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AMANITA GRALLIPES, A NEW SPECIES IN AMANITA SUBSECTION VITTADINIAE FROM SOUTHERN BRAZIL

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Amanita grallipes, a new species from the State of Paraná in southern Brazil, belonging to *Amanita* sect. *Lepidella* subsect. *Vittadiniae*, is extensively described and illustrated. It is well-characterized by a long, slightly rooting stipe with a non-bulbous base and scattered remnants of the universal veil, a dark brown pileus with dark brown warts, lamellae turning maize yellow, ellipsoid spores shorter than 9.5 µm and the presence of clamp-connections.

In large areas of South America the genus *Amanita* is poorly represented. After six years of collecting in the Brazilian State of Paraná and bringing together material of more than 1000 species of macromycetes, the second author for the first time found a probably indigenous species of *Amanita*, presented here under the name *Amanita grallipes*, spec. nov.

Amanita grallipes belongs to the rapidly expanding subsection *Vittadiniae* of which many species are almost certainly non-ecto-mycorrhizal, as they are able to grow in fields, pampas, prairies, meadows and lawns without any tree or shrub in the surroundings. In the case of the present species, little can be said about this important ecological aspect, as its type-locality is a mixed forest in which *Araucaria augustifolia* is present. This tree, however, probably has endotrophic and no ectotrophic mycorrhiza (Harley & Smith, 1983: 19).

The abbreviation K. & W. refers to Kornerup & Wanscher (1978). The notation [30/2 /1] stands for '30 spores measured from 2 basidiocarps belonging to one collection'.

Amanita grallipes Bas & A. de Meijer, *spec. nov.* — Figs. 1–6

? *Amanita spissa* var. *laeta* Rick, Brotéria 5 (1906) 25.

Pileus 22–90 mm latus, initio hemisphaericus vel convexus, demum plano-convexus vel planus, exumbonatus, brunneus, fibrillosus, siccus, margine appendiculatus, verrucis sparsis, conicis, adnatis, concoloribus ornatus. Lamellae liberae, confertae, usque ad 11 mm latae, ex albo flavescentes. Stipes 70–120 × 6–18 mm, subfusiformis, solidus, radicans, sub annulo squamis floccosis, erectis vel adpressis, pallide flavobrunneis munitus. Annulus fugax, coacto-membranaceus, albus, margine verrucis brunneis praeditus. Caro albo, inodora, mitis.

Sporae 7.5–9.6 × 5.6–6.9 µm, amyloideae. Fragmenta volvae cellulis elongatis, catenulatis composita. Fibulae frequentes.

Typus: '*A.A.R. de Meijer 2078*, 31 Dec. 1991, Brazil, Paraná, Curitiba, Parque Barigui, L'.

Etymology: grallae = stilts; pes = foot.

