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SOUTHEASTERN AGARICALES, IV[1]

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STUDIES OF MARASMIUS TYPES

In an earlier paper (Hesler, 1957), a report was made on studies of the following *Marasmius* types: *M. alachuanus* Murr., *M. elongatipes* Pk., *M. floridanus* Murr., *M. multivenosus* Murr., *M. pseudoimpudicus* Murr., *M. tageticolor* Berk., and *M. atropurpureus* Murr. This paper reports further observations on American types of the genus.

The Southeastern species treated here are organized into four groups, according to the structure of the epicutis of the pileus: I. epicutis cellular, the cells smooth (hairs may be present, but no spicules); II. epicutis cellular, the cells bearing spicules or rod-like projections, – broom-cells; III. epicutis composed of diverticulate hyphae; IV. epicutis composed of smooth hyphae.

Group I. *Epicutis cellular, the cells smooth.* (hairs may be present, but no spicules)

Marasmius minutissimus Peck. New York State Mus. Ann. Rept. 27:97. 1875. Type locality: Forestburgh, New York.—*Pileus* about 0.1-0.2 mm. broad, white. with fine hairs. *Stipe* about 1.0 mm. long, capillary, brownish except the white apex, pubescent (caulocystidia), solid. *Spores* 3-4 x 2-3 μ, ovoid-ellipsoid, smooth, non-emyloid. *Pleurocystidia* and *cheilocystidia* none found. *Epicutis* composed of globose, hymeniform cells, with scattered hairs, 20-40 x 0.5-1.0 μ, tapering to a point.

Marasmius sicciformis Murrill. Torrey Bot. Club Bull. 67:150. 1940. Type locality: Gainesville, Florida.—*Spores* 7-9 (10) x 5-6 μ, ellipsoid, smooth, non-amyloid. *Pleurocystidia* 20-37 x 6-7 μ, clavate; *cheilocystidia* 20 x 6 μ, clavate (Murrill says they are pointed, projecting about 80 μ). *Epicutis* composed of a palisade of smooth, brick-shaped to cuneate cells. *Stipe* hollow.

Group II. *Epicutis cellular, the cells bearing spicules or rod-like projections, broom-cells*

Marasmius albiceps Pk. New York State Mus. Ann. Rept. 43:21. 1890. Type locality: Manor, New York.—*Spores* 6-7 (8) x 3.5-4.5 μ. pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of large broom-cells. *Stipe* hollow, cortex composed of thin-walled

[1]Contributions from the Botanical Laboratory, The University of Tennessee, N Ser. No. 205.

cells, rind composed of thick-walled brown cells; surface of rind composed of "broom-cells."

Marasmius callicarpellus Murrill. Lloydia 8:273. 1945. Type locality: Gainesville, Florida.—*Spores* 7-8 x 3-4 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of broom-cells. *Stipe* hollow, with stalked *caulocystidia* of the broom-cell type,—similar to those comprising the epicutis.

Marasmius delectans Morgan. Jour. Myc. 11:206. 1905. Type locality: Ohio. The following notes are based on studies of authentic material collected by Underwood and Earle.—*Spores* 6-7 x 3 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* 26-48 x 3-7 μ, buried or projecting, brown in Melzer's reagent, irregularly sub-fusiform, subventricose, or sub-aculeate. *Epicutis* of broom-cells. *Stipe* hollow.

Marasmius glabellus Pk. New York State Mus. Ann. Rept. 26:66. 1874. Type locality: New York.—*Spores* 6-8.5 x 2.5-3.5 μ, ellipsoid, at times subfusoid, smooth, non-amyloid. *Pleurocystidia* fusiform, 42-51 x 5-7 μ; *cheilocystidia* clavate, 24-28 x 6-8 μ. *Epicutis* composed of cuneate broom-cells. *Stipe* hollow; *cortex* composed of sclerenchyma-like, sharply-angular cells; *rind* composed of several layers of compact, thick-walled cells.

Marasmius hemisphaericus Murrill. Lloydia 9:320. 1946. Type locality: Gainesville, Florida.—*Spores* none found. (Murrill says they are about 5 x 3 μ, ovoid, smooth, scant) *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of broom-cells. *Stipe* hollow.

Marasmius minutus Pk. New York State Mus. Ann. Rept. 27:97. 1875. Type locality: New York—*Pileus* 1 mm. broad, vinous-brown, semi-globose, sulcate, glabrous. *Stipe* 10-15 mm. x 0.1-0.2 mm., pale reddish brown, hollow. *Spores* none found (Pennington, 1915: 280, says they are 8 x 3.5-4 μ). *Pleurocystidia* slender, bottle-shaped to subfusoid, at times subcapitate, 20-28 x 3-4-5 μ; *cheilocystidia* similar. *Epicutis* composed of epermoid (globose, pyriform, ellipsoid, or loaf-shaped) broom-cells, 7-12 x 8-13 μ, densely spiculose, the spicules about 1 μ high.

