

Taxonomic and Distributional Notes on  
Corticiaceae (Homobasidiomycetes,  
Aphylophorales) of the Southern Appalachians  
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Abstract

Taxonomic and distributional information is presented along with descriptions and illustrations of eight species in the family Corticiaceae (Homobasidiomycetes, Aphylophorales). These species demonstrate several distributional patterns exhibited by many other species of the Corticiaceae in the southern Appalachians. A new combination is proposed for *Corticium filamentosum* Berk. et Curt.

Introduction

The Corticiaceae, a heterogenous family of the Homobasidiomycetes, primarily encompasses lignicolous resupinate fungus species that are usually associated with the decay of woody substrates. In nature some of these species fruit on both softwood and hardwood substrates, but others prefer one or the other. In rare instances a fungus species will fruit only on one or more species of a particular higher plant genus, as is the case with two treated in this paper.

Little (1970) pointed out that no genera of trees are restricted in their distribution to the southern Appalachians. The woody flora of this region is composed of convergences of the northern hardwood, spruce-fir, piedmont, coastal plain, and Ozark associations (Little, 1970). The hardwood flora extends west, though interrupted, into the arid southwest where *Platanus*, *Juglans*, *Fraxinus*, *Quercus*, and other hardwood genera, present in the southern Appalachians, occur along the wetter stream beds and washes. The higher plant distribution allows for a similar distribution of fungus species when moisture, temperature, or other environmental conditions are not limiting to the fungus. The intermingling of these various floras in the southern Appalachians produces an enormous variety of available substrate types. As a result, the fungal floras of these particular regions extend into and are consolidated into a restricted geographic area in the southern Appalachians. Coker (1921) reported a number of resupinate species from the

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southern Appalachians and Burt (1914-26) sampled some of the area. But except for the work of these two early mycologists, little information is available on the species makeup of the corticiaceous flora of this region. As a result, accurate distributional data on genera and species of the Corticiaceae from the southern Appalachians is extremely difficult to obtain and is at best inaccurate.

In view of this it seems that the best approach is to describe and to discuss some individual species which occur in the southern Appalachians and demonstrate several distributional patterns found in the Corticiaceae.

## Materials and Methods

For the descriptive treatments of the species demonstrating these distributional patterns, morphological data were recorded and structures illustrated from squashed, freehand, or microtome sectioned mounts of tissues in 2% KOH with 1% aqueous phloxine added. Mounts were also made in Melzer's reagent (Ainsworth, 1971) to determine dextrinoid or amyloid reactions and in lactophenol-cotton blue (Stevens, 1974) to test for the cyanophilous reaction. Photomicrographs were prepared with a camera mounted on a Zeiss WL microscope. Line drawings were prepared with a Zeiss drawing tube. Color notations are those of Kornerup and Wanscher (1967) with the notation reading plate number, vertical column, and horizontal column, respectively. The herbarium abbreviations are those of Holmgren and Keuken (1974).

*Aleurodiscus mirabilis* (Berk. et Curt.) Hoehn. et Litsch., K. Akad. Wiss. Wien Math.-nat. Kl. Sitzungsab. 118:818, 1909. (Figs. 1a, 2a-g)

Basidiocarps at first cupulate, becoming effused and confluent with adjacent ones (Fig. 1a), up to 2 cm in extent, each arising from and attached at one point; margin reflexed, white, pubescent; upper surface white, pubescent to tomentose; hymenium smooth to granular under a lens, near light orange (6A4) when fresh, paler to cream on drying.

Basidiocarps 500-750  $\mu\text{m}$  thick; abhymenial surface a *textura intricata*, hyphae antlerlike (Fig. 2d), densely intertwined, hyaline, smooth, thick-walled, sometimes obliterating lumen, clamped; margin of similar hyphae (Fig. 2b) but unbranched, with toothlike processes protruding from axis, curving away from apex of hyphae; hyphal

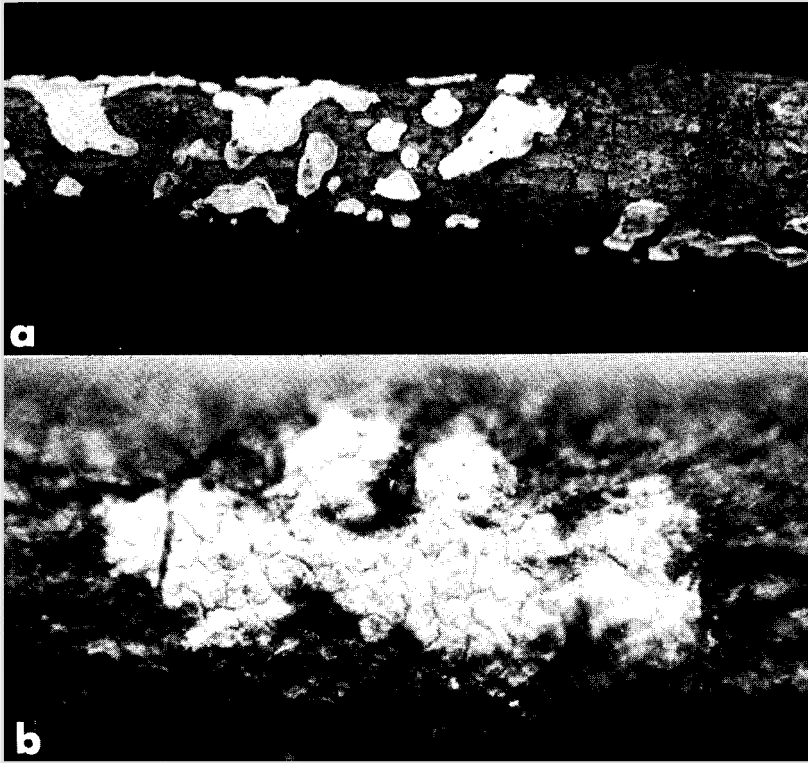


Fig. 1. Photographs of basidiocarps. *a*: *Aleurodiscus mirabilis* HHB 2274,  $\times 2.5$ ; *b*: *Aleurodiscus penicillatus* HHB 2287,  $\times 6$

system monomitic, subiculum a *textura intricata*, hyphae (Fig. 2a) thin-walled or with slight wall thickening, clamped, hyaline, 2–5  $\mu\text{m}$  diam, smooth; acanthophyses (Fig. 2e) mostly cylindrical, 5–8  $\mu\text{m}$  broad, thick-walled, most bearing prongs over most of length, hyaline, prongs variable in length, up to 7  $\times$  1  $\mu\text{m}$ ; some acanthophyses narrowly clavate, thin-walled, 75–100  $\times$  10–12  $\mu\text{m}$ , sometimes lacking prongs; cystidia (pseudocystidia; Fig. 2g) 75–200  $\times$  8–12(–14)  $\mu\text{m}$ , nearly hyaline in KOH, reaction in sulfuric-benzaldehyde variable, some becoming blue, others not reacting, smooth, thin-walled to slightly thick-walled, clamped at base; basidia (Fig. 2c) broadly clavate, 60–180  $\times$  11–26  $\mu\text{m}$ , with large oil droplets, thin-walled, hyaline, clamped at base, 4-sterigmate, sterigmata up to 17  $\mu\text{m}$  long, up to 6.5  $\mu\text{m}$  diam at base; basidiospores at first smooth and pip-shaped, becom-

