

SOUTHEASTERN AGARICALES, III¹

L. R. HESLER

The University of Tennessee, Knoxville

Acknowledgement is made to the National Science Foundation for a grant of funds which has facilitated these studies; and to the following herbaria for the loan of types: The University of Florida, The New York Botanical Garden, The New York State Museum, and The University of North Carolina.

STUDIES OF COLLYBIA TYPES

This paper is a report of studies of American types of the genus *Collybia*. Type studies on two species, namely *Collybia expallens* Pk. and *C. agricola* Murr., were reported in an earlier paper (Hesler, 1957). The species treated here are found in the Southeastern United States, and are organized into two groups: I. Those species in which the cuticle of the pileus is composed of a palisade of globose ellipsoid, clavate, or pyriform cells; or sometimes a tangled mass of hyphal tips which project as a turf of pilocystidia (sterile cells on the surface of the pileus); II. Those species in which the cuticle of the pileus is composed of repent hyphae, from which, in some species, hyphal tips project as pilocystidia.

Group I: *Cuticle of the pileus cellular, or with a dense turf of pilocystidia*

Collybia aurantiaca Murr. Torrey Bot. Club Bull. 66:160. 1939. (*Gymnopus aurantiacus* Murr. Torrey Bot. Club Bull. 66:157. 1939). Type locality: near Gainesville, Florida. — Spores 6-7.5 x 2.5-3 μ , fusiform to pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of pseudo-parenchymatous cells which are globose to ellipsoid, 9-13 x 6-9 μ , with scattered or somewhat clustered *pilocystidia* which are cylindrical, 10-12 x 1-2 μ .

Collybia lilacina Coker & Beardslee. Elisha Mitchell Sci. Soc. Jour. 37:104. 1921. Type locality: Chapel Hill, North Carolina. — Spores 6.5-8 x 3.5-5 μ , ellipsoid, smooth, non-amyloid. *Pleurocystidia* 60-76 x 8-17 μ , flask-shaped to fusoid, some more or less knobby; *cheilocystidia* similar. *Cuticle of the pileus* composed of clavate to pyriform, closely-packed cells, 22-30, x 19-18 μ . Although Singer (1949) thinks that this species is a *Marasimus*, dried specimens do not revive well.

Collybia ludoviciana Murr. Mycologia 8:219. 1916. Type locality: New Orleans, Louisiana. — Spores 4.5-6 x 2.5-3 μ , pip-shaped subellipsoid, smooth, non-amyloid. *Pleurocystidia* none; *cheilocystidia* few, not conspicuous, clavate, 25-28 x 6-8 (11) μ . *Cuticle of the pileus* composed of a palisade of pyriform or cuneate cells, 12-20 x 7-15 μ . In a dozen dried specimens of the type, the lamellae are adnate-decurrent, attached to the stipe, and there is no evidence of a collar. The type readily revives in water, — a character which places it in the genus *Marasimus* (Singer, 1949).

1. Contributions from the Botanical Laboratory, The University of Tennessee, N. Ser. No. 200.

Group II: *Cuticle of the pileus composed of hyphae which are more or less appressed*

Collybia alba Pk. New York Stat Mus. Ann. Rept. 41:62. 1888. Type locality: Gansevoort, New York. — Spores 4.5-6 (7) x 3-4 (4.5) μ , ellipsoid, rarely subglobose, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Cuticle of the pileus* composed of appressed, narrow hyphae, with some hyphae projecting.

This species is distinguished from *C. albida* Murrill by its smaller, ellipsoid spores.

Collybia albida Murr. Torrey Bot. Club Bull. 66:37. 1939. (*Gymnopus albidus* Murr. Torrey Bot. Club Bull. 66:32. 1939). Type locality: Magnesia Springs, Florida. Spores (9) 10-11.5 x 3.7-4.5 (5) μ , pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of appressed hyphae. (See *C. alba* Pk., above.)

Collybia albistricta Murr. Mycologia 30:371. 1938. (*Gymnopus albistrictus* Murr. Mycologia 30:365. 1938). Type locality: Gainesville, Florida. — No. 16104, collected and determined by Murrill, not the type, was examined. Spores 6-7.5 x 3-4 μ , ellipsoid-pip-shaped to narrowly ovoid, smooth, non-amyloid. *Pleurocystidia* none; *cheilocystidia* clavate-cylindrical, 24-32 x 5-8 μ . *Pileus cuticle* composed of repent hyphae, 3-6 μ diam.

This species is related to *C. strictipes* Pk. but differs in its smooth, white pileus, and in the structure of the cuticle. In *C. strictipes* the cuticle is composed of a palisade of pyriform cells.

