Notes on *Mycena pseudotenax* A. H. Smith (Agaricales)

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The holotype of *Mycena pseudotenax* has been studied and compared with material collected in Andalusia (Southern Spain). Macroscopical and microscopical characters indicate a close relationship to *Hydropus scabripes*, from which it differs in the structure of the pileipellis and size of cystidia and spores. The study of typical material of *Hydropus scabripes* f. *safranopes* (Malenç.) has revealed that this taxon is a synonym of *Mycena pseudotenax*. The combination *Hydropus pseudotenax* comb. nov. is proposed. Finally, the taxonomic position of this species is discussed and a comparison with other closely related taxa is made.

Keywords: *Mycena pseudotenax*, *Hydropus scabripes* f. *safranopes*, taxonomy, Andalusia, Spain.

During some mycological journeys conducted through the autumn of 1992 in Andalusia (Southern Spain), a collection identified as *Mycena* sp. „*in situ*" was found, growing abundantly on *Pinus halepensis* humus. After microscopical examination, this material revealed characters such as non-amyloid trama, amyloid spores, intracellular pigments and very protruding pleurocystidia. These features allow to assign the material to *Hydropus* (Kühner) Sing. ex Sing. (*sensu* Singer, 1986), a genus that includes species with some macroscopical heterogeneity, with „omphaloid", „collybioid" and „mycenoid" habits, which seem to share a non- or hardly amyloid trama, in contrast to that of *Mycena* species.

Hydropus was proposed as a taxonomic group by Kühner (1938), who included in the subgenus *Eu-Mycena* section *Spuriae* species with non- or weakly amyloid trama and cystidia and covering-cells without diverticulae. In this section, taxa with „mycenoid" habit and big pleurocystidia were included in the *Subtypicae* (e.g. *Mycena scabripes* or *M. trichoderma*), whereas the group *Hydropus* comprised species with „collybioid" or „omphaloid" habit and blackening flesh (e.g. *Mycena marginella* or *M. fuliginaria*). Both groups or subsections also show differences in pileal structure, being a cutis of parallel hyphae in the *Subtypicae* and a (sub-)hymeniform structure in

subsection *Hydropus*. These taxonomic criteria have been discussed and illustrated more recently by Kühner (1980: 777–782).

Nearly coincidental in time with Kühner's (1938) „Le genre *Mycena*", Smith (1939), and subsequently in his monograph about this genus in North America (Smith, 1947), included *M. scabripes* and *M. trichoderma* in the genus *Mycena* section *Typicae* (!), close to some well known species such as *M. alcalina* or *M. leptocephala*.

The first author who adopted a generic rank for *Hydropus* was Singer (1942, 1943, 1948), who later contributed a large number of species, mainly from neotropical areas (Singer, 1982).

The study of the samples gathered in Andalusia (Spain) did not completely match the description of *Hydropus scabripes*. Therefore, we examined the holotype of *Mycena pseudotenax* A. H. Smith, a taxon which seemed to be the closest, according to the descriptions and illustrations of Smith (1939, 1947). In Smith's descriptions, however, some important characters related to covering cells are lacking, and there is an evident contradiction about the amyloid reaction of the spores.

The material collected in Andalusia is deposited at the Herbarium of Granada University (GDAC). Part of the holotype of *M. pseudotenax* (five fruit-bodies) was kindly sent from the A. H. Smith collection, deposited at the Michigan University Herbarium (A. H. Smith 8134-MICH); this material is perfectly preserved and also includes annotations by Dr. C. Bas, who previously revised it and checked the positive amyloid reaction of the spores.

The samples were mounted in water, KOH 2%, Congo Red, Melzer reagent and Cresyl Blue for light microscopy. Both pileipellis and stipitipellis were observed using phase-contrast. Twenty spores were measured from lamellae in every collection studied.

Hydropus pseudotenax (A. H. Smith) F. Esteve-Raventós et A. Ortega comb. nov. – Figs. 1–2.

Basionym: *Mycena pseudotenax* A. H. Smith, Mycologia 31: 275. 1939.