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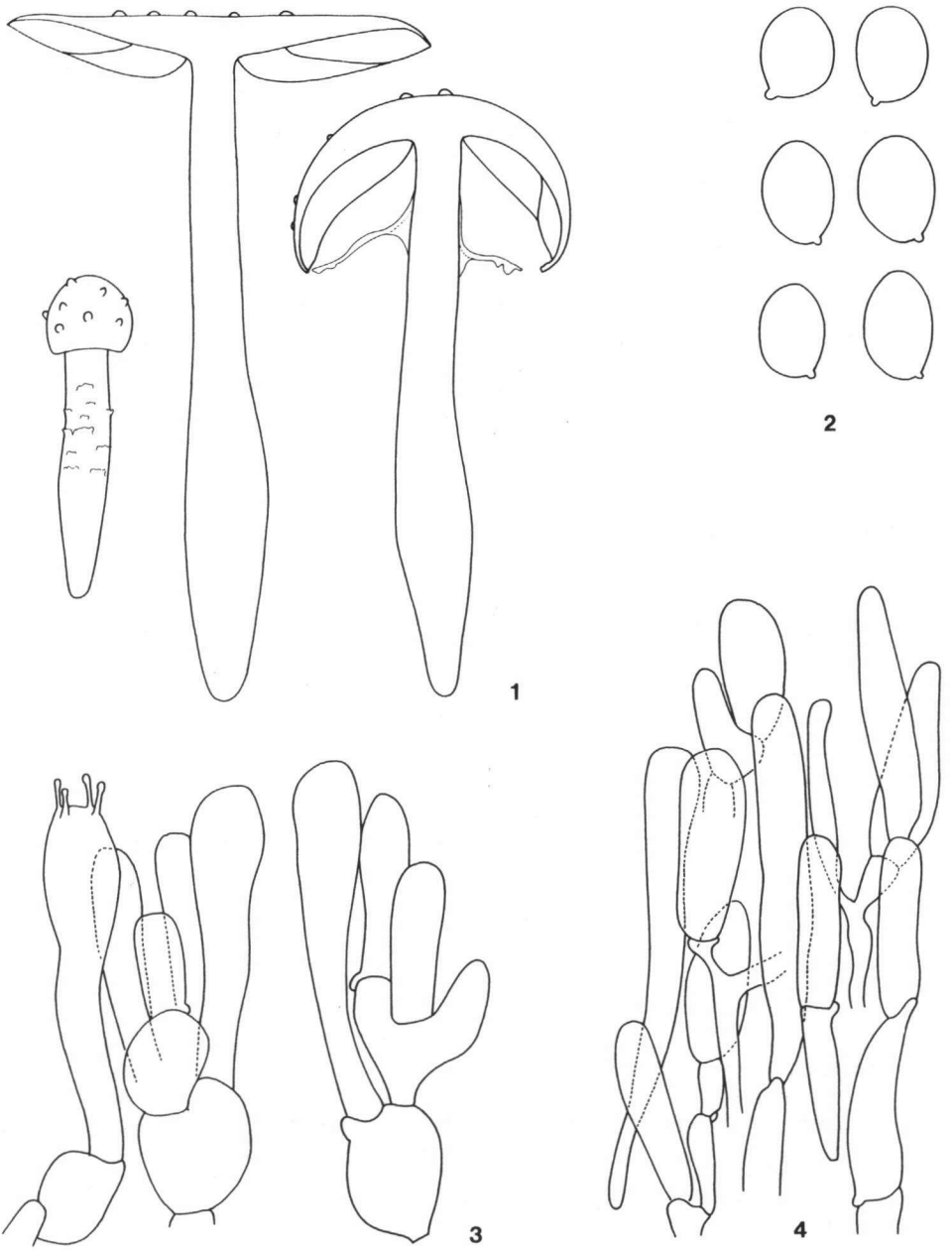


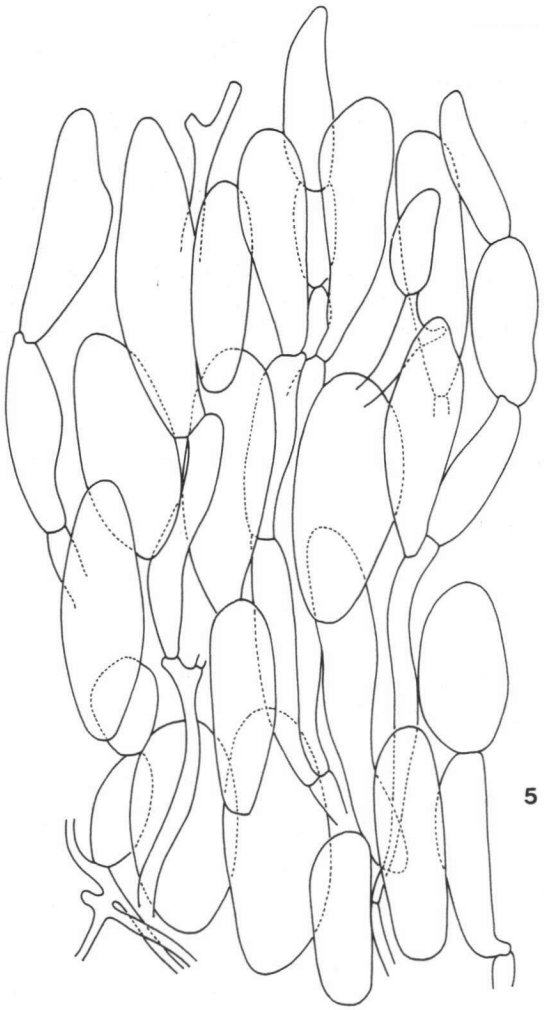
Figs. 1–4. *Amanita grallipes*. 1. Basidiocarps, × 0.5; 2. spores, × 1500; 3. basidia and subhymenial cells, × 1000; 4. volval tissue on stipe, × 500 (all from type).

