

**AMANITA SALMONESCENS—A NEW SPECIES
FROM THE SOUTHEASTERN UNITED STATES**

Rodham E. Tulloss
21 Lake Drive
Roosevelt, New Jersey 08555

Summary

Amanita salmonecens is described as new from New Jersey and South Carolina.

Amanita salmonecens Tulloss, sp. nov. Holotypus: South Carolina, Oconee County, Sumter National Forest, Stumphouse Tunnel Park, M. A. King & R. E. Tulloss 7-16-83-A (NY¹).

Pileus albus, 35 - 57 mm in mensura diametrica, convexus, partes contusae tarde rufobrunnescentes; margine nonstriata, parum appendiculata; materies volvica alba, cinerea vel subnigra ut senescit. Lamellae albae vel subalbidae, condensae, plus minusve liberae. Stipes 20 - 53 × 10 mm, albus, subsalmonecens, annulatus; annulus subapicalis, membranaceus, albus, subsalmonecens. Basidiae tetrasterigmatae, 30 - 42 × 7.7 - 11 μm; fibulae absentes. Sporae (5.9-) 6.6 - 9.1 (-10.5) × (4.2-) 4.5 - 5.9 (-6.3) μm, late ellipsoideae vel ellipsoideae vel elongatae, amyloideae.

Amanita salmonecens (Figs. 1-2) is a medium-sized, white mushroom with a subapical, membranous annulus; an universal veil left as graying, small, pyramidal warts on the pileus; a slightly appendiculate pileus margin; and few universal veil remnants on its ovoid bulb. Basidiocarps of this species have the property that bruising the stipe and partial veil produces a distinct discoloration—sordid pinkish or sordid pale salmon. Damaged areas of the pileus become dark reddish-brown slowly. *Amanita salmonecens* represents another taxon in the small group which, while having some characters typical of section *Validae*, have other properties suggesting a relationship with section *Lepidella*. *Amanita salmonecens* is placed in section *Validae*.

PILEUS: white to off-white, subviscid to dry and shiny, 35 - 57 mm diam, at first globose, at maturity planar with depressed center; margin at first inflexed, becoming rimose, nonstriate, finely appendiculate or not appendiculate; universal veil remnants as large, coarse, subpyramidal to truncate pyramidal warts with polygonal base, at times

1.

NY - Herbarium of the New York Botanical Garden, Bronx, U.S.A.

Collections without herbarium designation are in my private herbarium.



Fig. 1 *Amanita salmonescens*. Habit (King & Tulloss 7-16-83-A) [$\times 1.8$].