= *Mycena scabripes* Murr. f. *safranopes* Malençon & Bertault, Fl. Champ. Sup. Maroc II: 304. 1975. – *ad.int.*

= *Hydropus scabripes* (Murr.) Sing. f. *safranopes* (Malençon & Bertault) Lonati, Boll. Assoc. Micol. Ecol. Romana 6–7: 20. 1986. – *ad. int.*

Macroscopical characters and a black and white photograph of this species are found in Smith (1939, 1947). In the holotype a saffron-yellow color is predominant both in the stipe and lamellae, whereas the pilei are fuscous-brown in color. In accordance with the author's description, the material shows a typical saffron

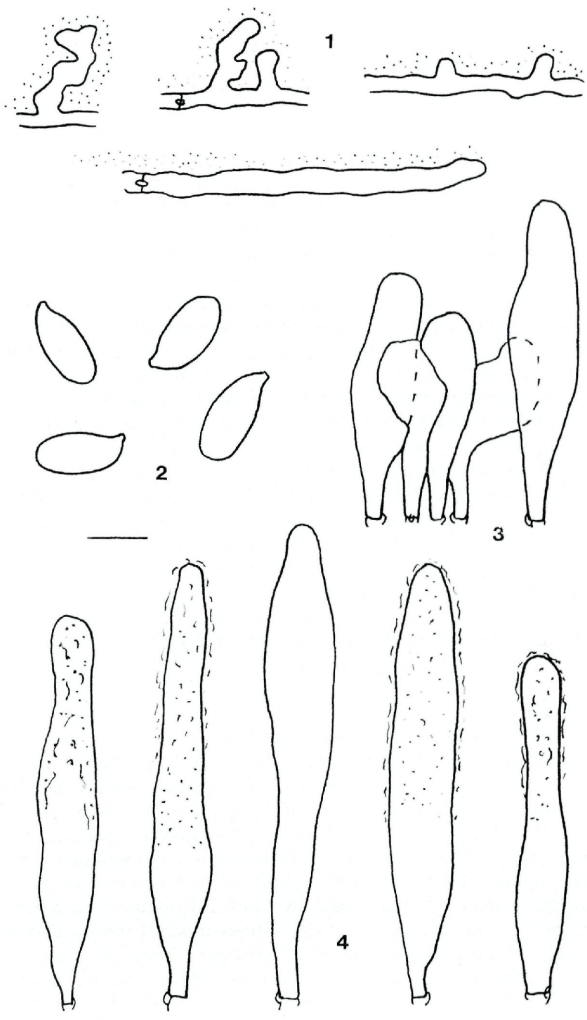

Fig. 1. – *Mycena pseudotenax* (A. H. Smith 8134, holotype). – 1. Elements of the epicutis of the pileipellis. – 2. Spores. – 3. Caulocystidia. – 4. Hymenial cystidia. – Bar: 10 μm (except spores: 5 μm).

mycelial structure at the stipe base. This color is probably due to the rather frequent oleiferous hyphae filled with yellowish contents in the tissues of the stipe and lamellae.

Microscopical and complementary data of the holotype (MICH 8134) are: spores 6.5–8.2 x 3.5–4.2 µm, ellipsoid, hyaline, smooth, weakly amyloid, with distinct apiculus. – Basidia 23–27 x 6–8 µm, clavate, 4-spored. – Pleurocystidia 55–80 x 8–14 (–16) µm, abundant, strongly projecting from gill face, usually cylindrical to fusiform, but sometimes (sub-)lageniform or clavate, tapering at the base, with rounded apex, thin-walled (at times slightly thick-walled), mostly with an amorphous, yellowish content, metachromatic in cresyl blue, usually also with amorphous incrustations around the necks or near the apex. – Cheilocystidia sparse, similar to pleurocystidia. – Lamellar trama composed by parallel, 4–12 µm wide hyphae, purplish in cresyl blue, with rather frequent vascular hyphae 2.5–5 µm wide; caulocystidia similar to hymenial cystidia but smaller, mixed with groups of hairs which arise from the stipitipellis, 20–30 x 8–12 µm. – Pileocystidia not seen; pileipellis covered by a thin, not separable, very slightly gelatinous pellicle that covers a thin pileicutis of mostly parallel and narrow hyphae (–5 µm wide), these frequently with a sinuose, strangled profile, showing some short and erect branches, with wide and sparse digitiform projections 2.5–5 µm wide, frequently with moniliform aspect; hypocutis with broader elements –30 µm wide, pseudoparenchymatic. – Stipitipellis formed by parallel hyphae, 5–8 µm wide, not or weakly gelatinized; context non-dextrinoid; hymenium tissues non metachromatic; pigments intracellular; clamp-connections present in all tissues.

