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THE THELEPHORACEAE OF NORTH AMERICA. IX¹

ALEURODISCUS

EDWARD ANGUS BURT

*Mycologist and Librarian to the Missouri Botanical Garden
Professor in the Henry Shaw School of Botany of
Washington University*

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 amorpha* by Persoon, then transferred to *Thelephora* by Fries when known to be a basid-

¹ Issued September 20, 1918.

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 York2. *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 tips3. *A. Oakesii*
2. Spores minutely echinulate, apiculate; many paraphyses of bottle-brush form, none moniliform; sometimes resupinate; Jamaica to Grenada4. *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 yellow6. *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. cremeus*

8. Bottle-brush structure disorganized by KHO solution; spores $12-15 \times 9-12 \mu$; fructifications white, $60-90 \mu$ thick; on frondose wood in Cuba12. *A. tenuis*
8. Paraphyses flexuous, 6μ in diameter, some of them with a cluster of prongs at the tips; spores subglobose, $15-20 \mu$ in diameter; on *Tsuga* and *Pseudotsuga* in Idaho and westward.....13. *A. penicillatus*
8. Bottle-brush organs about $23 \times 12 \mu$, cockroach-shaped; spores subglobose, $6-12 \mu$ 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. **116**⁵ : *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 $500-1000 \mu$ thick, composed of densely interwoven, hyaline hyphae 3μ in diameter, granule-incrusted and with the granules crystalline and sometimes up to 12μ in diameter but not so numerous as to conceal the structure of the fructification; paraphyses hyaline, filiform, flexuous, often moniliform, $4-4\frac{1}{2} \mu$ in diameter; basidia clavate, large, $120 \times 18 \mu$, with four large sterigmata; spores subglobose with hyaline wall, minutely echinulate, $20-27 \times 16-21 \mu$.

Fructifications 1-3 and 4 mm. in diameter, $\frac{1}{2}$ -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*.

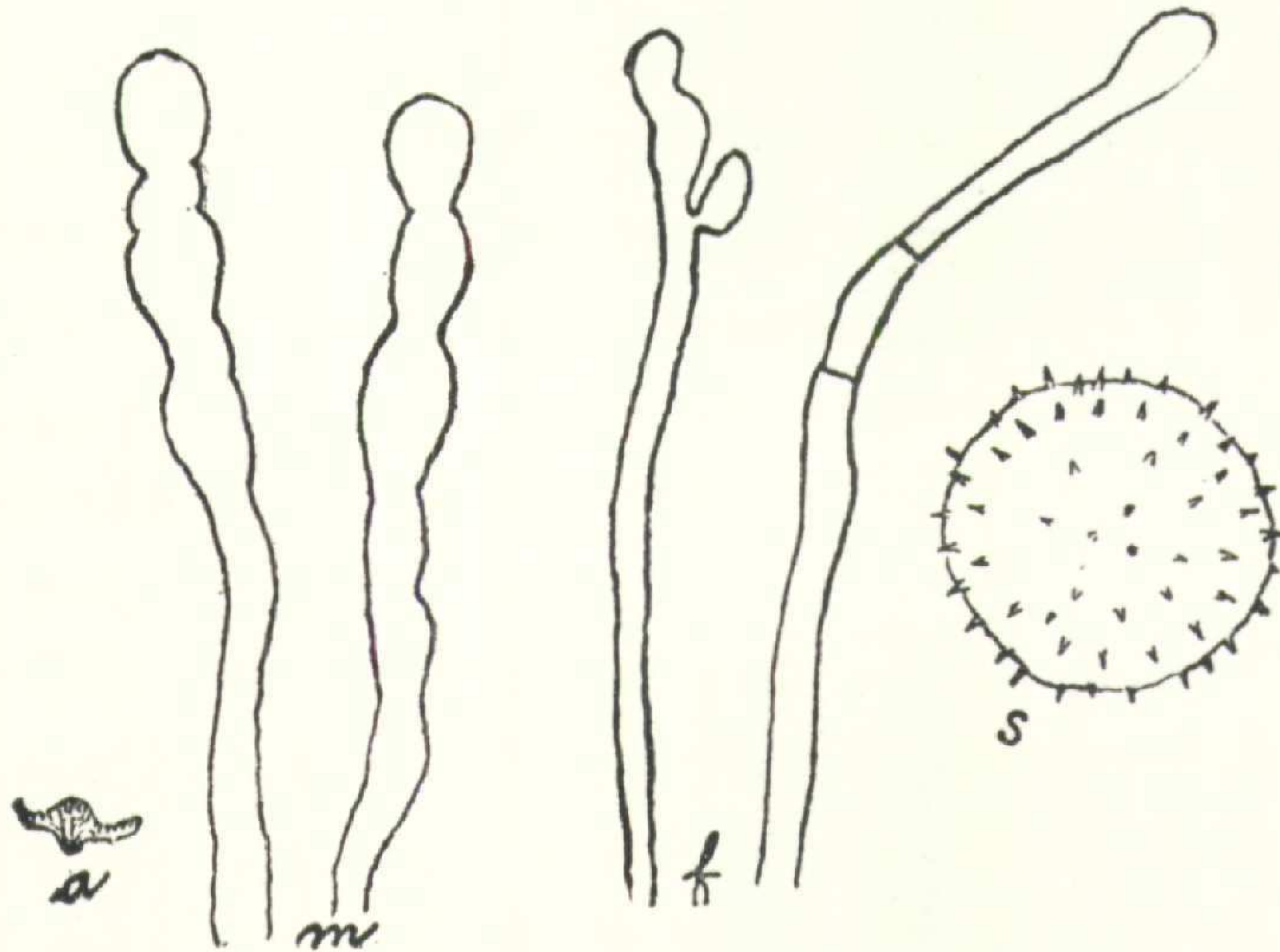


Fig. 1. *A. amorphus*. Section of fructification showing tubercular base of attachment, *a*, $\times 2$; moniliform paraphyses, *m*; flexuous paraphyses, *f*; and spore, *s*, $\times 870$.

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.

