexed, with the upper side tomentose, Prout's brown, the resupinate margin often brighter colored, antique brown, determinate; hymenium velvety, raw umber to Saccardo's umber when mature and thick, becoming deeply cracked in drying; in structure 600–1400 μ thick, with an intermediate layer 400–600 μ broad, composed of longitudinally interwoven, colored hyphae 3–4 μ in diameter, and with a zonate hymenial layer up to 800 μ thick containing colored incrustated cystidia in all the zones; sections darkened by KHO solution; cystidia colored, cylindric, obtuse, usually incrustated, 100–150 \times 7–12 μ , protruding up to 100 μ ; basidiospores white in spore collection,

even, $10-13 \times 3\frac{1}{2}-4\frac{1}{2} \mu$; colored spores $12 \times 3\frac{1}{2}-4 \mu$ sometimes occur in deeper zones of the hymenium.

Resupinate part 1-8 cm. long, 1-4 cm. wide, reflexed part 1-5 mm. broad in the only reflexed specimen known.

On logs of *Abies* and, perhaps, *Pinus Strobus*. Vermont and New York. June to November. Very rare.

S. ambiguum belongs in the group of species with *S. abietinum* and *S. rugisporum* on account

of similarity in microscopic structure including the colored cystidia. It may be separated from both these species at sight by the color of its hymenium which is permanently umber and not at all cinereous nor glaucous. There is a difference in chemical composition also, for dilute potassic hydrate solution blackens the sections and becomes itself discolored as in the case of species of *Hymenochaete*. In fact, the general aspect of resupinate, thick, mature, deeply cracked specimens is very like that of *Hymenochaete spreta*—a species which occurs only exceptionally on a coniferous substratum. It is possible that *S. ambiguum* occurs in reflexed form in the state of Washington, for the collection cited under *S. rugisporum*, Olympic Mts., *T. C. Frye, 1*, resembles *S. ambiguum* but is not quite in perfect enough condition for confident reference here.

Specimens examined:

Vermont: Middlebury, *C. G. Lloyd, 10652* (in Lloyd Herb. and Mo. Bot. Gard. Herb., 44585); Ripton, *E. A. Burt*; Smugglers Notch, Mt. Mansfield, *E. A. Burt*.

New York: Adirondack Mts., *C. H. Peck*, type (in N. Y. State Mus. Herb.); Averyville, *C. H. Peck* (in N. Y. State Mus. Herb. and Mo. Bot. Gard. Herb., 55699).

59. *S. umbrinum* Berk. & Curtis, Grevillea 1: 164. 1873; Wakefield, Kew Bul. 1915: 369. 1915.—Compare *Stereum umbri-*

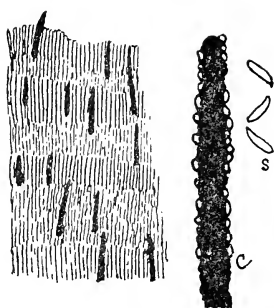


Fig. 30. *S. ambiguum*. Section of hymenial region $\times 68$; peripheral part of cystidium, *c*, and spores, *s*, $\times 650$.

num Fries in Lehmann, *Plantae Preissianae* 2: 137. 1847.
Plate 6, fig. 59.

Thelephora crassa Léveillé in Gaudichaud, *Voyage Bonite Bot.* 1: 190. *pl.* 139. *f.* 1. 1846. Not *Stereum crassum* Fries, R. Soc. Sci. Upsal. Actis III. 1: 111. 1851.—*Hymenochaete crassa* (Lév.) Berkeley in Cooke, *Grevillea* 8: 148. 1880; Sacc. Syll. Fung. 6: 597. 1888; Masee, Linn. Soc. Bot. Jour. 27: 114. 1890.—*H. umbrina* Berk. & Curtis in Cooke, *Grevillea* 8: 148. 1880; Morgan, *Cincinnati Soc. Nat. Hist. Jour.* 10: 198. 1888; Sacc. Syll. Fung. 6: 598. 1888; Masee, Linn. Soc. Bot. Jour. 27: 113. 1890.—*H. vinosa* (Berk.) Cooke, *Grevillea* 8: 149. 1880; Sacc. Syll. Fung. 6: 600. 1888.—*H. multispinulosa* Peck, *Bot. Gaz.* 7: 54. 1882; Sacc. Syll. Fung. 6: 600. 1888; Masee, Linn. Soc. Bot. Jour. 27: 108. 1890.—*H. scabriseta* Cooke in Ravenel, *Fungi Am.*, 717. 1882; Masee, Linn. Soc. Bot. Jour. 27: 113. *pl.* 5. *f.* 7. 1890.—*Lloydella scabriseta* (Cooke) v. Höhn. & Litsch. *K. Akad. Wiss. Wien Sitzungsber.* 115: 1580. 1906.—*Hymenochaete purpurea* Cooke & Morgan in Cooke, *Grevillea* 11: 106. 1883; Morgan, *Cincinnati Soc. Nat. Hist. Jour.* 10: 198. 1888; Sacc. Syll. Fung. 6: 597. 1888; Masee, Linn. Soc. Bot. Jour. 27: 115. 1890.—*Knieffia purpurea* (Cooke & Morg.) Bresadola, *Ann. Myc.* 1: 100. 1903.—*Peniophora intermedia* Masee, Linn. Soc. Bot. Jour. 25: 143. 1889; Sacc. Syll. Fung. 9: 238. 1891.—*Hymenochaete Kalchbrenneri* Masee, Linn. Soc. Bot. Jour. 27: 116. 1890; Sacc. Syll. Fung. 9: 230. 1891.

Illustrations: Gaudichaud, *Voyage Bonite Bot.* *pl.* 139. *f.* 1; Linn. Soc. Bot. Jour. 27: *pl.* 5. *f.* 7.

Type: in Kew Herb. and Curtis Herb.

Fructifications coriaceous-spongy, resupinate, effused, often becoming reflexed, light vinaceous lilac to dark lavender when young, at length brownish drab to snuff-brown, the upper surface spongy, pitted, somewhat sulcate, the reflexed margin thick, entire; hymenium even, somewhat velvety, sometimes cracking in drying, light vinaceous lilac to snuff-brown; in structure 500–1000 μ thick, composed of loosely interwoven, slightly colored hyphae $3\frac{1}{2}$ –5 μ in diameter, not forming an intermediate layer; in the subhymenial region thick-walled organs 5–6 μ in diameter, darker colored than the hyphae, originate among the

hyphae and curve outward through the hymenium as sharp-pointed cystidia, even, rough-walled, or incrustated, $100-200 \times 6-10 \mu$, protruding up to 40μ ; spores white in spore collection, even, $6 \times 3\frac{1}{2} \mu$.

Resupinate on areas 1-3 cm. in diameter, becoming laterally confluent for 10-15 cm., reflexed portion 2-5 mm. broad.

On fallen limbs of oak, hickory, and other frondose species. North Carolina to Texas and southward from Ohio and Illinois, in Arizona, West Indies, and Central America; occurs also in Poland, Cochin China, and Australia. September to February, but collected occasionally in the other months of the year.

S. umbrinum may be recognized by the purple color of young specimens which fades or changes finally to snuff-brown, although usually showing a vinaceous tinge, and by its remarkable cystidia, which, on account of their color and lack of conspicuous incrustation, verge towards setae. However, these organs are paler colored and much more elongated than undoubted setae; furthermore, sections of fructifications in which these colored cystidia are present do not immediately darken when dilute potassium hydrate is brought in contact with them, as invariably happens to sections containing true setae. It has seemed best to retain for this species the name *Stereum umbrinum* B. & C., because the type of *Stereum umbrinum* Fr., Herb. Preiss., No. 2686, collected in Australia on *Banksia Menziesii*, must be found and studied to complete the Friesian description before it can be known whether the Preiss specimen is not really a *Hymenochaete*, *Eichleriella*, *Auricularia*, or, perhaps, even identical with *S. umbrinum* B. & C., a common species in Australia. The presence of a white, intermediate layer seems to preclude the

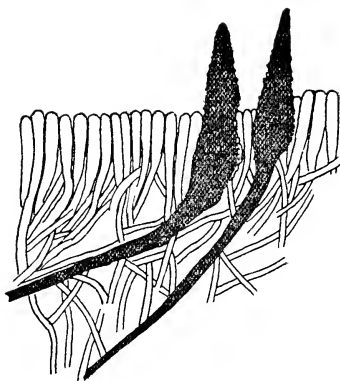


Fig. 31. *S. umbrinum*. Section of hymenial region $\times 488$, showing z, cystidia.

latter possibility. No. 2686 has not been found in the Preiss series of specimens in the Missouri Botanical Garden Herbarium; perhaps it is most likely to be found in the Stockholm collection.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 606 b, under the name *Stereum papyrinum*, and 1108; Ell. & Ev., N. Am. Fungi, 2315; Ravenel, Fungi Car. 2: 36, under the name *S. papyrinum*; Ravenel, Fungi Am., 118, under the name *S. papyrinum*, the type distribution of *Peniophora intermedia*, and 445, and 717, the type distribution of *Hymenochaete scabriseta*; Rabenhorst, Fungi Eur., 3524; de Thümen, Myc. Univ., 1504, under the name *Corticium murinum*, the type distribution of *Hymenochaete Kalchbrenneri*.

North Carolina: Asheville, *E. Bartholomew*, 5653 (in Mo. Bot. Gard. Herb., 44215); Creedmoor, *J. G. Hall*, comm. by Lloyd Herb., 10299 (in Mo. Bot. Gard. Herb., 55465).

South Carolina: *H. W. Ravenel*, Curtis Herb., 1903, type (in Kew Herb.), and in Ravenel, Fungi Car. 2: 36; Aiken, *H. W. Ravenel*, in Ravenel, Fungi Am., 445, and *H. W. Ravenel*, 1716 (in Curtis Herb., 2308, under the name *Hymenochaete cervina*); Clemson College, *P. H. Rolfs*, 1615, 1633.

Georgia: Darien, *H. W. Ravenel*, in Ravenel, Fungi Am., 117; Tallulah Falls, *A. B. Seymour*, comm. by W. G. Farlow, GG.

Florida: *C. G. Lloyd*, 2134, 4857, and *W. W. Calkins*, in Ellis, N. Am. Fungi, 606 b; Eustis, *R. Thaxter*, 12 (in Farlow Herb. and Mo. Bot. Gard. Herb., 43931); Gainesville, *N. L. T. Nelson*, comm. by Lloyd Herb., 427 (in Mo. Bot. Gard. Herb., 55624), and *H. W. Ravenel*, in Ravenel, Fungi Am., 118; Green Cove Springs, *G. Martin*, in Ellis, N. Am. Fungi, 1108; New Smyrna, *C. G. Lloyd*, 192, 2122, 2134.

Alabama: *Peters*, 770 (in Curtis Herb., under the name *S. papyrinum*); Auburn, *P. H. Mell* (in U. S. Dept. Agr. Herb. and Mo. Bot. Gard. Herb., 5106); Mobile, *E. Bartholomew*, 5751 (in Mo. Bot. Gard. Herb., 44221); Montgomery, *R. P. Burke*, 139, 150 (in Mo. Bot. Gard. Herb., 21228, 44906); Talapoosa region, *F. S. Earle & C. F. Baker* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56598).

- Louisiana: *A. B. Langlois*, comm. by W. G. Farlow (in Mo. Bot. Gard. Herb., 44650); St. Martinville, *A. B. Langlois*, *A, B, C, ag*, and an *unnumbered specimen*, and in Ell. & Ev., N. Am. Fungi, 2315.
- Ohio: *A. P. Morgan*, 11, type of *Hymenochaete purpurea* (in Kew Herb.); Cincinnati, *C. G. Lloyd*, 190, and *A. P. Morgan*, comm. by Lloyd Herb., 2626; Linwood, *C. G. Lloyd*, 2261.
- Indiana: Greenwood, *M. C. Jensen*, comm. by C. J. Humphrey, 2133 (in Mo. Bot. Gard. Herb., 22825).
- Illinois: Christopher, *C. J. Humphrey*, 2133 (in Mo. Bot. Gard. Herb., 42926); Genesee, *E. T. & S. A. Harper*, 824.
- Missouri: Bismarck, *L. O. Overholts* (in Mo. Bot. Gard. Herb., 56716); Columbia, *B. M. Duggar*, 571; Pacific, *L. O. Overholts*, 3162 (in Mo. Bot. Gard. Herb., 5718); Perryville, *C. H. Demetrio*, in Rabenhorst, Fungi Eur., 3524; Pickering, *E. Bartholomew*, 6424 (in Mo. Bot. Gard. Herb., 55194); St. Louis, *N. M. Glatfelter*, 1187, comm. by N. Y. Bot. Gard. Herb.; Valley Park, *E. A. Burt* (in Mo. Bot. Gard. Herb., 44056, 44061).
- Arkansas: Bigflat, *W. H. Long*, 19858, 19895 (in Mo. Bot. Gard. Herb., 8965, 8883); Cass, *W. H. Long*, 19832, 19905 (in Mo. Bot. Gard. Herb., 8884, 8885); Womble, *W. H. Long*, 19821 in part, 19869 (in Mo. Bot. Gard. Herb., 14650, 9142).
- Texas: Gillespie Co., *C. Jermy*, 444 (in Mo. Bot. Gard. Herb., 5171); Gonzales, *C. L. Shear*, 1229.
- Arizona: 34 near Camp Lowell, *C. G. Pringle*, type of *Hymenochaete multispinulosa* (in N. Y. State Mus. Herb. and a portion in Burt Herb.).
- Cuba: *C. Wright*, Fungi Cubenses Wrightiani, 832, comm. by W. G. Farlow (in Mo. Bot. Gard. Herb., 43908), and *C. G. Lloyd*, 165 (in Mo. Bot. Gard. Herb., 55153); Ciego de Avila, *Earle & Murrill*, 607, comm. by N. Y. Bot. Gard. Herb.; La Magdalena, *Earle & Baker*, 2470, comm. by N. Y. Bot. Gard. Herb.; San Diego de Los Baños, *Earle & Murrill*, 263, comm. by N. Y. Bot. Gard. Herb.
- Porto Rico: Rio Piedras, *J. A. Stevenson*, 2389 (in Mo. Bot. Gard. Herb., 9441).
- Guatemala: Secanquim, *W. R. Maxon & R. Hay*, 3140a

Cochin China: authentic specimen of *Thelephora crassa* from Lévillé (in Kew Herb.).

Australia: *W. N. Cheesman*, comm. by E. M. Wakefield, Kew Herb. (in Mo. Bot. Gard. Herb., 44582); Victoria, *J. G. Luchmann*, in de Thümen, Myc. Univ., 1504, under the name of *Corticium murinum*, the type distribution of *Hymenochaete Kalchbrenneri*.

60. *S. papyrinum* Montagne in Ramon de la Sagra, Hist. Cuba Pl. Cell. 374. 1842; *ibid.*, folio ed., 9: 228. 1845; Syll. Crypt. 178. 1856; Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 331. 1868. Plate 6, fig. 60.

Peniophora papyrina (Mont.) Cooke, Grevillea 8: 20. pl. 124. f. 9. 1879; Sacc. Syll. Fung. 6: 641. 1888; Masee, Linn. Soc. Bot. Jour. 25: 140. 1889.—*Stereum nicaraguense* Berk. & Curtis, Am. Acad. Arts & Sci. Proc. 4: 123. 1853; Sacc. Syll. Fung. 6: 567. 1888.—*S. nicaraguae* Berk. & Curtis in Masee, Linn. Soc. Bot. Jour. 27: 183. 1890.—An *Hymenochaete pallida* Cooke & Masee, Linn. Soc. Bot. Jour. 27: 97. 1890? See Patouillard, Myc. Soc. Fr. Bul. 10: 78. 1894, and Burt, Ann. Mo. Bot. Gard. 5: 367. 1918.

Illustrations: Cooke, Grevillea 8: pl. 124. f. 9; Australian Fungi, pl. 11. f. 82.

Type: in Kew Herb.

Fructification coriaceous-papery, thin, pliant, resupinate and widely effused, sometimes reflexed, rarely umbonate sessile,



Fig. 32. *S. papyrinum*. Section of hymenium $\times 488$, showing cystidia and paraphyses. From authentic specimen.

the upper side tomentose, concentrically sulcate, drying snuff-brown, weathering to cartridge-buff, the margin entire; hymenium even, velvety, snuff-brown to Benzo-brown; in structure 500–600 μ thick exclusive of the tomentose covering, composed of longitudinally and loosely interwoven, even-walled, pale-colored hyphae 3–3½ μ in diameter, which give their color to the fructification, the intermediate layer not dense on its upper side but grading into the

tomentum; no conducting organs present; cystidia rather few and scattered, heavily and coarsely incrustated on the peripheral half, conical, $30-75 \times 12-25 \mu$, usually colored under the incrustation, confined to the hymenium; slender, flexuous paraphyses $2\frac{1}{2} \mu$ in diameter are abundant in the hymenium; spores hyaline, even, $4\frac{1}{2}-8 \times 3-4 \mu$ —but few found.

Resupinate on under side of limbs over areas up to $25 \times 3\frac{1}{2}$ cm., and reflexed along both sides $1-2\frac{1}{2}$ cm.

On under side of fallen limbs of frondose species. Florida, West Indies, Mexico, Colombia, and Brazil. October to May. Probably common.