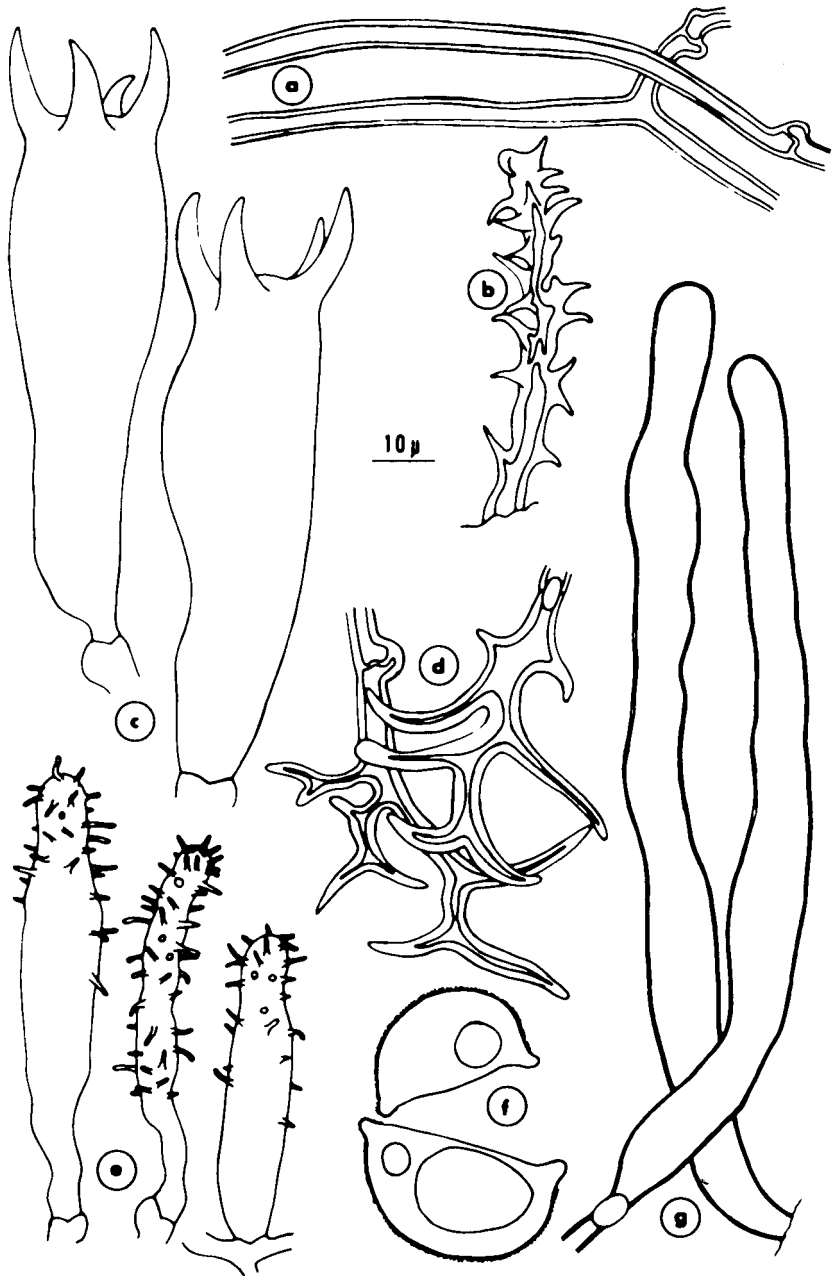


Fig. 2. Line drawings of microscopic characters of *Aleurodiscus mirabilis*. *a*: subicular hyphae; *b*: hyphae of margin; *c*: basidia; *d*: hyphae of abhymenial surface; *e*: acanthophyses; *f*: basidiospores; *g*: cystidia

ing citriform (Fig. 2f), biapiculate, strongly amyloid,  $23\text{--}29 \times 13\text{--}17 \mu\text{m}$ , with narrow amyloid spines  $1\text{--}2.5 \mu\text{m}$  long on abaxial surface and apical apiculus, adaxial surface smooth and amyloid, other apiculus attached to sterigma, negative in Melzer's reagent, apiculae rounded,  $2\text{--}2.5 \mu\text{m}$  long and broad.

### *Specimens Examined*

North Carolina—Macon County, on *Rhododendron* sp. (rhododendron): HHB 2274, 2289, and 2290, Cullasaja River at Turtle Creek Rd., Nantahala Natl. Forest; HHB 2418, Rhododendron Trail, Highlands Biol. Sta. (all CFMR).

### *Remarks*

*Aleurodiscus mirabilis* is considered uncommon by Lemke (1965), occurring only on *Rhododendron*. It is, however, common on *Rhododendron* species, probably throughout the distribution of *Rhododendron*. The fungus occurs on the dead branches that remain on living plants. Two additional observations not included in Lemke's (1965) work are the fact that the fresh hymenium has a definite orange pink color which disappears on drying, and that the cystidia (pseudocystidia) do not always react with sulfuric-benzaldehyde. The latter inconsistency may be a function of the "collective species" referred to by Lemke (1965), and as he suggests, culture studies are needed to solve this problem and others like it.

*Aleurodiscus penicillatus* Burt, Ann. Missouri Bot. Gard. 5: 201, 1918. (Figs. 1b, 3a–f)

Basidiocarps (Fig. 1b) effused, corticioid, beginning as small patches, becoming irregularly confluent, up to  $3 \times 0.5$  cm in extent; up to 0.5 mm thick, smooth, cream-buff to cream color, somewhat cracked, pruinose under a lens; margin irregular, pruinose, abrupt.

In section  $350 \mu\text{m}$  thick; hyphal system monomitic; subiculum a *textura intricata*, hyphae (Fig. 3e)  $2\text{--}3 \mu\text{m}$  diam, thin-walled, hyaline, septate, smooth or with scattered crystals, with clamps; cataphymenium composed of acanthophyses, cystidia (pseudocystidia), paraphysoid structures, and basidia; acanthophyses (Fig. 3c) cylindrical to clavate,  $30\text{--}100 \times 5\text{--}15 \mu\text{m}$ , thin-walled, hyaline, clamped at base, with hyphoid processes protruding from apex, processes up to  $6 \times 1 \mu\text{m}$ ;