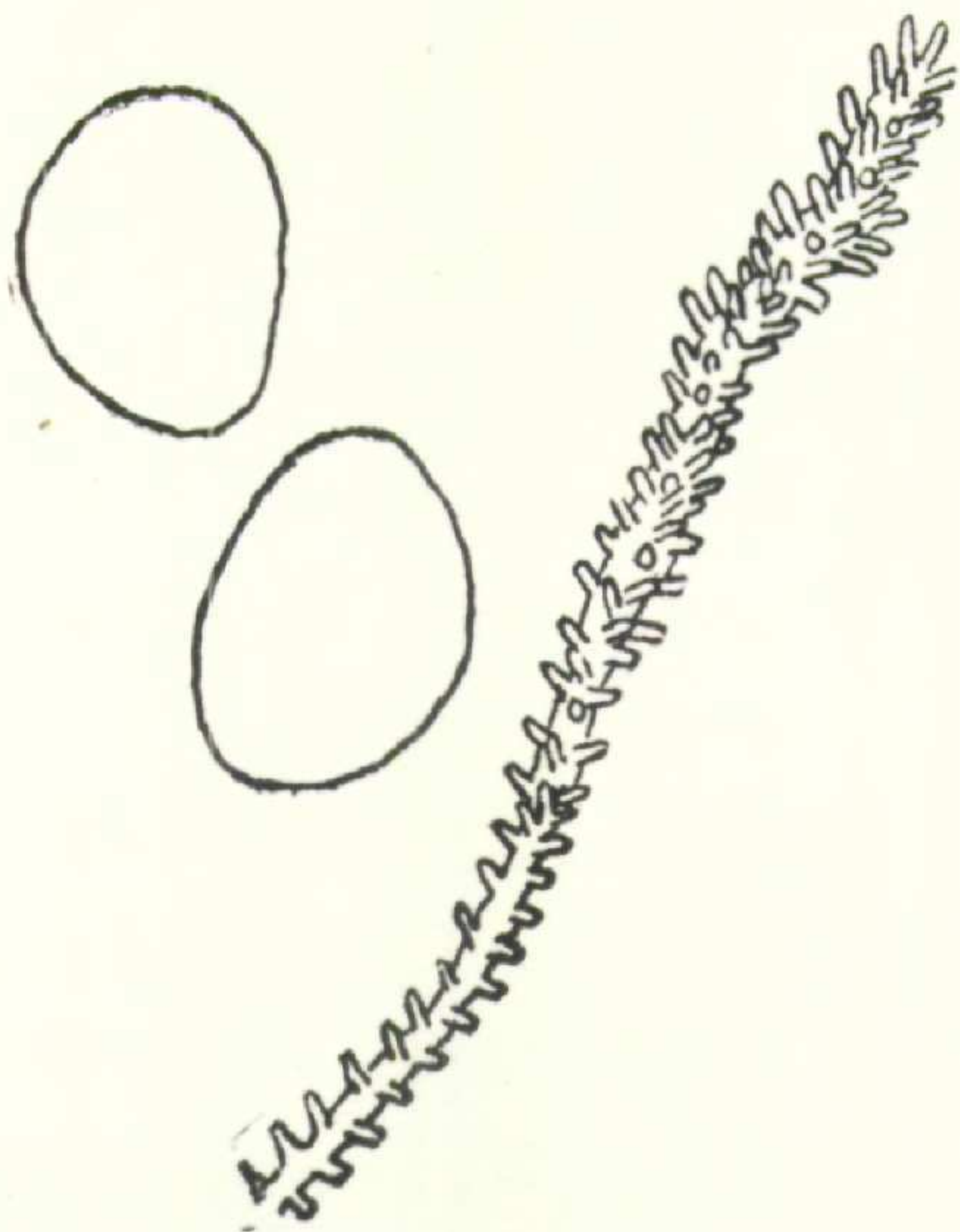


Fig. 2

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 'Hymenomycetes 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, unequal-lateral, apiculate, minutely echinulate, $20-25 \times 12-15 \mu$.