S. papyrinum belongs in the group with *S. umbrinum* and *S. albo-badium*; resupinate specimens of these species require examination of sectional preparations for accurate determination. The specimens which have been distributed by Ravenel and by Ellis in their exsiccati as *S. papyrinum* are *S. umbrinum*. In its reflexed stage, *S. papyrinum* is much more broadly reflexed than *S. umbrinum* and is concentrically sulcate; its cystidia are heavily incrustated and from 12 to 25μ in diameter by 30 to 75μ long, while those of *S. umbrinum* are much longer in proportion to their diameter and often can be followed from deep in the subhymenium, taper so gradually and bear so little incrustation, and are so uniformly colored that some mycologists have regarded them as setae, although they do not satisfy the definition of setae. The cystidia of *S. papyrinum* are concolorous with the hyphae under the incrustation. *S. albo-badium* has cystidia heavily incrustated but smaller than those of *S. papyrinum* and not colored.

On account of their structure, I have included in *S. papyrinum* the Cuban specimens listed by Berkeley & Curtis as *S. membranaceum*, for I find nothing to show that these specimens were ever compared with the type of the latter in Herb. Willdenow and collected on the Isle of Bourbon in the Indian Ocean; there is nothing in the original description of *S. membranaceum* to show that this may not be more closely related to *S. fasciatum* than to *S. papyrinum*. I have referred to *S. papyrinum*, as umbonate-sessile forms, the specimen from Nicaragua distributed in Smith, Central Am. Fungi, 94, and a collection from Cuba by Underwood & Earle, 1584, which are cited below; these speci-

mens have cystidia of the minimum dimensions given for the species and with less than the usual incrustation, as is the case with cystidia of the type of *S. nicaraguense*; perhaps these two specimens are *Hymenochaete pallida*.

Specimens examined:

Exsiccati: Smith, Central Am. Fungi, 95 and 93 a and b, under the name *Stereum rufo-fulvum* (Mont.), and 94, under the name *S. purpureum*.

Florida: Adams Key, Dade Co., *J. H. Small & C. A. Mosier*, 5364, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 71448); Miami, *W. H. Long*, 18310 (in Mo. Bot. Gard. Herb., 55442); Palm Beach, *R. Thaxter*, 16 (in Mo. Bot. Gard. Herb., 43927).

Cuba: type, from Montagne (in Kew Herb.), and *C. Wright*, 274, and 240, both under the name *S. membranaceum* (both in Curtis Herb.); Alto Cedro, *L. M. Underwood & F. S. Earle*, 1481, 1492, 1584, comm. by N. Y. Bot. Gard. Herb.; Ceballos, *C. J. Humphrey*, 2726 (in Mo. Bot. Gard. Herb.); El Yunque Mt., Baracoa, *L. M. Underwood & F. S. Earle*, 364 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56714), and 739, 745, and 1233, comm. by N. Y. Bot. Gard. Herb.; Managua, *Earle & Murrill*, 32, comm. by N. Y. Bot. Gard. Herb.; San Diego de los Baños, *Earle & Murrill*, 264, 356, 362, 367, 380, all comm. by N. Y. Bot. Gard. Herb.

Porto Rico: Espinosa, *J. A. Stevenson*, 2751 (in Mo. Bot. Gard. Herb., 5554).

Jamaica: *A. E. Wight*, comm. by W. G. Farlow; Hope Gardens, *F. S. Earle*, 141, 165, 431, 494, all comm. by N. Y. Bot. Gard. Herb.; Port Maria, *F. S. Earle*, 467, comm. by N. Y. Bot. Gard. Herb.; Troy and Tyre, *W. A. Murrill & W. Harris*, 898, comm. by N. Y. Bot. Gard. Herb.; Westmoreland, *F. S. Earle*, 425A, comm. by N. Y. Bot. Gard. Herb.; San Juan, *F. S. Earle*, 62, comm. by N. Y. Bot. Gard. Herb.

Mexico: Colima, *W. A. & E. L. Murrill*, 637, 648, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54583, 54584); Jalapa, *C. L. Smith*, in Smith, Central Am. Fungi, 93a; Orizaba, *W. A. & E. L. Murrill*, 748, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54655).

Nicaragua: *C. Wright*, 264, type of *S. nicaraguense* (in Curtis Herb.); Castillo Viejo, *C. L. Smith*, in Smith, Central Am. Fungi, 95; Ometepe, *C. L. Smith*, in Smith, Central Am. Fungi, 93b; San Juan del Norte, *C. L. Smith*, in Smith, Central Am. Fungi, 94.

Canal Zone: Gatun, *M. A. H.* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56715).

Colombia: Bonda, *C. F. Baker*, 26.

Brazil: Santo Anna da Chapada, Matto Grosso, *G. O. Malme*, 564, comm. by L. Romell.

61. *S. Earlei* Burt, n. sp.

Plate 6, fig. 61.

Type: in Burt Herb. and N. Y. Bot. Gard. Herb.

Fructification coriaceous-spongy, dry, effuso-reflexed, with the upper surface tomentose, snuff-brown, the margin entire; hymenium mouse-gray and somewhat pruinose in the older portion, snuff-brown and veined toward the margin; in structure with the intermediate layer $150\ \mu$ thick, composed of longitudinally interwoven, colored hyphae $3\text{--}4\ \mu$ in diameter, with the hymenial layer up to $200\ \mu$ thick, zoned, containing cystidia in all its portions; cystidia colored, heavily hyaline incrustated on the outer half, slender-pointed, $45\text{--}60 \times 5\text{--}12\ \mu$, protruding up to $30\ \mu$; spores hyaline, even, $5\text{--}6 \times 3\text{--}3\frac{1}{2}\ \mu$.

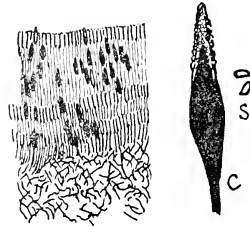


Fig. 33. *S. Earlei*. Section of type $\times 68$; cystidium, *c*, and spores, *s*, $\times 488$.

Reflexed portion up to 1 cm. broad; resupinate portion laterally confluent for 8 cm., but a strip only 1 cm. wide removed from the substratum.

In a wood pile. Hope Gardens, Jamaica. November.

Fructifications of this species have the general aspect of those of *S. papyrinum*, but are thinner, more compactly interwoven, with slenderer cystidia, and have the hymenial layer up to $200\ \mu$ thick and composed of several zones; cystidia are present in each of these zones, and those of the innermost zones do not reach to the surface of the hymenium. In *S. papyrinum*

the hymenium is a single layer of basidia, cystidia, and paraphyses. In the collector's note, the color is given as "violet purple edged with white," but colors of dried specimens are as given above.

Specimens examined:

Jamaica: Hope Gardens, *F. S. Earle, 151*, type, comm. by N. Y. Bot. Gard. Herb.

62. *S. Chailletii* Persoon, *Myc. Eur.* 1: 125. 1822 (in ******Stereum* of *Thelephora*); Fries, *Epicr.* 551. 1838; *Hym. Eur.* 642. 1874; *Sacc. Syll. Fung.* 6: 566. 1888; Bresadola, *I. R. Accad. Agiati Atti III.* 3: 106. 1897. Plate 6, fig. 62.

Thelephora Chailletii Pers. in Fries, *Elenchus Fung.* 1: 188. 1828.—*Xerocarpus ambiguus* Karsten, *Soc. pro Fauna et Flora Fennica Actis* 21: 38. 1881.—*Trichocarpus ambiguus* Karsten, *Finska Vet.-Soc. Bidrag Natur och Folk* 48: 407. 1889.—*Hymenochaete ambigua* Karsten in *Sacc. Syll. Fung.* 9: 230. 1891.—*Peniophora Atkinsonii* Ellis & Everhart, *Phila. Acad. Nat. Sci. Proc.* 1894: 324. 1894; *Sacc. Syll. Fung.* 11: 129. 1895.

Fructification coriaceous, nearly always resupinate, effused, occasionally reflexed, with upper surface tomentose, more or less concentrically sulcate when well developed, hair-brown to clove-brown, the margin entire; hymenium rather uneven, not polished, avellaneous to wood-brown; in structure 300–600 μ thick, composed of somewhat longitudinally and not densely interwoven hyphae 3–4½ μ in diameter, some of which are hyaline, thin-walled, and with deeply staining protoplasm, and many thick-walled, stiff, giving their color to the fructification, and

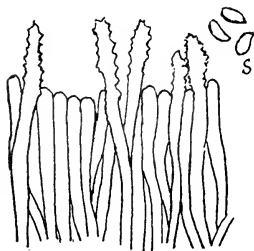


Fig. 34. *S. Chailletii*. Section of hymenium $\times 665$, showing paraphyses; spores, s.

curving into the hymenium where they terminate in cystidia; cystidia slightly colored, roughened above, 50–120 \times 4–4½ μ , protruding up to 20 μ , slender-pointed; spores white in spore collection, ellipsoidal, 5–6 \times 3–3½ μ .

Wholly resupinate specimens $\frac{1}{2}$ –2 cm. in diameter, becoming laterally confluent over areas up to 15×2 cm.; reflexed portions 1–5 mm. broad—up to 2 cm. broad in European specimens.

On dead *Tsuga*, *Pseudotsuga*, *Abies*, *Picea*, *Larix*, *Thuja*, and *Cupressus*. Canada to New Jersey, in Wisconsin, in Idaho to British Columbia and Washington, and in New Mexico at altitude 7500 ft. Occurs also in Europe. Probably throughout the year but most collections dated July to October. Infrequent.

S. Chailletii occurs just often enough reflexed so that an observant collector will soon locate his gatherings correctly in *Stereum*. It is noteworthy by its colored cystidia of the same type as those of *S. umbrinum* but of only half the diameter of those of the latter, and by its occurrence on conifers of the species named above, and by restriction in geographic range to the northern United States and southern Canada and the Rocky Mountain plateau. The avellaneous, somewhat velvety hymenium is so uniform in appearance that when once learned this species may usually be recognized thereafter at sight.

Specimens examined:

Exsiccati: Ell. & Ev., N. Am. Fungi, 2904, under the name *Hymenochaete simulans* Ell. & Ev., n. sp., but description does not seem to have been published; Krieger, Fungi Sax., 1202. Norway: Christiania, *M. N. Blytt*, determined by E. Fries (in Herb. Fries).

Finland: Merimason, *P. A. Karsten*, authentic specimen of *Trichocarpus ambiguus*.

Sweden: Stockholm, *L. Romell*, 24, 25, 341, all under the name *Stereum abietinum*.

France: Arnac, Aveyron, *A. Galzin*, unnumbered spec. and 17948, comm. by H. Bourdot, 7926, and unnumbered respectively.

Switzerland: Sachs, *W. Krieger*, in Krieger, Fungi Sax., 1202.

Italy? or perhaps Hungary?: locality not given, *G. Bresadola*.

Canada: Cow's Swamp, *J. Macoun*, 115; Dow's Swamp, *J. Macoun*, 249 in part.

Ontario: Ottawa, *J. Macoun*, 57.

Vermont: Ripton, *E. A. Burt*, two collections.

New York: Beaver River, Adirondack Mts., *G. F. Atkinson*, Bot. Dept. of Cornell Univ., 4607; Ithaca, *G. F. Atkinson*, 14189; Syracuse, *G. F. Atkinson*, 677, part of type of *Peniophora Atkinsonii*.

- New Jersey: Newfield, *J. B. Ellis*, in *Ell. & Ev.*, N. Am. Fungi, 2904.
- Wisconsin: *M. C. Jensen*, comm. by *C. J. Humphrey*, 2502 (in *Mo. Bot. Gard. Herb.*, 5060).
- Idaho: Coolin, *J. R. Weir*, 11133, 11527, 11940 (in *Mo. Bot. Gard. Herb.*, 56717, 56722, 56718); Kaniksu National Forest, Priest River, *J. R. Weir*, 65, 110 (the latter in *Mo. Bot. Gard. Herb.*, 13272).
- British Columbia: Kootenai Mts., near Salmo, *J. R. Weir*, 482, 510, 513 (in *Mo. Bot. Gard. Herb.*, 18282, 3771, 1739); Sidney, *J. Macoun*, 81 (in *Mo. Bot. Gard. Herb.*, 5887); Squamish, *J. Macoun*, 533 (in *Mo. Bot. Gard. Herb.*, 55186).
- Washington: Bellingham, *J. R. Weir*, 7559 (in *Mo. Bot. Gard. Herb.*, 55467, 55790); Stanwood, *C. J. Humphrey*, 7358 (in *Mo. Bot. Gard. Herb.*, 20103).
- New Mexico: Tejano Experiment Station, near Albuquerque, *W. H. Long & P. W. Seay*, comm. by *W. H. Long*, 21313 (in *Mo. Bot. Gard. Herb.*, 54884).

63. *S. ferreum* Berk. & Curtis, *Linn. Soc. Bot. Jour.* 10: 332. 1868; *Sacc. Syll. Fung.* 6: 586. 1888; *Massee*, *Linn. Soc. Bot. Jour.* 27: 197. 1890. Plate 6, fig. 63.

An *Stereum arcolatum* Fries?

Type: in Kew Herb. and Curtis Herb.

Fructifications corky, effused, usually resupinate, sometimes becoming barely reflexed on the upper side and there drab, nearly even; hymenium somewhat colliculose, not shining, cinnamon-drab to drab; in structure up to 1100 μ thick, with the intermediate layer 500 μ thick, bordered by a darker zone next to substratum and composed of colored, thick-walled, somewhat ascending, interwoven hyphae 3-3½ μ in diameter; hymenial layer up to 600 μ thick, containing in all parts innumerable incrusted cystidia, minutely rough, either colored throughout or colored under the incrustation, 20-25 \times 5-7 μ , protruding up to 6 μ ; spores hyaline, even, globose, 4 μ in diameter, but few found.



Fig. 35. *S. ferreum*. Section of hymenial region of type, \times 488. Shows rough, colored cystidia.

Fructifications 4-8×1-2 cm., margin reflexed 1 mm.

On bark of fibrous structure of an unrecorded species. Cuba and Jamaica. Rare.

S. ferreum may be recognized by its resupinate, drab fructifications, rarely having a narrowly pileate margin, and by the thick hymenial layer containing innumerable small colored cystidia which at the surface of the hymenium have the colorless incrustation roughened. So few spores were observed that it may be they were foreign spores. *S. ferreum* is at least closely related to *S. areolatum*, a European species occurring on *Taxus*, and I have been inclined to regard it as not specifically distinct from the latter, but we do not know yet that *S. ferreum* occurs on *Taxus* or a related genus; if not a strictly tropical species but a synonym of *S. areolatum*, the lack of a northern range in eastern United States is at variance with species common to Europe and North America.

Specimens examined:

Cuba: *C. Wright*, 199, type (in Kew Herb.).

Jamaica: Cinchona, *W. A. & E. L. Murrill*, 458, comm. by N. Y. Bot. Gard. Herb.; Sir John Peak, *W. A. Murrill*, 803, comm. by N. Y. Bot. Gard. Herb.

64. *S. cinerascens* (Schw.) Masee, Linn. Soc. Bot. Jour. 27: 179. 1890. Plate 6, fig. 64.

Thelephora cinerascens Schweinitz, Am. Phil. Soc. Trans. N. S. 4: 167. 1832.—*Hymenochaete cinerascens* (Schw.) Léveillé, Ann. Sci. Nat. Bot. III. 5: 152. 1846; Morgan, Cincinnati Soc. Nat. Hist. Jour. 10:197. 1888.—*Peniophora cinerascens* (Schw.) Sacc. in Sacc. Syll. Fung. 6: 646. 1888.—*P. Schweinitzii* Masee, Linn. Soc. Bot. Jour. 25: 145. 1889.—*Corticium aschistum* Berkeley & Curtis, Am. Acad. Arts & Sci. Proc. 4: 123. 1858.—*Peniophora Berkeleyi* Cooke, Grevillea 8: 20. pl. 122. f. 4. 1879; Sacc. Syll. Fung. 6: 642. 1888; Masee, Linn. Soc. Bot. Jour. 25: 144. 1889.—*Stereum moricola* Berkeley, Grevillea 1: 162. 1873; Sacc. Syll. Fung. 6: 567. 1888.—*Peniophora moricola* (Berk.) Masee, Linn. Soc. Bot. Jour. 25: 141. 1889.—*Stereum dissitum* Berkeley, Grevillea 1: 164. 1873.—*Peniophora dissita* (Berk.) Cooke, Grevillea 8: 150. 1880; Sacc. Syll. Fung. 6: 645. 1888; Masee, Linn. Soc.

Bot. Jour. 25: 143. 1889.—*Corticium ephebi* Berk. & Curtis, Grevillea 1: 178. 1873; Sacc. Syll. Fung. 6: 618. 1888.—*Peniophora ephebia* (Berk. & Curtis) Masee, Linn. Soc. Bot. Jour. 25: 151. 1889.—*Stereum neglectum* Peck, N. Y. State Mus. Rept. 33: 22. 1880.—*Peniophora neglecta* Peck, N. Y. State Mus. Rept. 40: 76. 1887.—*P. occidentalis* Ellis & Everhart, Torr. Bot. Club Bul. 24: 277. 1897; Sacc. Syll. Fung. 14: 224. 1900.—*Lloydella occidentalis* (Ell. & Ev.) v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 116: 791. 1907.—*Stereum purpurascens* Lloyd, Myc. Writ. 4. Letter 53: 14. 1914.

Illustrations: Cooke, Grevillea 8: pl. 122. f. 4. 1879.

Type: in Herb. Schweinitz, Curtis Herb., and Kew Herb.