Collybia amara Murr. Florida Acad. Sci. Proc. 7:127. 1945. (*Gymnopus amarus* Murr. Florida Acad. Sci. Proc. 7:109. 1945). Type locality: Gainesville, Florida. — No. 21124, from Murrill, not the type, was examined. Spores 5-6 x 2.5-3.5 μ , ellipsoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of appressed hyphae.

Collybia atriceps Murr. Lloydia 5:157. 1942. (*Gymnopus atriceps* Murr. Lloydia 5:137. 1942). Type locality: Levy Co., Florida. — Spores 6-7.5 x 4-5 μ , broadly ovoid, smooth, non-amyloid. *Pleurocystidia* scattered, conspicuous, bottle-shaped, 42-51 x 10-15 μ ; *cheilocystidia* of two types: (a) those similar to the pleurocystidia in size and shape; (b) those which are cylindrical, 34-38 x 6-8 μ . *Pileus cuticle* composed of appressed hyphae.

The uniformly dark-fuliginous color of the pileus, and the conspicuous pleurocystidia distinguish *C. atriceps*.

Collybia atrigilva Murr. Lloydia 9:330. 1946. (*Gymnopus atrigilvus* Murr. Lloydia 9:315. 1946). Type locality: Gainesville, Florida. Spores 8-13 x 4-6 μ , ellipsoid, angular-nodulose, apiculate, non-amyloid. *Pleurocystidia* none, or rare, then flask-shaped, 28-36 x 4-5 μ (apex); *cheilocystidia* cylindrical-clavate, 30-32 x 4-8 μ . *Pileus cuticle* composed of appressed hyphae.

This species is closely related to *C. nitellina* (Fr.) Quel., which, together with other warty-spored species, are brought by Singer and others under the genus *Rhodocybe*.

Murrill, in his original description, gives the spores as subellipsoid, smooth, about 7 x 3-4 μ . Spores of the type are 8-13 x 4-6 μ .

Collybia atriviolacea Murr. Mycologia 30:371. 1938. (*Gymnopus atriviolaceus* Murr. Mycologia 30:366. 1938). Type locality: Gainesville, Florida. — Spores 4-5 x 2.5-3.5 μ , ellipsoid to top-shaped (turbinate) angular, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* of appressed hyphae which are narrow, about 2 μ broad.

Because of its angular spores, this species, like *C. atrigilva* Murr., is related to species of the genus *Rhodocybe*.

Collybia caryophila Murr. *Lloydia* 7:326. 1944. (*Gymnopus caryophilus* Murr. *Lloydia* 7:303. 1944). — Type locality: Gainesville, Florida. Spores 4.5-6 x 2-3 μ , pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of appressed hyphae.

This species appears related to *C. dryophila* from which it is distinguished by its anise odor, broad lamellae, smaller size, and smaller spores.

Collybia coniceps Murr. *Lloydia* 5:157. 1942. (*Gymnopus coniceps* Murr. *Lloydia* 5:138. 1942). Type locality: Gainesville, Florida. — Spores 7-8 x 5-6 μ , ellipsoid, smooth, non-amyloid. *Pleurocystidia* none; *cheilocystidia* clavate, usually few, 32-40 x 6-8 μ . *Pileus cuticle* composed of repent hyphae.

Collybia earleae (Murr.) Coker & Beardslee. *Elisha Mitchell Sci. Soc. Jour.* 37:89. 1921. (*Gymnopus earleae* Murr. *North American Flora* 9:364. 1916). Type locality: near Auburn, Alabama. — Spores 6-7 x 2-4 μ , pip-shaped or more or less ellipsoid, smooth, non-amyloid. *Pleurocystidia* none, or a few near the gill-edge; *cheilocystidia* few, filamentous, 25-42 x 2-4 μ . *Pileus cuticle* composed of appressed, narrow hyphae, 2-4 μ broad.

Collybia familia (Pk.) Sacc. *Syll. Fung.* 5:241. 1887. (*Agaricus familia* Pk. *New York State Cab. Rept.* 23:79. 1873). Type locality: Adirondack Mountains, New York. — Spores 2.5-3-5 μ , globose to subglobose, somewhat amyloid, smooth. *Pleurocystidia* and *cheilocystidia* none. *Cuticle of the pileus* composed of appressed, narrow hyphae, with a few *pilocystidia* which are flask-shaped to clavate. *Stipe* hollow; *cortex* of angular colorless cells; *rind* of small cells and not sharply distinguished as in *Marasmius*, surface with numerous, irregular, hyphoid *caulocystidia*.

This is one of the few species of *Collybia* with amyloid spores.

