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FURTHER NEW SPECIES OF MYCENA AND A NEW SECTION FROM SPAIN

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This short note directs the attention towards a new section and its type species, and two new species of section *Fragilipedes* (Fr.) Quél. *Hydropus flocculinus* is transferred to the genus *Mycena*.

Section *Fragilipedes* is the most numerous and complex group within the genus *Mycena* (Pers.) Roussel. Several new species belonging to this section have been described in recent times in Europe alone (Maas Geesteranus, 1988a, 1988b, 1988c, 1991a, 1991b, 1992, 1993, 1995; Aronsen & Maas Geesteranus, 1989; Maas Geesteranus & Schwöbel, 1989; Robich, 1992; Aronsen, 1994; Maas Geesteranus & Enderle, 1994; Maas Geesteranus & Münzmay, 1997) and more are likely to be discovered in future.

Mycena flocculina (Kalamees) Villarreal, *comb. nov.* — Figs. 1–5

≡ *Hydropus flocculinus* Kalamees, Folia Cryptog. Eston. 26 (1987) 7.

Original diagnosis:

Pileus ad usque 1 cm latus, hygrophanus, striatus, griseo-farinaceus, griseo-brunneus, campanulatus, umbonatus. Lamellae brunneo-griseae, ad aciem claro-griseae anastomosans, rugosae, distantes, adnexae. Stipes ad usque 5 cm longus, 1 cm crassus, griseo-brunneus, griseo-farinaceus. Odor alcalinus, sapor indistinctus. Sporae 6,5–11 × 5–6,5 µm, cylindricae, ellipsoideae, ovoideae vel guttiformes. Cheilocystidia 50–75 × 11–13 × 6,5 µm, numerosa, lageniformia. In juniperetis, ad lignum putridum.

Holotypus: URPSS, Uzbekistan, regio Dzhizak, distr. Zaamin, montes Pamiro-Alai, jugum Turkestan, Tujasai, in Junipereto, ad truncum *Juniperus sp.*, alt. 2500 m. s. m., 25. V. 1980, leg. K. Kalamees (TAA 121354).

Basidia 30–34 × 8–10 µm, clavate, 4-spored, rarely 2-spored, clampless, with sterigmata up to 6 µm long. Spores (8.50–)8.75–***11.11***–13 × 5.20–***6.23***–7.20 µm; Q = 1.61–***1.78***–1.94; (n = 21), ellipsoid to narrowly ellipsoid, smooth, weakly amyloid. Cheilocystidia 39–62 × 10–17.5 µm, hyaline, clampless, broadly lageniform, lageniform to fusiform, smooth, forming a sterile band (lamella-edge homogeneous). Pleurocystidia not observed. Hymenophoral trama slightly dextrinoid. Hyphae of the pileipellis 2.5–4 µm wide, clampless, vacuolar pigment absent, densely covered with simple or more rarely somewhat furcate excrescences 3–5(–14) × 2–4 µm, embedded in dense gelatinous matter. Hyphae of the pileitrama up to 45 µm wide. Hyphae of the stipitipellis 2–6 µm wide, clampless, covered with short or long excrescences 3–25 × 3–5 µm and caulocys-