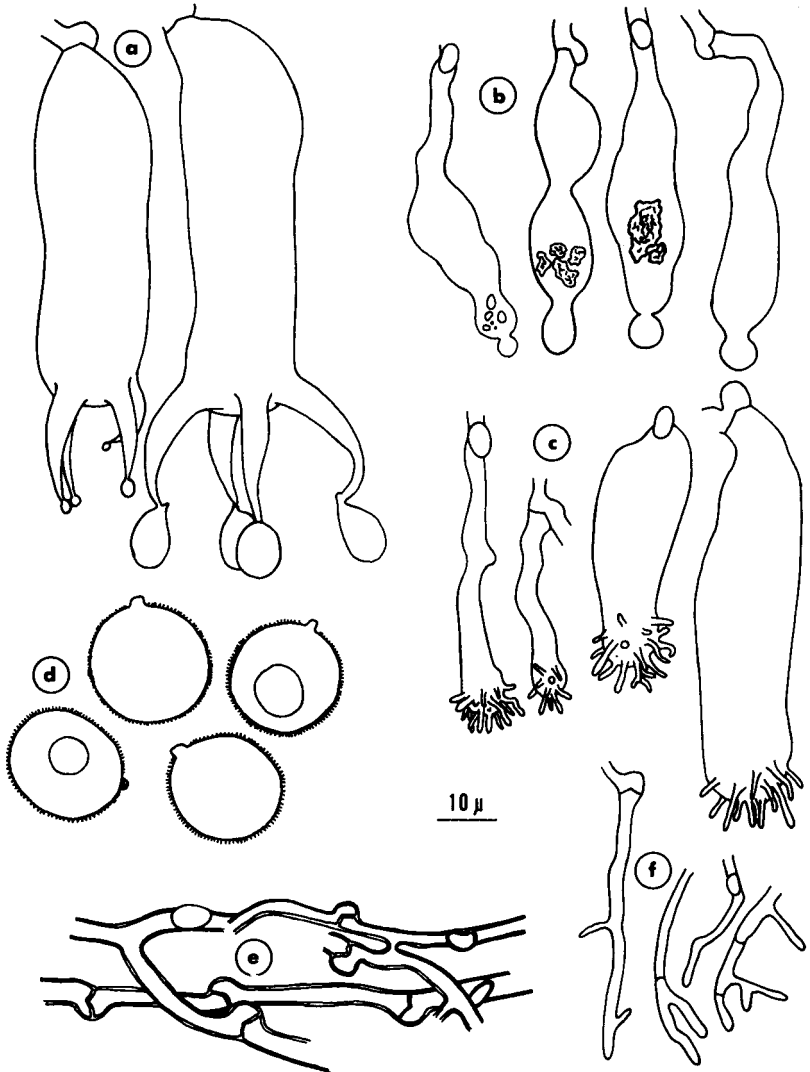


Fig. 3. Line drawings of microscopic characters of *Aleurodiscus penicillatus*.  
*a*: basidia; *b*: cystidia; *c*: acanthophyses; *d*: basidiospores; *e*: subicular hyphae;  
*f*: paraphysislike structures

cystidia (Fig. 3*b*) arising in subiculum, clavate, often moniliform or variously constricted at apex, thin-walled, hyaline, clamped at base, imbedded or protruding up to 10  $\mu\text{m}$ , often containing a yellow globule or crystalline inclusion; paraphysislike structures (Fig. 3*f*), simple or branched, 2–2.5  $\mu\text{m}$  diam, smooth, clamped, hyaline, thin-walled; basidia (Fig. 3*a*) clavate to nearly cylindrical, 50–90  $\times$  15–23  $\mu\text{m}$ , thin-walled, hyaline, 4-sterigmate, sterigmata up to 16  $\mu\text{m}$  long, 4–5  $\mu\text{m}$  wide at base; basidiospores (Fig. 3*d*), globose to subglobose, echinulate, 16–19  $\times$  14–18  $\mu\text{m}$ , thick-walled, with noticeable apiculus, amyloid, acyanophilous.

#### *Specimen Examined*

HHB 2287 on dead *Tsuga canadensis* (L.) Carr. (eastern hemlock) twigs, Cullasaja River at Turtle Pond Rd., Nantahala Natl. Forest, Macon County, North Carolina (CFMR).

#### *Remarks*

*Aleurodiscus penicillatus* is characterized by globose echinulate amyloid spores and the more or less penicillate arrangement of the hyphoid processes at the apex of thin-walled acanthophyses. Thin-walled acanthophyses of this type are also found in *A. fruticetorum* W. B. Cooke, but this species differs in possessing smooth spores and a dimittic hyphal system (Lemke, 1965). *A. penicillatus* has been collected on numerous conifers all across the northern part of North America but has never been reported south of New York State. The lack of specimens from the southern Appalachians is undoubtedly due to the lack of collecting in this region. Collecting on conifer substrates in the southern Appalachians will certainly result in additional collections of this species from the area. It is an example of the northern flora extending along the Appalachian chain into the southern Appalachians.

*Peniophora septocystidium* Burt, Ann. Missouri Bot. Gard. 12: 260, 1926. (Figs. 4*a*, 5*a-d*)

Basidiocarps (Fig. 5*d*) broadly effused, extending up to 8  $\times$  4 cm, hypochnoid, thin, somewhat discontinuous, surface pubescent to mealy, pale yellowish tan; margin thin, white, granular.

Hyphal system monomitic; subiculum a loose *textura intricata*, poorly developed or up to 250  $\mu\text{m}$  thick; hyphae (Fig. 5*b*) 4–6(–9)  $\mu\text{m}$

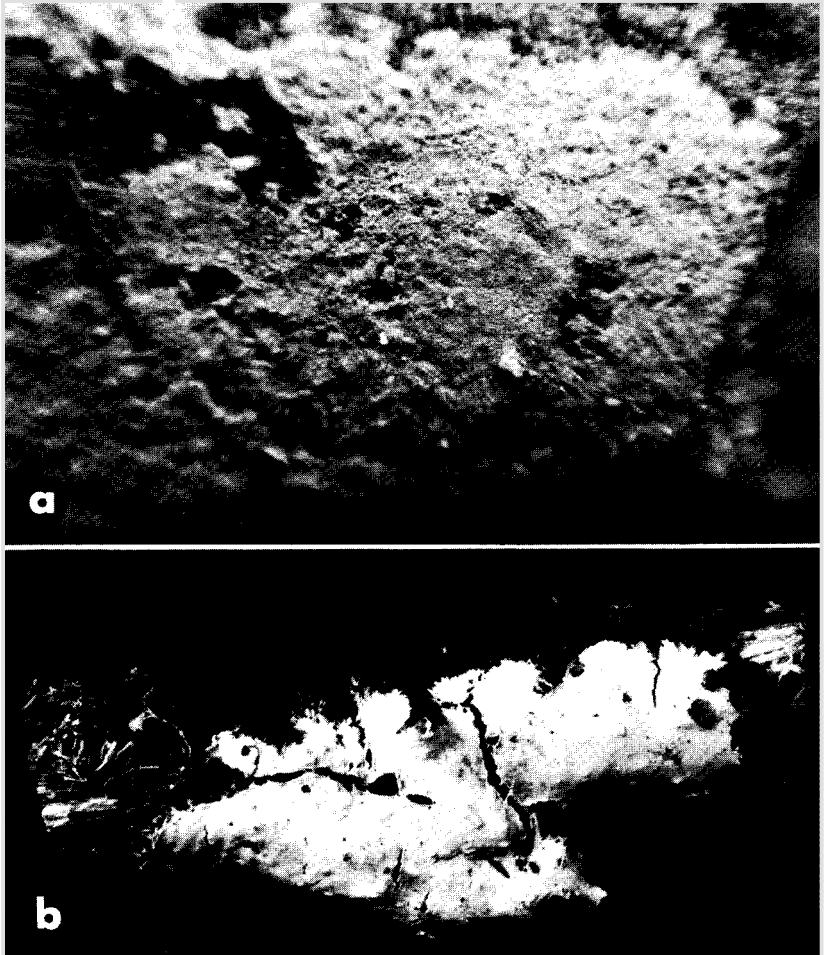


Fig. 4. Photographs of basidiocarps. *a*: *Peniophora septocystidium* HHB 4207,  $\times 4$ ; *b*: *Phanerochaete burtii* HHB 6574,  $\times 1.5$

diam, thin- to thick-walled (walls up to  $1.5\mu\text{m}$  thick), hyaline, septate, lacking clamps, noticeably constricted at septa, branching at wide angles, smooth or irregularly coated with yellow-brown granular to globular material; subhymenium often poorly developed, a dense *textura intricata*, hyphae short-celled,  $2.5\text{--}4\mu\text{m}$  diam, frequently branched, densely encrusted with yellow brown granular to globular material; hymenium composed of cystidia and basidia; cystidia (Fig.