Fructifications coriaceous, often resupinate and effused, sometimes reflexed, with upper surface strigose-hairy, concentrically sulcate, warm buff to pinkish buff, weathering gray, often laterally confluent, the margin entire; hymenium minutely bristly with the cystidia, even, drying pinkish buff to drab; in structure 400–600 μ thick excluding the hairy covering, with the intermediate layer composed of longitudinally interwoven, thick-walled hyphae 4–4½ μ in diameter; cystidia large, in-crust, thick-walled, often brownish at the base, conical, 100–150 \times 12–20 μ , emerging up to 40–70 μ ; spores white in spore collection, even, 10–12 \times 6 μ , somewhat flattened on one side.

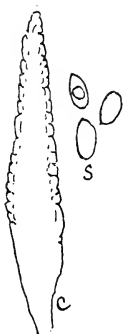


Fig. 36.
S. cinerascens.
Cystidium, c, and
spores, s, \times 488.

Resupinate portions 1–10 \times 1–2½ cm.; reflexed margin 2–8 mm. broad.

On logs and fallen limbs of *Ulmus*, *Tilia*, *Robinia*, *Morus*, etc. Canada to Texas, westward to California, and in Mexico, Cuba, and Brazil. Common. June to February.

Fully developed specimens of *S. cinerascens* may be recognized by their narrowly reflexed, strigose-hairy pileus and hymenium somewhat pruinose with the large, bristly, colorless cystidia. In sectional preparations, these cystidia are usually slightly colored at the base and more numerous and larger than in any other North American *Stereum*; the spores are very large also.

Wholly resupinate specimens have merely a superficial resemblance to *Peniophora*, for they are loosely attached to the substratum by the layer of loosely arranged, coarse hairs which forms the strigose covering of the upper surface of a reflexed specimen; the intermediate layer is well developed in resupinate specimens, and the cystidia and spores are the same as in reflexed specimens. It is surprising that a species so common and so marked in its microscopical characters should have seemed new so many times.

Specimens examined:

- Exsiccati: Bartholomew, Fungi Col., 2337, 4648; Ell. & Ev., N. Am. Fungi, 2314, type distribution of *Peniophora occidentalis*; Shear, N. Y. Fungi, 313.
- Canada: *J. Macoun*, 45, 68, and another specimen comm. by J. B. Ellis, under the name *Peniophora occidentalis*; Lower St. Lawrence valley, *J. Macoun*, 33, 34, 79.
- Quebec: Hull, *J. Macoun*, Nat. Hist. Surv. of Canada, 359, and *J. Macoun*, 52; Ironsides, *J. Macoun*, 282.
- Ontario: Guelph, *J. H. Faull*, Univ. Toronto Herb., 669 (in Mo. Bot. Gard. Herb., 44916); Jefferson, *G. H. Graham*, Univ. Toronto Herb., 673 (in Mo. Bot. Gard. Herb., 44922); Ottawa, *J. Macoun*, 234; Toronto, *J. H. Faull*, Univ. Toronto Herb., 651 (in Mo. Bot. Gard. Herb., 44947).
- Vermont: Middlebury, *E. A. Burt*, six collections.
- Massachusetts: *W. G. Farlow*, two collections.
- New York: Alcove, *C. L. Shear*, 1312, and in Shear, N. Y. Fungi, 313; Cayuga Lake Basin, *G. F. Atkinson*, 3020, 8023, J; Greenbush, *C. H. Peck* (in N. Y. State Mus. Herb. and Mo. Bot. Gard. Herb., 56020); Ithaca, *C. J. Humphrey*, 261, and a specimen comm. by G. F. Atkinson, *Van Hook*, comm. by G. F. Atkinson, 7988; Knowersville, *C. H. Peck* (in N. Y. State Mus. Herb. and Mo. Bot. Gard. Herb., 55755); Syracuse, *L. M. Underwood*, 5 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56709); Verona, *C. H. Peck*, type of *Stereum neglectum* (in N. Y. State Mus. Herb., and perhaps a duplicate in Mo. Bot. Gard. Herb., 55754).
- Pennsylvania: Bethlehem, *Schweinitz*, type (in Herb. Schweinitz, Curtis Herb., and Kew Herb.).
- South Carolina: Curtis Herb., 5997, type of *Stereum moricola* (in Kew Herb.).

- Georgia: Atlanta, *E. Bartholomew*, 5694 (in Mo. Bot. Gard. Herb., 44220), and in Bartholomew, Fungi Col., 4648.
- Florida: Cocoanut Grove, *R. Thaxter*, 95 (in Mo. Bot. Gard. Herb., 43922); Miami, *W. H. Long*, 12951 (in Mo. Bot. Gard. Herb., 55102); Totten Key, *P. H. Rolfs*.
- Alabama: *Peters*, 923, type of *Corticium ephedium*, 1004, 1007 (in Curtis Herb., 6050, 6088, and 6089 respectively, and in Kew Herb.).
- Texas: *C. Wright*, Curtis Herb., 3903, type of *Stereum dissitum* (in Kew Herb., and probably a co-type in Burt Herb., and U. S. Dept. Agr. Herb.).
- Michigan: Ann Arbor, *C. H. Kauffman*, 25; New Richmond, *C. H. Kauffman*, 64 (in Mo. Bot. Gard. Herb., 19651).
- Ohio: Cincinnati, *A. P. Morgan*, comm. by Lloyd Herb., 2590, and *A. P. & S. V. Morgan*, comm. by U. S. Dept. Agr. Herb., under the name *Hymenochaete imbricatula* as determined by Morgan; Linwood, *C. G. Lloyd*, 3553, 02835.
- Indiana: Hibernian Mills, *Whetzel & Reddick*, comm. by D. Reddick, 2.
- Minnesota: Cass Lake, *J. R. Weir*, 324 (in Mo. Bot. Gard. Herb., 6968); Clearwater Lake, *F. Weiss*, 4 (in Mo. Bot. Gard. Herb., 56634); Wright Co., *F. Weiss* (in Overholts Herb., 5367).
- Iowa: Webster, *O. M. Oleson*, 437 (in Mo. Bot. Gard. Herb., 44060); Woodbine, *C. J. Humphrey & C. W. Edgerton*, comm. by C. J. Humphrey, 6535 (in Mo. Bot. Gard. Herb., 14042).
- Missouri: Creve Coeur, *P. Spaulding* (in Mo. Bot. Gard. Herb., 5137); Upper Creve Coeur, *E. A. Burt* (in Mo. Bot. Gard. Herb., 56711).
- Arkansas: Fordyce, *C. J. Humphrey*, 5778.
- Nebraska: Lincoln, *C. L. Shear*, 1052; Pawnee City, *C. L. Shear*, 1016.
- Kansas: Louisville, *E. Bartholomew*, in Bartholomew, Fungi Col., 2337; Rooks Co., *E. Bartholomew* (in Burt Herb. and Mo. Bot. Gard. Herb., 5011).
- Montana: *F. W. Anderson*, in Ell. & Ev., N. Am. Fungi, 2314.
- California: Bear Valley, near Olema, *M. A. H.* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56591); Berkeley,

H. A. Lee, comm. by *W. A. Setchell*, 1020 (in *Mo. Bot. Gard. Herb.*, 44304).

Mexico: Xuchiles, near Cordoba, *W. A. & E. L. Murrill*, 1181, 1213, comm. by *N. Y. Bot. Gard. Herb.* (in *Mo. Bot. Gard. Herb.*, 54590, 54591).

Nicaragua: *C. Wright*, 274, type of *Corticium aschistum* and *Peniophora Berkeleyi* (in *Curtis Herb.*).

Cuba: *C. G. Lloyd*, 428 (in *Mo. Bot. Gard. Herb.*, 55157); Alto Cedro, *Earle & Murrill*, 515 (in *N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb.*, 56291); Havana, *Bro. Leon*, comm. by *J. R. Weir*, 10188 (in *Mo. Bot. Gard. Herb.*, 56216).

Jamaica: Chester Vale, *W. A. & E. L. Murrill*, 343, comm. by *N. Y. Bot. Gard. Herb.*

Brazil: Matto Grosso, Santa Anna da Chapada, *G. V. Malme*, 572, comm. by *L. Romell*.

65. *S. magnisporum* Burt, n. sp.

Plate 6, fig. 65.

Type: in Burt Herb.

Fructifications coriaceous-gelatinous, thin, resupinate, becoming confluent, free all around, with margin reflexed on the upper side, probably white, drying pale pinkish buff, hoary, the margin white, entire; hymenium even or with one or two broad veins, setulose with the large cystidia, drying pinkish buff; in structure 300 μ thick when dry, swelling to 1200–1500 μ thick when wet for sectioning, of gelatinous consistency, composed of loosely interwoven, hyaline hyphae 2 μ in diameter, not incrustated; hymenial layer not zonate, composed of large simple basidia 45–60 \times 15 μ , having 4 sterigmata 12 μ long, of hyaline, filiform, flexuous paraphyses 2–2½ μ in diameter, not exceeding the basidia, and of conical, incrustated cystidia 45–90 \times 12–15 μ , protruding up to 60 μ ; spores hyaline, even, 15–20 \times 12–14 μ .

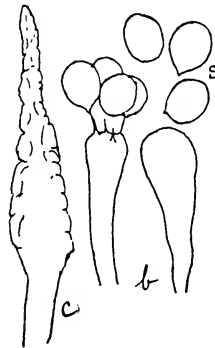


Fig. 37. *S. magnisporum*. Cystidium, *c*, basidia, *b*, and spores, *s*, \times 488. From type.

Fructifications 2–6 mm. in diameter, laterally confluent for 15 mm., margin reflexed for 1–2 mm.

On dead limbs of a frondose species. Jamaica. December to January.

S. magnisporum may be recognized by its small, whitish fructifications, with narrowly reflexed or free margin, pale hymenium distinctly setulose with the large cystidia, and by the very large spores. The large spores and basidia show relation of *S. magnisporum* to *Aleurodiscus*, but the absence of granular matter or of any unusual character of the paraphyses leads to the belief that this species will usually be sought for among the Stereums.

Specimens examined:

Jamaica: Chester Vale, *W. A. & E. L. Murrill*, 328, type, comm. by N. Y. Bot. Gard. Herb.; Cinchona, *W. A. & E. L. Murrill*, 522, comm. by N. Y. Bot. Gard. Herb.

66. *S. spumeum* Burt, n. sp.

Plate 6, fig. 66.

Corticium spumeum Berk. & Rav. in Curtis Herb. (in part); *Grevillea* 20: 13. 1891 (in part—nomen).—*C. ochroleucum*, "as resupinate ambient condition," Berk. & Curtis, *Grevillea* 1: 166. 1873, but not *Stereum ochroleucum* Fries.—Not *Corticium ochroleucum* var. *erimosum* Berk. & Curtis, *Grevillea* 1: 166. 1873.

Type: in Burt Herb.

Fructifications spongy-soft, effused, resupinate, separable, sometimes narrowly reflexed, the upper surface tomentose and becoming cartridge-buff to pinkish buff in the herbarium, the margin entire; in structure 400–1500 μ thick, composed of loosely interwoven, hyaline, thick-walled hyphae 3–4½ μ in diameter, sometimes nodose-septate, the intermediate layer not bordered on its upper side by a crust-like or colored zone; hymenium even, cream-buff to pinkish buff; no conducting organs; cystidia incrustated, 36–60×9–12 μ , sometimes protruding up to 40 μ ; spores hyaline, even, 5–9×3–4 μ .

Resupinate over areas 1–10×1–5 cm., reflexed portion 1–4 mm. broad when present.

On bark and wood of dead beech, oak, and other frondose limbs. New York to Mexico. August to January. Rare.

S. spumeum is noteworthy by its narrowly reflexed pileus, spongy-soft throughout, and without differentiation of its sur-

face of soft, matted, interwoven hairs from the hyphae of the intermediate region, by its buff hymenium, and by its incrustated cystidia. These incrustated cystidia and different aspect of the fructifications afford sharp separation from *S. ochraceo-flavum*; *S. ochroleucum* and *S. rugosiusculum* have the general aspect of *S. spumeum* but both lack incrustated cystidia, and *S. rugosiusculum* has in its subhymenial region pyriform, vesicular organs. *S. spumeum* is so frequently resupinate or very narrowly reflexed that gatherings are likely to be referred to *Peniophora*.

Specimens examined:

New York: Hudson Falls, *S. H. Burnham*, 27 (in Mo. Bot. Gard. Herb., 54486).

Pennsylvania: *E. Michener*, 1864 (in Curtis Herb., under the name *Corticium giganteum*).

South Carolina: Aiken, on oak limbs, *H. W. Ravenel*, 1772 (in Curtis Herb., under the name *Corticium ochroleucum*, "formerly *C. spumeum*").

Louisiana: Baton Rouge, *Edgerton & Humphrey*; St. Martinville, *A. B. Langlois*, *E*, type

Mexico: Guernavaca, *W. A. & E. L. Merrill*, 405, 413, 414, 498, 503, 520, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54520-54523, 56685, 55524); Cordoba, *W. A. & E. L. Merrill*, 1214, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54592).

67. *S. erumpens* Burt, n. sp.

Plate 6, fig. 67.

Type: in Burt Herb.

Fructifications corky, rarely resupinate, usually bursting out from the inner bark as small pezizaeform, orbicular disks or cups with elevated black margins and cinereous or pallid neutral gray hymenium; these fructifications may become crowded as if confluent, and then broken up into frustules and remain attached by the under side to the substratum, or the margin on the upper side may grow outward so as to form umbonate, sessile pilei attached by the umbo and lower side, with the upper surface narrowly concentrically sulcate, mummy-brown to fuscous; hy-



Fig. 38. *S. erumpens*.
Section of type, $\times 90$.

menium even or somewhat tubercular, pallid neutral gray; in structure 200–300 μ thick, composed of ascending, densely interwoven hyphae both colored and hyaline, the former $3\frac{1}{2}$ μ in diameter, with the tips arranged side by side in colored subhymenial zones, mark the 1–3 strata finally present; cystidia incrustated, cylindric, 30–60 \times 8–20 μ , sometimes protruding up to 20 μ beyond the hymenium, starting from all parts of the fructification; spores hyaline, even, 5–7 \times $1\frac{1}{2}$ –2 $\frac{1}{2}$ μ .

Fructifications 1–2 $\frac{1}{2}$ mm. in diameter, reflexed 1–2 mm.

On dead limbs of alder, chestnut, willow, and other frondose species. Rhode Island to Alabama and westward to Washington and Oregon. March to January. Occasional.

S. erumpens combines the characters of *S. versiforme* and *Peniophora cinerea*; it is more constantly and distinctly reflexed than *S. versiforme*, always has a gray hymenium, and has quite a different mode of origin from the latter. In the type small blackish bodies burst out from the bark, open at the tip, disclosing whitish hymenium, and then grow to mature condition. Specimens at hand do not show how such a large resupinate fructification as that collected by E. T. and S. A. Harper, No. 819, cited below, does arise, and I may be wrong in referring the specimen to *S. erumpens*. An important microscopical detail of *S. erumpens* is the narrow olivaceous zone of colored hyphal tips at the very base of the basidia of the hymenium.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 720, under the name *Corticium quercinum* var. *scutellatum*.

Rhode Island: Lincoln, *F. W. Collins*.

New York: East Galway, *E. A. Burt*; Ithaca, *C. J. Humphrey*, 2568 (in Mo. Bot. Gard. Herb., 20784); Karner, *H. D. House* (in N. Y. State Mus. Herb. and Mo. Bot. Gard. Herb., 55210); New Scotland, *C. H. Peck* (in N. Y. State Mus. Herb., T 28, and Mo. Bot. Gard. Herb., 54658).

New Jersey: Newfield, *J. B. Ellis*, in Ellis, N. Am. Fungi, 720.

Maryland: Takoma Park, *C. L. Shear*, 959.

District of Columbia: North Takoma, *C. L. Shear*, 1043, type.

Georgia: Raleigh, *R. M. Harper*, 2037b, comm. by P. L. Ricker, and (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 42597).

Alabama: Auburn, *F. S. Earle*, 2301 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56292).

Indiana: Scottsburg, *J. R. Weir*, 5836 (in Mo. Bot. Gard. Herb., 55462).

Illinois: Glencoe, *E. T. & S. A. Harper*, 819, 937.

Arkansas: Fayetteville, *R. R. Rosen*, comm. by L. O. Overholts, 5117 (in Mo. Bot. Gard. Herb., 56358).

Montana: Missoula, *J. R. Weir*, 354 (in Mo. Bot. Gard. Herb., 9435).

Washington: Brewerton, *E. Bartholomew*, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 4939).

Oregon: Grants Pass, *J. R. Weir*, 8701 (in Mo. Bot. Gard. Herb., 36742).

68. *S. sulcatum* Burt in Peck, N. Y. State Mus. Rept. 54: 154. 1901; Lloyd, Myc. Writ. 5. Notes 44: 619. text f. 878. 1917. Plate 6, fig. 68.

Illustrations: Lloyd, *loc. cit.*

Type: in Burt Herb., N. Y. State Mus. Herb., and Bresadola Herb.

Fructification corky, rigid, resupinate or effuso-reflexed, with the reflexed part becoming glabrous, bister, irregular, deeply and concentrically sulcate; hymenium uneven or somewhat tubercular, not polished, drying between light buff and pinkish buff, assuming a reddish color where bruised; in structure 600–1500 μ thick, with the intermediate layer bordered by a dark dense zone on its upper side, and composed of very densely and longitudinally interwoven, hyaline hyphae 3–3½ μ in diameter, the hymenial layer becoming zonate or stratose; no colored conducting organs; cystidia incrusted, 30–50 × 8–12 μ ; spores white in spore collection, even, subglobose, 4–6 × 3–5 μ .