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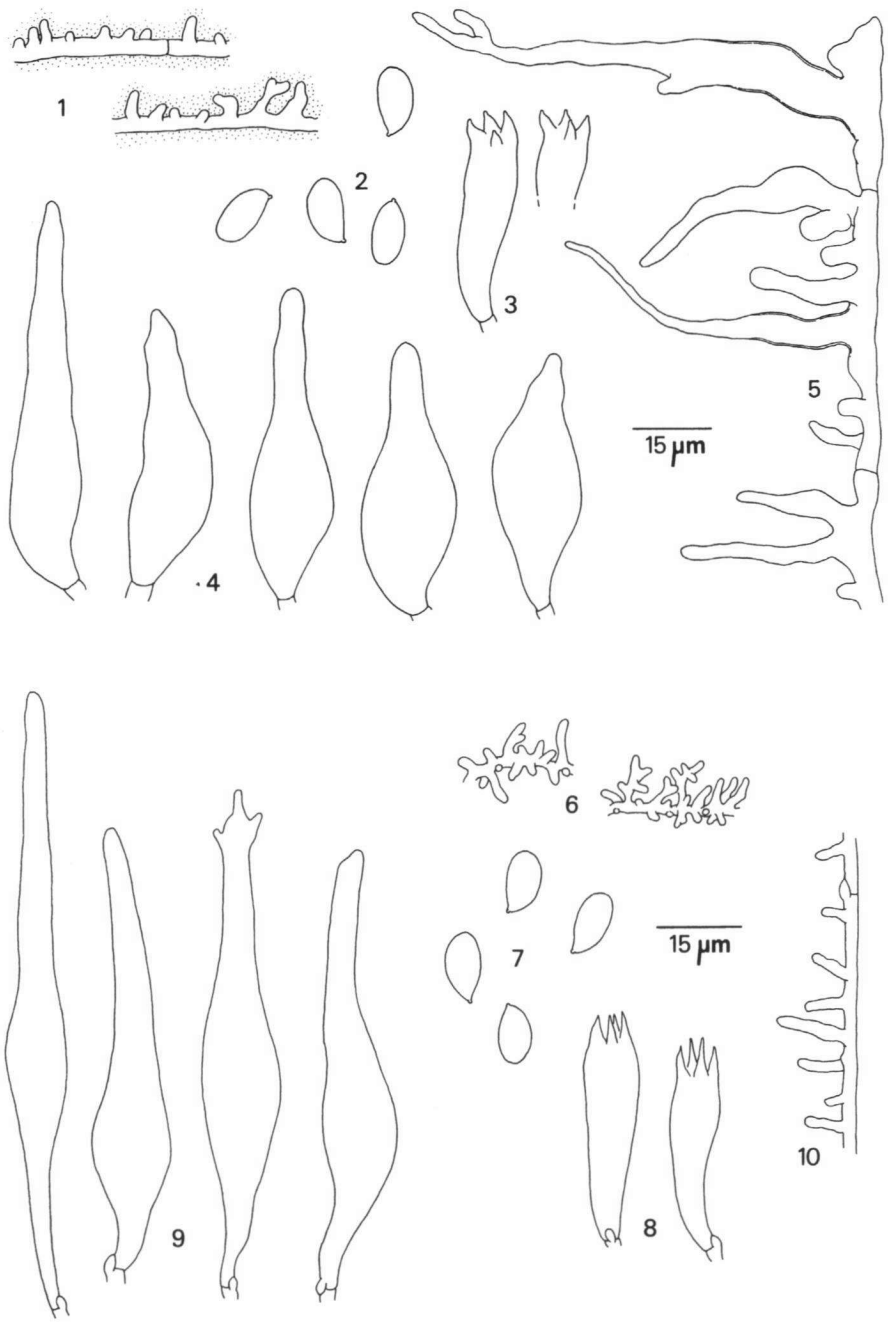


Figs. 1– 5. *Mycena flocculina* (holotype). 1. Hyphae of the pileipellis; 2. spores; 3. basidia; 4. cheilocystidia; 5. stipitipellis. — Figs. 6 –10. *Mycena gilvipes* (holotype). 6. Hyphae of the pileipellis; 7. spores; 8. basidia; 9. hymenial cystidia; 10. hypha of the stipitipellis.

tidia up to 110 (or more) × 7–20 µm, versiform, usually tapering towards the apex, flexuose to straight, thin-walled but sometimes fairly thick-walled at their bases, not embedded in gelatinous matter.

Because of the fragmentary state of the holotype, we refrain from re-evaluating the macroscopic features described by Kalamees (1987) except for the width of the stipe which hardly could be 1 cm wide, as indicated by its author (in dried material not even 1 mm), and the colours mentioned for the gills which are stated to be grey-brown (in dried material pale cream). The microscopic details are based on re-examination of the holotype.

According to the following characters, i) the absence of any trace of vacuolar pigment in the hyphae of pileipellis, ii) the absence of oleiferous hyphae [more or less rare in *Mycena* (Kühner, 1938), and often present in *Hydropus* (Singer, 1986)], iii) the densely diverticulate hyphae of pileipellis embedded in gelatinous matter [according to Singer (1982), the epicutis in *Hydropus* is never gelatinized except in cases where the upper layer of the hypodermium is gelatinized, which is not the case in *M. flocculina*] and, iv) the dextrinoid hymenophoral trama (very rare in *Hydropus*), it becomes clear that this taxon should be placed in *Mycena*.