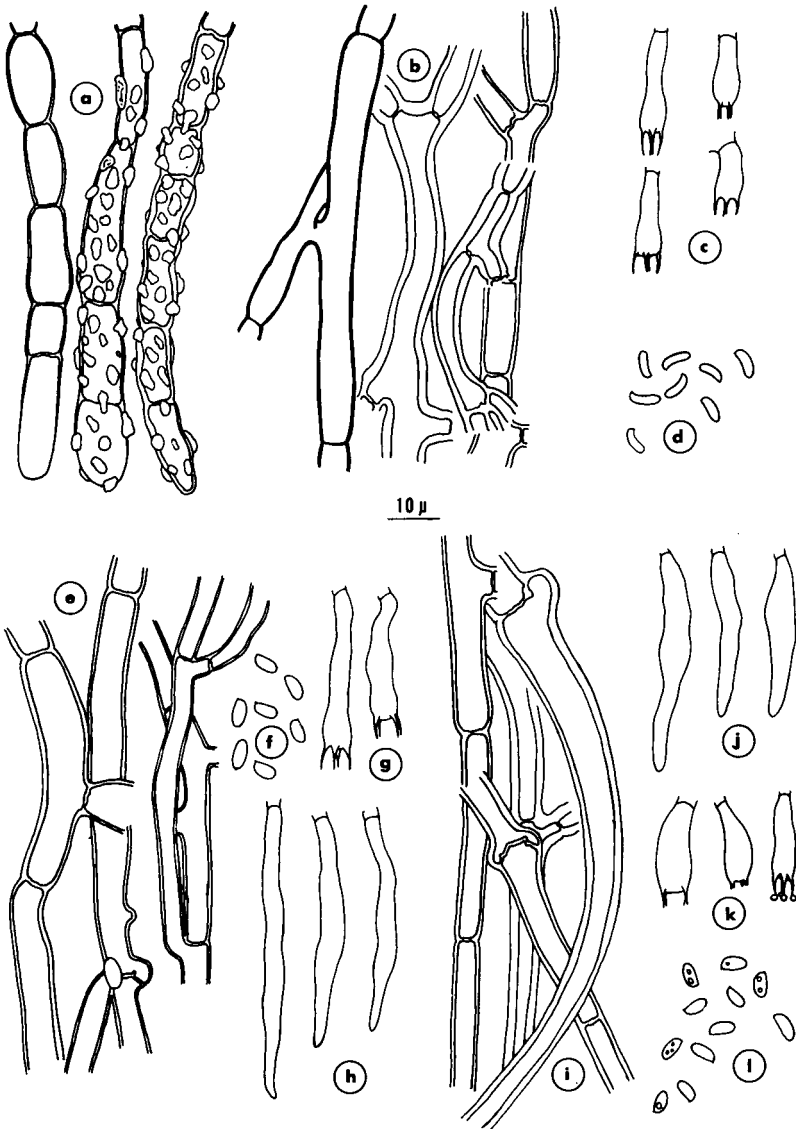


Fig. 5. Line drawings of microscopic characters. *Peniophora septocystidium* — a: cystidia; b: subicular hyphae; c: basidia; d: basidiospores. *Phanerochaete burtii* — e: subicular hyphae; f: basidiospores; g: basidia; h: cystidia. *Phanerochaete chrysorhizon* — i: subicular hyphae; j: cystidia; k: basidia; l: basidiospores

5a) arising in subiculum at all levels,  $60-150 \times 5-9(-12)\mu\text{m}$ , with many septa, short-celled, constricted at septa, lacking clamps, thick-walled (walls up to  $1.5\mu\text{m}$ ) or at least with slight wall thickening near origin and somewhat thickened over much of the length, apical cell with thinner walls, whole length covered with large orange-brown granular and globular material, protruding up to  $35\mu\text{m}$ ; basidia (Fig. 5c) broadly clavate,  $12-18 \times 4.5-5.5\mu\text{m}$ , hyaline, thin-walled, lacking clamp at base, 4-sterigmate, sterigmata  $3-4\mu\text{m}$  long; basidiospores (Fig. 5d) allantoid,  $4.5-6.5 \times 1.5-2\mu\text{m}$ , thin-walled, hyaline, negative in Melzer's reagent, acyanophilous.

#### *Specimens Examined*

Jamaica — Holotype, Murrill and Harris 840, Missouri Botanical Gardens 61490, Troy and Tyre, Cockpit Country, Jan. 12-14, 1909 (BPI). U.S.A. — North Carolina, HHB 4207 and 4208, on *Liriodendron tulipifera* L. (tulip poplar), Baxter Creek Trail, Great Smoky Mts. Natl. Park, Haywood County (CFMR); Tennessee, HHB 3884, on *Acer* sp. (maple), Jake's Creek Trail near Elkmont, Great Smoky Mts. Natl. Park, Sevier County (CFMR); Minnesota, RLG 9759, on *Populus balsamifera* L. (balsam poplar), Itasca State Park, Clearwater County (ARIZ, CFMR) and FP 100695 on *Populus* sp. (poplar), Itasca State Park (CFMR).

#### *Remarks*

*Peniophora septocystidium* is apparently a very rare species. This is only the second report of its occurrence, the type being collected in 1909 in Jamaica. This first report of this species in the United States is interesting because the species was found twice in two widely separated areas of the Great Smoky Mountains National Park. Also of note is that it occurred in a very dry year when fruiting was scarce. Two other specimens were collected at Lake Itasca, Minnesota, the same year as those in the Smokies. It was also a dry year there. The true disposition of this species is still in question, but it appears at best to be on the fringes of the genus *Phanerochaete*. A more appropriate placement is being sought.

*Phanerochaete burtii* (Rom. in Burt) Parm., Eesti NSV Taed. Akad. Toim. 16: 388, 1967 (Fig. 4b, 5e-f)

Basidiocarps (Fig. 4b) broadly effused, up to 0.5 mm thick; fertile area yellowish white (1A2) to light yellow (near 3A4) or grayish yellow

(4B4), smooth, cracking on drying to reveal subiculum, no reaction in 2% KOH; subiculum white, byssoid to fibrous, sometimes red in 2% KOH, extending beyond fertile area to form margin; margin fimbriate, white, becoming rhizomorphic; rhizomorphs up to 0.5 mm diam, some concolorous with fertile area, most light yellow (4A5) to yellowish orange (4A6), orange color disappearing in 2% KOH.