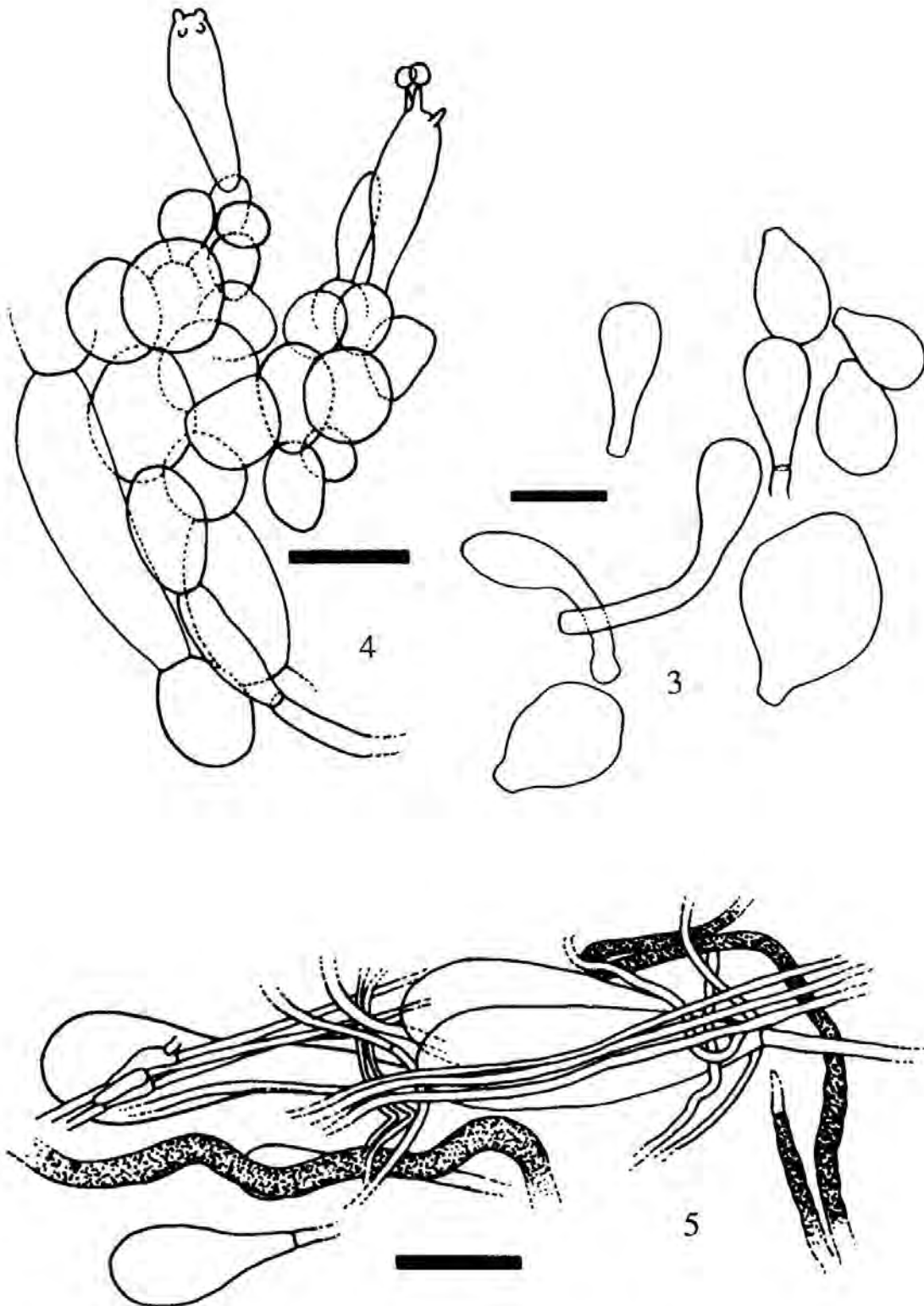


Fig. 2 *Amanita salmoneoscens*. Habit in early development (King & Tulloss 7-16-83-D) [$\times 2.5$].

confluent, lifting at the edges, white at first becoming gray to blackish at maturity; pileipellis slowly turning dark reddish-brown where cut, sometimes with pinkish discoloration around the darkened edges; context white, sometimes faint pinkish in areas of insect damage and sometimes taking on a dark reddish-brown color near pileipellis, up to 5 mm thick at stipe. LAMELLAE: white to whitish, sometimes browning in spots, close to crowded, free to occasionally adnate, all with decurrent line, up to 5 mm broad; lamellulae truncate to rounded truncate to subattenuate. STIPE: white becoming pinkish (close to "reddish (or pinkish) white" (7A2), but with a gray tint)² or pallid orange gray, 20 - 53 × 10± mm, narrowing upward, flaring at apex, surface undecorated to finely fibrillose to fibrillose and with pellis recurving in thin scales and fibrils discoloring like pileipellis, pruinose above partial veil; bulb subnapiform to elongate-subclavate, rooting, 25 - 35 × 15 - 22 mm; universal veil sometimes in up to three or four concentric circles of dash-like warts on upper portion of bulb, white becoming grayish or pallid orange gray and sometimes disappearing; context white, solid, occasionally brownish in bulb probably due to injury; pellis brown in section in aging specimen; partial veil subapical, membranous, becoming lacerate and appressed to stipe, white becoming pinkish to pallid orange gray like the stipe, margin thickened, striate above, lacerate fibrillose below, sometimes with fibrils from stipe attached below. Odor pleasant, pungent, flowery or fruit-like to faintly so. Taste not recorded.