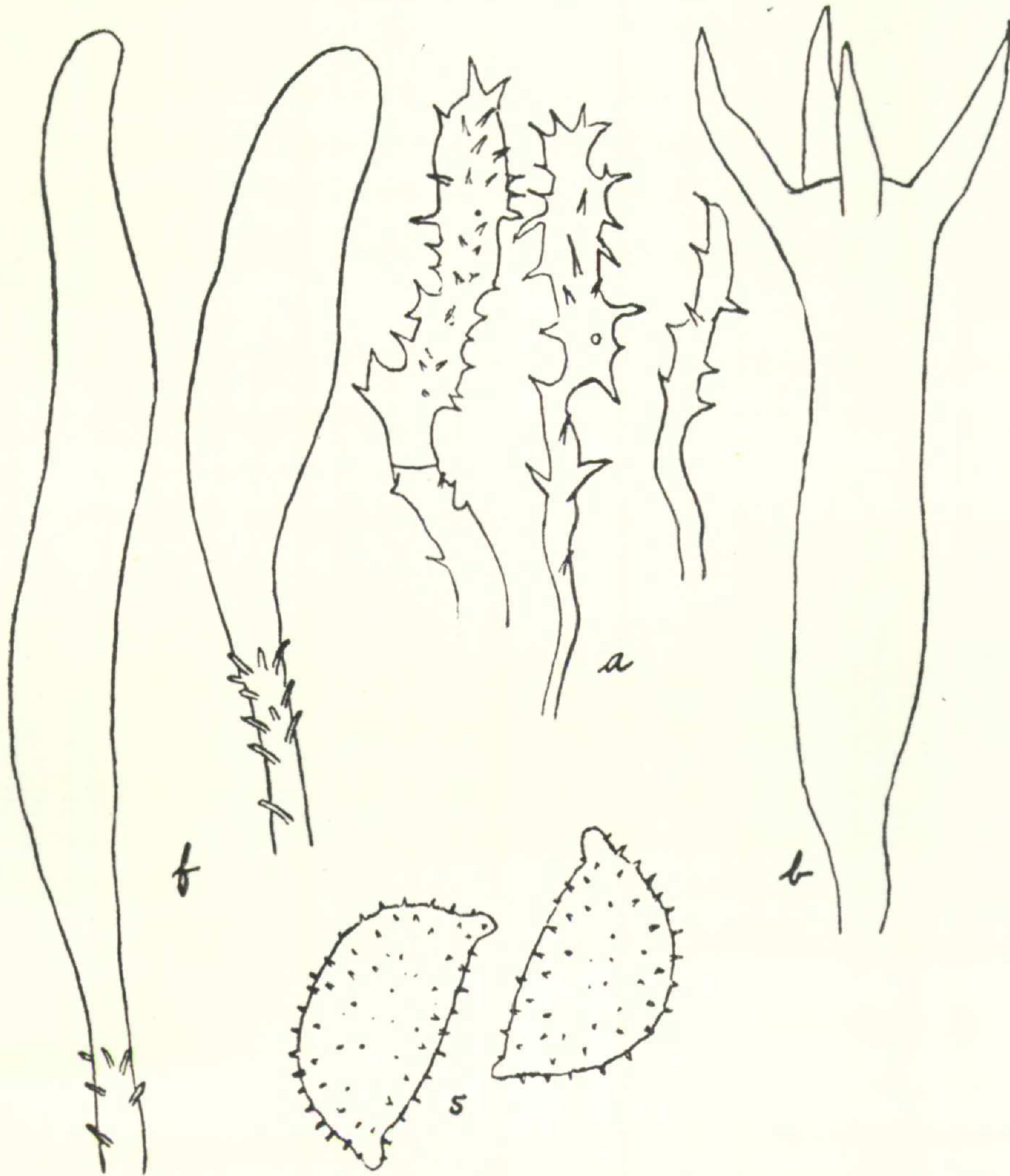


Fig. 4. *A. apiculatus*. Flexuous paraphyses, *f*; paraphyses with aculeate prongs, *a*; basidium, *b*; and spores, *s*. $\times 870$.

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, Epicr. 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.

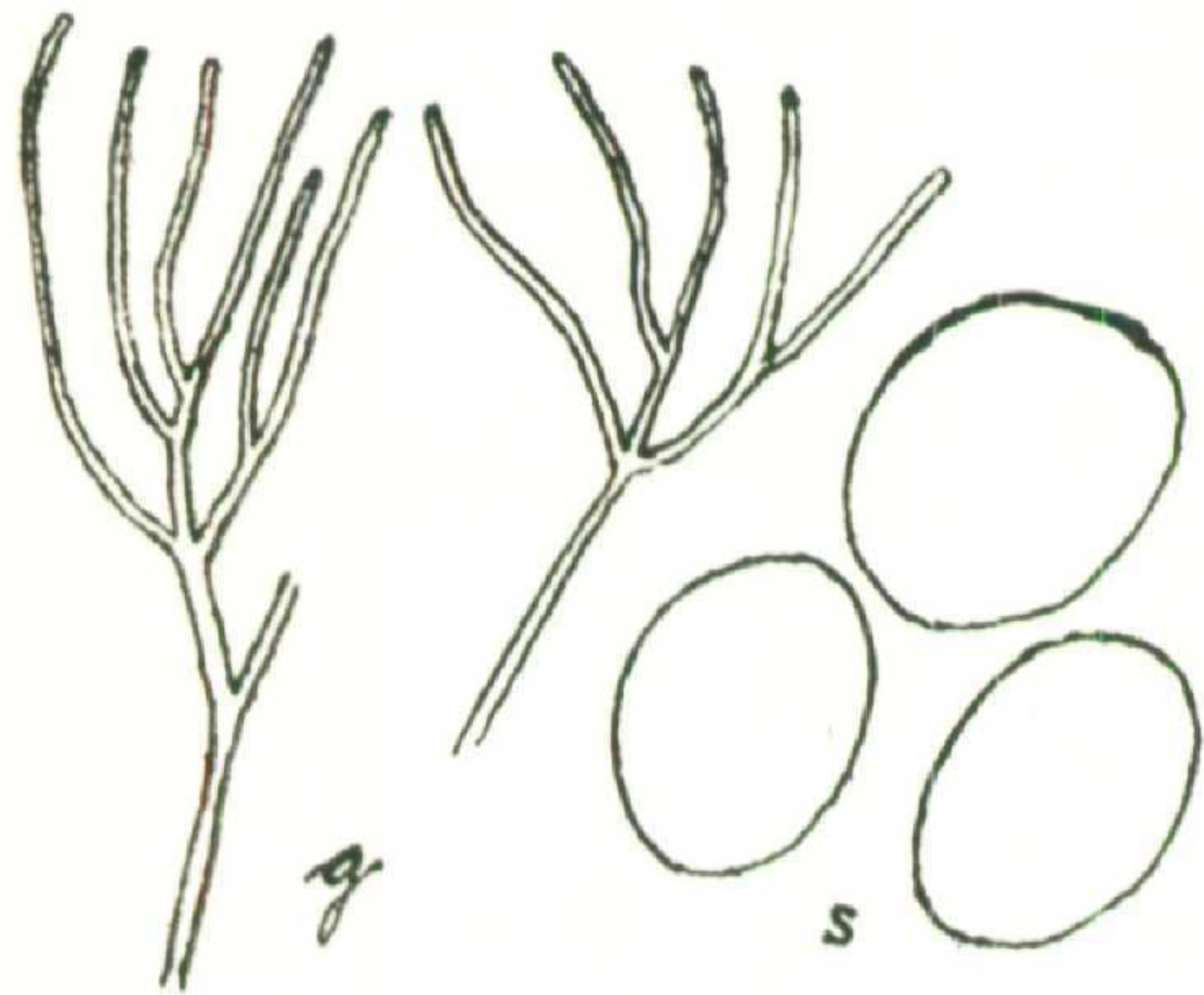


Fig. 5
A. candidus.

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, suberect, 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).

