

DISTRIBUTION AND TAXONOMIC NOTES ON  
*AMANITA MUTABILIS*

R. E. TULLOSS

21 Lake Drive, Roosevelt, New Jersey 08555

*Amanita mutabilis* Beardslee was first described in 1919. In 1969, Bas considered *A. abruptiformis* (Murrill) Murrill, *A. submutabilis* (Murrill) Murrill, and *A. anisata* (Murrill) Murrill, originally described in 1938, 1943, and 1944, respectively, to be synonymous with *A. mutabilis*. This paper reports a new record of *A. mutabilis* as far north as central New Jersey and notes certain taxonomic features. A variation on the sporograph technique of Corner (1947) is described as a taxonomic aid.

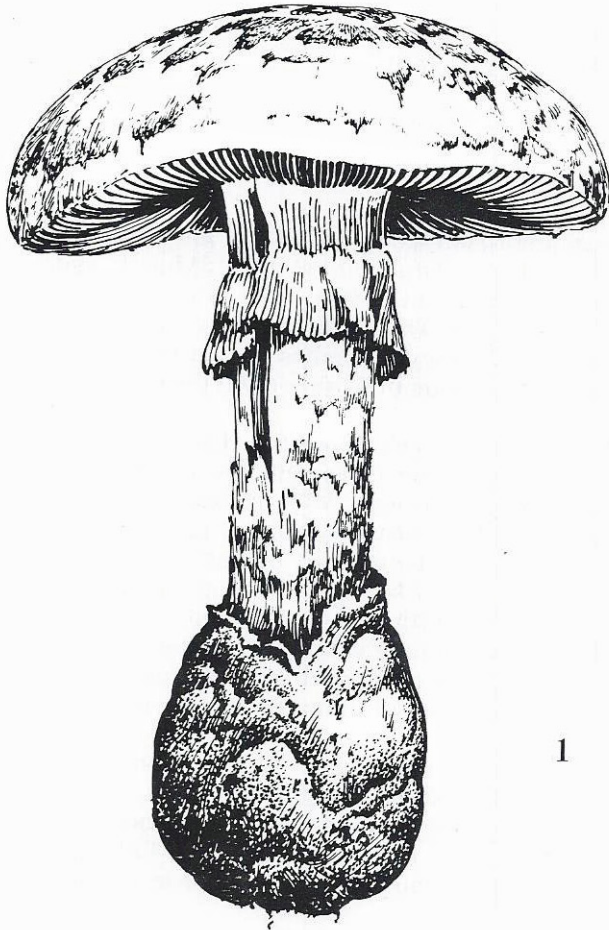
All spore measurements were made in Melzer's reagent (Lange and Hora, 1978) at magnifications of 430× or 720×. Spore measurements are depicted graphically based on a technique described by Corner (1947). At least 15 spores from each collection were measured to obtain satisfactory plots. The points of a Corner-type sporograph were not plotted. The boundaries of Bas' spore measurements are depicted (FIGS. 2, 3) by an irregular hexagon. The top and bottom edges correspond to the limits of the length-breadth ratio as recorded by Bas; the vertical edges, to the limits of length; the remaining two edges, to the limits of spore widths. Dots representing the dimensions of more than one spore are enlarged, and the number of spores with a given set of dimensions appears above the enlarged dot.

Color designations other than my own are either given in quotation marks (Kornerup and Wanscher, 1978) or are italicized (Ridgway, 1912).

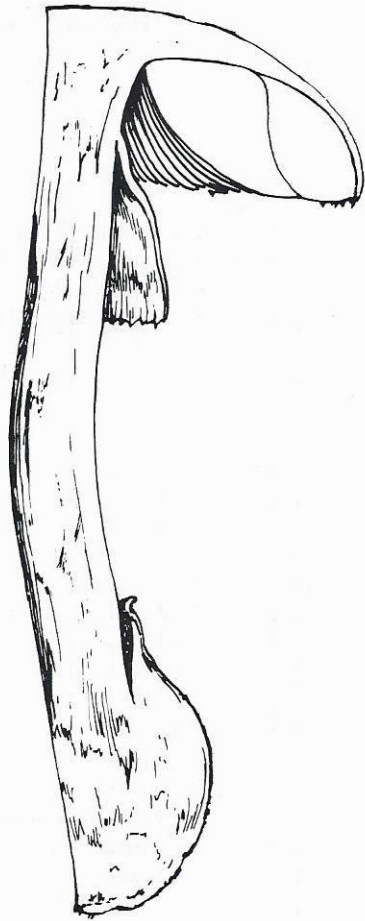
Specimens collected in New Jersey are deposited in my herbarium and in the herbaria of Rutgers University, Department of Plant Pathology (RUTPP) and The New York Botanical Garden (NY). Specimens from Florida are in my herbarium.