PILEIPELLIS: branching interwoven radially-arranged barely gelatinizing filamentous undifferentiated hyphae 1.2 - 16.0 µm diam; oleiferous hyphae present, 2.5 - 6.2 µm diam, some containing guttulate material that stains deeply in Congo Red. PILEUS CONTEXT: scattered granules throughout tissues which stain deeply in Congo Red; branching interwoven filamentous undifferentiated hyphae 4.8 - 13.0 µm diam; abundant thin-walled inflated cells, elongate to 79 × 23 µm, subpyriform to very broadly clavate to 59 × 32 µm, ovoid to 92 × 48 µm; branching oleiferous hyphae present, 4.0 - 10.2 µm diam. LAMELLA TRAMA: bilateral; inflated cells arise at acute angles to distinct central stratum; undifferentiated filamentous branching hyphae 2.1 - 9.8 µm diam; inflated cells elongate to 75 × 24 µm, but mostly half those dimensions or less; oleiferous hyphae common to plentiful, 4.0 - 10.5 µm diam. SUBHYMENIUM: cellular (pseudoparenchymatous); basidia arise from globose to subglobose to pyriform cells of varying size (to about 15 µm major diam) in ramifying chains, forming a layer 30 - 45 µm deep. BASIDIA: 4-sterigmate, thin-walled, 30 - 42 × 7.7 - 11.0 µm; no clamps seen. UNIVERSAL VEIL: On pileus adjacent to pileipellis: gelatinizing undifferentiated filamentous branching interwoven hyphae plentiful. On pileus other than near pileipellis: without clear arrangement of structures; filamentous undifferentiated branching hyphae plentiful, 1.8 - 10.5 µm diam, rather frequently septate—especially near terminal inflated cells; inflated cells terminal, dominating, globose to subglobose to broadly pyriform to 66 × 63 µm, clavate to ellipsoid to 75 × 56 µm, with walls 0.5 - 1.0 µm thick; oleiferous hyphae plentiful, 2.8 - 12.6 µm diam. On stipe base: undifferentiated filamentous branching hyphae 1.7 - 6.3

2. Color designations in quotation marks are from Komerup & Wanscher (1978). All others are mine.



Figs. 3-5 *Amanita salmoneascens*. 3. Dissociated inflated cells from upper surface of the partial veil (King & Tulloss 7-16-83-D). 4. Elements of hymenium and subhymenium (King & Tulloss 7-16-83-A). 5. Partial veil elements (King & Tulloss 7-16-83-A). In Figs. 3-6: the dark bars represent 20 µm; stippling indicates oleiferous hyphae.

μm diam, about equally plentiful to inflated cells; inflated cells globose, subglobose, broadly ellipsoid, ellipsoid, cylindrical, clavate, up to $70 \times 60 \mu\text{m}$, terminal or in short chains; no clamps seen. STIPE CONTEXT: acrophysalidic; undifferentiated filamentous branching hyphae $1.0 - 11.5 \mu\text{m}$ diam; acrophysalides narrow, subcylindric to subfusiform to clavate, up to $156 \times 47 \mu\text{m}$, many less than half this diameter, some with thin-walls, many with walls $0.8 - 1.0 \mu\text{m}$ thick, some with basal septa to $14 \mu\text{m}$ diam because of slightly inflated subterminal cells; oleiferous hyphae common, but sometimes difficult to discern because they are rather narrow ($4.2 - 7.0 \mu\text{m}$ diam) and mostly longitudinally arranged and infrequently branching, no coiling or curving segments seen; no clamps seen. PARTIAL VEIL: Below upper surface, branching filamentous undifferentiated hyphae predominant, $1.4 - 5.2 \mu\text{m}$ diam, interwoven; inflated cells terminal, clavate to broadly clavate, up to $119 \times 35 \mu\text{m}$, thin-walled; oleiferous hyphae common, irregularly arranged, locally dense and coiled in loose knots, occasionally branching, $2.0 - 11.0 (-18.0) \mu\text{m}$ diam; many filamentous hyphae and inflated cells have a common, subradial orientation. Upper surface has a predominance of rounder smaller dissociated cells, pyriform to broadly clavate as well as narrower clavate cells to $44 \times 31 \mu\text{m}$ mixed with plentiful dissociated partially gelatinizing fragments of undifferentiated filamentous branching hyphae and plentiful oleiferous hyphae. All tissues pale yellow as reinflated in $10\% \text{NH}_4\text{OH}$.

BASIDIOSPORES: [105 from 4 specimens] $(5.9-) 6.6 - 9.1 (-10.5) \times (4.2-) 4.5 - 5.9 (-6.3) \mu\text{m}$, (average length (per specimen) = $7.7 - 8.4 \mu\text{m}$; average length (all specimens) = $8.1 \mu\text{m}$; average breadth (per specimen) = $4.9 - 5.4 \mu\text{m}$; average breadth (all specimens) = $5.2 \mu\text{m}$; $Q = (1.18-) 1.30 - 1.78 (-1.88)$; average Q (per specimen) = $1.45 - 1.62$; average Q (all specimens) = 1.56), thin walled, hyaline, smooth, amyloid, broadly ellipsoid to ellipsoid to elongate, occasionally expanded at one end; contents guttulate; apiculus sublateral, cylindrical; white in deposit.