Marasmius octifolius Murrill. Lloydia 8:273. 1945. Type locality: Gainesville, Florida.—*Spores* 6.5-8 (9) x 4-5 μ (Murrill says 5-6 x 4 μ), pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of rather small broom-cells. *Stipe* hollow.

Marasmius pulcherripes Peck. New York State Mus. Ann. Rept. 24:77. 1872. Type locality: Garrison, New York.—*Spores* 10-15 x 3.5-5 μ, lanceolate, slightly curved, smooth, non-amyloid. *Pleurocystidia* fusiform, 28-37 x 4-7 μ; *cheilocystidia* of two types: (1) similar to pleurocystidia; (2) broom-cell type, 12-15 x 3-4 μ, with rod-like projections. *Epicutis* composed of spathulate cells with projections (broom-cells). *Stipe* hollow.

Marasmius setulosus Murrill. Torrey Bot. Club Bull. 67:150. 1940. Type locality: near Gainesville, Florida.—*Spores* (5) 6-8 x (2-5) 3-4 μ (Murrill says 10-12 x 4-4.5 μ), pip-shaped, smooth, non-amyloid. *Pleurocystidia* 51-86 x 7-8 μ, aculeate-ventricose to fusiform, brownish above, numerous, conspicuous; *cheilocystidia* similar. *Epicutis* composed of broom-cells, with numerous *pilocystidia*, which are similar to the pleurocystidia. *Stipe* hollow; surface bearing *caulocystidia* which are similar to the pilocystidia. The cystidia are strikingly like those of *M. cohaerens* (A. & S.) Quèl. Singer (Lilloa 25:489) considers *M. setulosus* Murr. a synonym of *M. cohaerens* (A. & S.) Quèl.

Marasmius testaceiceps Murrill. Lloydia 9:321. 1946. Type locality: Gainesville, Florida. — *Spores* 9-12 x 3-4.5 μ, subfusiform, inequilateral, smooth, non-amyloid. *Pleurocystidia* 22-28 x 4-5 μ, subfusiform, more or less appendiculate, numerous; *cheilocystidia* of two types: (1) subfusiform (similar to pleurocystidia); (2) more or less bottle-shaped with roughened to echinulate apices. *Epicutis* composed of cuneate, broom-cells. *Stipe* hollow; surface pubescence composed of long, graceful, more or less aciculate hairs.

Group III: *Epicutis composed of diverticulate hyphae*

Marasmius pruinosipes Murrill. Lloydia 8:274. 1945. Type locality: Gainesville, Florida.—*Spores* not found (Murrill says they are globose, 3 μ). *Pleurocystidia* and *cheilocystidia* subfusoid, not conspicuous, 24-32 x 5-7 μ. *Epicutis* surface-contour roughened-wavy, with irregular, more or less nodulose-branched, diverticulate cells. *Stipe* solid; surface bearing hyphoid *caulocystidias* some of which are subcapitate.

Marasmius thujinus Pk. New York State Mus. Bull. 67:26. 1903. Type locality: North Elba, New York.—*Spores* 7-8 x 2-5-3 μ, pip-shaped to subellipsoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of somewhat interwoven hyphae, some of which have diverticulate apices. *Stipe* solid with an occasional short hyphoid *caulocystidium*.

Group IV: *Epicutis composed of smooth hyphae*

Marasmius badiceps Pk. Torrey Bot. Club Bull. 24:142. 1897. (*Marasmius badius* Pk. Torrey Bot. Club Bull. 22:487. 1895. Not *M. badius* Berk. & Curt., 1868). Type locality: Kansas. The material studied was not the type, but was identified by Peck. — *Spores* 4-6 x 2.6-3 μ, pip-shaped smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* of appressed hyphae. *Stipe* hollow, nearly glabrous, with a few, short hyphae.

Marasmius biformis Pk. New York State Mus. Bull. 67:25. 1903. Type locality: Sandlake, New York. — *Spores* 5-7 x 2.5-3 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of appressed hyphae. *Stipe* hollow.

Marasmius caesius Murrill. Torrey Bot. Club Bull. 67:148. 1940. Type locality: Gainesville, Florida. Specimens studied were not the type, but authentic material identified by Murrill. — *Spores* 5-6.5 x 3-4μ, ovoid to subellipsoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of appressed hyphae. *Stipe* solid, usually glabrous or with irregular, very short surface filaments.