Characters of the material collected in Andalusia (GDAC 38855) are as follows:

Pileus 1–2 cm broad, conical to convex, umbonate, the umbo sometimes flattened and with a small papilla, glabrous, slightly lubricous when wet but not gelatinized, translucent striate toward the center when humid, grey-blackish to grey-fuscous, pallescent when drying. – Stipe –4 x 0.1–0.2 cm, cylindrical, cartilaginous, pruinose in the upper third, the rest glabrous, grey-yellowish to grey-olivaceous, paler at the apex, weakly lubricous. – Lamellae ascendant, adnate to slightly decurrent by a small tooth, moderately to hardly sinuate, 20–25 lamellae reaching the stipe, narrow and hardly ventricose, first pale grey, then grey with an olivaceous reflection, the edges concolorous, even. – Flesh pale grey, olivaceous-grey in the stipe cortex. – Taste and smell not distinctive. – Spores (6.2–)6.5–7(–8) x 3.5–4 µm, ellipsoid, hyaline, smooth; basidia clavate, 4-spored. – Pleurocystidia 50–75 x

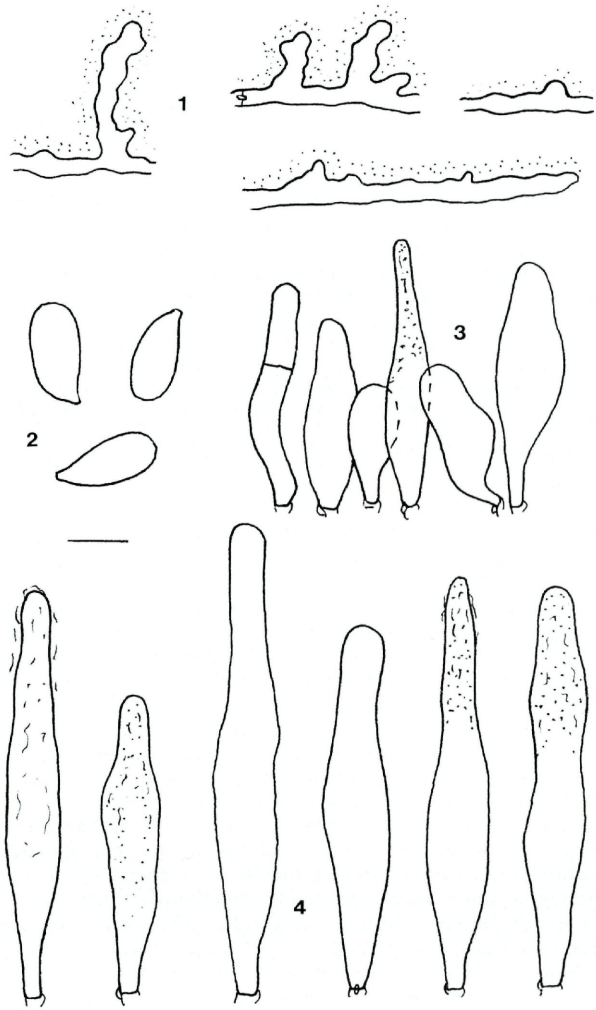

Fig. 2. – *Hydropus pseudotenax* (GDAC 38855). – 1. Elements of the epicutis of the pileipellis. – 2. Spores. – 3. Caulocystidia. – 4. Hymenial cystidia. – Bar: 10 μm (except spores: 5 μm).

8–12 µm, abundant, usually fusiform to narrowly lageniform, sometimes irregularly clavate, tapering at the base, with rounded apex, thin-walled, with an amorphous yellowish content, metachromatic. – Cheilocystidia sparse, similar to pleurocystidia. – Caulocystidia 25–40 x 5–8 µm, in clumps, differently shaped, clavate, cylindrical, pipe-shaped, similar to pleurocystidia but smaller. – Pileocystidia not seen. – Pileipellis formed by a thin pellicle, beneath a cutis of narrow and parallel hyphae (–5 µm wide), frequently showing a sinuose-strangled profile with short, erect branches with digitiform and irregular projections (moniliform in some cases). – Subcutis of wider elements (–30 µm wide), pseudoparenchymatic. – Stipitipellis not or weakly gelatinized. – Trama non-amyloid. – Pigments intracellular. – Clamp-connections present in all tissues.

Material examined. – UNITED STATES: Oregon, Lane Co., Belknap Springs, 23. 10. 1937, terricolous, under conifers, A. H. Smith 8134 (Holotype). – ITALY: Rome, Villa Ada, 25. 10. 1983, on humus and vegetal debris under *Aesculus hippocastanum*, H. G. Lonati (without a collection number), typical material of *Hydropus scabripes* f. *safranopes* (Malenç.). – SPAIN: Andalusia, Granada, Natural Park of Sierra de Baza, Cortijo Narváez, 6. 11. 1992, terricolous under *Pinus halepensis*, GDAC 38855.