In section, 250–500 $\mu$ m thick; hyphal system monomitic; abhymenial surface not differentiated substantially from subiculum, if differentiated, then a *textura porrecta*, parallel to substrate, hyphae like those of subiculum; subiculum a *textura intricata*, hyphae (Fig. 5e) 3.5–7(–8) $\mu$ m, thin-walled to thick-walled (walls up to 1.5  $\mu$ m thick), hyaline, branching frequent, at nearly right angles, septate, mostly lacking clamps, single clamps infrequent, multiple clamps rare, encrusted with hyaline granules and yellow granules, not dissolving rapidly in 2% KOH; subhymenium a compact *textura porrecta*, thin, hyphae 2.5–4.5 $\mu$ m diam, thin-walled, hyaline, short-celled, septate, lacking clamps, frequently branched; rhizomorphs composed of *textura intricata*, rind poorly differentiated, hyphae 4–7 $\mu$ m diam, like those of subiculum, but walls yellow-tinted and with yellow granular encrustation, not dissolving in KOH, hyphal walls turn red in 2% KOH, interior hyphae hyaline, walls also turning red in 2% KOH, reaction fades in time; hymenium of cystidia and basidia; cystidia (Fig. 5h) nearly cylindrical, tapered to obtuse apex, hyaline, thin-walled or with slight wall thickening over lower half, smooth, lacking clamp at base, 25–55  $\times$  3.5–6  $\mu$ m; basidia (Fig. 5g) 25–35  $\times$  4.5–6  $\mu$ m, clavate, hyaline, thin-walled, lacking clamp at base, 4-sterigmate, sterigmata 3–4  $\mu$ m long; basidiospores (Fig. 5f) 4.5–6  $\times$  2–3  $\mu$ m, ovoid, thin-walled, smooth, hyaline, adaxially flattened, negative in Melzer's reagent, acyanophilous.

### *Specimens Examined*

Florida—HHB6574, on *Quercus virginiana* Mill. (live oak), Upper Sugarfoot Prairie, Gainesville, Alachua County; Tennessee—HHB 3896, on *Nyssa sylvatica* Marsh. (black tupelo, blackgum), Jake's Creek Trail, Great Smoky Mts. Natl. Park, Sevier County; HHB 4447, on *Liquidambar styraciflua* L. (sweetgum), near Cable Cemetery, Cades Cove, Great Smoky Mts. Natl. Park, Blount County (all CFMR).

### *Remarks*

The pale yellow to grayish yellow hymenium and dark yellow to orange rhizomorphs are characteristic of this infrequently found species. Mi-

microscopically it can be confused with *Phanerochaete carnosa* (Burt) Parm., but in *P. carnosa* the hymenium is dark mustard yellow, the rhizomorphs concolorous (if present), and the species occurs on conifers. *Peniophora sulfurina* (Karst.) Hoehn. et Litsch. differs in having a bright lemon yellow, fertile area, encrusted cystidia, and clamps at most septa.

Of special interest is the reaction of the cell walls of rhizomorph hyphae. They become dark orange to red on contact with 2% KOH, even though there does not appear to be granular material dissolving, giving this reaction. Encrusting granules reacting with the KOH cause the color change in several other species of this and other genera. In the case of *P. burtii* the reaction seems to involve the wall material itself.

*Phanerochaete burtii* has a wide distribution but is not common in the southern Appalachians. It has been recently encountered on woody hosts in the Sonoran Desert, Arizona (Gilbertson et al., 1974) indicating that the flora of the southern Appalachians and that of the Southwest may be similar in many respects.

*Phanerochaete chrysorhizon* (Torrey in Eaton) Budington et Gilbertson, Southwestern Nat. 17: 417, 1973 (Figs. 5i-l, 6a)

Basidiocarps (Fig. 6a) broadly effused, extending up to 20 × 10 cm, thin, membranous, easily separable, with widely spaced to crowded teeth; teeth orange white (5A2) to deep orange (5A8) or reddish orange (7A8), up to 1.5 mm long, cylindrical or tapered to rounded apex; margin fimbriate to rhizomorphic, up to 1 mm diam, concolorous or paler than teeth; no reaction with 2% KOH on any tissues.

Hyphal system monomitic; abhymenial surface not differentiated; subiculum 250–500 μm thick (excluding teeth), a *textura intricata* to *textura porrecta*, hyphae (Fig. 5i) 4–7(–9) μm diam, hyaline to pale yellow, with slight wall thickening or walls up to 2 μm thick, lacking clamps at most septa, some septa clamped, rarely with several clamps at one septum, branching frequent, mostly at nearly right angles: tooth trama a compact *textura porrecta* oriented perpendicular to substrate, hyphae like those of subiculum; rhizomorphs up to 400 μm diam, composed of *textura intricata*, hyphae 5–7 μm diam, hyaline, thick-walled, encrusted with hyaline granules persisting in 2% KOH, clamps present or absent, rarely several at one septum; subhymenium a compact *textura porrecta*, short-celled, hyaline, thin-walled, lacking clamps,

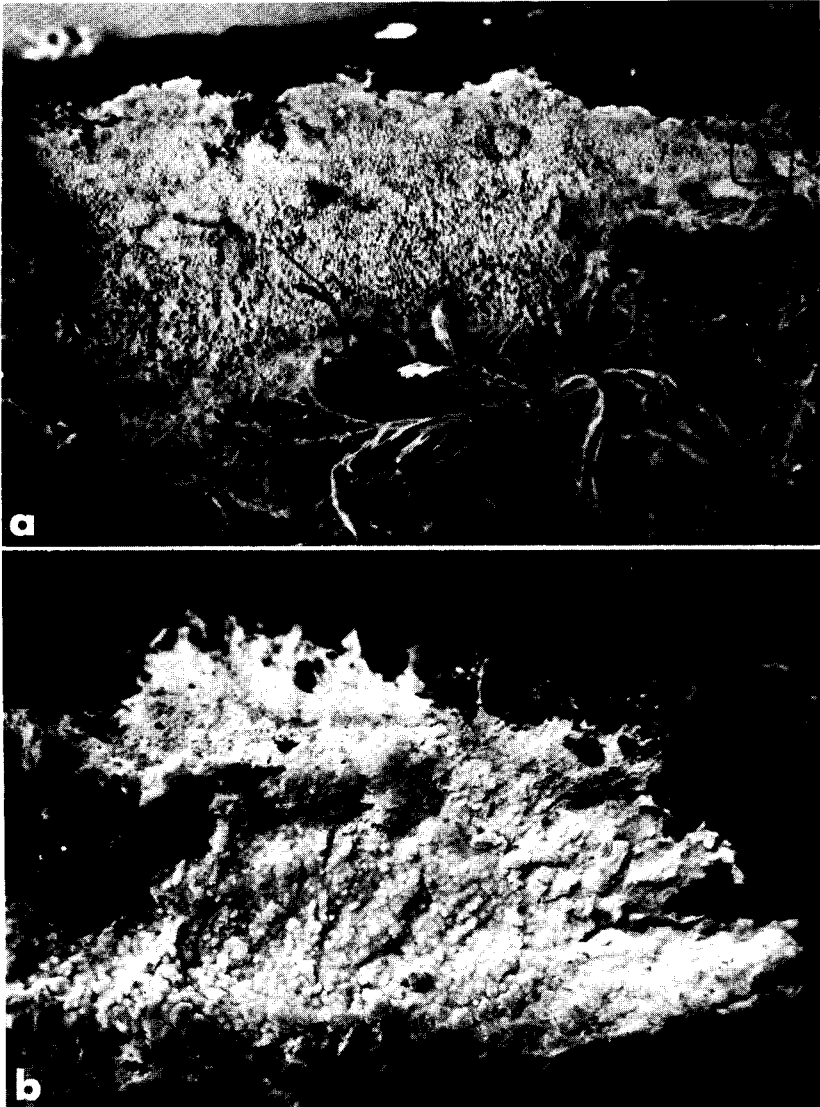


Fig 6. Photographs of basidiocarps. *a*: *Phanerochaete chrysorhizon* HHB 6478,  $\times 1.5$ ; *b*: *Phanerochaete filamentosa* HHB 4329,  $\times 2$