Marasmius castaneicolor Pennington. North American Flora 9:274. 1915. Type locality: St. Martinsville Louisiana. — *Spores* 6-7 x 2.7-3 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* numerous, subfusoid, apex tapering somewhat, 17-23 x 3-5 μ; *cheilocystidia* similar. *Epicutis* composed of more or less erect, brown hyphae. *Stipe* hollow.

Marasmius domesticus Murrill. Torrey Bot. Club Bull. 66:160. 1939. Type locality: Gainesville, Florida. — *Spores* 6-7 (8) x 4-5 μ, ellipsoid, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* of subparallel, appressed hyphae. *Stipe* solid; *cortex* and *rind* moderately well differentiated; surface with a few scattered, short hyphoid *caulocystidia*.

Marasmius heliomyces Murrill. Torrey Bot. Club Bull. 67:149. 1940. Type locality: near Gainesville, Florida. — *Spores* 10-12 (13) x 3-4 μ, sublanceolate smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of interwoven hyphae. *Stipe* hollow; *rind* glabrous, not sharply differentiated from *cortex*.

Marasmius leptopus Peck. New York State Mus. Bull. 67:25. 1903. Type locality: Bronx Park, New York City.—*Pileus* brown, regulose-striate. *Lamellae* rather bright yellow. *Stipe* pruinose. *Spores* 8-10 x 3-4 μ, elongate-pip-shaped, smooth, non-amyloid. *Pleurocystidia* 18-25 x 3-5 μ, slender clavate-cylindric, occasionally ventricose-appendiculate; *cheilocystidia* similar. *Epicutis* composed of appressed hyphae. *Stipe* hollow; *caulocystidia* cylindric, tips blunt-rounded or at times forked. 12-25 x 5-7 μ.

Marasmius nolaneiformis Murrill. Torrey Bot. Club Bull. 67:149. 1940. Type locality: Gainesville, Florida. — *Spores* 7.5-9 (10) x 4-6μ, ovoid,

smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of interwoven hyphae with numerous hyphal tufts which constitute the fibrillose-squamulose scales on pileus. *Stipe* hollow.

Marasmius pallidiceps Murrill. Lloydia 8:274. 1945. Type locality: near Gainesville, Florida. — *Spores* 5-6 (7) x 2.5-3.0 μ, pip-shaped, smooth, non-amploid (Murrill says 2-3 μ, globose). *Pleurocystidia* 18-30 x 3-4 μ, cylindric to subfusiform, usually appendiculate; *cheilocystidia* similar. *Epicutis* composed of appressed hyphae. *Stipe* hollow.

Marasmius quercuum Murrill. Lloydia 9:321. 1946. Type locality: Gainesville, Florida. — *Spores* not found (Murrill says they are about 4 x 2 μ, pip-shaped, smooth). *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of appressed hyphae. *Stipe* solid; *surface* bearing a tangled mat of hyphae.

Marasmius resinosus (Pk.) Sacc. Syll. Fung. 5:522. 1887. (*Marasmius resinosus* var. *candidissimus* Pk. New York State Mus. Bull. 94:40. 1905). Type locality: Albany, New York. — *Spores* 5-6 x 2.5-3.5 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* none; *cheilocystidia* clustered, clavate to subcylindric, 25-40 x 5-8 μ (apex). *Epicutis* composed of more or less appressed hyphae with numerous clavate *pilocystidia*. *Stipe* hollow.

Marasmius semihirtipes Pk. Buffalo Soc. Nat. Sci. Bull. 1:57. 1873. (*Marasmius spongiosus* B. & C. Berk. Jour. Bot. & Kew Misc. 1:100. 1849). Type locality: West Point, New York. — *Spores* 7-9 x 3-4.5 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of appressed hyphae. *Stipe* hollow.

Marasmius stenophylloides Murrill. Lloydia 8:274. 1945. Type locality: Gainesville, Florida. — *Spores* 6-7 x 3-4.5 μ, pip-shaped (Murrill says globose, about 4 μ), smooth, non-amyloid, abundant. *Pleurocystidia* prominent, projecting, clavate, often more or less collapsing, 48-64 x 8-10 μ; *cheilocystidia* similar, 25-37 x 5-7 μ. *Epicutis* composed of interwoven hyphae, with numerous, more or less erect hyphae constituting the pubescence. *Stipe* hollow..

Marasmius subalbiceps Murrill. Lloydia 9:321. 1946. Type locality: Gainesville, Florida. — *Spores* 6-7 x 2.5-3 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of closely appressed hyphae. *Stipe* hollow.