Collybia flavescens Murr. *Mycologia* 8:219. 1916. (*Gymnopus flavescens* Murr. *North American Flora* 9:357. 1916). Type locality: New Orleans, Louisiana. — Spores 6-75 x 4.5-5 (6) μ , ellipsoid, smooth, non-amyloid. *Pleurocystidia* scattered, usually conspicuous, mostly slender fusiform, 30-37 x 2-5 μ , some fusiform to bottle-shaped, 28-40 x 10-12 μ ; *cheilocystidia* clustered, 30-37 x 2-5 μ , usually cylindrical, few fusiform. *Cuticle of the pileus* composed of narrow, appressed and slightly interwoven hyphae.

Collybia lentinoides Pk. *New York State Mus. Ann. Rept.* 32:27. 1879. Type locality: Montgomery County, New York. — Spores 5.5-7 x 2.5-4 μ , ellipsoid, with a suprahilar depression, smooth, non-amyloid. *Pleurocystidia* none; *cheilocystidia* 18-32 x 6-10 μ , basidiiform, not conspicuous. *Cuticle of the pileus* composed of appressed subparallel, narrow, slightly gelatinous hyphae, about 2 μ broad. *Trama* of pileus loosely organized.

Collybia leucocephaloides (Pk.) Singer. *Lloydia* 5:124. 1942. (*Tricholoma leucocephaloides* Pk. *New York State Mus. Ann. Rept.* 49:30. 1897). Type locality: Delmar, New York. — Spores 5-6 x 3-4 μ , ellipsoid to sub-ovoid, smooth, pale yellow in Melzer's reagent. *Pleurocystidia* and *cheilocystidia* none. *Gill-trama* composed of parallel hyphae. *Cuticle of the pileus* composed of interwoven hyphae, 5-10 μ broad.

Collybia luxurians Pk. *Torrey Bot. Club Bull.* 24:141. 1897. Type locality: Auburn, Alabama. — Spores 7-9 (10) x 3-4.5 (5) μ , pip-shaped to sub-ellipsoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of narrow, appressed hyphae. *Pileus trama* loosely organized. This species is close to *C. castaneidisca* Murr. which has a stipe glabrous except pruinose or tomentose apex. It differs from *C. subluxurians* Murr. in its slightly larger, pip-shaped to sub-ellipsoid spores.

Collybia omphalina Murr. *Florida Acad. Sci. Jour.* 8:198. 1945. (*Gymnopus omphalina* Murr. *Florida Acad. Sci. Jour.* 8:176. 1945). Type locality: Gainesville, Florida. — Spores 4-6 x 1.5-2.5 μ , smooth, pip-shaped, non-amy-

loid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of appressed hyphae.

Murrill describes the spores as $3 \times 1.5 \mu$.

Collybia palmarum Murr. Torrey Bot. Club Bull. 66:37. 1939. (*Gymnopus palmarum* Murr. Torrey Bot. Club Bull. 66:32. 1939.) Type locality: Gainesville, Florida.—*Spores* $4.5-6.5 \times 2.5-3 \mu$, smooth, ellipsoid, non-amyloid. *Pleurocystidia* not found; *cheilocystidia* clavate, $21-24 \times 4-6 \mu$. *Pileus cuticle* fibrillose.

In the original description, Murrill states that cystidia are few, hyaline, long, gradually tapering to a sharp point. It appears close to *C. atriceps* which has a fuliginous, glabrous pileus, and larger spores, and bottle-shaped pleurocystidia.

Collybia praemultifolia Murr. Florida Acad. Sci. Proc. 7:127. 1945. (*Gymnopus praemultifolius* Murr. Florida Acad. Sci. Proc. 7:109. 1945). Type locality: Gainesville, Florida. — No. 16110, from Murrill, not the type, was examined. *Spores* $2-3.3 \times 1-2 \mu$, subglobose to short-ellipsoid, smooth, non-amyloid. *Pleurocystidia* none, or rare and then filamentous, similar to the cheilocystidia; *cheilocystidia* $12-20 \times 1-2 \mu$ filamentous. *Pileus cuticle* composed of appressed hyphae.

Collybia subabundans Murr. Lloydia 9:330. 1946. (*Gymnopus subabundans* Murr. Lloydia 9:316. 1946). Type locality: Gainesville, Florida. *Spores* $6-7.5 \times 2-3 \mu$, ovoid to subfusoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Lamellae* medium broad. *Pileus cuticle* composed of closely interwoven, narrow hyphae.

Collybia subagricola Murr. Mycologia 33:448. 1941. (*Gymnopus subagricola* Murr. Mycologia 33:439. 1941). Type locality: Gainesville, Florida. — *Spores* $4-5 \times 1.8-2 \mu$, smooth, pip-shaped, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of appressed hyphae.

This species differs from a close relative, *C. praemultifolia* Murr., in its slightly longer spores, its lack of cystidia of any kind, its smaller, isabelline pileus and its astringent taste.