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

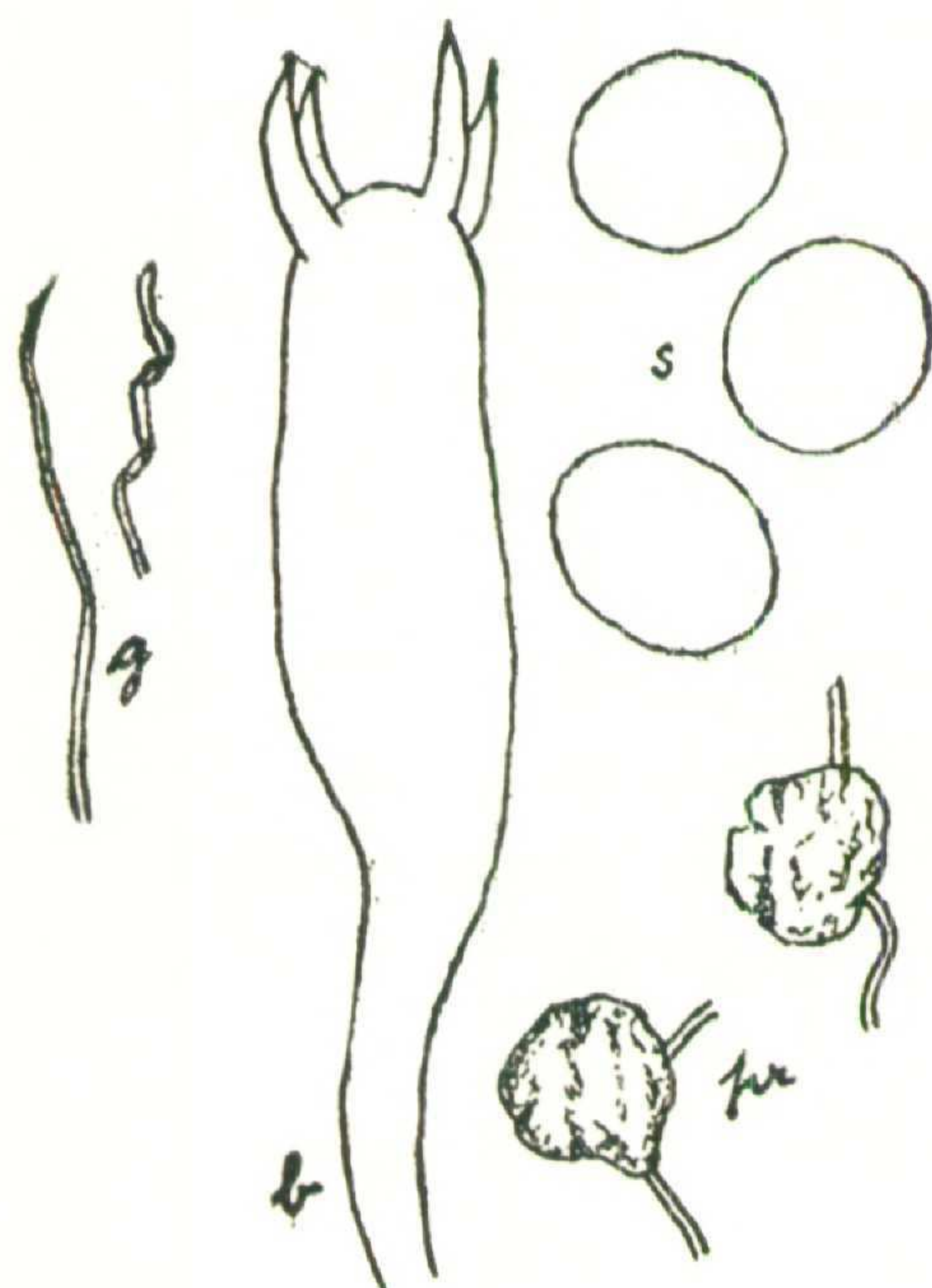


Fig. 7

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 9½–13 μ ; globose organs of proteid reaction, 6–15 μ in diameter, with shriveled

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 incrusted 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. Murrill*, 1155, N. Y. Bot. Gard. (in Mo. Bot. Gard. Herb., 55453).

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

Jamaica: Cinchona, *W. A. & Edna L. Murrill*, 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; Masee, 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 anti-mony-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-