smooth, or with slight, pale yellow encrustation; cystidia (Fig. 5j) ventricose, thin-walled, hyaline, 18–40 x 4.5–6  $\mu\text{m}$ , lacking clamp at base; basidia (Fig. 5k) clavate to broadly clavate, 15–20 x 4.5–6  $\mu\text{m}$ , hyaline, thin-walled, 4-sterigmate, sterigmata 3–3.5  $\mu\text{m}$  long; basidiospores (Fig. 5l) ovoid to narrowly ovoid, slightly flattened adaxially, hyaline, thin-walled, smooth, 4–5 x 2–2.5  $\mu\text{m}$ , negative in Melzer's reagent, acyanophilous.

### *Specimens Examined*

Florida—HHB6478, on *Carpinus caroliniana* Walt. (American hornbeam), Hogtown Creek Basin, Gainesville, Alachua County (CFMR). North Carolina—HHB2652, on *Fraxinus* sp. (ash), Scaly School-Dryman Chapel Rd., Nantahala Natl. Forest, Macon County (CFMR); HHB 4352, on *Cornus florida* L. (flowering dogwood), Kephart Prong, Great Smoky Mts. Natl. Park, Swain County (CFMR). South Carolina—Isotype of *Hydnum fragillissimum* Berk. et Curt., Curtis 2608, on *Quercus* sp. (oak), April 1849, Society Hill, Darlington County (FH). Tennessee—Great Smoky Mts. Natl. Park; HHB 3012, on *Juglans* sp. (walnut), near Cable Mill, Cades Cove, Blount County; HHB 4134, on maple, Snake Den Trail, Cocke County (both CFMR).

### *Remarks*

*Phanerochaete chrysorhizon* is the only hydneous species of *Phanerochaete*. It is also characterized by the deep orange color of the teeth and rhizomorphs. It is commonly found on hardwood species throughout the southeastern United States. It is one of the species recently found to occur also in the Southwest on Sonoran Desert hardwoods (Gilbertson et al., 1974).

*Phanerochaete filamentosa* (Berk. et Curt.) Burds., *comb. nov.* (Figs. 6b, 7a-d)

Basionym: *Corricium filamentosum* Berk. et Curt., Grevillea 2: 178, 1873

Basidiocarps (Fig. 6b) broadly effused, thick (as much as 1 mm thick), membranous, easily separable, fertile area smooth to warted, finely pilose under a lens, orange-gray (5B2) to brownish orange (5C3) occasionally grayish yellow (4B4); subiculum thick, yellowish orange (near 4B7) or paler, extending beyond fertile area to form concolorous or

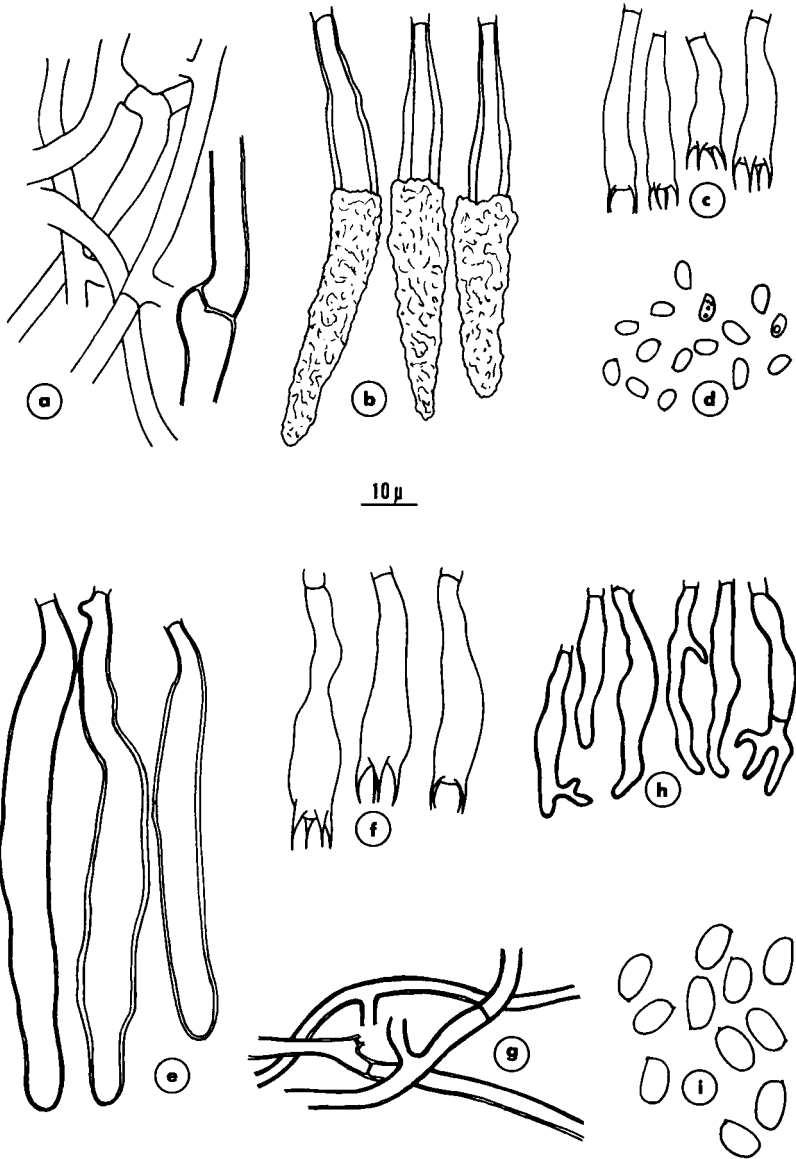


Fig. 7. Line drawings of microscopic characters. *Phanerochaete filamentosa*—a: subicular hyphae; b: cystidia; c: basidia; d: basidiospores. *Phanerochaete viticola*—e: cystidia; f: basidia; g: subicular hyphae; h: paraphysislike structures; i: basidiospores

paler margin; margin sometimes white at extreme edge, thin, fimbriate to rhizomorphic; rhizomorphs, concolorous with subiculum, up to 1 mm diam; all parts of basidiocarps turn red when contacted by 2% KOH.