Collybia subconiceps (Murr.) comb. nov. (*Gymnopus subconiceps* Murr. Lloydia 9:316. 1946). Type locality: Gainesville, Florida — *Spores* $5-6.5 \times 3-4.5 \mu$, ellipsoid, smooth, brown in Melzer's reagent. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of appressed, tangled hyphae, a few slender ones more or less erect.

The rosy-isabelline, umbonate pileus, and bay, white-pulverulent stipe separate *C. subconiceps* from *C. alba*. From *C. coniceps*, it is distinguished by its smaller spores and more highly colored pileus.

Collybia subfunicularis Murr. Lloydia 9:330. 1946. (*Gymnopus subfunicularis* Murr. Lloydia 9:316. 1946). Type locality: Gainesville, Florida. — *Spores* $6.5-7.5 \times 2.8-3.2 \mu$, subovoid, smooth, non-amyloid. *Pleurocystidia* none; *cheilocystidia* few, clavate, at times nodulose, $20-25 \times 5-7 \mu$. *Pileus cuticle* composed of appressed hyphae.

This species is similar in color to *C. subconiceps*, but differs in its cespitose habit of growth and in its subovoid, more narrow spores. It also resembles *C. subluxurians* which lacks cheilocystidia, and has broader spores.

Collybia subluxurians Murr. Florida Acad. Sci. Proc. 7:127. 1945. (*Gymnopus subluxurians* Murr. Florida Acad. Sci. Proc. 7:110. 1945). Type locality: Gainesville, Florida. — *Spores* $7-8 \times 4-5 \mu$, ellipsoid-ovoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of appressed brownish hyphae. (See comments under *C. luxurians* and *C. subfunicularis* above.)

Collybia subtortipes Murr. Lloydia 9:330. 1946. (*Gymnopus subtortipes* Murr. Lloydia 9:316. 1946). Type locality: Gainesville, Florida.—Spores 5-7 x 2.5-3.0 μ , slender-ovoid to pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of closely appressed, narrow hyphae.

This species appears related to *C. caryophila*, but differs in its fuliginous disk, lack of anise odor, slightly longer spores, and its longer, grayish-pulverulent stipe. From *C. tortipes* Murr., it differs in its much shorter spores, its lack of cheilocystidia, and its dull-fulvous pileus.

Collybia tortipes Murr. Mycologia 8:219. 1916. (*Gymnopus tortipes* Murr. North American Flora 9:361. 1916). Type locality: Auburn, Alabama.—Spores 8-10 x 3.5-4 μ , pip-shaped, somewhat curved, smooth, non-amyloid. *Pleurocystidia* none; *cheilocystidia* clustered, rather inconspicuous, 24-40 x 4-6 μ , clavate. *Cuticle of pileus* composed of appressed, narrow hyphae (2-3 μ diameter).

See remarks under *C. subtortipes*, above.

Collybia tricholoma Murr. Mycologia 33:448. 1941. (*Gymnopus tricholoma* Murr. Mycologia 33:439. 1941). Type locality: Gainesville, Florida.—Spores 6.5-7 x 4-5 μ , ellipsoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of more or less erect, loosely disposed hyphae, 5-8 μ diameter.

From *C. subagricola*, it differs in its larger, ellipsoid spores, and its stipe which tapers upward.

Collybia umbrinescens Murr. Mycologia 43:235. 1951. Type locality: near Gainesville, Florida — Spores 5-6 x 2.5-3 μ , ellipsoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Pileus cuticle* composed of brownish, interwoven hyphae, 10-12 μ diameter.

Collybia unakensis Murr. Mycologia 8:219. 1916. (*Gymnopus unakensis* Murr. North American Flora 9:366. 1916). Type locality: Unaka Springs, Tennessee. — Spores 5-7.5 x 3-4 μ , ellipsoid-ovoid, smooth, non-amyloid. *Pleurocystidia* none; *cheilocystidia* 37-50 x 2.5-3 μ , cylindrical-filamentous. *Cuticle of the pileus* composed of appressed, narrow hyphae (1-3 μ broad), the surface a thin, gelatinous layer, 12-25 μ thick.

This species has white lamellae and stipe both of which become somewhat fulvous on bruising.

Collybia virginiana Murr. Mycologia 8:219. 1916. (*Gymnopus virginianus* Murr. North American Flora 9:357. 1916). Type locality: Falls Church, Virginia. — Spores 6-7 x 2.5-3.5 μ , ellipsoid to slightly ovoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Cuticle of the pileus* composed of appressed, narrow hyphae (3-5 μ broad), with scattered, projecting *pilocystidia*, 51-51 x 4-6 μ .

LITERATURE CITED

- Hesler, L. R. Notes on Southeastern Agaricales. *Tennessee Acad. Sci. Jour.* 32:198-207. 1957.
- Singer, Rolf. The "Agaricales" (Mushrooms) in Modern Taxonomy. *Lilloa* 22:5-832. 1949.