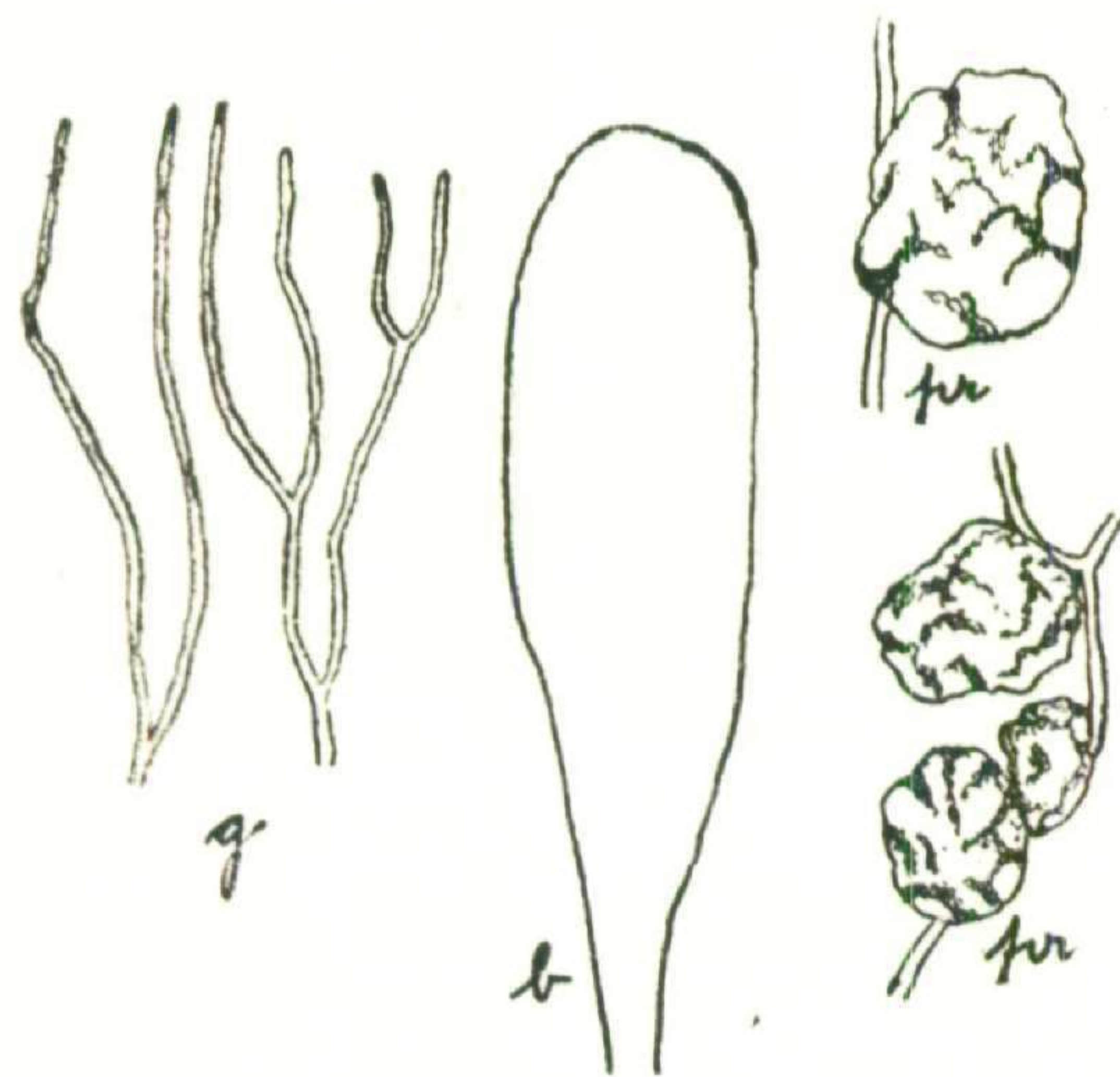


Fig. 6

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

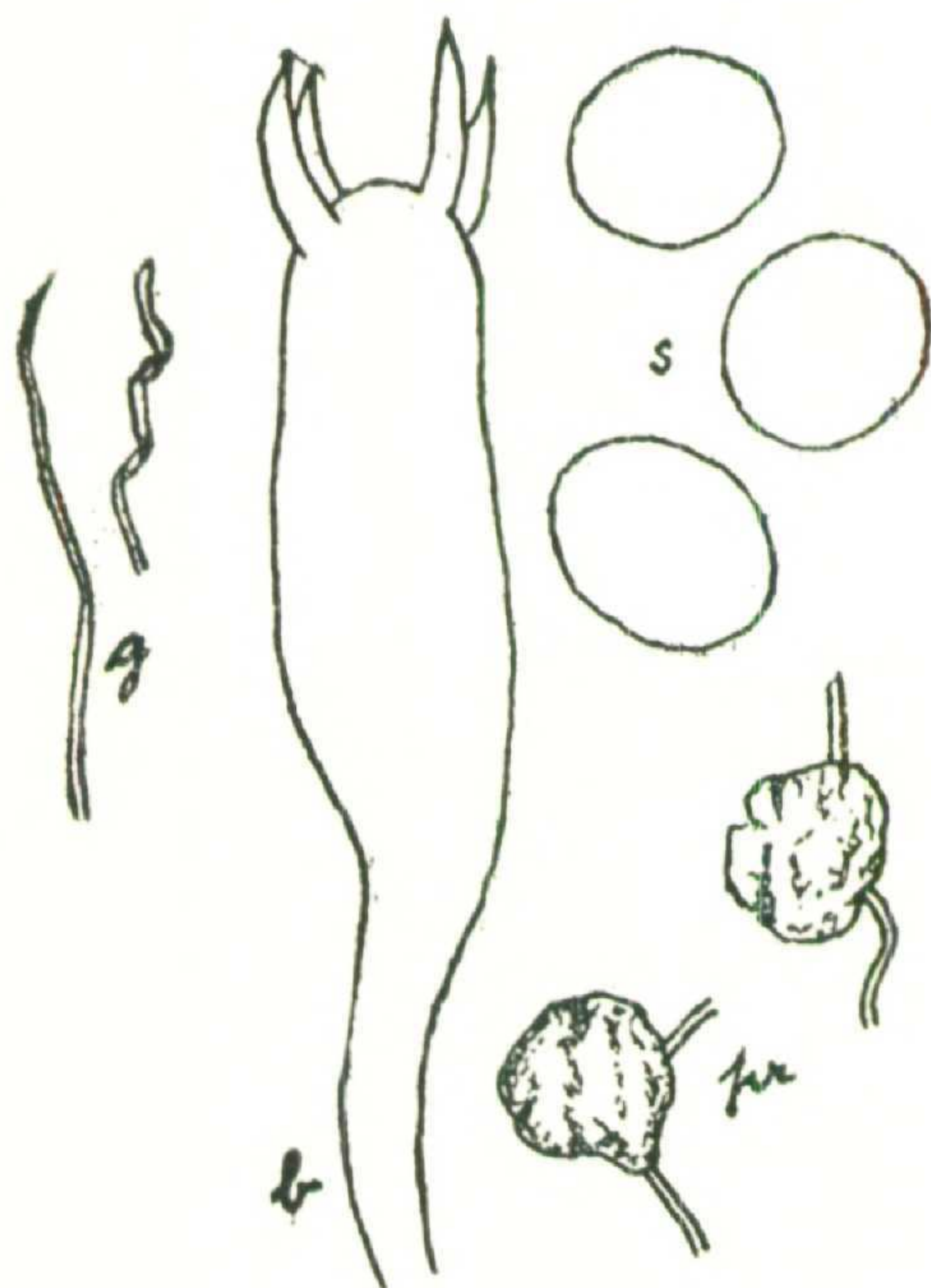


Fig. 7

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 9½–13 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 cylindric 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 ;