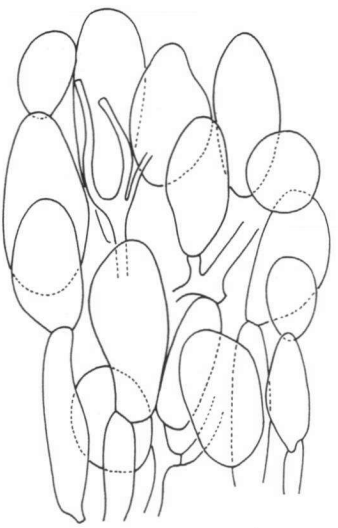
Basidiocarps large and slender, solitary to subgregarious. Pileus 22–90 mm in diam., from hemispherical or conico-convex to plano-convex or flat without umbo, with smooth margin appendiculate when young, uniformly dark brown to somewhat paler greyish brown (K. & W. 6E5 to 5D4), dry, with scattered, concolorous, adnate, pyramidal warts, fleshy (context up to 10 mm thick near centre and up to 6 mm thick above midpoint of lamellae). Lamellae free, very crowded, fairly broad (up to 11 mm), first pure white, then cream (4A2), finally yellow (3.5A5) to golden yellow (K. & W. 4A6), with concolorous, even edge; lamellulae attenuate. Stipe 70–120 mm long, 10–18 mm wide at broadest part just above the soil, 6–11 mm wide at narrowest part, with lower 20–45 mm tapering downwards and rooting, solid, white, at first annulate but soon exannulate, below annulus covered with small, erect to appressed, pale yellowish brown, floccose volval scales, dry. Annulus apical, pendulous, rather thick felted-membranous, fugacious, white and smooth below and above, at margin with brown pyramidal warts similar to those on pileus. Context white, unchanging except for a slight yellowing in base of stipe after bruising, inodorous; taste mild. Spore print pure white when fresh.

Spores [50/4/2] (7.2–)7.5–9.6 × 5.6–6.9(–7.5) µm, Q = (1.15–)1.2–1.5(–1.6), average Q = 1.25–1.4, broadly ellipsoid to ellipsoid, thin-walled, smooth, amyloid, with small, abrupt apiculus, usually with granular contents and/or one or a few large oil-drops. Basidia 37–51 × 8.3–9.9 µm, 4-spored, with distinct clamp-connection. Marginal tissue, only present in very early stages, consisting of early disintegrating strands of colourless, thin-walled, 1–3 µm wide hyphae parallel to edge of lamellae. Hymenophoral trama bilateral, with narrow, 20–30 µm wide central plate of 2.5–7 µm wide, parallel hyphae, flanked by 30–40 µm wide zones of diverging hyphae and up to 20 µm wide, diverging, inflated elements, and 30–35 µm wide subhymenial zones of mostly ellipsoid to ovoid or irregularly shaped inflated cells, 10–30 × 9.5–19 µm, in rows perpendicular to hymenium. Pileipellis a rather indistinct, non-gelatinized layer of mainly radial, 5–10 µm wide hyphae gradually passing into trama of pileus. Volval tissue directly overlaying the pileipellis consisting of repent to ascending short rows of elongate-fusiform, elongate-subclavate, and subcylindrical cells, 57–240 × 22–57 µm, with brown vacuolar pigment (dissolving in NH_4OH) and sparsely branching, 5–14 µm wide hyphae; volval warts on pileus made up of sparse, 2–8 µm wide, branching hyphae and dominant, erect chains of inflated, thin- to slightly thick-walled, slenderly to broadly fusiform, clavate, and oblong cells, 45–135 × 15–45 µm, with intracellular brown pigment, but inflated cells shorter to almost globose, 25–85 × 20–40 µm, and paler in apex of warts. Context of stipe acrophysalidic with remarkably wide, thin- to slightly thick-walled acrophysalides, 165–380 × 25–85 µm; refractive vascular hyphae present but scarce. Scales on stipe made up of parallel rows of mainly cylindrical to subfusiform or oblong, almost colourless cells, 110–240 × 14–25(–32) µm. Clamp-connections abundant in all parts.

Habitat & distribution. Found twice at the type-locality and once at a second locality in southern Brazil, in mixed ombrophilous forest with or without *Araucaria angustifolia*, at c. 900 m altitude.

Collections examined. BRAZIL: Paraná, Curitiba, 'Parque Barigui', 31 Dec. 1991, *A.A.R. de Meijer 2078* (holotype, L); Curitiba, Parque Barreirinha, 13 March 1992, *A.A.R. de Meijer 2179* (L).