Smith (1947) considers *Mycena pseudotenax* close to *M. scabripes*, from which it differs by the less furfuraceous stipe, smaller spores and terricolous habitat. Although the spores of *M. pseudotenax* were originally described as "amyloid", Smith (1947) later changed his opinion; the study of the holotype leaves no doubt about this character, also noted by Dr. C. Bas in the label that accompanies the samples. Probably this author confirmed the positive reaction when comparing it with the related *Hydropus conicus* Bas & Weholt. An interesting feature, which does not seem to have been noted before, is the structure of the pileipellis, which shows some hyphae with sinuose profile, sometimes difficult to discern, probably owing to the thin gelified pellicle over it. This kind of arrangement is also present in some *Mycena* spp. *M. pseudotenax*, however, shows characters of *Hydropus*, such as the non-amyloid trama, amyloid spores and metachromatic pleurocystidia with oleiferous contents (gloeocystidia according to Singer, 1986), originating from the gill trama.

Like *Hydropus scabripes*, originally described from North America, and also known in Europe, *Hydropus pseudotenax* is also distributed in the European continent, and has so far been called *H. scabripes* f. *safranopes*. Its distribution seems to be as wide as in *H. scabripes*, recorded both in broad-leaved and conifer forests. The study of typical material of forma *safranopes*, described by Lonati (1986) from Italy, and in agreement with the invalid original

description of this taxon by Malençon & Bertault (1975) from Morocco, has revealed the same type of pileipellis structure, cystidia and spores.

According to the characters exhibited by *H. pseudotenax*, this taxon should be included in section *Floccipedes* (Kühner) ex Sing. (Singer, 1986). Its placement in a subsection level, however, is problematic. *H. scabripes* is the type-species of subsection *Spurii* (Kühner) ex Sing. and is the closest taxon to *H. pseudotenax*. Nevertheless, the presence of cystidia with oleiferous contents in the latter would place it in subsection *Lipocystides* Sing. For the moment, we prefer to place *H. pseudotenax* in subsection *Spurii*, as taxa of subsection *Lipocystides* have so far been described from neotropical areas of South America, and the taxonomic significance of the presence of gloeocystidia in section *Floccipedes* has yet to be assessed. We have no information about this character for *H. scabripes*, although the presence of a vacuolar content in the cystidia of this species is often noted (e.g. Kühner, 1938; Robich, 1986; Lonati, 1986). Singer's description of *H. lipocystis* from Patagonia (Singer, 1969) fits rather well the characters of *H. pseudotenax*, although nothing is said about the saffron mycelium characteristic for the latter; Singer also indicates the presence of some diverticulae in the pileipellis of *H. lipocystis*. As the study of the holotype of this taxon has not been carried out, we cannot conclude at the moment whether or not both taxa are conspecific; the lack of yellow contents in *H. lipocystis*, however, seems to be significative.

Some close taxa have been described from Europe. *H. scabripes* differs in its longer and wider pleurocystidia, larger spores and the absence of a saffron-yellow mycelium at the stipe base. This species has been already recorded in Spain once by Checa & Moreno (1982), but the study of this material (AH 2056) revealed that the collection belongs to *Mycena niveipes* (Murr.) Murr., a completely different taxon with typical dextrinoid trama. Thus, *H. scabripes* is still unknown in the Iberian Peninsula. Another similar taxon, *Hydropus conicus* Bas & Weholt, was described from Norway, but this species has very long pleurocystidia, larger spores and smooth hyphae in the pileipellis (Bas & Weholt, 1984). *Hydropus nitens* Maas Geest. & Hausknecht, recently described from Austria, shows a different pileipellis, very narrow fusiform caulocystidia, larger spores and a weakly amyloid trama (Maas Geesteranus & Hausknecht, 1993).

Among the taxa described from North America, *Hydropus taxodii* (Murr.) Sing. is a species with larger spores [(9–11 x 5–6 µm), according to Smith (1947: 393)] and lacks pleurocystidia. The differences between the original description and the one by Smith are remarkable. On the other hand, Smith (1947: 487–488) has revised the type of *Mycena plumbeibrunnea* Murr., a taxon that he considers as dubious, owing to the bad state of preservation that makes impossible

a clear distinction from other taxa (e.g. *M. scabripes*, *M. stannea s.* A. H. Smith or *M. aetites s.* Kühner); Murrill (1916), in the original description of *M. plumbeibrunnea*, indicated the stipe as „smooth, glabrous", which is clearly in disagreement with this character in *H. pseudotenax*. According to Maas Geesteranus (1988: 148–149), who has re-examined the fragments of Murrill's type, this has turned out to be heterogeneous, consisting of, at least, two different species, one suggestive of *H. scabripes* and the other of *Mycena pectinata* (Murr.) Murr.

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