Confluent over areas 3–15 × 1–8 cm.; reflexed margin 3–10 mm. broad.

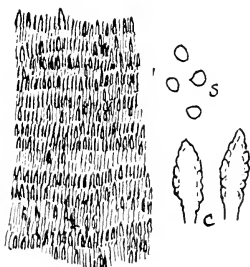


Fig. 39. *S. sulcatum*. Section of hymenial region × 90; cystidia, c, and spores, s, × 665.

On logs and stumps of *Tsuga*, *Abies*, *Picea*, *Taxodium*, *Pseudotsuga*, and *Larix*. Canada to Texas and westward to British Columbia and Washington. May to November. Frequent.

S. sulcatum may be recognized by its brown, deeply and sharply and concentrically sulcate pileus, ruddy hymenium, incrustated cystidia, and occurrence on conifers. Where the northern hemlock occurs it is usually on this species. *S. Chailletii* is found on conifers throughout the same northern geographical range, but is much thinner and does not have as large nor incrustated cystidia. In the older herbaria *S. sulcatum* is often found under the name *Stereum rugosum*, to which specimens were erroneously referred.

Specimens examined:

Exsiccati: Ell. & Ev., N. Am. Fungi, 1935, under the name *Stereum rugosum*; Ell. & Ev., Fungi Col., 217, under the name *S. rugosum*.

Canada: *J. Macoun*, 27, 32, 43; Lower St. Lawrence Valley, *J. Macoun*, 69a, 76.

Ontario: Ottawa, *J. Macoun*, 234, and in Ell. & Ev., N. Am. Fungi, 1935.

New Hampshire: North Conway, *L. O. Overholts* & *H. H. York*, comm. by *L. O. Overholts*, 5033 (in Mo. Bot. Gard. Herb., 56350).

New York: Floodwood, *E. A. Burt*, type; Ithaca, *G. F. Atkinson*, 2023, 2617, 2636, 5072, 7889, 19398, and *C. O. Smith*, comm. by *G. F. Atkinson*, 8032; North Elba, *C. H. Kauffman*, 7 (in Mo. Bot. Gard. Herb., 21821); Pompey, *L. M. Underwood*, in Ell. & Ev., Fungi Col., 217.

Louisiana: Litcher, *H. von Schrenk*, 26 (in Mo. Bot. Gard. Herb., 42637).

Texas: Houston, *H. W. Ravenel*, 113 (in U. S. Dept. Agr. Herb., under the herbarium name *Stereum tricolor*).

Wisconsin: Ladysmith, *C. J. Humphrey*, 1908 (in Mo. Bot. Gard. Herb., 42917).

West Virginia: comm. by *W. G. Farlow*.

Tennessee: Elkmont, *C. H. Kauffman*, 60 (in Mo. Bot. Gard. Herb., 16403).

Montana: Gallatin National Forest, Spring Hill, *G. G. Hedgcock*, comm. by *C. J. Humphrey*, 2164 (in Mo. Bot. Gard. Herb., 10399).

Idaho: Kaniksu National Forest, Priest River, *J. R. Weir*, 4, 29, 58, 74, 82, and 102 (the last in Mo. Bot. Gard. Herb., 16029).

Canadian Rocky Mts.: Lake Louise, *J. Macoun*, 3; Lake O'Hara, *J. Macoun*, 7; Papiston Creek, *J. Macoun*, 8.

British Columbia: Yoho Valley, *J. Macoun*, 5.

Washington: Mt. Paddo, *W. N. Suksdorf*, 843, 844.

Oregon: Sumpter, *G. G. Hedgcock*, comm. by C. J. Humphrey, 2570 (in Mo. Bot. Gard. Herb., 20460).

69. *S. subpileatum* Berk. & Curtis, *Hooker's Jour. Bot.* 1: 238. 1849; *Grevillea* 1: 163. 1873; *Sacc. Syll. Fung.* 6: 585. 1888; *Masseé, Linn. Soc. Bot. Jour.* 27: 192. 1890; *Long, Jour. Agr. Res.* 5: 421. *pl.* 41. 1915. Plate 6, fig. 69.

Illustrations: *Jour. Agr. Res.* 5: *pl.* 41.

Type: in Curtis Herb. and Kew Herb.

Fructifications thick, corky, drying rigid, very hard, resupinate or effuso-reflexed, sometimes laterally confluent and attached by the umbos, with upper surface concentrically sulcate, somewhat zonate, tomentose, cinnamon-brown, the margin entire; hymenium even, light buff; in structure 800–1200 μ thick, with the intermediate layer bordered and connected with the tomentum by a denser and darker crust and bearing on the opposite side a hymenial layer which becomes multizonate; hyphae of intermediate layer colored, thick-walled, stiff, 3–3½ μ in diameter, densely and longitudinally arranged; cystidia incrustated, cylindric, 30–36 \times 7 μ , becoming colored where buried in older zones of the hymenium, at first sometimes slightly aculeate; spores hyaline, even, 4–5 \times 3 μ .

Fructifications with reflexed portion 1–6 cm. broad.

Perennial on logs of several species of *Quercus* causing a pock-

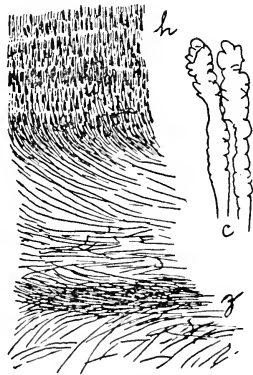


Fig. 40. *S. subpileatum*. Section \times 68; hymenium, *h*, crust-like zone, *z*, cystidia of type, *c*, \times 488.

eted or honeycomb heart rot. North Carolina and Ohio to Mexico, and in Cuba.

In general aspect *S. subpileatum* is not distinguishable from *S. sepium* and *S. insigne*; it is more commonly met with than these latter species and with them occurs on oak logs, is also tobacco-colored and sulcate above and has a whitish hymenium which differs from the other species of this group by containing cylindrical, incrusting cystidia and only very rarely an occasional paraphysis with its outer portion of bottle-brush or aculeate form. Usually such paraphyses are not found in preparations of the hymenium of this species. Occasionally preparations may show young cystidia which are merely rough above or somewhat aculeate. One must not confuse *S. subpileatum* with the other species which have numerous and conspicuous bottle-brush paraphyses.

Specimens examined:

Exsiccati: Ell. & Ev., Fungi Col., 917; Ravenel, Fungi Am., 219;

Ravenel, Fungi Car. 1: 30; Smith, Cent. Am. Fungi, 146.

North Carolina: Blowing Rock, *G. F. Atkinson*, 4183.

South Carolina: Santee, *H. W. Ravenel*, type (in Curtis Herb., 1007); Society Hill (in Curtis Herb., 1062).

Georgia: Vienna, *C. J. Humphrey*, 5228.

Florida: *W. W. Calkins* (in U. S. Dept. Agr. Herb., Burt Herb., N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 56759), and in Ell. & Ev., Fungi Col., 917.

Alabama: Auburn, *F. S. Earle & C. F. Baker* (in Burt Herb. and Mo. Bot. Gard. Herb., 5110); Montgomery Co., *R. P. Burke*, 31 (in Mo. Bot. Gard. Herb., 17137).

Louisiana: St. Martinville, *A. B. Langlois*.

Ohio: *A. P. Morgan* (in Lloyd Herb., 2607).

Kentucky: Mammoth Cave, *C. G. Lloyd*, 2798.

Missouri: Columbia, *B. M. Duggar*, 550; Marianna, *H. von Schrenk* (in Burt Herb. and Mo. Bot. Gard. Herb., 42837); Wicks, *L. O. Overholts*, 3161 (in Mo. Bot. Gard. Herb., 5713).

Arkansas: *W. H. Long*, 12703, 18502 (in Mo. Bot. Gard. Herb., 44160, 44161).

Texas: Jasper, *E. R. Hodson*, 325, comm. by P. L. Ricker.

Mexico: Jalapa, *C. L. Smith*, in Smith, Cent. Am. Fungi, 146.

Cuba: *C. Wright*, 515, the *S. scytale* of Fungi Cubenses but not according to the type (in Curtis Herb.).

70. *S. sepium* Burt, n. sp.

Plate 6, fig. 70.

Type in Burt Herb.

Fructification corky, drying rigid, hard, resupinate, becoming broadly reflexed, with the upper surface concentrically sulcate, somewhat zonate, tomentose, sepia, the margin paler and entire; hymenium even, not shining, between light buff and avellaneous; in structure 600–1500 μ thick—up to 3 mm. thick in resupinate portion of Mexican specimens—, with the intermediate layer bordered and connected with the tomentum by a denser and darker zone and bearing on the opposite side a hymenial layer which becomes multizonate; hyphae of intermediate layer colored, thick-walled, densely and horizontally arranged, 3–3½ μ in diameter; cystidia incrusted, cylindric, 25–35 \times 7 μ , becoming colored where buried in the deeper zones of the hymenium; paraphyses of bottle-brush or aculeate form, numerous and conspicuous in the hymenial surface, cylindric, 12–25 \times 3–5 μ ; spores hyaline, even, 4 \times 2½ μ .

Probably resupinate over large areas, for fragments fractured on three sides are 6 cm. square; reflexed margin 2–4 cm. long, 6 cm. wide.

Under side of rotten logs of frondose species. Pennsylvania to Mexico and Colombia. Collected from July to December but probably perennial.

The few collections of *S. sepium* which have been observed have the upper surface of the pileus a little brighter colored than that of *S. subpileatum* and the hymenium more avellaneous, but I cannot certainly separate the former from the latter except by the very numerous and conspicuous bottle-brush paraphyses which are present, in addition to cystidia, in the hymenium of

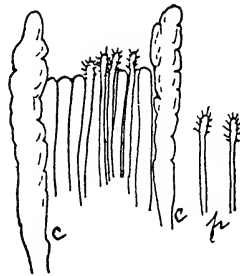


Fig. 41. *S. sepium*. Hymenium of type \times 665, showing cystidia, *c*, and bottle-brush paraphyses, *p*.

S. sepium. The specimens of Mexican collections cited below have larger size than those from the United States.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 1205, under the name *Stereum subpileatum*.

Pennsylvania: West Chester, *Everhart & Haines*, in Ellis, N. Am. Fungi, 1205.

North Carolina: Blowing Rock, *G. F. Atkinson*.

South Carolina: Clemson College, *P. H. Rolfs*, 1632.

Georgia: Vienna, *C. J. Humphrey*, 5229, type.

Mexico: Jalapa, *W. A. & E. L. Merrill*, 117, 188, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 11011, 54445), and 39 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56760).

Colombia: Bonda, *C. F. Baker*, 24, in Plants of Santa Marta, Colombia, under the name *Stereum illudens*.

71. *S. albobadium* (Schw.) Fries, *Epier.* 551. 1838; Morgan, *Cincinnati Soc. Nat. Hist. Jour.* 10: 195. 1888; *Sacc. Syll. Fung.* 6: 579. 1888; Masee, *Linn. Soc. Bot. Jour.* 27: 194. 1890. Plate 6, fig. 71.

Thelephora albobadia Schweinitz, *Naturforsch. Ges. Leipzig Schrift.* 1: 108. 1822 (in *C. Corticia*); *Am. Phil. Soc. Trans. N. S.* 4: 167. 1832; Fries, *Elenchus Fung.* 1: 189. 1828.—*T. albo-marginata* Schweinitz in Berkeley, *Hooker's London Jour. Bot.* 6: 324. 1847; *Lea's Cat. Plants Cincinnati*, 66. 1849; *Sacc. Syll. Fung.* 6: 539. 1888.—*Peniophora albo-marginata* (Schw.) Masee, *Linn. Soc. Bot. Jour.* 25: 144. 1889.—*Stereum bizonatum* Berkeley & Curtis, *Grevillea* 1: 163. 1873; *Sacc. Syll. Fung.* 6: 582. 1888; Masee, *Linn. Soc. Bot. Jour.* 27: 178. 1890.—*S. Coffearum* Berkeley & Curtis, *Linn. Soc. Bot. Jour.* 10: 332. 1868; *Sacc. Syll. Fung.* 6: 576. 1888.—*Hymenochaete paupercula* Berkeley & Curtis, *Linn. Soc. Bot. Jour.* 10: 334. 1868.—*Peniophora paupercula* (Berk. & Curtis) Cooke, *Grevillea* 8: 150. 1880; *Sacc. Syll. Fung.* 6: 645. 1888.

Type: I was unable to find the type in Herb. Schweinitz, although it was studied by Berkeley & Curtis, *Acad. Nat. Sci. Phila. Jour.* 3: 221. 1856.

Fructifications coriaceous, thin, at first resupinate, orbicular,

becoming confluent, sometimes becoming narrowly reflexed, with the upper surface villose, varying from buffy brown to Natal-brown, becoming somewhat zonate when reflexed about 5 mm., the margin entire and usually whitish; hymenium even, somewhat velvety, bistre or snuff-brown, becoming light drab and somewhat pruinose with age; in structure about $500\ \mu$ thick, the intermediate layer with a darker zone on its upper side and composed of loosely, longitudinally arranged, slightly colored hyphae

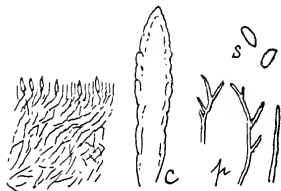


Fig. 42. *S. albobadium*. Section $\times 90$; cystidium, *c*, paraphyses, *p*, and spores, *s*, $\times 665$.

3– $3\frac{1}{2}\ \mu$ in diameter; hymenium $30\text{--}45\ \mu$ thick, not zonate, having incrustated cystidia $30\text{--}45 \times 8\text{--}15\ \mu$ all confined to the single-layered hymenium, protruding up to $25\ \mu$; branched, filiform paraphyses $2\ \mu$ in diameter, becoming colored, are present also in the hymenium, basidia simple, 4-spored; spores white in spore collection, even, flattened on one side, $6\text{--}11 \times 3\text{--}4\frac{1}{2}\ \mu$.

Fructifications 5–10 mm. in diameter, becoming confluent over areas 1–2 cm. wide and 3 to many cm. long, and reflexed 2–5 mm.

On dead frondose wood and fallen limbs. New York to Mexico and westward to Idaho and Arizona, in the West Indies, and reported from Brazil. Throughout the year. Common.

S. albobadium may usually be recognized by its brown, velvety hymenium with a white border; with age the hymenium tends to become more uniformly light drab or pruinose, but some small fructifications in the vicinity are likely to show the original color contrasts. This species has a wide geographic range and is somewhat variable in coloration but is very constant in microscopic structure; the branched, colored paraphyses are highly distinctive.

Specimens examined:

Exsiccati: Bartholomew, Fungi Col., 3688, 4784; Ellis, N. Am. Fungi, 15; Ravenel, Fungi Am., 221, 449; Ravenel, Fungi Car. 1: 29.

New York: Grand View, *H. von Schrenk* (in Mo. Bot. Gard.

- Herb., 43009); Orient, *R. Latham* (in Mo. Bot. Gard. Herb., 16267).
- New Jersey: Newfield, *J. B. Ellis*, in Ellis, N. Am. Fungi, 15.
- Maryland: Plummers Island, *C. L. Shear*, 1276, 1277; Seven Locks, *P. L. Ricker*, 1007; Takoma Park, *C. L. Shear*, 1118, 1126.
- District of Columbia: Washington, *C. L. Shear*, 1263-1265, 1402.
- Virginia: Arlington Cemetery, *W. H. Long*, 12978 (in Mo. Bot. Gard. Herb., 55104).
- North Carolina: Chapel Hill, *W. C. Coker*, 3849 (in Mo. Bot. Gard. Herb., 56672).
- South Carolina: Curtis Herb., 1924, type of *Stereum bizonatum* (in Kew Herb.); *Ravenel*, in Ravenel, Fungi Car. 1: 29; Aiken, *H. W. Ravenel*, in Ravenel, Fungi Am., 449; Clemson College, *P. H. Rolfs*, 1637; Society Hill, under the name *T. albo-marginata* (in Curtis Herb.).
- Georgia: Atlanta, *E. Bartholomew*, in Bartholomew, Fungi Col., 4784; Darien, *H. W. Ravenel*, in Ravenel, Fungi Am., 221.
- Florida: New Smyrna, *C. G. Lloyd*, 2089, 2104, 2132.
- Alabama: Auburn, *F. S. Earle* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56764), *F. S. Earle & C. F. Baker* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 5055, 56765, 56772), *C. R. Hudson* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 55568); *McGeher* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56766), and *L. M. Underwood*, comm. by U. S. Dept. Agr.; Fayette Co., *P. V. Siggers*, comm. by A. H. W. Povah, 16 (in Mo. Bot. Gard. Herb., 14849); Mobile, *E. Bartholomew*, 5752 (in Mo. Bot. Gard. Herb., 44257); Montgomery, *R. P. Burke*, 5, 29 (in Mo. Bot. Gard. Herb., 20914, 17071).
- Mississippi: Ocean Springs, *F. S. Earle*, 181 (in Mo. Bot. Gard. Herb., 44311).
- Louisiana: St. Martinville, *A. B. Langlois*.
- Texas: Paris, *C. L. Shear*, 1234; Quitman, *W. H. Long*, 18448, 12081 (in Mo. Bot. Gard. Herb., 55105, 55131); San Antonio, *H. von Schrenk*, also *W. H. Long*, 21217 (in Mo. Bot. Gard. Herb., 42577 and 55131 respectively).
- Ohio: *C. G. Lloyd*, 189, 594 (in Lloyd Herb.); College Hill, *C. G. Lloyd*, P; Norwood, *C. G. Lloyd*, 2810.