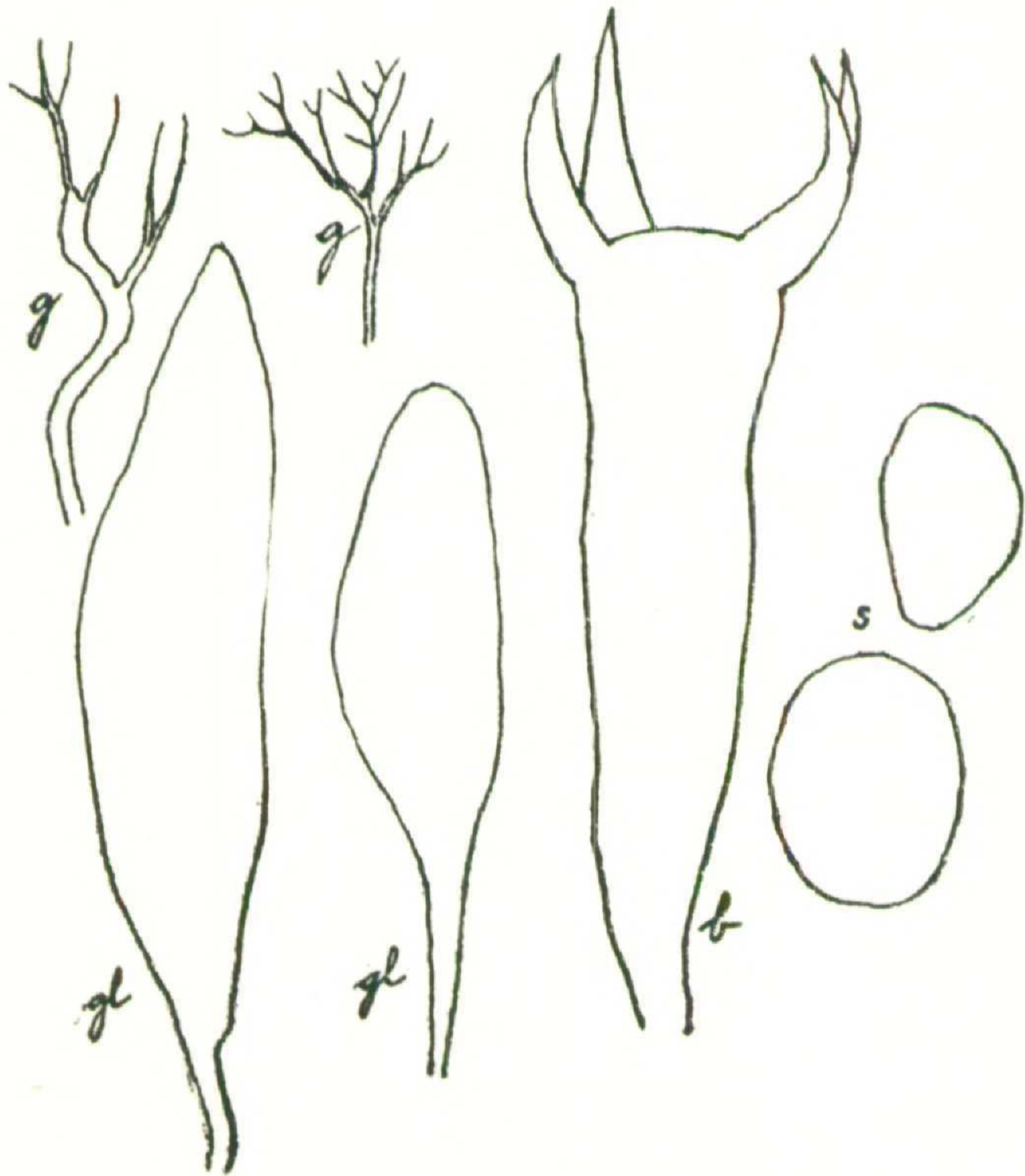


Fig. 8. *A. nivosus*. Granule-bearing paraphyses, *g*, after removal of the granular matter by HCl; gloeocystidia, *gl*; basidium, *b*; spores, *s*. $\times 870$.

cystidia clavate, hyaline, even, 18–30 \times 9 μ ; paraphyses about 2–3 μ in diameter under the incrustation, cylindrical, 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.

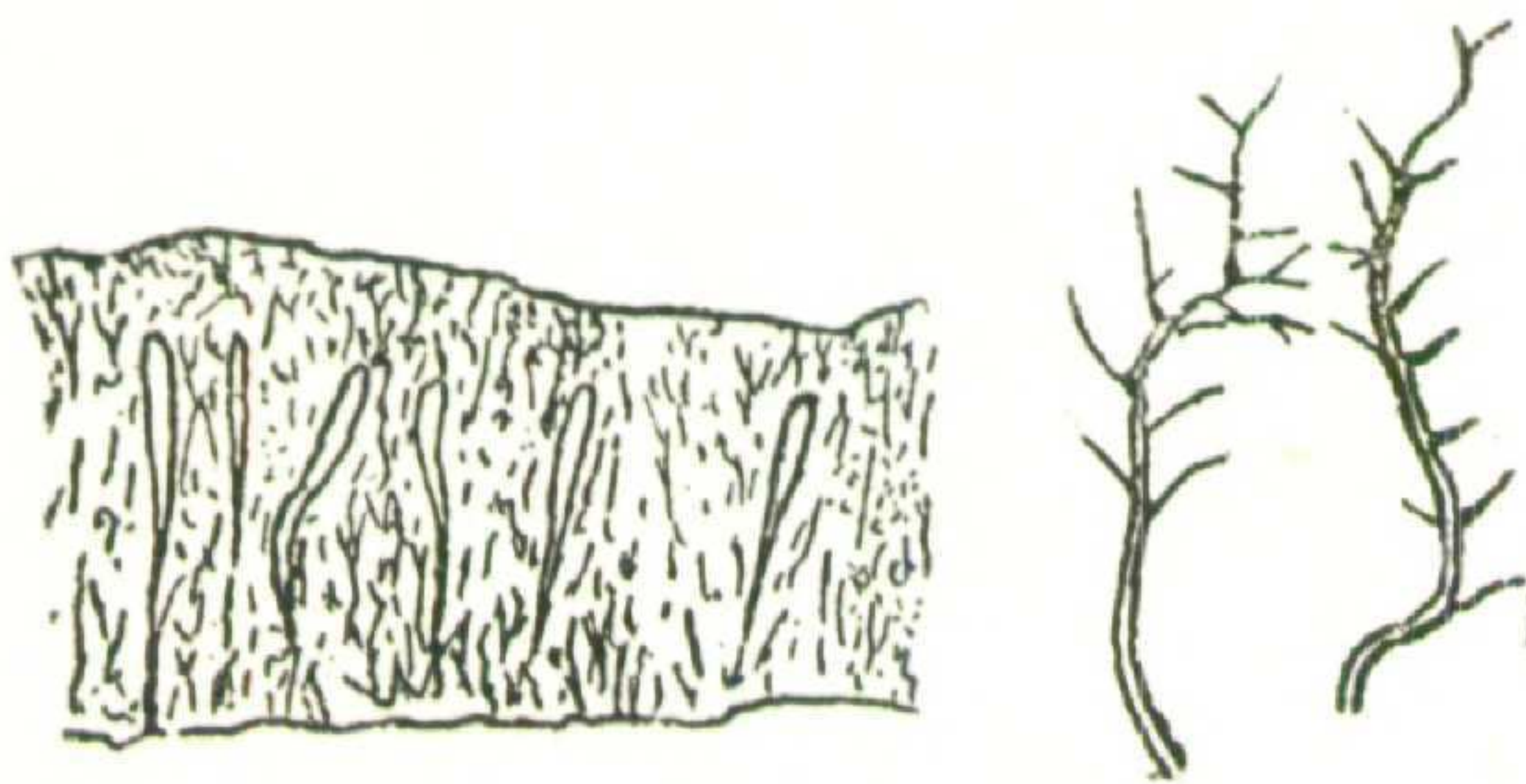


Fig. 9

A. acerinus.

Vertical section of fructification showing scattered immature basidia and absence of gloeocystidia, $\times 92$; 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 incrusted, 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 gloeocystidia 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: Cocoanut 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.