This description is based on specimens I collected in the Pine Barrens of New Jersey near Lakehurst and two recent collections from Florida supplied by H. E. Barnhart. Where the description varies from that of Bas (1969), Bas' description is given in brackets.

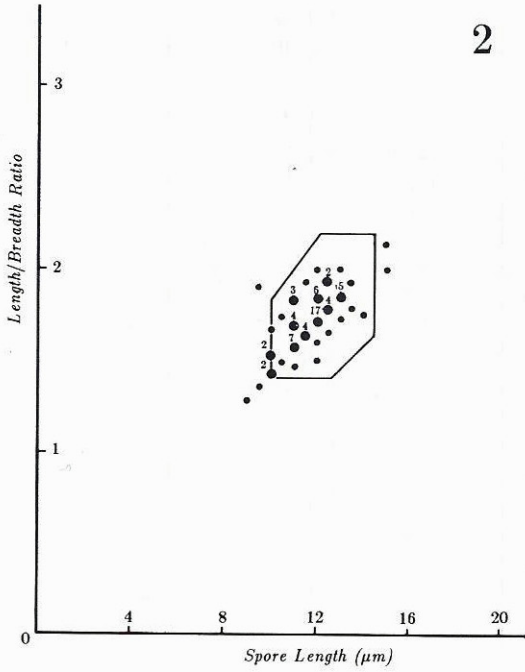
Pileus pale tan, tannish cream, cream, near white; 54-110 mm diam [Bas: (40-)50-100 mm]; planar with very broad, low umbo; margin down-curved, non-striate; patches of concolorous to slightly darker, thin, submembranous volval material which may be inconspicuous; context white, up to 12 mm thick at stipe and thinning slowly to a thin line for the last 10 mm of the radius, rapidly bruising raspberry-sherbet pink when cut, fading to grayish-white after 24 h refrigeration; odor strong of anise retained for months in dried New Jersey specimens [Florida specimens odorless; Bas: also sometimes "oily"]; no reaction to 10% KOH. Lamellae free to narrowly adnate with decurrent lines on stipe, pale cream, bruising like cap context, broad, up to 11 mm at widest point [Bas: 14 mm], close, about 1 mm apart at margin, on drying turning "pale orange" (5A3) to "orange white" (6A2) to "greyish orange" (6B4) to "Venetian Red" (8D8) to "Fox" (8D7) to "reddish brown" (8D6) to "cream" (4A3) to "greyish orange" (5B4-5B5); lamellulae very short for *Amanita* to absent in one Florida specimen, obliquely truncate, sometimes anastomosing to lamellae. Stipe 42-100 × 10-22 mm; bulb 22-42 × 24-46 mm [Bas: 40-130 × 10-20 mm with bulb 45-50(-80) × 20-40 (-50) mm]; bulb globose with limbate, submembranous-membranous volval sac



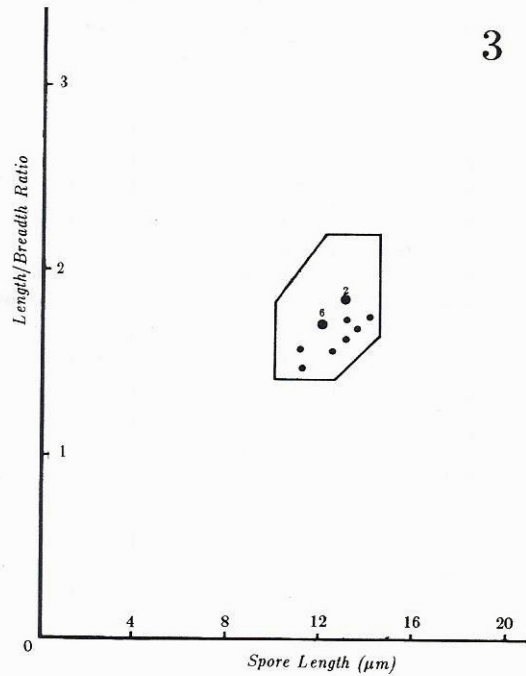
1



3



2





(tip of limb to base of bulb 29–49 mm [Bas: “limb up to 30 mm high”]); annulus white to yellowish, apical to superior, membranous with a sawtooth edge, becoming appressed to stipe, fibrils of stipe adhering to underside of annulus in one Florida specimen; surface below annulus having browning fibrils; context solid, white, rapidly bruising as in pileus and lamellae (Florida collections reported bruising *begonia rose* in 5–10 seconds); bruising also in volval sac tissue even after 24 h refrigeration.