- Missouri: Meramec, *P. Spaulding* (in Mo. Bot. Gard. Herb., 5017); Perryville, *L. O. Overholts & R. A. Studhalter*, comm. by L. O. Overholts, 2723 (in Mo. Bot. Gard. Herb., 44293); Upper Creve Coeur, *E. A. Burt* (in Mo. Bot. Gard. Herb., 54861, 56768).
- Kansas: Rooks Co., *E. Bartholomew* (in Burt Herb. and Mo. Bot. Gard. Herb., 5054); Stockton, *E. Bartholomew*, in Bartholomew, Fungi Col., 3688.
- Idaho: Bonner's Ferry, *J. R. Weir*, 592 (in Mo. Bot. Gard. Herb., 36746).
- Arizona: Phoenix, *W. H. Long*, 19030 (in Mo. Bot. Gard. Herb., 55106).
- New Mexico: Cienega Springs, *W. H. Long*, 21525 (in Mo. Bot. Gard. Herb., 55155); Tyom Experiment Station, *W. H. Long*, 21364, 21408 (in Mo. Bot. Gard. Herb., 55107, 55108); Tejano Experiment Station, *W. H. Long*, 21889, 21897, 21902 (in Mo. Bot. Gard. Herb., 55165-55167).
- Bermuda: *S. Brown, N. L. Britton, & F. J. Seaver*, 1244 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56273).
- Cuba: *C. Wright*, 247, type of *Stereum Coffearum* (in Curtis Herb.), and 542, type of *Hymenochaete paupercula* (in Curtis Herb.), and *C. G. Lloyd*, 423 (in Mo. Bot. Gard. Herb., 55159); Alto Cedro, *L. M. Underwood & F. S. Earle*, 1492, 1590, comm. by N. Y. Bot. Gard. Herb.; La Gloria, Camaguey, *J. A. Shafer*, 740 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56770); Managua, *Earle & Murrill*, 11, comm. by N. Y. Bot. Gard. Herb.; Omaja, *C. J. Humphrey*, 2746 (in Mo. Bot. Gard. Herb., 14385); San Diego de los Baños, *Earle & Murrill*, 281, 302, 316, 353, comm. by N. Y. Bot. Gard. Herb.
- Porto Rico: Rio Piedras, *J. A. Stevenson*, 2424, 6272 (in Mo. Bot. Gard. Herb., 3607, 55090).
- Mexico: Jalapa, *W. A. & E. L. Murrill*, 301, 309, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54432, 54483); Motzorongo, Cordoba, *W. A. & E. L. Murrill*, 992, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54597); Orizaba, *W. A. & E. L. Murrill*, 760, 761, 766, 769, 774, 779, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54627, 54631, 54628, 54629, 54610,

54645); Tepeite Valley, Guernavaca, *W. A. & E. L. Merrill*, 408, comm. by N. Y. Bot. Gard. Herb. (in *Mo. Bot. Gard. Herb.*, 54544); Xuchiles, Cordoba, *W. A. & E. L. Merrill*, 1209, 1210, comm. by N. Y. Bot. Gard. Herb. (in *Mo. Bot. Gard. Herb.*, 54598, 54599).

72. *S. heterosporum* Burt, n. sp. Plate 6, fig. 72.
Type: in *Mo. Bot. Gard. Herb.*

Fructifications coriaceous, thin, resupinate, orbicular, becoming confluent, sometimes reflexed, with the upper surface villose, bister, somewhat concentrically sulcate and zonate, the margin entire, whitish; hymenium even, somewhat velvety, bister, becoming light drab and somewhat pruinose in the center with age; in structure 300–500 μ thick, the intermediate layer with a darker zone on its upper side and composed of loosely and longitudinally arranged, slightly colored hyphae 3–3½ μ in diameter, many of

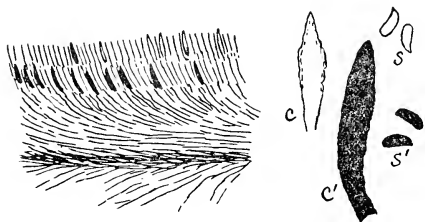


Fig. 43. *S. heterosporum*. Section $\times 90$; hyaline cystidium, *c*, colored cystidium, *c'*, hyaline spores, *s*, colored spores *s'*, $\times 665$.

which curve into the hymenium and often become there as dark-colored as conducting organs and sometimes incrustated; hymenium 70–120 μ thick, becoming more or less zonate, with cystidia incrustated starting from all parts of the layer, 30–35 \times 6–7 μ , protruding up to 15 μ , often colored under the incrustation in the deeper layers of the hymenium; paraphyses filiform, 2 μ in diameter, branched, numerous at the surface of the hymenium; basidiospores hyaline, even, 8–9 \times 3½ μ , borne 4 to a basidium; ochraceous spores of the same form and dimensions as the basidiospores often occur copiously imbedded throughout the hymenium.

Fructifications 5–10 mm. in diameter, becoming confluent over areas 1–2 cm. wide and up to 12 cm. long, and reflexed 2–7 mm.

On wood and in crevices of the bark of dead limbs and logs of *Eucalyptus*, oak, pecan, and other frondose species. Oregon to Mexico. September to April.

Resupinate specimens of *S. heterosporum* are not distinguishable in aspect from the darkest colored specimens of *S. albobadium*; all specimens of the former which have been seen so far have been bister or seal-brown, which is also the color of the upper side of the pileus. Mature specimens of *S. heterosporum* differ from those of *S. albobadium* in the much thicker zonate hymenium which has cystidia in all parts of this layer and many wholly buried below the surface; the deeper region of the hymenium is dark-colored in the type because of the abundance of dark-colored hyphal ends which are occasionally incrustated, and colored imbedded spores are as numerous as in *Stereum rugisporum*, which has nearly the same geographic range. I have not found colored imbedded spores in the collection distributed in Ell. & Ev., Fungi Col., 1116, which I refer to *S. heterosporum* on account of other distinctive characters of this species.

Specimens examined:

Exsiccati: Ell. & Ev., Fungi Col., 1116, under the name *Stereum albobadium*.

Oregon: Portland, *C. J. Humphrey*, 6125.

California: Berkeley, *C. J. Humphrey*, 5981; Campo Mts., *C. R. Orcutt*, 2007, 2008, comm. by U. S. Dept. Agr. Herb.; Compton, *A. J. McClatchie*, in Ell. & Ev., Fungi Col., 1116, and (in N. Y. Bot. Gard. Herb., Burt Herb., and Mo. Bot. Gard. Herb., 56769); Claremont, *D. L. Crawford*, 1513, comm. by L. O. Overholts, 3325 (in Mo. Bot. Gard. Herb., 21688); Santa Cruz, *Dr. Anderson*, comm. by W. G. Farlow.

Arizona: Coronado National Forest, *G. G. Hedgcock & W. H. Long*, comm. by C. G. Humphrey, 2562, 2563 (in Mo. Bot. Gard. Herb., 13070, 12811).

Mexico: Parral, Chihuahua, *E. O. Matthews*, 3, and 27, type (in Mo. Bot. Gard. Herb., 44282, 44420, 44106); Rosario, *E. O. Matthews* (in Mo. Bot. Gard. Herb., 44110).

73. *S. versiforme* Berk. & Curtis, Grevillea 1: 164. 1873; Sacc. Syll. Fung. 6: 580. 1888; Masee, Linn. Soc. Bot. Jour. 27: 193. 1890. Plate 6, fig. 73.

Peniophora Ellisii Masee, Linn. Soc. Bot. Jour. 25: 144. 1889; Sacc. Syll. Fung. 9: 237. 1891.—An *Thelephora obscura* Persoon, Myc. Eur. 1: 146. 1822 (in **** Corticium)? See *Peniophora obscura* (Pers.) Bresadola, I. R. Accad. Agiati Atti III. 3: 113. 1897.

Type: in Kew Herb. and Curtis Herb.

Fruetifications at first thin, effused, resupinate, adnate, orbicular, becoming confluent, finally thickening, cracking, and becoming narrowly reflexed and somewhat complicate and curling away from the substratum, the upper side uneven, plicate, somewhat fuscous or blackish; hymenium velvety, Prout's brown to bister, somewhat papillate; in structure 200–400 μ thick, composed of densely arranged, ascending and interwoven hyphae, some of which are colored; hymenium usually simple but sometimes with one or two additional zones in some places, containing heavily incrustated, cylindric cystidia 45–75 \times 12–24 μ , starting in various parts of the hymenium and subhymenium, wholly buried below the surface of the hymenium or emerging up to 15 μ ; hymenial surface velvety, with very numerous colored paraphyses with bushy-branched tips; spores hyaline, even, curved, 5–7 \times 2–3 μ .



Fig. 44. *S. versiforme*. Cystidium, c, and paraphyses, p, \times 665.

Fruetifications 2–10 mm. in diameter, confluent over areas up to 7 \times 1–2 cm.; margin reflexed about 1 mm. usually, rarely up to 2 mm.

On the bark of dead limbs of oak, chestnut, birch, and other frondose species. Canada to Alabama and westward to Iowa and Arkansas. July to February. Common.

S. versiforme is distinct among the Stereums by its Prout's brown, velvety, or at least dull, hymenium, barely reflexed margin, and colored, bushy-branched paraphyses, among which are scattered large, incrustated cystidia. The presence of these

paraphyses, the location of the cystidia in the hymenial side of the fructification, and the velvety surface sharply separate wholly resupinate specimens of *S. versiforme* from brownish colored forms of *Peniophora cinerea*.

Peniophora obscura (Pers.) Bresadola, according to specimen collected in Hungary, communicated to me by Bresadola and compared by him with an authentic specimen of Persoon, is strikingly similar to very young and wholly resupinate specimens of *Stereum versiforme*. There is no European record that *P. obscura* ever has been observed reflexed or has shown any tendency to become reflexed. In America, *S. versiforme* is wholly resupinate only when very young and soon thickens, becomes more or less reflexed, and in well-developed specimens such as that cited below, collected by Underwood at White Plains, N. Y., has but little in common with *P. obscura*. For these reasons I believe that the name *Stereum versiforme* should be applied to American specimens until Europeans find their *Peniophora obscura* in a reflexed stage identical in its characters with *S. versiforme*.

Specimens examined:

- Exsiccati: Ellis, N. Am. Fungi, 606, under the name *Stereum papyrinum*; Ell. & Ev., N. Am. Fungi, 3209; Ell. & Ev., Fungi Col., 611; de Thümen, Myc. Univ., 307.
- Canada: J. Macoun, 8 in part, 70; on peach tree, J. H. Faull (in Mo. Bot. Gard. Herb., 55561).
- Quebec: Hylmer, J. Macoun, 229.
- Ontario: York Mills, J. H. Faull, Univ. Toronto Herb., 322 in part (in Mo. Bot. Gard. Herb., 44933).
- New Hampshire: Chocorua, W. G. Farlow (in Mo. Bot. Gard. Herb., 55586).
- Vermont: Ripton, E. A. Burt.
- Massachusetts: Arlington Heights, E. A. Burt; Sharon, A. P. D. Piquet, comm. by W. G. Farlow (in Mo. Bot. Gard. Herb., 55231); Waverly, A. B. Seymour, T 15 (in Mo. Bot. Gard. Herb., 18098).
- New York: Alcove, C. L. Shear, 1139, 1304, 1328; East Galway, E. A. Burt; Grand View, H. von Schrenk (in Mo. Bot. Gard. Herb., 42807); Ithaca, Van Hook, comm. by G. F. Atkinson, 8217; Karner, H. D. House (in N. Y. State Mus. Herb.

- and Mo. Bot. Gard. Herb., 54354, 54366); White Plains, *L. M. Underwood* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 5031).
- New Jersey: Newfield, *J. B. Ellis*, comm. by C. G. Lloyd, and in Ellis, N. Am. Fungi, 606, Ell. & Ev., N. Am. Fungi, 3209, Fungi Col., 611, and de Thümen, Myc. Univ., 307.
- Pennsylvania: *Michener*, type (in Curtis Herb., 4265, and in Kew Herb.); Bethlehem, *Schweinitz* (in Herb. Schweinitz, under the name *Thelephora amphibola* of Schw., Syn. N. Am. Fungi, No. 726, but not of Fries); Carbondale, *E. A. Burt*, two collections; State College, *C. R. Orton & L. O. Overholts*, comm. by L. O. Overholts, 2661 (in Mo. Bot. Gard. Herb., 11419); Trexlertown, *W. Herbst*, 14.
- Maryland: Glen Sligo, *C. L. Shear*, 1050, 1095; Hyattsville, *F. L. Scribner*, 90, comm. by U. S. Dept. Agr. Herb.; Takoma Park, *C. L. Shear*, 1020, 1336.
- Virginia: Fairfax, comm. by U. S. Dept. Agr. Herb.; Woodstock, *C. L. Shear*, 1196.
- South Carolina: Salem, *Schweinitz* (in Herb. Schweinitz, under the name *Thelephora bufonia* of Schw., Syn. N. Am. Fungi, No. 725, but probably not *T. bufonia* Pers., which is too imperfectly known for recognition in Europe); Summer-ville, *C. L. Shear*, 1227.
- Alabama: Auburn, *F. S. Earle* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56785, 56786), and *F. S. Earle & C. F. Baker* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56787, 56788).
- Michigan: Ann Arbor, *C. H. Kauffman*, 21 (in Mo. Bot. Gard. Herb., 9808), and *Abrams* (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 56789).
- Iowa: Woodbine, *C. J. Humphrey & C. W. Edgerton*, comm. by C. J. Humphrey, 6518 (in Mo. Bot. Gard. Herb., 20624).
- Missouri: Concordia, *C. H. Demetrio* (in Mo. Bot. Gard. Herb., 5030); Oran, *H. von Schrenk* (in Mo. Bot. Gard. Herb., 42887); St. Louis, *E. A. Burt* (in Mo. Bot. Gard. Herb., 8725); Williamsville, *B. M. Duggar*, 478, 481.
- Arkansas: Bigflat, *W. H. Long*, 19783, 19898 (in Mo. Bot. Gard. Herb., 5921, 9138); Cass, *W. H. Long*, 19800, 19827 (in Mo. Bot. Gard. Herb., 8636, 8886); Womble, *W. H. Long*,

19768, 19873, 19881 (in Mo. Bot. Gard. Herb., 9143, 8964, 5920).

74. *S. insigne* Bresadola, Nuov. Gior. Bot. Ital. 23: 158. 1891; Sacc. Syll. Fung. 9: 222. 1891. Plate 6, fig. 74.

Type: authentic specimen, probably part of the type, in Burt Herb.

Fructification corky, drying rigid, hard, effuso-reflexed, the upper surface concentrically sulcate, somewhat zonate, tomentose, snuff-brown to bister, the recent growth at the margin paler; hymenium even, pinkish buff to drab-gray and pruinose; in structure 1500 μ thick, with the intermediate layer bordered and connected with the tomentum by a darker and denser zone and bearing on the opposite side a multizonate hymenium; hyphae of the intermediate layer colored, thick-walled, densely and longitudinally arranged, $3\frac{1}{2}$ μ in diameter; no cystidia; paraphyses of bottle-brush or aculeate form, numerous and conspicuous in the hymenial surface, cylindric, $25-30 \times 4-4\frac{1}{2}$ μ ; spores published by Bresadola as hyaline, even, $4-6 \times 3-3\frac{1}{2}$ μ —none found by me.



Fig. 45. *S. insigne*. Section of hymenium of authentic specimen $\times 665$; bottle-brush paraphyses, *p*.

Reflexed $1\frac{1}{2}-4$ cm., laterally confluent for 9 cm. in the Florida specimen.

On oak logs. Florida, Venezuela, and Italy. February. Rare.

This species belongs in the group with *S. subpileatum* and *S. sepium* and is not distinguishable in general aspect from these species, but its hymenium contains numerous and conspicuous bottle-brush paraphyses and no cystidia, while both of the other species named have cystidia. The Venezuelan specimen cited below was determined by Berkeley as *Stereum illudens*, from which it appears distinct, for while the type of *S. illudens*, in Kew Herbarium, collected by Drummond, 158, Swan River, Australia, has bottle-brush paraphyses for its hymenial surface, it has in its subhymenium elongated, cylindrical, thick-walled organs 6 μ in diameter, up to 100 μ long, a little darker colored than the surrounding hyphae and curving outward into the deeper portion of the hymenium, which is not zonate.

Specimens examined:

Italy: Florence, *Martelli*, comm. by G. Bresadola.

Florida: *C. G. Lloyd*, 4846.

Venezuela: *Fendler*, 177 (in Curtis Herb.).

75. *S. durum* Burt, n. sp.

Plate 6, fig. 75.

Type: in Smith, Central Am. Fungi, 147, copy in Mo. Bot. Gard. Herb.

Fructification very hard, orbicular, attached by the center, free or reflexed all around, concentrically sulcate, fuscous to bone-brown, with a horn-like crust, becoming somewhat shining; hymenium even, not shining, between pale drab-gray and tilleul-buff, somewhat pruinose; in structure 2-3 mm. thick, hazel throughout, and multizonate or stratose, containing many scattered crystals, hyphae $3\frac{1}{2}$ -4 μ in diameter; paraphyses of bottle-brush or aculeate form, numerous and conspicuous in the hymenial surface, cylindric, 12-15 \times 4-5 μ ; no cystidia; no spores found.