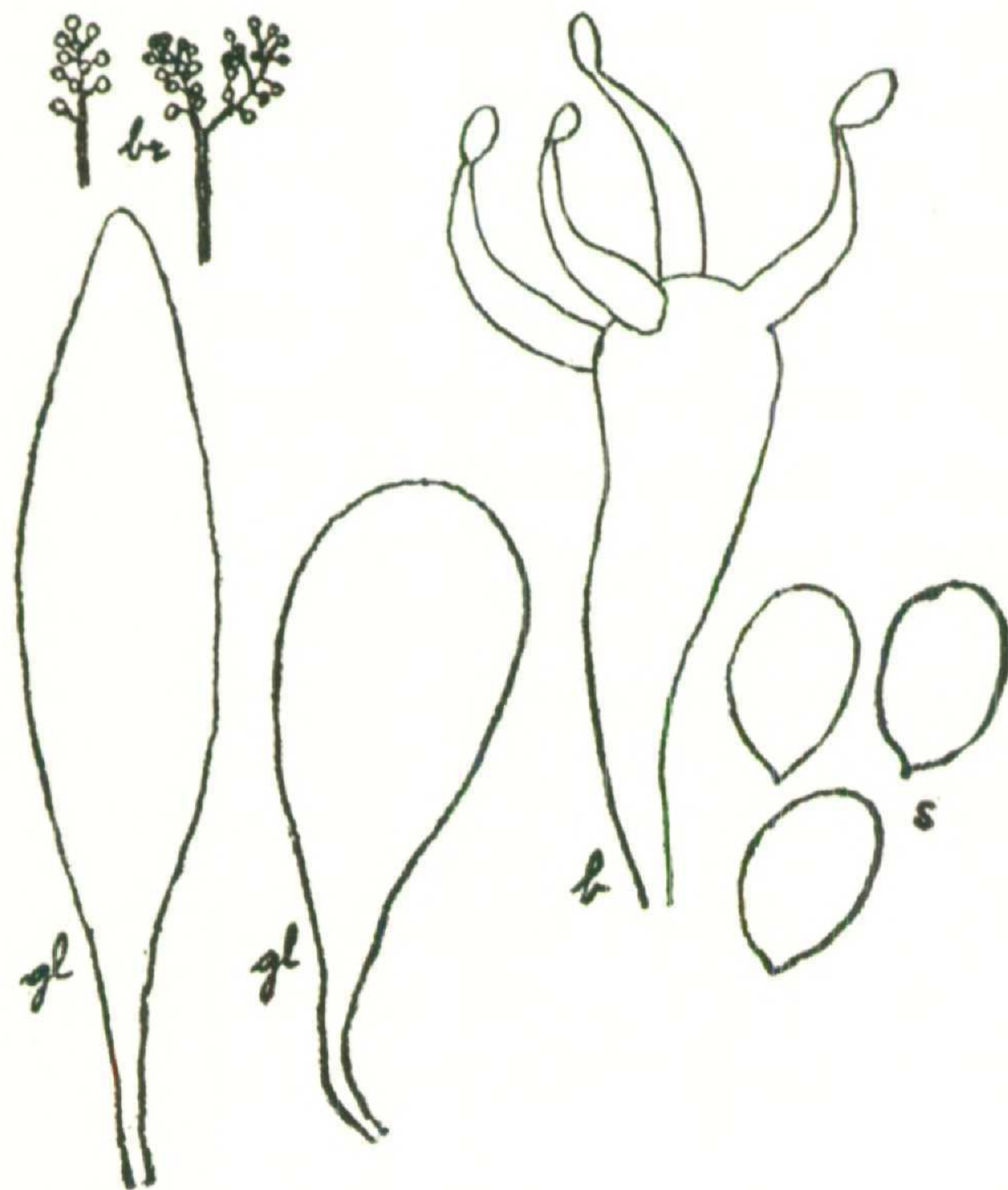


Fig. 10. *A. botryosus*. Racemose paraphyses, *br*; gloeocystidia, *gl*; basidium, *b*; and spores, *s*. $\times 870$.