In section up to 1 mm thick; hyphal system monomitic; subiculum 400–700 $\mu$ m thick, a *textura intricata*, abhymenial surface not noticeably differentiated, hyphae (Fig. 7a) 2.5–7 $\mu$ m diam, hyaline, thin-walled or with slight wall thickening, septate, with rare clamps, covered with dense brownish-yellow granular material, dissolving in 2% KOH turning solution pink, leaving hyphae smooth; rhizomorphs up to 1 mm diam, composed of *textura porrecta*, hyphae of two types, some 2–4 $\mu$ m diam, thin-walled, hyaline, lacking clamps at most septa, others 6–12 $\mu$ m diam, thick-walled, hyaline, lacking clamps at most septa, some septa with several clamps, all hyphae heavily encrusted with hyaline granules, persistent in 2% KOH and inconspicuous pale yellow granules dissolving in 2% KOH turning solution red; subhymenium a compact *textura intricata* or *porrecta*, hyphae 2–4 $\mu$ m diam, hyaline, thin-walled, lacking clamps, short-celled, heavily encrusted as in subiculum; hymenium of cystidia and basidia; cystidia (Fig. 7b) 30–50(–120)  $\times$  6–10(–12) $\mu$ m, nearly cylindrical, or tapered to obtuse apex, thin-walled or with slight wall thickening, heavily encrusted with hyaline granules over upper half, protruding up to 35 $\mu$ m, lacking clamp at base; basidia (Fig. 7c) clavate, 20–35(–50)  $\times$  5–7(–9) $\mu$ m, hyaline, thin-walled, lacking clamp at base, 4-sterigmate, sterigmata 3–5 $\mu$ m long; basidiospores (Fig. 7d) (3.5–)4–5.5(–6.5)  $\times$  2–2.5(–3) $\mu$ m, ovoid, adaxially flattened, hyaline, thin-walled, smooth, negative in Melzer's reagent, acyanophilous.

### *Specimens Examined*

North Carolina—HHB 934, on oak, Rich Mt. Gap, Macon County; HHB 4203, on tulip poplar, Baxter Creek Trail, Great Smoky Mts. Natl. Park, Haywood County. Tennessee—HHB 2367 on maple, HHB 4327, on *Fagus grandifolia* Ehrh. (American beech), HHB 2370, on *Ulmus americana* L. (American elm) bark, and HHB 4329, on tulip poplar, all from Roaring Fork, Great Smoky Mts. Natl. Park; HHB 4406, on *Robinia pseudoacacia* L. (black locust), Crib Gap, Great Smoky Mts. Natl. Park, Blount County (all CFMR).

### *Remarks*

The inclusion of *Corticium filamentosum* Berk. et Curt. in the genus *Phanerochaete* was suggested by Parmasto (1968) when he referred to

that species as "*Ph. filamentosa* (Berk. et Curt.)" without citing the basionym, thus making the combination invalid. The valid transfer with cited basionym is made above.

*Phanerochaete filamentosa* is one of the more commonly found of the *Phanerochaete* species in the southern Appalachians. Characterized by its grayish orange hymenium, orange subiculum, and hardwood habitat, it is not readily confused with any other species. *Phanerochaete viticola* is similarly colored but is uncommon outside the spruce-fir areas where it occurs on well-decayed logs. Both species possess yellow granules which dissolve in and turn 2% KOH red. Microscopically they differ, with *P. filamentosa* having encrusted cystidia and small spores while *P. viticola* has smooth cystidia and spores up to  $12 \times 7 \mu\text{m}$ .

*Phanerochaete filamentosa* occurs all through the eastern mountains on hardwood slash and debris. It has not been reported from the Northwest. Several recent finds in the Southwest indicate, however, that its distribution probably extends from the Southeast across the Gulf Coast and into the Southwest (Gilbertson et al., 1974) and on into Mexico (Burt, 1926). In the Southwest it changes its substrate preference, occurring on conifers in that area. This change in substrate is surprising since a number of the same genera on which it occurs in the Southeast are present in these areas of the Southwest. The habitat is, however, much drier where these species occur. It probably also occurs on conifers in the Southeast under the right climatic conditions.

*Phanerochaete viticola* (Schw.) Parm., Eesti NSV Tead. Akad. Toim. 16: 389, 1967. (Figs. 7e-i, 8a)

Basidiocarps (Fig. 8a) effused in patches, up to  $4 \times 2$  cm in extent, fertile area brownish gray (near 11C2) to reddish gray (near 8B2), a thin pellicle, becoming grayish yellow (2B3) to greenish gray, flaking easily off subiculum when dry. Subiculum orange (6B8), byssoid to fibrous, thick, extending beyond fertile area to form margin; margin concolorous with subiculum, thin, extending up to 3 mm beyond fertile area, byssoid, fibrillose.

In section up to  $400 \mu\text{m}$  thick; hyphal system monomitic; abhymenial surface not differentiated from rest of subiculum; subiculum a *textura intricata*, hyphae (Fig. 7g)  $2.5-43 (-6) \mu\text{m}$  diam, hyaline, thin-walled or with slight wall thickening (walls rarely up to  $1 \mu\text{m}$  thick), frequently septate, frequently branched, clamps rare, obscured by dense coating of yellow granules soluble in 95% ethanol turning solution yellow, also

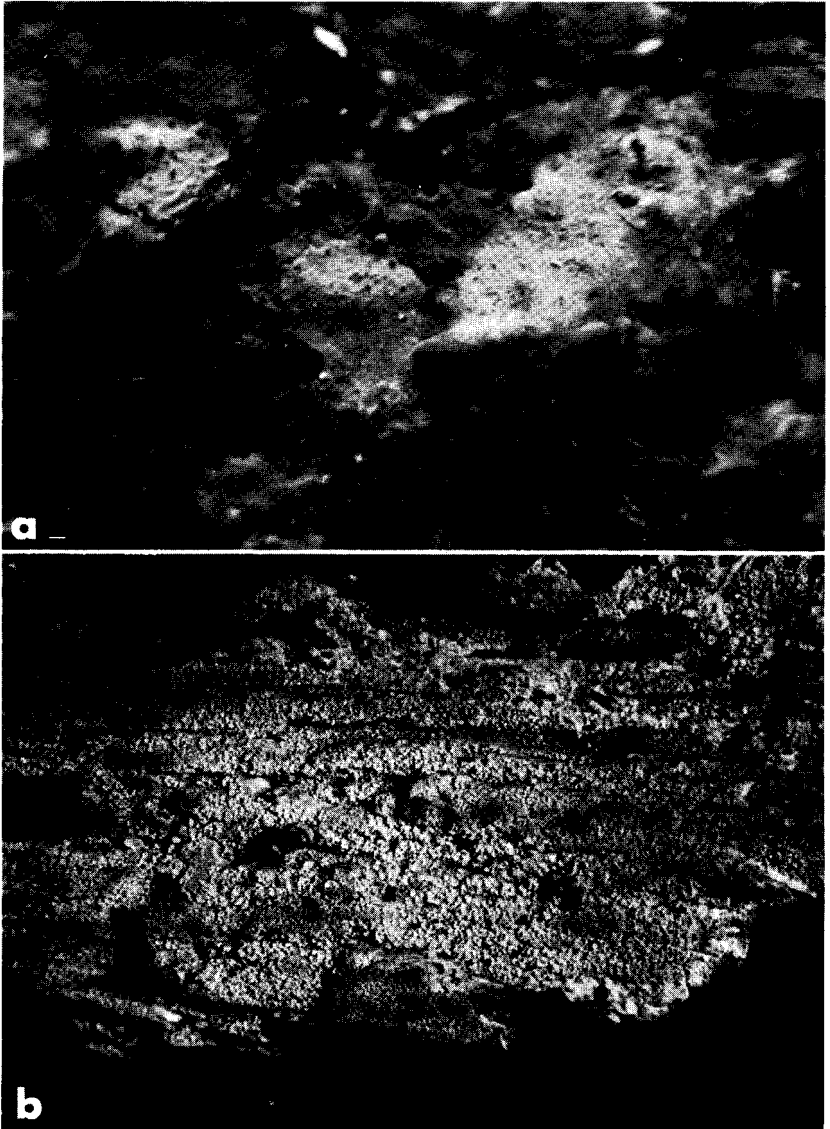


Fig. 8. Photographs of basidiocarps. *a*: *Phanerochaete viticola* HHB 2136,  $\times 4$ ; *b*: *Phlebia hydnoidea* HHB 1993,  $\times 3$