Spores, in New Jersey specimens (120 spores, 8 specimens), (8.5–)9–15 × (5–)6–8 μm, in Florida specimen (15 spores) 11–13(–14) × 7–8 μm [Bas: (110 spores, 8 specimens) (10–)11–13.4(–14.5) × (5.5–)6–8.5(–9) μm]; length-breadth ratio 1.3–2 averaging 1.6–1.8 in New Jersey specimens, 1.5–1.9 with average 1.7 in Florida specimen [Bas: 1.4–2.2, averaging 1.55–1.95]; amyloid, white in print.

Other microscopic features were as described by Bas. Of particular interest were the dextrinoid granules found in crushes of gill tissue. These granules were seen in some basidia and covered the surface of only an occasional spore. Granule-covered spores were not found in spore prints. While granules were observed in both the New Jersey and Florida collections, they were so numerous as to clutter the mount in the former and rather scarce in the latter.

**SPECIMENS EXAMINED:** NEW JERSEY, Ocean County, Lakehurst, R. E. Tulloss and M. A. King 9-7-81-D, 9-10-81-A, 9-10-81-B, 9-13-81-A, 9-11-82-N (RUTPP), 9-11-82-O (NY). FLORIDA, Sarasota County, Sarasota Lakes, 18 July 1980, H. E. Barnhart 80-1; Highlands County, Highlands Hammock State Park, 29 July 1981, H. E. Barnhart 81-17.

*Amanita mutabilis* is found in sandy soil under *Pinus rigida* Miller with *Sassafras albidum* (Nutt.) Nees and *Quercus* spp. in New Jersey, and under *P. taeda* L.(?) or under *Q. virginiana* Miller and *P. elliotii* Engelm. in Florida. Its habit may be solitary to gregarious.

The off-white coloring, pink-bruising, rather squat habit, lack of reaction with KOH, and, if present, anise odor separate this entity from the species around *A. virosa* (Fr.) Bertillon in DeChambre. The intensity of the bruising reaction, the lack of browning of volval material on the cap, and the odor serve to separate the species from those near *A. volvata* (Peck) Lloyd and *A. peckiana* Kauffman in Peck. While it is not the case with the collections I have examined, Bas does note that staining may be restricted to the base of the bulb or be absent.

*Amanita mutabilis* may be found in sandy soil of the Coastal Plain in the scrubby pine-oak woods characteristic of the New Jersey Pine Barrens. This suggests that the plant should be expected in similar locations on Long Island and Cape Cod, as noted by G. H. Lincoff (private correspondence).

The dextrinoid granules were used by Bas to create a key separating the four forms distinguished by Murrill on the grounds that they might indeed be taxonomically distinct. Bas associated the presence of the granules with an oily smell and the absence of granules with an anise-like odor. My observations, however, indicate there is no correlation between odor and the presence or absence of dextrinoid granules and give support to Bas' contention that the three species described by Murrill are synonymous with *A. mutabilis*.

I gratefully acknowledge the enthusiastic support of Dr. S. S. Ristich, Cumberland Center, Maine, the supportive correspondence of Dr. C. T. Rogerson, The New York Botanical Garden, Bronx, New York, and the support and laboratory facilities provided by Dr. E. H. Varney, Department of Plant Pathology,

←  
FIGS. 1–3. *Amanita mutabilis*. 1. Habit, ×1. 2. Sporograph for New Jersey collections. 3. Sporograph for Florida collection Barnhart 80-1.

New Jersey Agricultural Experiment Station and Rutgers University, New Brunswick, New Jersey. The figures were prepared by Mr. Neal Macdonald, Princeton, New Jersey.

Key Words: sporograph, taxonomy, *Amanita*.

## LITERATURE CITED

- Bas, C. 1969. Morphology and subdivision of *Amanita* and a monograph of its section *Lepidella*. *Persoonia* 5: 285-579.
- Beardslee, H. C. 1919. A new species of *Amanita*. *J. Elisha Mitchell Sci. Soc.* 34: 198-199.
- Corner, E. J. H. 1947. Variation in the size and shape of spores, basidia and cystidia in Basidiomycetes. *New Phytol.* 46: 195-228.
- Kornerup, A., and J. H. Wanscher. 1978. *Methuen handbook of colour*. Methuen and Co., London. 252 p.
- Lange, M., and F. B. Hora. 1978. *Collins guide to mushrooms & toadstools*. Collins, London. 257 p.
- Murrill, W. A. 1938. New Florida agarics. *Mycologia* 30: 359-371.
- . 1943. Some southern novelties. *Mycologia* 35: 422-433.
- . 1944. More fungi from Florida. *Lloydia* 7: 303-327.
- Ridgway, R. 1912. *Color standards and color nomenclature*. Publ. by the author. Washington, D.C. 43 p. + 53 pl.
-