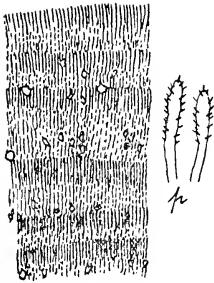


Fig. 46. *S. durum*. Section of hymenial region of type \times 90; bottle-brush paraphyses, *p.* \times 665.

Fructification 3 cm. in diameter, reflexed 1 cm.

On dead wood. Mexico.

S. durum is much thicker, harder, and more rigid than *S. insigne* and

not tomentose. The microscopic structure agrees exactly with that of preparations from an authentic specimen in Kew Herbarium of *Stereum annosum*, No. 99, collected at Neilgherries, Ceylon, and should be compared with the latter when better known. For the present the development of a pileus by *S. durum*, with characters as stated, is reason for regarding this species as distinct from *S. annosum*, a resupinate species of the other side of the world.

Specimens examined:

Exsiccati: Smith, Central Am. Fungi, 147, under the name *Stereum ferreum*.

Mexico: Jalapa, *C. L. Smith*, type, in Smith, Central Am. Fungi, 147.

76. *S. frustulosum* (Pers.) Fries, Epicr. 552. 1838; Hym. Eur. 643. 1874; Morgan, Cincinnati Soc. Nat. Hist. Jour. **10**: 196. 1888; Sacc. Syll. Fung. **6**: 572. 1888; Masee, Linn. Soc. Bot. Jour. **27**: 199. 1890. Plate 6, fig. 76.

Thelephora frustulosa Persoon, Syn. Fung. 577. 1801; Myc. Eur. **1**: 134. 1822; Fries, Syst. Myc. **1**: 445. 1821.—*Thelephora perdix* Hartig, Zersetzung. des Holzes, 103–108. *pl.* 13. 1878.

Illustrations: Cooke, Fung. Pests, *pl.* 20. *f.* 20; Hartig, *loc. cit.*; Masee, Dis. Cult. Plants, 397. *text f.* 124; Tubeuf, Dis. of Plants, 35. *text f.* 11, and 430. *text f.* 260, 261.

Fructifications woody, resupinate, tuberculose, crowded as if confluent and then broken up into frustules, sometimes grown outward from place of attachment and narrowly reflexed or with a free margin all around, the upper side black, crust-like,

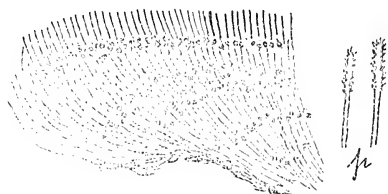


Fig. 47. *S. frustulosum*. Section $\times 45$; bottle-brush paraphyses, *p.* $\times 665$.

concentrically sulcate, glabrous; hymenium convex, pinkish buff to whitish and pruinose; in structure $800\ \mu$ or more thick, with hyphae densely arranged, radiating outward from the place of attachment and bearing a multizonate hymenium in which are great numbers of bottle-brush or aculeate paraphyses; spores hyaline, even, $5-6 \times 3-3\frac{1}{2}\ \mu$.

Fructifications 2–4 mm. in diameter; margin reflexed 3 mm. in the best developed specimen known to me.

On wood of oak logs and stumps in which it causes a pocketed or honey-comb rot. Canada to Texas and westward to Oregon, in Mexico and in Europe.

S. frustulosum may be recognized by its occurrence in small convex fructifications of woody consistency, crowded together

on the under side of dry and hard oak wood or on the sides of stumps. On the sides of stumps it may sometimes be found reflexed. The bottle-brush paraphyses and many-zoned hymenium are good structural characters for confirmation of the determination.

Specimens examined:

- Exsiccati: Bartholomew, *Fungi Col.*, 1881, 4587; Ellis, *N. Am. Fungi*, 106; Ell. & Ev., *Fungi Col.*, 7; Ravenel, *Fungi Car.* 2: 34; de Thümen, *Myc. Univ.*, 308.
- Sweden: Stockholm, *L. Romell*, 28; Upsala, *E. P. Fries* (in *Curtis Herb.*).
- France: Aveyron, *A. Galzin*, 13935, comm. by H. Bourdot, 26649.
- Ontario: Carleton Place, *J. Macoun*, 421 (in *Macoun Herb.*).
- Vermont: Grand View Mt., *E. A. Burt*, three collections.
- Massachusetts: Dedham, *Hanna*; Wellesley, *L. W. Riddle*, 14.
- New York: Glaseo, *P. Wilson*, 50 (in *Mo. Bot. Gard. Herb.*, 54763); Ithaca, *W. C. Muenscher*, 144 (in *Mo. Bot. Gard. Herb.*, 56601); Palisades, *P. Wilson*, 62 (in *Mo. Bot. Gard. Herb.*, 54761).
- New Jersey: Alpine, *P. Wilson*, 8 (in *Mo. Bot. Gard. Herb.*, 54764); Englewood, *P. Wilson*, 60 (in *Mo. Bot. Gard. Herb.*, 54762); Hackensack Swamp, *W. H. Ballou* (in *Mo. Bot. Gard. Herb.*, 56599); Newfield, *J. B. Ellis*, in *Ellis, N. Am. Fungi*, 106, in *Ell. & Ev., Fungi Col.*, 7, and *de Thümen, Myc. Univ.*, 308.
- Pennsylvania: Kittanning, *D. R. Sumstine*.
- Maryland: Hyattsville, *F. L. Scribner* (in *U. S. Dept. Agr. Herb.*).
- South Carolina: *H. W. Ravenel*, in *Ravenel, Fungi Car.* 2: 34; Clemson College, *P. H. Rolfs*, 1621, 1630, 1638.
- Florida: Tallahassee, *E. Bartholomew*, in *Bartholomew, Fungi Col.*, 4587.
- Alabama: Auburn, *F. S. Earle & C. F. Baker* (in *Mo. Bot. Gard. Herb.*, 5079); Montgomery, *R. P. Burke*, 27 (in *Mo. Bot. Gard. Herb.*, 17875).
- Louisiana: *A. B. Langlois*.
- Texas: Denton, *W. H. Long*, in *Bartholomew, Fungi Col.*, 1881; Galveston, *H. W. Ravenel*, 36, comm. by *U. S. Dept. Agr. Herb.*

- Ohio: *C. G. Lloyd*, 185 (in *Lloyd Herb.*); Loveland, *D. L. James* (in *U. S. Dept. Agr. Herb.*).
- West Virginia: Paw Paw, *C. L. Shear*, 1180.
- Kentucky: Crittenden, *C. G. Lloyd*, 1685.
- Wisconsin: Blue Mounds, *Miss A. O. Stucki*, 30; Madison, *W. Trelease*, 83 (in *Mo. Bot. Gard. Herb.*, 44105).
- Iowa: Webster Co., *O. M. Oleson*, 450 (in *Mo. Bot. Gard. Herb.*, 44062).
- Missouri: Columbia, *B. M. Duggar*, 443; Creve Coeur, *P. Spaulding* (in *Mo. Bot. Gard. Herb.*, 44103), and *E. A. Burt* (in *Mo. Bot. Gard. Herb.*, 7861); St. Louis, *Miss C. Rumbold*; Valley Park, *E. A. Burt* (in *Mo. Bot. Gard. Herb.*, 44058, 44063).
- Nebraska: Saltillo, *C. L. Shear*, 1051.
- Kansas: Bourbon Co., *A. O. Garrett*, 125.
- Oregon: Portland, *J. R. Weir*, 597 (in *Mo. Bot. Gard. Herb.*, 36747).
- Mexico: Tepeite Valley, Guernavaca, *W. A. & E. L. Merrill*, 411 (in *Mo. Bot. Gard. Herb.*, 54545).
- U. S. Northern Pacific Expl. Exp.: Ousmia, *C. Wright*, comm. by U. S. Dept. Agr. Herb.

77. *S. roseo-carneum* (Schw.) Fries, *R. Soc. Sci. Upsal. Actis* III. 1: 112. 1851. Plate 6, fig. 77.

Thelephora roseo-carnea Schweinitz, *Naturforsch. Ges. Leipzig Schrift.* 1: 107. 1822 (under *C. Corticia*).—*T. anthochroa* Schweinitz, *Am. Phil. Soc. Trans. N. S.* 4: 168. 1832, but not *T. anthochroa* of European authors.—*Corticium lilacino-fuscum* Berkeley & Curtis, *Grevillea* 1: 180. 1873; *Sacc. Syll. Fung.* 6: 621. 1888; Masee, *Linn. Soc. Bot. Jour.* 27: 143. 1890.—*Stereum lilacino-fuscum* (Berk. & Curtis) Lloyd, *Myc. Writ.* 5. Letter 68: 8. 1919.—*S. sendaiense* Lloyd, *Myc. Writ.* 5. *Myc. Notes* 48: 680. *text f.* 1015. 1917.—*Corticium subrepandum* Berkeley & Cooke, *Grevillea* 6: 81. 1878; *Sacc. Syll. Fung.* 6: 608. 1888; Masee, *Linn. Soc. Bot. Jour.* 27: 119. 1890.

Illustrations: Lloyd, *loc. cit.*

Type: in *Herb. Schweinitz*, under the name *Thelephora anthochroa*.

Fructifications coriaceous-soft, thin, usually resupinate, effused,

becoming confluent, sometimes with margin barely free, rarely distinctly reflexed, with the upper surface tomentose, light buff to pinkish buff, the margin entire; hymenium even, cracking in a tessellated manner, not shining, light vinaceous purple when young, gradually changing to avellaneous when mature; in structure 250–300 μ thick, composed of somewhat longitudinally and loosely interwoven, hyaline, thin-walled, nodose-septate hyphae $2\frac{1}{2}$ –3 μ in diameter, not differentiated into an intermediate layer with a dark or dense bordering zone; hymenial layer simple when young, with very numerous and conspicuous, filiform paraphyses, colored above and with short-branched tips or bearing short lateral prongs on from 5–20 μ of the outer portion of the paraphysis, the paraphyses less conspicuous when basidia appear; spores white in spore collection, even, flattened on one side, 6–9 \times 4–5 μ , borne 4 to a basidium on simple basidia.

Fig. 48. *S. roseo-carneum*. Paraphyses of type, *p*; paraphyses, *p'*, of collection at Ithaca, and spores, *s*, all \times 665.



At first forming little fructifications 3–5 \times 2 mm., which become confluent over areas up to 6 \times 1 $\frac{1}{2}$ cm.; margin becoming free or reflexed for 1–3 mm.

On fallen limbs of frondose species. Canada to North Carolina and westward to Wisconsin, and in Brazil and Japan.

Since *S. roseo-carneum* is nearly always resupinate and does not show in sectional preparations of such specimens a distinct intermediate layer, its inclusion in the genus *Stereum* must trouble beginners. Fortunately it is a species so unique in structure that it may be determined with confidence. Most collections are likely to show more or less of the fuscous-lilac color, which is intense in young stages; the hymenium cracks and has the aspect of *Corticium evolvens* in other features than color, although of different structure; sections of *S. roseo-carneum* show in the hymenial surface filiform paraphyses branched above, as shown in the text figure. Such paraphyses are present in only one of our *Corticiums*—*Corticium roseum*. It is regrettable that the Schweinitz type was relabeled by Dr.

Michener to conform to the name used by Schweinitz in 'Synopsis North American Fungi' and the original label removed from the specimen, but Schweinitz gives in the later publication the name which he originally used.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 515 and 20, the latter under the name *Corticium incarnatum*.

Ontario: London, *J. Dearness*, D945 k, reflexed specimen (in Mo. Bot. Gard. Herb., 14251).

New Hampshire: Chocorua, *W. G. Farlow*, reflexed specimen; North Conway, *L. O. Overholts*, 5032, 5161—the latter reflexed (in Mo. Bot. Gard. Herb., 56348, 56349).

Vermont: Middlebury, *E. A. Burt*, two collections, of which one is reflexed; Ripton, *E. A. Burt*.

Massachusetts: reflexed specimen, comm. by *C. H. Peck*; Arlington Heights, reflexed specimen, *E. A. Burt*; Sharon, *A. P. D. Piquet*, comm. by *W. G. Farlow*.

Connecticut: *C. Wright*, type of *Corticium lilacino-fuscum* (in Kew Herb. and Curtis Herb., 5610).

New York: Alcove, *C. L. Shear*, 1001, 1002, 1004, 1072, 1321; Altamont, reflexed specimen, *E. A. Burt*; Brookton, *W. C. Muenscher*, 215 (in Mo. Bot. Gard. Herb., 56612) Cayuga Lake basin, *G. F. Atkinson*, 3022; East Galway, *E. A. Burt*; Ithaca, *Van Hook*, and *H. S. Jackson*, comm. by *G. F. Atkinson*, 8247 and 14396 respectively; North Elba, *C. H. Kauffman*, 13 (in Mo. Bot. Gard. Herb., 16987).

New Jersey: Newfield, *J. B. Ellis*, 2487, type of *Corticium subrepandum* (in Kew Herb.), and in Ellis, N. Am. Fungi, 20, and 515.

Pennsylvania: Spruce Creek, *J. H. Faull*, Univ. Toronto Herb., 312 (in Mo. Bot. Gard. Herb., 44886); State College, *L. O. Overholts*, 2676 (in Mo. Bot. Gard. Herb., 5946), and *L. O. Overholts* & *C. R. Orton*, comm. by *L. O. Overholts*, 5041, reflexed specimen (in Mo. Bot. Gard. Herb., 56359).

District of Columbia: Rock Creek, *C. L. Shear*, 1352; Washington, *T. Pergande* (in U. S. Dept. Agr. Herb.).

Virginia: Woodstock, *C. L. Shear*, 786, 788.

North Carolina: Salem, *Schweinitz*, type, under the name *Thelephora anthochroa* (in Herb. Schweinitz).

West Virginia: Fayette Co., *L. W. Nuttall*, comm. by Lloyd.
Herb.

Michigan: Ann Arbor, *C. H. Kauffman*, 13.

Indiana: Crawfordsville, *D. Reddick*, 9, 10.

Wisconsin: Palmyra, *Miss A. O. Stucki*, 48.

Brazil: Rio Grande do Sul, Hamburgerberg, *G. O. Malme*, 75,
comm. by L. Romell, 330.

Japan: *A. Yasuda*, comm. by C. G. Lloyd (in Mo. Bot. Gard.
Herb., 55214), and part of type of *Stereum sendaiense* (in
Mo. Bot. Gard. Herb., 55448); Sendai, *A. Yasuda*, reflexed
specimen (in Mo. Bot. Gard. Herb., 56247).

SPECIES IMPERFECTLY KNOWN

Thelephora aculeata Berk. & Curtis, *Grevillea* 1: 149. 1873;
Sacc. Syll. Fung. 6: 523. 1888.

The type was collected on the ground in Santee Swamp, South Carolina, in June. I had compared with the type a collection made by Professor P. H. Rolfs, on the ground, Clemson College, South Carolina, on June 18, and found this collection so similar to the type in aspect, although smaller, that I referred this specimen to *Thelephora aculeata*. I had not been able to demonstrate basidia for the type nor for the Rolfs specimen; now while working out the detailed structure of the latter specimen for publication, I find globose, longitudinally septate basidia $9\ \mu$ in diameter, and hyaline, even spores up to $9 \times 4\frac{1}{2} - 5\ \mu$. It seems probable that when there is opportunity to examine the type again it may be found to have similar basidia and belong in *Tremellodendron*.

Stereum arenicolum Berkeley in Masee, *Linn. Soc. Bot. Jour.* 27: 201. 1890.

"Resupinatum, effusum, crassum, rigidum, subtus tomento ferrugineo molli vestitum; hymenio levi, glabro fusco-purpurascente; sporae ellipsoideae, $7 \times 4 - 5\ \mu$ (Berk. in Herb. n. 3822).

"On sand under trees, Vera Cruz.

"Rigid, thick, 2-3 inches across, attached to the sand and probably decayed wood by a dense ferruginous tomentum; margin sometimes slightly upraised; substance pale cinnamon."

The above should be compared with *S. crassum*.

Stereum cuneatum Lloyd, Myc. Writ. 4. Letter 54:7. 1916.

“Pileus cuneate, tapering to the base (2 cm. high), cut into a few fimbriate segments. Surface pale, smooth. Hymenium unilateral, pale yellow (honey yellow of Ridgway), smooth. Cystidia none. Spores globose, $3\frac{1}{2}$ –4 mic., hyaline, smooth. The plant grows densely caespitose in the earth, from a common mycelial base. It belongs in Section 7 of my recent pamphlet on Stipitate Stereums.” Florida.

Perhaps the above is *S. Burtianum* or *S. tenerrimum*.

Stereum cupulatum Patouillard in Duss, Fl. Crypt. Antilles Fr. 233. 1904.

Scattered or close together, orbicular, from resupinate becoming cup-shaped, attached by a dorsal point, coriaceous, rigid, hard; external face glabrous, not zonate, brown, the margin entire or sinuate, acute; hymenium pruinose, even, concave, dull cinereous, reddish towards the border; trama compact, brown-umber; spores cylindric-ovoid, colorless, $6 \times 3 \mu$; no cystidia.

Fructifications 6–8 mm. in diameter.

On bark of *Prunus Dussii*.—Forest of Buins-Jaunes. Duss, 212.

The above is a translation of the original description; the species seems to be very near, if at all distinct from, *Stereum vibrans*, which Patouillard did not recognize among the species of Guadeloupe.

Stereum fragile Patouillard, Soc. Myc. Fr. Bul. 16:179. 1900; Sacc. Syll. Fung. 16:187. 1902.