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

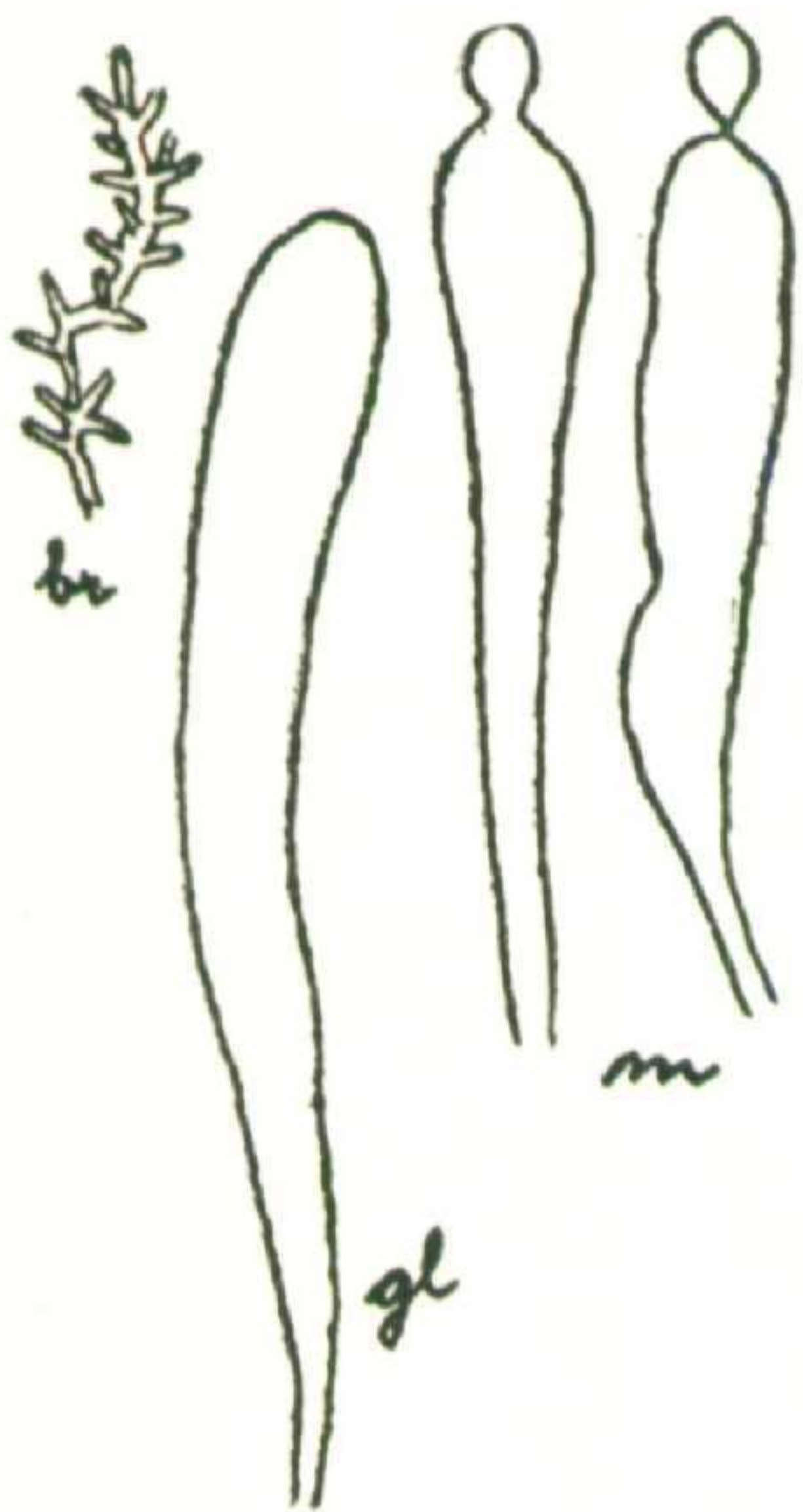


Fig. 11

A. cremeus.

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

Fructifications at first 2-5 mm. long, about $1-2\frac{1}{2}$ mm. broad, becoming confluent into masses 5 cm. long, $1-1\frac{1}{2}$ 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 $60-90\ \mu$ thick, composed of two kinds of densely arranged, erect organs which start from the substratum and extend to surface of hymenium — (1)

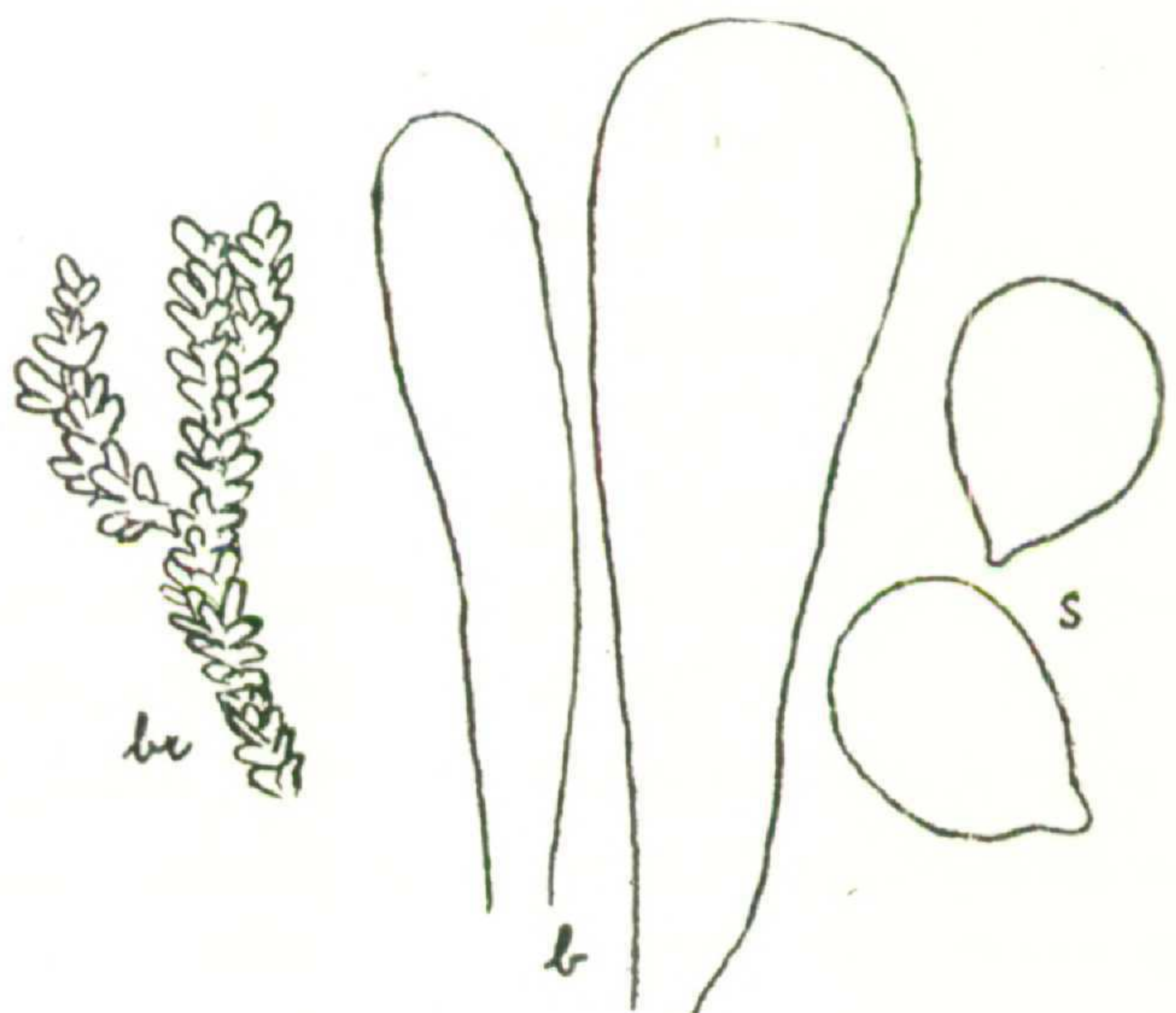


Fig. 12

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 incrusted; 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-