Figs. 5–6. *Amanita grallipes*. 5. Volval tissue in centre of wart on pileus; 6. volval tissue in apex of wart on pileus (both from type; × 500).

Amanita grallipes is a typical member of *Amanita* sect. *Lepidella* subsect. *Vittadiniae*. With Bas (1969: 347) it keys out in stirps *Vittadinii* because of its clamp-connections, broadly ellipsoid to ellipsoid spores and remnants of the volva evenly distributed over the part of the stipe below the annulus. Within stirps *Vittadinii*, as presented by Bas (l.c.), *A. grallipes* belongs to a group of species with spores shorter than 9.5 µm, consisting of one North American species, *A. silvifuga* Bas, and four South American species, viz.

A. bubalina Bas, *A. lilloi* Sing. & Digilio, *A. singeri* Bas and *A. boliviana* (nom. prov.). None of these five species, however, combines a uniformly dark brown pileus with distinctly yellowing gills. *Amanita silvifuga* from Texas comes very close microscopically to *A. grallipes* but has a paler pileus (white to pale ochraceous) with at first brown but later concolorous warts, no conspicuously yellowing lamellae, a non-rooting stipe, and a bitter taste.

The present species also cannot be named with the keys to South American Amanitas given by Garrido & Bresinsky (1985: 530) and to Colombian Amanitas by Tulloss et al. (1992). Two recently described members of subsect. *Vittadiniae* from Idaho (Miller et al., 1990), viz. *A. armillariiformis* Trueblood & Jenkins and *A. malheurensis* Trueblood et al., have pale pilei and spores longer than 10 µm.

Amanita ingrata, described by Pegler (1983: 293) from Martinique, with a paler brown pileus and deep cream-coloured lamellae, has a nauseous smell, larger spores (8–11.5 × 6.5–8.5 µm) and clampless basidia.

In the key to the species of subsect. *Vittadiniae* at present known from the United States, constructed by Tulloss (in msc.), *A. grallipes* belongs to a group of small-spored species (spores < 9.5 µm) consisting of *A. praegraveolens* (Murrill) Sing., *A. silvifuga,* and *A. thiersii* Bas, but all three have whitish or paler pilei. Moreover, *A. praegraveolens* has globose to broadly ellipsoid spores (Q = 1.0–1.3) and a nauseous smell and *A. thiersii* (sub)globose spores, no clamp-connections, and a bitter taste. *Amanita silvifuga* has already been discussed above.

Among the distinctly coloured species in Tulloss' key, only *A. pruittii* Tulloss & Lindgren (Tulloss, in msc.) from western Oregon has microscopical characters more or less similar to those of *A. grallipes* and a dark universal veil. But it has somewhat longer and distinctly wider spores (8–12 × 7–9 µm), the volval remnants on the pileus more grey-brown to grey, and a thick to very thick stipe (its thickness often one quarter to one third, sometimes even approaching one half of its length).

Among some recently described species from South Africa (Reid & Eicker, 1991), *A. foetidissima* Reid & Eicker is microscopically rather similar to *A. grallipes,* but has a paler pileus (buff to yellowish ochre), lamellae not turning deep yellow, and a nauseous smell. The same authors (l.c.) redescribed *A. pleropus* (Kalchbr. & MacOwan) Reid, another brownish species with clamp-connections, ellipsoid spores and clamped basidia in subsect. *Vittadiniae,* but with large spores (10–14 × 7–9.5 µm).

It is possible that *A. grallipes* represents the taxon described under the name *A. spissa* var. *laeta* by Rick (1906: 25) from Rio Grande do Sul in southern Brazil. Singer (1953) studied Rick's types, but did not report on that taxon, which probably means that its type does not exist. Ricks protologue reads as follows (translated): "138. *Amanita spissa* var. *laeta* Rick. Pileus and scales are isabella-grey; the stipe widens upwards, has no bulb, and is from below upwards covered with concentric scales; the lamellae are deep yellow."

Taking into consideration the lack of a type collection, hence the lacking information on microscopical characters, the poor protologue, and the colour described for the pileus (isabella-grey instead of dark brown), we prefer to describe a new species with extensive notes and illustrations, based on a well-dried type collection, rather than raising Rick's var. *laeta* to the rank of species and applying its name to the present collection.

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