Fructification resupinate at first, becoming dimidiate, orbicular, rigid, hard, more or less incised at first, the margin erect and acute; upper surface plane, ochraceous russet, tomentose, with some reddish and nearly glabrous concentric zones; trama 1 mm. thick, whitish, compact; hymenium plane, livid, becoming purplish; cystidia abundant, fusoid, not colored, thin-walled, $40 \times 10 \mu$.

On decaying wood. Guadeloupe.

This fungus is very fragile and divides radially with great ease. Its aspect is like that of *S. fasciatum*, *S. lobatum*, etc., but

it is easily distinguished by the violaceous tint of the hymenium. I have not seen authentic specimens of *S. fragile*, but from the foregoing translation of the original description, it seems very probable that *S. fragile* may prove a synonym of *S. albobadium*, a species common in the West Indies but not recognized by Patouillard among the species of Guadeloupe.

Stereum fimbriatum Ellis, Torr. Bot. Club Bul. 6: 133. 1877.

According to the authentic specimen from Ellis to Cooke in Kew Herb., this is a whitish, flaxy mass having no hymenium and quite indeterminable.

Stereum Galeottii Berkeley, Hooker's Jour. Bot. 3: 15. 1851; Sacc. Syll. Fung. 6: 574. 1888; Massee, Linn. Soc. Bot. Jour. 27: 176. 1890.

"Umbonato-sessile, parvum, convexum, rigidum; pileo cervino velutino-tomentoso creberrissime badio-zonati; zonis hic illic glabris nitentibus; hymenio cinereo-alutaceo. Galeotti, No. 6853.

"Hab. Caripi, Spruce; Vera Cruz, Galeotti; Xalapa, Mr. Harries.

"Pileus $1\frac{1}{2}$ inch broad, 1 inch long, subflabelliform, umbonato-sessile, mostly convex above, slightly undulated, thin but rigid, fawn-colored, clothed with velvety down; repeatedly zoned; zones mostly very close and narrow, frequently forming bay-brown, smooth and shining, alternating with paler fasciae. Hymenium tan-colored with a cinereous tinge.

"Undoubtedly nearly allied to *Stereum lobatum*, Kze, but a much smaller and neater species."

The type of the above should be compared with *Stereum versicolor*.

Stereum griseum Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1: 106. 1822 (under *B. Sterea* of *Thelephora*); Fries, Elenchus Fung. 1: 179. 1828.—*Stereum porrectum* Fries, Epicr. 548. 1838; Sacc. Syll. Fung. 6: 579. 1888.

I have been unable to find any Schweinitzian specimen of this species. It seems probable that the description was based on the old stage of *Stereum fasciatum* in which the attachment is by

umbo prolonged into stem-like form. Such fructifications occur rarely and are perplexing if not gathered in the same collection with the usual sessile fructifications.

S. ochroleucum Fries, Hym. Eur. 639. 1874; Sacc. Syll. Fung. 6: 562. 1888; Masee, Linn. Soc. Bot. Jour. 27: 184. 1890.

Corticium ochroleucum Fries, Epicr. 557. 1838.—Not *Stereum ochroleucum* Bres. Ann. Myc. 1: 91. 1903, nor Brinkmann, Westfälische Pilze, 49.

Type: authentic specimen in Kew Herb.

This species does not occur in North America and adjacent regions although reported from time to time from United States, Cuba, and Venezuela. Since I have not received under any name specimens of the true *Stereum ochroleucum* from European correspondents, this species is probably rare in Europe, and it may help toward recognition of the species to call attention to the specimen in Kew Herbarium.

The specimen is labelled:

“*Corticium ochroleucum* Fr.

Svex. Westm.

Maji — leg. Lbd.”

This specimen agrees well with the original description; its reflexed portion is $1\frac{1}{2}$ cm. broad, about $1-1\frac{1}{5}$ mm. thick as the sections show in my preparation; the consistency is soft in comparison with *S. hirsutum* and the hyphae about $2\frac{1}{2}$ mm. in diameter, granule-incrusted, and interwoven throughout the thickness of the pileus rather than parallel and longitudinally arranged side by side as in *S. hirsutum* and *S. sulphuratum*. In other words there is not the sharply marked intermediate layer which Fries regarded as an important distinctive character of the genus *Stereum*, and this is probably the reason for his originally regarding this species as a *Corticium* although broadly reflexed. There is not present a hardened crust or golden zone to mark the upper side of the intermediate region, but instead the hyphae become more loosely arranged toward the surface and become the hairy covering of that side. No cystidia, gloeocystidia, nor colored conducting organs are present; the spores are hyaline, even, $4\frac{1}{2}-5 \times 3 \mu$.

The American *Stereum spumeum* has aspect and structure very similar to *Stereum ochroleucum* Fr. but differs by having incrustated cystidia.

Stereum unicum Lloyd, Myc. Writ. 4. Stip. Stereums, 35. text f. 556. 1913.

The type is in New York State Museum under the name *Thelephora speciosa* unless relabeled to conform to the name applied by Lloyd. The type bears no basidia yet and is not determinable as to genus; it was collected in Providence, Saratoga County, New York, where I have been looking for a fertile specimen when in the original locality occasionally in the summer.

EXCLUDED SPECIES

Stereum acerinum (Pers.) Fr. is *Aleurodiscus acerinus* (Pers.) v. Höhn. & Litsch.

Stereum acerinum var. **nivosum** Berk. & Curtis is *Aleurodiscus nivosus* (B. & C.) v. Höhn. & Litsch.

Stereum calyculus Berk. & Curtis is *Craterellus calyculus* (B. & C.) Burt.

Stereum candidum Schweinitz is *Aleurodiscus candidus* (Schw.) Burt.

Stereum carolinense Cooke & Ravenel is *Sparassis spathulatus* (Schw.) Fr.

Stereum duriusculum, as determined by Patouillard in Duss, Fl. Antilles Fr. 232. 1903, is probably *Hypochnus pallescens* (Schw.) Burt, a species common in the West Indies.

Stereum Guadelupense Patouillard, Soc. Myc. Fr. Bul. 15: 201. pl. 10. f. 1. 1899. According to von Höhnel & Litschauer, K. Akad. Wiss. Wien Sitzungsber. 116: 753. 1907, this is a *Boletus* overrun by a *Sepedonium*.

Stereum Haydeni Berkeley in Masee, Linn. Soc. Bot. Jour. 27: 199. 1890.

The type, in Kew Herbarium, was collected in Ohio; it is strictly resupinate, has its hyphae loosely interwoven from hymenium to substratum, and has no characters which justify its inclusion in *Stereum* as comprehended in my work. The

hymenium is deteriorated but shows no cystidia; the species may be sought for in Ohio as a probable *Corticium*.

Stereum insolitum Lloyd, Myc. Writ. 5. Myc. Notes 47: 665. *text f. 956*. 1917, is a young specimen of *Thelephora regularis* Schw.

Through the kindness of Professor McFarland, I have examined his portion of the original specimen. Most of the spores attached to the basidia are as published by Lloyd; a few spores are $6-7 \times 5 \mu$, rough-walled and still hyaline; occasional spores in a preparation from near the base of the pileus are colored and tuberculate-irregular.

Stereum Leveillianum Berk. & Curtis is *Tremellodendron Leveillianum* (B. & C.) Burt.

Stereum Micheneri Berk. & Curtis is *Thelephora albido-brunnea* Schw.

Stereum Mancianus Sacc. & Cub. is *Aleurodiscus strumosus* (Fr.) Burt.

Stereum populneum Peck, N. Y. State Mus. Rept. 47: 145. 1894.

This is known in resupinate form only and should not be included in *Stereum*.

Stereum pruinatum Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 332. 1868.

This is known in resupinate form only and should not be included in *Stereum*.

Stereum scriblitum Berk. & Cooke, Grevillea 7: 102. 1879; Sacc. Syll. Fung. 6: 567. 1888.

The type collected by *Gerard, 171* (in Kew Herb.) was studied. This is the conidial stroma of *Ustilina vulgaris*.

Stereum seriatum Berk. & Curtis is *Aleurodiscus seriatum* (B. & C.) Burt.

Stereum spongiosum Masee is *Thelephora albido-brunnea* Schw.

Stereum strumosum Fries is *Aleurodiscus strumosus* (Fr.) Burt.

Stereum subcruentatum Berk. & Curtis, Am. Acad. Arts & Sci. Proc. 4: 123. 1858, is *Aleurodiscus subcruentatus* (Berk. & Curtis) Burt, n. comb.; now included among American species, because of collections received from California and Oregon.

Stereum triste Berk. & Curtis, Linn. Soc. Bot. Jour. **10**: 332. 1868.

This is the conidial stroma of a Pyrenomycete and shows young perithecia under the stroma in the type in Curtis Herb. Collection in Kew Herb., *C. Wright, 252*, has similar structure but did not show perithecia in my sections.

(To be continued.)

EXPLANATION OF PLATE

PLATE 2

All figures of plates 2-6 have been reproduced natural size from photographs of dried herbarium specimens unless otherwise noted.

Fig. 1. *Stereum caperatum*. Specimen collected at St. Martinville, La., by A. B. Langlois.

Fig. 2. *S. hydrophorum*. Specimen collected at Rio Mato, Venezuela, by M. A. Carriker.

Fig. 3. *S. Ravenelii*. Type distribution in Ravenel, Fungi Car. 4: 13.

Fig. 4. *S. surinamense*. Specimen collected at Consuelo, San Domingo, by N. Taylor, 12.

Fig. 5. *S. Burtianum*. Specimens collected at Amherst, Mass., by P. J. Anderson.

Fig. 6. *S. quisquiliare*. From Lloyd's illustration of the type.

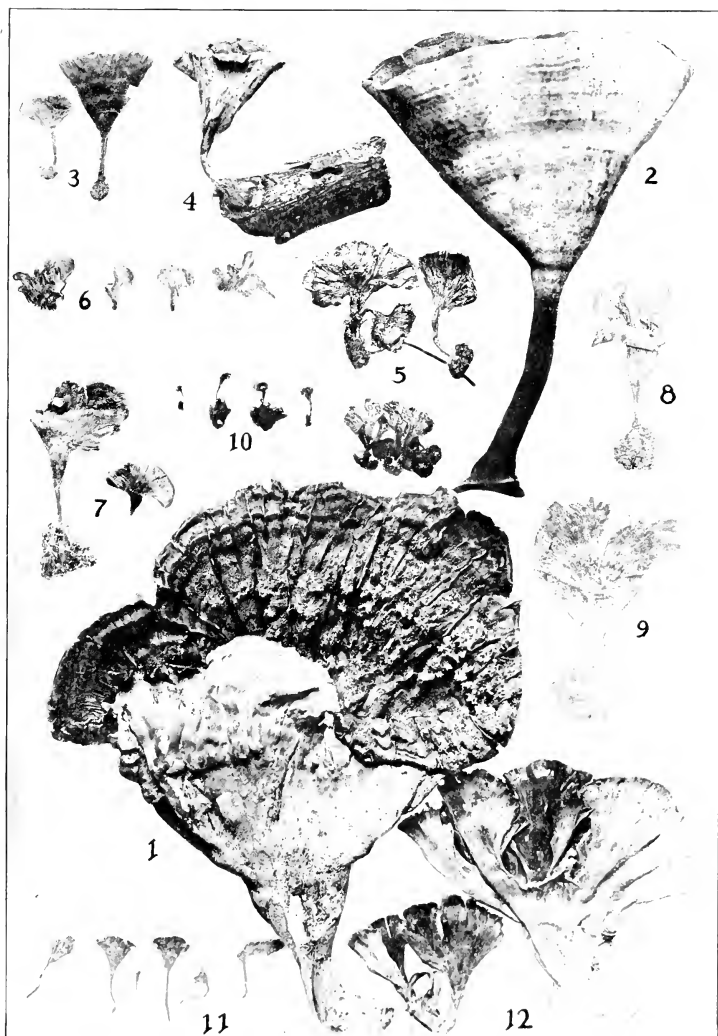
Fig. 7. *S. aurantiacum*. Specimens collected at Port Antonio, Jamaica, by F. S. Earle.

Figs. 8 and 9. *S. diaphanum*. Fig. 8 from type of *S. diaphanum*, and Fig. 9 from type of *S. Willeyi*.

Fig. 10. *S. exiguum*. Type.

Fig. 11. *S. tenerrimum*. Type.

Fig. 12. *S. pergamenum*. Type distribution in Ravenel, Fungi Car. 3: 25.



BURT-THELEPHORACEAE OF NORTH AMERICA

1. STEREOUM CAPERATUM. 2. S. HYDROPHORUM. 3. S. RAVENELII. 4. S. SURINAMENSE.—
 5. S. BURTIANUM. 6. S. QUISQUILIARE. 7. S. AURANTIACUM. 8. 9. S. DIAPHANUM.—10. S. EXI-
 GUEUM.—11. S. TENERRIMUM. 12. S. PERGAMENUM.

EXPLANATION OF PLATE

PLATE 3

Figs. 13 and 14. *S. pallidum*. Fig. 13, specimen collected and determined by G. Bresadola; Fig. 14, specimen collected at Blowing Rock, N. C., by G. F. Atkinson.

Fig. 15. *S. elegans*. Specimen collected at Mayaguez, Porto Rico, by B. L. Santiago, 12.

Fig. 234. *S. decolorans*. Type.

Fig. 16. *S. radicans*. Specimen collected at Grenada, by W. E. Broadway.

Fig. 17. *S. pusiolum*. Specimen collected at Rio Piedras, Porto Rico, by J. R. Johnston, 89.

Fig. 18. *S. glabrescens*. Specimen collected at Sumidero, Cuba, by J. A. Shafer, 13906.

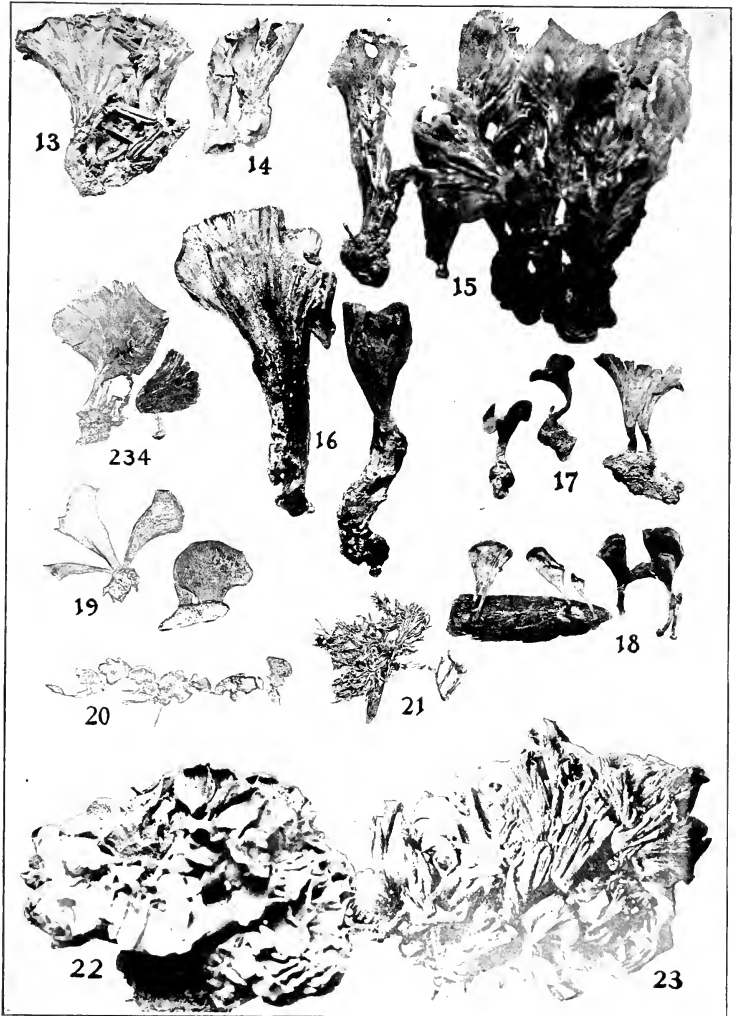
Fig. 19. *S. fissum*. Type.

Fig. 20. *S. cyphelloides*. Type.

Fig. 21. *S. Hartmanni*. Specimen collected at St. Kitt's, by N. L. Britton & J. F. Cowell.

Fig. 22. *S. craspedium*. Specimen collected in Dutch Guiana, by J. Samuels.

Fig. 23. *S. petalodes*. From C. G. Lloyd's illustration of the type.