soluble in 2% KOH turning solution pink; subhymenium thin, poorly delimited from context; hyphae 2–4  $\mu\text{m}$  diam, hyaline, thin-walled, septate, lacking clamps, densely encrusted as in subiculum; hymenium composed of cystidia, paraphysoid structures, and basidia; cystidia (Fig. 7e) cylindrical, 60–125(–175)  $\times$  7–10(–12)  $\mu\text{m}$ , hyaline, smooth, with slightly thickened walls, or walls up to 1.5  $\mu\text{m}$  thick, mostly aseptate, lacking clamp at basal septum, with obtuse apex; paraphysoid structures (Fig. 7h) 2–4  $\mu\text{m}$  diam, hyaline, thin-walled, smooth, sometimes branched near apex; basidia (Fig. 7f) broadly clavate to clavipedunculate, 25–50(–85)  $\times$  6–9(–11)  $\mu\text{m}$ , hyaline, thin-walled, lacking clamp at base, 4-sterigmate, sterigmata up to 7.5  $\mu\text{m}$  long; basidiospores (Fig. 7i) ellipsoid to broadly ellipsoid, 8–12  $\times$  4.5–5.5  $\mu\text{m}$ , adaxially flattened, hyaline, thin-walled, smooth, with noticeable apiculus, negative in Melzer's reagent, acyanophilous.

#### *Specimens Examined*

*Ut Thelephora viticola* (authentic specimens)—“691-87 Syn Fung.”(PH); “Misit. Torrey, ex herb. Schw.” (FH—Curtis herb.). *Ut Phanerochaete viticola*—North Carolina—HHB 2036, 2039, 2059, and 2132, on *Abies fraseri* (Pursh) Poir. (Frazer fir), Richland Balsam, Blue Ridge Parkway, Jackson County (all CFMR).

#### Remarks

*Phanerochaete viticola* is striking with its liver-colored fertile area and bright orange subiculum. It is reported as occurring on *Vitis* and on high mountain conifers in the East. In the spruce-fir regions of the Appalachians it seems to be restricted to well-decayed moist logs and apparently requires a very moist habitat. Although rarely encountered in other ecological situations, it seems to be rather common in this restricted habitat. The extension of the range of this species into the Southwest is unlikely in spite of the presence of spruce-fir forests in the high mountain country. These habitats are apparently not moist enough to maintain this species.

*Phlebia hydroidea* Schw., Trans. Amer. Phil. Soc. N.S. 4: 165, 1832. (Fig. 8b)

Basidiocarps (Fig. 86) broadly effused, up to 15 + cm in extent, deep yellow (near 4A8, but more orange), up to 3 mm thick, firm, phlebioid

or odontoid, moist, adnate, cracking extensively to substrate on drying, subiculum concolorous, stains deep red in KOH.

In section 1–3 mm thick; hyphal system monomitic; subiculum a *textura intricata*, hyphae 3–5(–6)  $\mu\text{m}$  diam, septate, with clamps, with slight wall thickening, heavily encrusted by reddish-brown amorphous material throughout, obscuring clamps; some encrusted hyphae reacting with 2% KOH and turn pink, others not reacting; teeth a *textura porrecta*, some hyphae like those of subiculum, others hyaline, smooth, clamped, 2–5  $\mu\text{m}$  diam, compact, agglutinated; tooth apex sterile, a fascicle of agglutinated, hyaline, thin-walled hyphae finely encrusted with orange brown granules; hymenium of basidia only or with tramal hyphae extending through hymenium as hyphoid cystidia; cystidia encrusted with orange brown granules, almost smooth at apex, 3–4  $\mu\text{m}$  diam, protruding 15–45  $\mu\text{m}$ ; basidia 20–30  $\times$  4.5–5  $\mu\text{m}$ , clavate, hyaline, thin-walled, smooth, clamped at base, 4-sterigmate, sterigmata 3–4  $\mu\text{m}$  long; basidiospores narrowly ellipsoid, (3.5–)4.5–5.5  $\times$  2–2.5  $\mu\text{m}$ , hyaline, thin-walled, smooth, negative in Melzer's reagent, acyanophilous.

#### *Specimens Examined*

Alabama—Peter 101 1, on *Quercus* sp. (oak), Sept. 1856, isotype of *Odontia lateritia* Berk. et Curt. (FH-Curtis 6084). District of Columbia—on oak, Rock Cr. Park (BPI 75687). Georgia—HHB 1993, on *Castanea dentata* (Marsh.) Borkh. (American chestnut), Warwoman Dell, Chattahoochee Natl. Forest, Rabun County (CFMR, TAA, ARIZ, VPI). North Carolina—HHB 2798, on American chestnut, Horse Cove, Nantahala Natl. Forest, Macon County (CFMR); HHB 2917, on American chestnut, Ammon's Camp, Nantahala Natl. Forest, Macon County (CFMR); HHB 3107 on American chestnut, Back Side of Big Butt, Coweeta Expt. Forest, Nantahala Natl. Forest, Macon County (CFMR, TAA, ARIZ, VPI). Pennsylvania—Isotype of *Phlebia hydnoidea* Schw., Bethlehem, "xii.17, in rotten trunks" (BPI-Michener; PH).

#### *Remarks*

Although occasionally found on decaying oak, *Phlebia hydnoidea* is restricted in its substrate almost completely to American chestnut logs. With the disappearance of the preferred chestnut substrate, this

species will be encountered less frequently. I have found *P. hydnoidea* only on chestnut in the southern Appalachians. It has, however, been reported on pine (Peck, 1903), but in light of no other findings, perhaps either the fungus or the substrate was misidentified.

The synonymy of this species has been somewhat unsettled, with many authors (Saccardo, 1895; Peck, 1903; Gilbertson, 1965; and Ginns, 1970) indicating that it is probably conspecific with *Odontia laterita* Berk. et Curt. None, however, have compared the type specimens of the two species. My studies of isotypes of both species indicate that the two names do refer to a single species. The older name is that applied by Schweinitz (1832), and it is used here.

The generic placement of the species is also still in doubt. Ginns (1970) indicates it may belong in the genus *Veluticeps* Cooke, but *P. hydnoidea* lacks the brown hyphae present in *Veluticeps*. The fruiting bodies are of completely different construction; *Veluticeps* tends toward dimitic, having some hyphae that lack clamps and branching, while all hyphae of *P. hydnoidea* are clamped. The spores of *Veluticeps* are large (over 10  $\mu\text{m}$  long) and often with light pigmentation, while *P. hydnoidea* has small (less than 6  $\mu\text{m}$  long) hyaline spores.

*Veluticeps* appears to be more closely related to *Columnocystis* Pouz. of the Stereaceae rather than to the Corticiaceae where *P. hydnoidea* is more correctly placed. At present the genus *Phlebia* seems to be the most appropriate taxon for *P. hydnoidea*.

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