Marasmius subarchyropus Murrill. Torrey Bot. Club Bull. 67:151. 1940. Type locality: near Gainesville, Flodira. -- *Spores* 5.5-6.5 x 3-3.7 μ, ellipsoid to subovoid, smoothfi non-amyloid (most abundant on carpophores not fully expanded). *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of interwoven hyphae. *Stipe* hollow, the surface bearing scattered, cyllindric to sub-bottle-shaped *caulocystidia*.

Marasmius subprasiosmus Murrill. Torrey Bot. Club Bull. 67:153. 1940. Type locality: Gainesville, Florida. — *Spores* 5-6.0 x 2.5-3 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of appressed hyphae. *Stipe* hollow; *rind* not strongly differentiated from the *cortex*, the surface bearing short, hyphoid *caulocystidia*.

Marasmius substenophyllus Murrill. Torrey Bot. Club Bull. 67:153. 1940. Type locality: near Gainesville, Florida. — *Spores* 6-7 x 3.5-4.5 μ, ellipsoid, smooth, non-amyloid. *Pleurocystidia* 42-54 x 5-7 μ, projecting 25-30 μ, cylindric to clavate, conspicuous, numerous; *cheilocystidia* similar. *Epicutis* composed of appressed hyphae. *Stipe* hollow, with few short, hyphoid *caulocystidia*.

Marasmius subsynodicus Murrill. Torrey Bot. Club Bull. 67:154. 1940. Type locality: Gainesville, Florida. — *Spores* 4-6 (7) x 2-2.5 (3) μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none.

Epicutis composed of interwover hyphae, many of which are more or less erect. *Stipe* solid, the surface bearing a tangle of hyphae.

Singer says this is same as *M. nivosus* Berk.=*M. epilecus* Berk. =*M. subsynodicus* Murr.

Marasmius superabundans Murrill. Florida Acad. Sci. Jour. 8:180. 1945. Type locality: Gainesville, Florida. — *Spores* 7-8 (9) x 3.5-4.5 μ, pip-shaped, smooth, yellowish in Melzer's reagent. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of appressed, more or less parallel hyphae. At times, the epicutis is torn away in sectioning, leaving a subepicuticular region or erect, narrow parallel hyphae. *Stipe* hollow; *cortex* and *rind* with scattered *caulocystidia*.

Marasmius vialis Peck. New York State Mus. Ann. Rept. 51:287. 1898. Type locality: Gansvoort, New York. — *Spores* 7-8 x 3.5-4.5 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of appressed, brownish hyphae. *Stipe* hollow.

Marasmius westii Murrill. Florida Acad. Sci. Proc. 7:110. 1945. Type locality: Swan Lake, Florida. — *Spores* 5.5-6 x 2.8-3.0 μ, pip-shaped, smooth, non-amyloid. *Pleurocystidia* and *cheilocystidia* none. *Epicutis* composed of appressed hyphae. *Stipe* solid, glabrous.

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NEWS OF TENNESSEE SCIENCE

(Continued from Page 158)

Dr. Guy T. Barry of the University of Tennessee Memorial Research Center in Knoxville was one of 25 scientists invited to an international round-table conference of the Josiah Macy Jr. Foundation at Princeton University. Dr. Barry, research professor in biochemistry and microbiology, took part in a three-day discussion of the "Bacterial Cell Wall," June 1-3. The conference was one of a series of annual meetings on the general topic, "Polysaccharides in Biology." Dr. Barry is currently engaged in a four-year study of the chemical nature of substances frequently found on the surface of harmful bacteria. The study is financed by an $84,000 grant from the National Institutes of Health.

Dr. D. Frank Holtman, of the UT Bacteriology Department, and James Burns, graduate student, have discovered a new and simple way to detect highly virulent stophylococci. They reported on their work at the 59th annual meeting of the Society of American Bacteriologists in St. Louis in May. The test is based on the ability of pathogenic staphylococci to secrete enzymes that split desoxyribonucleic acid, or DNA, an important part of the living cell.

The University of Tennessee has received a $12,000 National Science Foundation grant for basic research dealing with a study of the fundamental properties of the molecule. Dr. William H. Fletcher, of the Department of Chemistry, is directing the two-year study. The research concerns the vibrational spectra and molecular structure of two classes of compounds known as diazoalkanes and ketenes. Thepurpose of the project is to find an explanation of the forces existing in the molecule.

Oak Ridge National Laboratory

Drs. Alexander Hollaender, W. L. Russell, and Drew Schwartz attended the ninety-sixth annual meeting of the National Academy of Sciences in Washington, D. C., April 27, 28, and 29. Dr. Russell presented a paper on

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