Habitat and distribution: Solitary to subgregarious in red clay or in loam under deciduous trees including *Quercus spp.*, *Liriodendron tulipifera* L., *Acer sp.*, *Cornus florida* L., *Fraxinus sp.*, etc. and in mixed woods with similar trees and *Pinus spp.*, July to September, central New Jersey to western South Carolina.

Collections examined: NEW JERSEY, Mercer County, Princeton, Herrontown Woods County Park, New Jersey Mycological Association foray member 9-18-83-B; SOUTH CAROLINA, Oconee Co., Sumter National Forest, Stumphouse Tunnel Pk., M. A. King & R. E. Tulloss 7-16-83-A (holotype, NY), 7-16-83-D, 7-16-83-E.

DISCUSSION

The group of North American species of *Amanita* that appear "to be intermediate between sections *Validae* and *Lepidella*" were first noted by Jenkins (1983) in the description of *A. media* Jenkins. Jenkins (1984) again noted that there was some blurring of definition between the two sections in his description of *A. radiata* Jenkins. In both these cases, the mushrooms involved exhibited subcylindric to cylindrical spores, had partial veils that tended to disappear rapidly after expansion of the basidiocarp, and had nonappendiculate pileus margins.

In the case of *A. salmoneascens* different characters combine to produce the impression of a species at the border of sections *Validae* and *Lepidella*. In stature,

One member of section *Validae* in North America is white and shows reddish or reddish-brown discoloration: *Amanita rubescens* var. *alba* Coker. It occurs in a range which overlaps the known range of *A. salmoneascens*; it can be distinguished from the latter by having a subcellular to inflated ramose subhymenium, larger inflated cells in the universal veil, larger acrophysalides in the stipe context, slower and darker and more red-brown staining of the stipe, irregular and floccose warts, and generally broader spores having an average Q of 1.35 (Jenkins, 1986).

In section *Lepidella*, there are two North American species that bear comparison to *A. salmoneascens*. *Amanita nitida* sensu Coker was described as having a pinkish-gray context (Coker, 1917). Bas (1969) examined Coker's collection and described the spores as follows: (20 from 1 specimen) $10.0 - 14.5 \times 5.5 - 7 (-7.5) \mu\text{m}$ (Q = 1.6 - 2.5; average Q = 2.0). The spores of *A. salmoneascens* are consistently shorter than those of *A. nitida* sensu Coker; and the differences between this taxon and *A. salmoneascens* in range of Q and average Q are marked. Moreover, *A. nitida* sensu Coker has a universal veil which, in the remains on the pileus, exhibits a structure dominated by vertically aligned chains of slightly inflated cells with larger, rounded cells less common than in *A. salmoneascens*.

Amanita canescens Jenkins exhibits pinkish-orange fibrils near the base of the stipe, but differs in having a grayish-brown pileus (at least in disk), slightly longer spores with an average Q of 1.66, and a thick white annulus which does not change color and frequently falls away because it is dominated by inflated cells rather than hyphae as in *A. salmoneascens* (Jenkins, 1986). Jenkins (1986) notes that the subhymenium of *A. canescens* is inflated ramose to subcellular, another character distinguishing it from *A. salmoneascens*.

Amanita salmoneascens is the entity I have called "species 8" in correspondence.

ACKNOWLEDGMENTS

I thank Dr. David T. Jenkins, Department of Biology, University of Alabama at Birmingham, for reviewing this article. I thank Dr. Cornelis Bas, Rijksherbarium, Leiden, The Netherlands, for his comments and suggestions on sectional placement of *A. salmoneascens*. I am grateful to Mr. Neal Macdonald, Princeton, New Jersey, for preparation of the illustrations and to Ms. Mary A. King, Roosevelt, New Jersey, for assistance in final preparation of the paper for publication.

LITERATURE CITED

- Bas, C. 1969. Morphology and subdivision of *Amanita* and a monograph of its section *Lepidella*. *Persoonia* 5(4): 285-579.
- Coker, W. C. 1917. The amanitas of the eastern United States. *J. Elisha Mitchell Scient. Soc.* 33: i + 1-88.
- Jenkins, D. T. 1983. A new species of *Amanita*. *Mycotaxon* 16(2): 414-416.
- _____. 1984. A new species of *Amanita* IV. *Mycotaxon* 20(2): 315-317.
- _____. 1986. *Amanita of North America*. (Mad River, Eureka). vi + 198 pp.
- Kornerup, A. and J. H. Wanscher. 1978. *Methuen handbook of colour*. (Methuen, London). 252 pp.