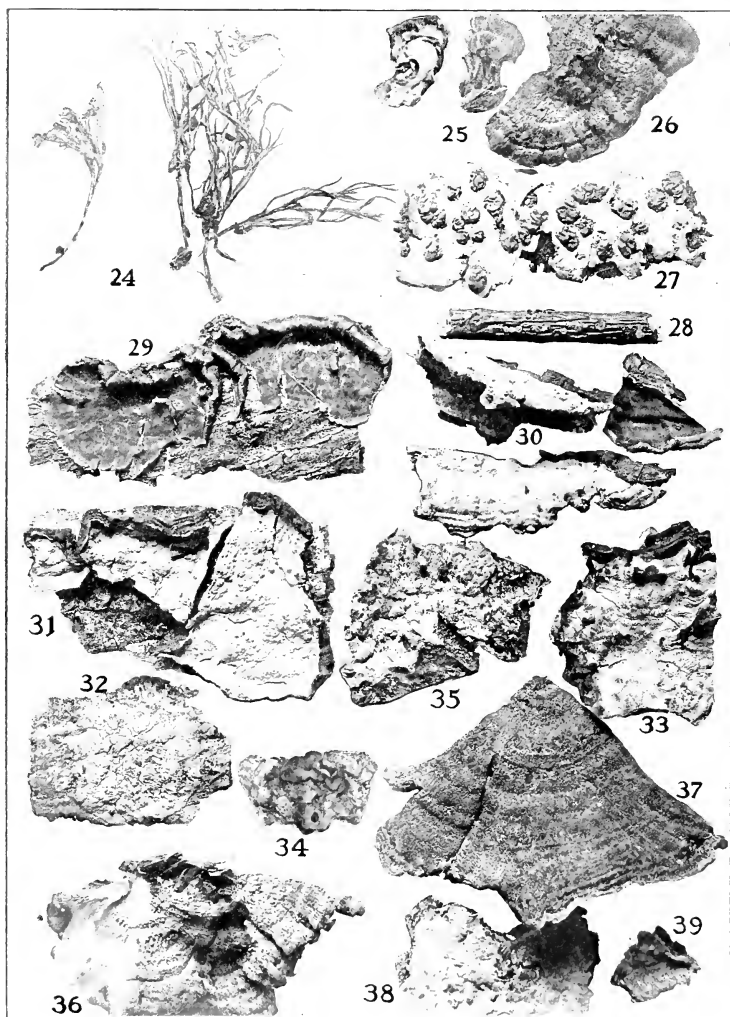
BURT-THELEPHORACEAE OF NORTH AMERICA

13-14. *STEREUM PALLIDUM*—15. *S. ELEGANS*—24. *S. DECOLORANS*—16. *S. RADICANS*—17. *S. PUSIOLUM*—18. *S. GLABRESCENS*—19. *S. FISSUM*—20. *S. CYPHELLOIDES*—21. *S. HARTMANNI*—22. *S. CRASPEDIUM*—23. *S. PETALODES*

EXPLANATION OF PLATE

PLATE 4

- Fig. 24. *S. proliferum*. Type.
Fig. 25. *S. caespitosum*. Type.
Fig. 26. *S. fuscum*. Specimen collected at Middlebury, Vt., by E. A. Burt.
Fig. 27. *S. rufum*. Specimen collected at Middlebury, Vt., by E. A. Burt.
Fig. 28. *S. Pini*. Specimen collected at Chocorua, N. H., by W. G. Farlow, 37.
Fig. 29. *S. purpureum*. Specimen collected at North Ferrisburg, Vt., by E. A. Burt.
Fig. 30. *S. rugosiusculum*. Specimen collected at Creve Coeur Lake, Mo., by E. A. Burt.
Figs. 31 and 32. *S. Murrayi*. Fig. 31, old reflexed specimen collected at Grand View Mt., Vt., and Fig. 32, resupinate specimen collected at Ripton, Vt., both by E. A. Burt.
Fig. 33. *S. saxitas*. Type.
Figs. 34 and 35. *S. styracifluum*. Fig. 34, type; Fig. 35, specimen collected at Auburn, Ala., by F. S. Earle & C. F. Baker.
Fig. 36. *S. gausapatum*. Specimen collected at Toronto, Canada, by T. Langton.
Fig. 37. *S. australe*. Type.
Figs. 38 and 39. *S. rugosum*. Fig. 38, specimen collected at Ithaca, N. Y. by G. F. Atkinson; Fig. 39, reflexed specimen collected in Epping Forest, England, by E. A. Burt.



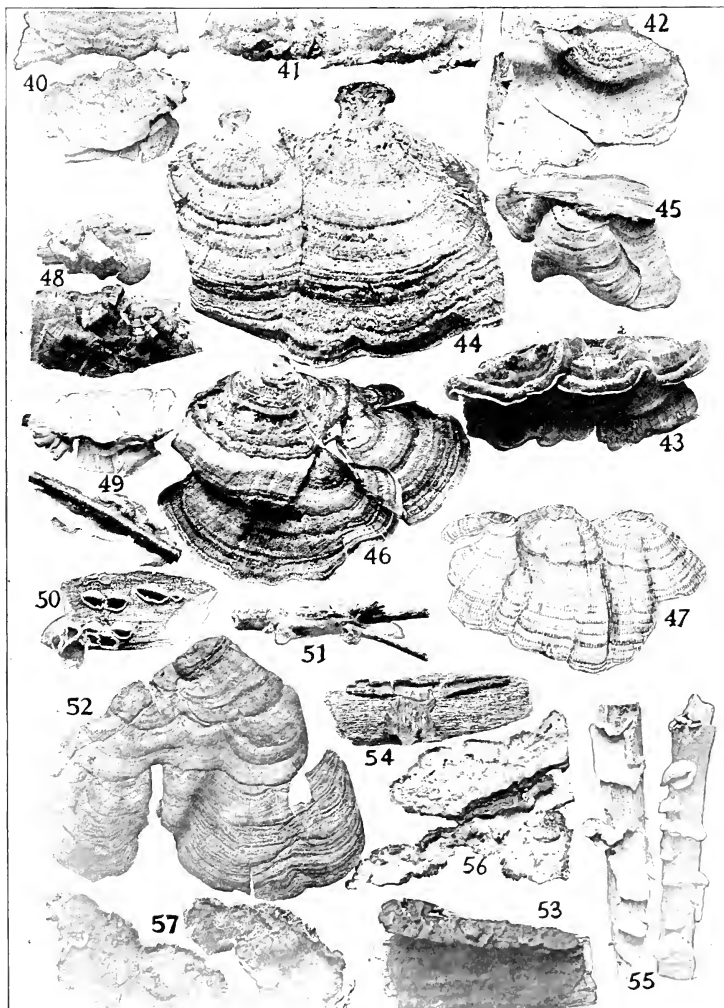
BURT -THELEPHORACEAE OF NORTH AMERICA

24. STERECUM PROLIFERUM 25. S. CAESPITOSUM 26. S. FUSCUM 27. S. RUFUM.—28. S. PINI
 29. S. PURPUREUM.—30. S. RUGOSUSCULUM 31. 32. S. MURRAYI 33. S. SAXITAS—34. 35. S. STY-
 RACIFLUM. 36. S. GAUSAPATUM. 37. S. AUSTRALE 38-39. S. RUGOSUM.

EXPLANATION OF PLATE

PLATE 5

- Fig. 40. *S. sanguinolentum*. Specimen collected in Little Notch, Vt., by E. A. Burt.
- Fig. 41. *S. sulphuratum*. Specimen collected at Auburn, Ala., comm. by F. S. Earle.
- Fig. 42. *S. hirsutum*. Specimen collected at Smugglers Notch, Vt., by E. A. Burt.
- Figs. 43-45. *S. fasciatum*. Fig. 43, young effuso-reflexed stage, and Fig. 44, old stage with attachment by umbos, both collected at Middlebury, Vt., by E. A. Burt; Fig. 45, specimen collected at Formosa, Japan, by S. Kusano, II. 16.
- Fig. 46. *S. lobatum*. Specimen collected at Lake City, Fla., by P. L. Ricker, 893.
- Fig. 47. *S. versicolor*. From Berkeley's illustration of the type.
- Fig. 48. *S. rameale*. Specimen collected at Arlington, Mass., by E. A. Burt.
- Fig. 49. *S. sericeum*. Specimen collected at Middlebury, Vt., by E. A. Burt.
- Fig. 50. *S. pubescens*. Type.
- Fig. 51. *S. conicum*. Type.
- Fig. 52. *S. vibrans*. Specimen collected at Rose Hill, Jamaica, by F. S. Earle, 303.
- Fig. 53. *S. radiatum*. Specimen collected at Harraby, Ontario, by E. T. & S. A. Harper, 636.
- Fig. 54. *S. patelliforme*. Type.
- Fig. 55. *S. ochraceo-flavum*. Specimen collected at Albany, N. Y., by H. D. House.
- Fig. 56. *S. abietinum*. Specimen collected at Smugglers Notch, Vt., by E. A. Burt.
- Fig. 57. *S. ambiguum*. Specimen collected at Ripton, Vt., by E. A. Burt.



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40 STEREOUM SANGUINOLENTUM—41 S. SULPHURATUM—42 S. HIRsutUM—43 45. S. FASCIA-
 TUM—46. S. LOBATUM—47. S. VERSICOLOR—48 S. RAMEALE—49 S. SERICEUM—50. S. PUBE-
 SCENS—51. S. CONICUM—52. S. VIBRANS—53 S. RADIATUM—54 S. PATELLIFORME—55. S.
 OCHRACEO-FLAVUM—56 S. ABIETINUM—57 S. AMBIGUUM.

EXPLANATION OF PLATE

PLATE 6

Fig. 58. *S. rugisporum*. Specimen collected at Flagstaff, Ariz., by W. H. Long, 21307.

Fig. 59. *S. umbrinum*. Specimen reflexed on both sides, collected at Valley Park, Mo., by E. A. Burt.

Fig. 60. *S. papyrinum*. Specimen on under side of a small limb and reflexed on both sides, collected at Alto Cedro, Cuba, by Underwood & Earle, 1481.

Fig. 61. *S. Earlei*. Type.

Fig. 62. *S. Chailletii*. Reflexed specimen collected at Albuquerque, N. M., by W. H. Long & P. W. Seay, 21313.

Fig. 63. *S. ferreum*. Reflexed specimen collected at Cinchona, Jamaica, by W. A. & E. L. Murrill, 458.

Fig. 64. *S. cinerascens*. Specimens collected at Middlebury, Vt., by E. A. Burt.

Fig. 65. *S. magnisporum*. Type.

Fig. 66. *S. spumeum*. Specimen collected at Cordoba, Mexico, by W. A. & E. L. Murrill, 1214.

Fig. 67. *S. erumpens*. Type.

Fig. 68. *S. sulcatum*. Type.

Fig. 69. *S. subpileatum*. Specimen collected at St. Martinville, La., by A. B. Langlois.

Fig. 70. *S. sepium*. Type.

Fig. 71. *S. albobadium*. Specimen collected at Seven Locks, Md., by P. L. Ricker, 1007.

Fig. 72. *S. heterosporum*. Type.

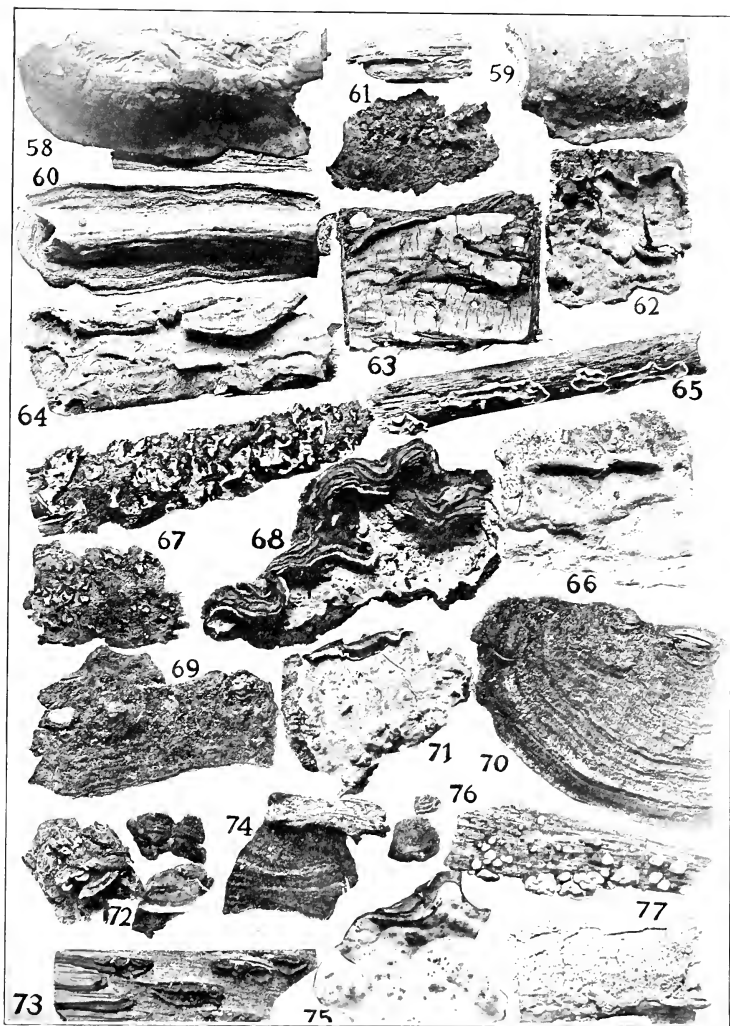
Fig. 73. *S. versiforme*. Specimen collected at White Plains, N. Y. by L. M. Underwood.

Fig. 74. *S. insigne*. Specimen collected in Florida by C. G. Lloyd, 4846.

Fig. 75. *S. durum*. Type.

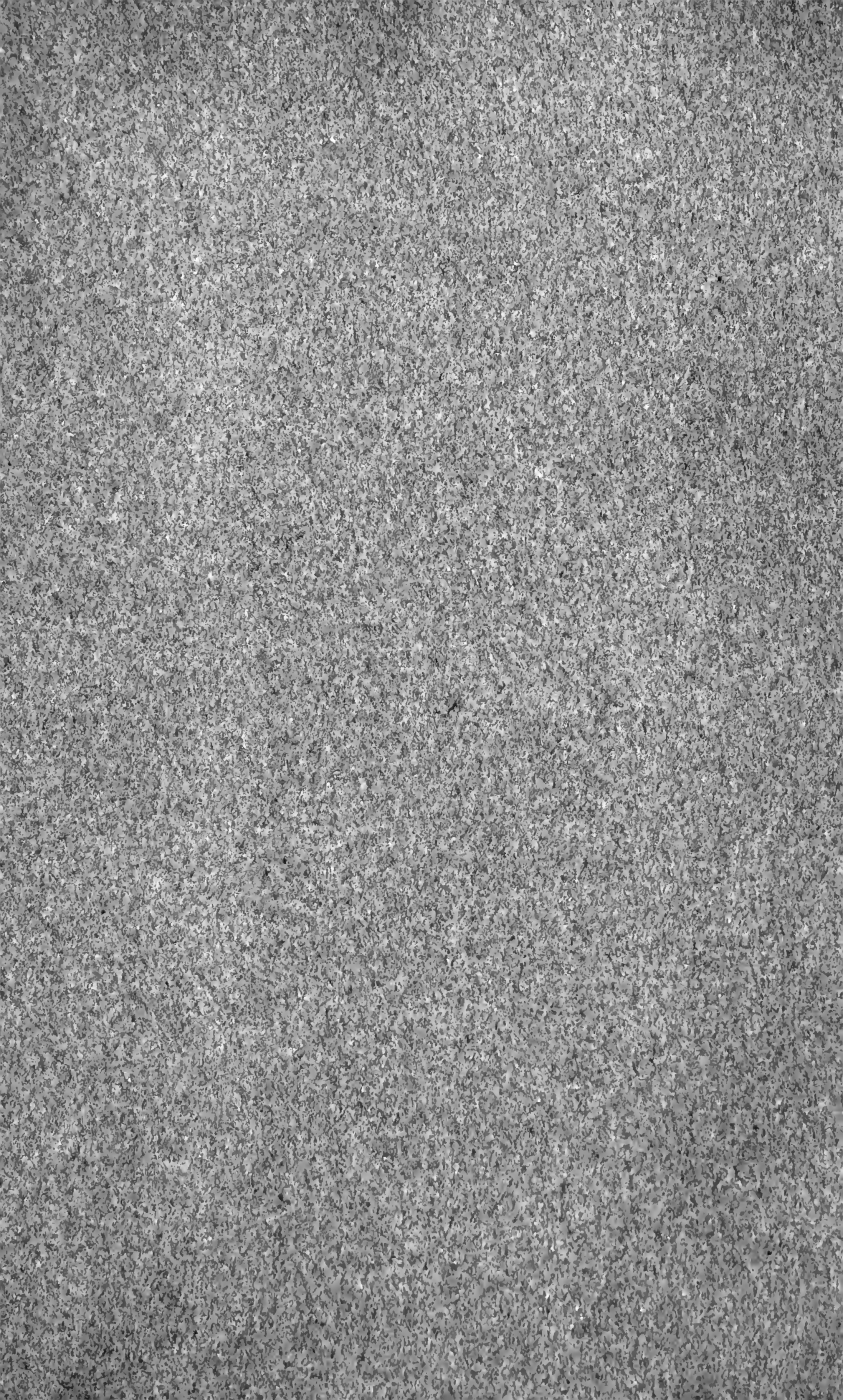
Fig. 76. *S. frustulosum*. Specimens collected at Creve Coeur, Mo., by E. A. Burt.

Fig. 77. *S. roseo-carneum*. Specimen collected at Arlington Heights, Mass., by E. A. Burt.



BURT THELEPHORACEAE OF NORTH AMERICA

58. *STERECUM RUGISPORUM* 59. *S. UMBRINUM* 60. *S. PAPYRINUM* 61. *S. EARLEI* 62. *S. CHALLETHI* 63. *S. FERREUM* 64. *S. CINERASCENS* 65. *S. MAGNISPORUM* 66. *S. SPUMIUM* 67. *S. ERUMPENS* 68. *S. SULCATUM* 69. *S. SUBPILEATUM* 70. *S. SEPIUM* 71. *S. ALBOBADIUM* 72. *S. HETEROSPORUM* 73. *S. VERSIFORME* 74. *S. INSIGNE* 75. *S. DURUM* 76. *S. FRUSTULOSUM* 77. *S. ROSEOCARNEUM*





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