Mycena flocculina belongs to sect. *Fragilipedes* and is characterized by its long and peculiar caulocystidia throughout the stipe, its pileipellis embedded in gelatinous matter, its relatively large and amyloid spores, and the absence of clamp-connections. Within sect. *Fragilipedes* this species keys out close to *M. deceptor* Maas G. (Maas Geesteranus, 1988a), which is however completely different.

On the other hand, the stipitipellis of *M. flocculina* recalls that of *M. pilosella* Maas G., but the latter differs in having cylindrical and slender caulocystidia, smaller spores, presence of clamps, and a pileipellis without any trace of gelatinous matter.

Another species which recalls *M. flocculina* is *M. scirpicola* (described as new in this paper), both sharing the greyish brown colour of the pileus, the structure of the stipitipellis, and the presence of similar cheilocystidia. The latter can be separated by the absence of a nitrous odour, presence of clamps, smaller spores, pileipellis which is not embedded in gelatinous matter, and the very different habitat (fruiting on dead culms of *Scirpus holoschoenus* L.).

Mycena gilvipes Villarreal, Heykoop & Maas G., *spec. nov.* — Figs. 6–10

Basidiomata caespitosa. Pileus 15–17 mm latus, conico-campanulatus, glaber videtur, hygrophanus, striatus, obscure olivaceogriseus, pallescens. Caro tenuis, albida, odore nitroso. Lamellae 14–17 mm stipitem attingentes, usque ad 3,5 mm latae, molles, adscendentes, adnatae, albae vel pallide flavidae, margine convexae, concolores. Stipes –100 × 1,5–3 mm, cavus, cylindraceus, aequalis, fragilis, glaber videtur, nitens, olivaceus, deorsum flavo-tinctus, sursum flavus, basi fibrillis albidis vel flavidis munitus.

Basidia 26–33 × 7–9 µm, clavata, 4-sporigera, fibulata. Sporae 8,50–***9,84***–11,50(–13) × 4,50–***5,17***–6 µm, ellipsoideae vel subcylindraceae, leves, amyloideae. Cheilocystidia 80–110 × 6,5–12(–16) µm, hyalina, fibulata, fusiformia vel lageniformia, levia, apice raro subramosa, interdum paulo crasse-tunicata. Pleurocystidia crebra, similia. Trama hymenophori dextrinoidea. Hyphae pileipellis –5 µm latae, fibulatae, dense diverticulatae, haud in materiam gelatinosam immersae. Hyphae stipitipellis 2,5–4 µm latae, fibulatae, diverticulatae, haud in materiam gelatinosam immersae, cellulae terminales haud observatae.

Ad aciculas dejectas in silvis acerosis.

Holotypus: no. 19360 (AH); isotypus: no. 996.157-396 (L).

Etymology: from Latin gilvus = yellowish tan referring to the colour of the stipe.

Basidiomata cespitose. Pileus 15–17 mm in diam., conical-campanulate, apparently glabrous, hygrophanous, translucent-striate nearly to the centre of pileus, dark grey or olive grey (Munsell 5Y 3/1–2, Munsell, 1988) at centre, becoming paler towards the margin to pale olive (–5Y 6/3–4), remaining almost whitish (5Y 8/2), finally light olive-brown (2.5Y 5/4–6) when dry. Flesh thin and whitish. Smell strongly nitrous. Taste 'sweetish'. Gills 14–17 reaching the stipe, up to 3.5 mm broad, tender, ascending, adnate, white to pale yellow (2.5Y 7/4) when dry, lamella-edge convex and concolorous; lamellulae present. Stipe up to 100 × 1.5–3 mm, hollow, cylindrical, equal, becoming slightly wider at the base, fragile, appearing entirely glabrous, shiny, olive (5Y 5/6, 4/3–4), with more pronounced yellowish tinges towards the base (5Y 6/6, 6/8), becoming yellow to pale yellow (5Y 8/4, 8/6, 8/8) towards the apex and with a slightly pinkish tinge, dark yellowish brown (10YR 4/4, 4/6, 3/4 to 3/6) in dried material, the base covered with long, interwoven, whitish to pale yellowish fibrils.

Basidia 26–33 × 7–9 µm, clavate, 4-spored, clamped. Spores 8.50–***9.84***–11.50(–13) × 4.50–***5.17***–6 µm; Q = 1.50–***1.91***–2.41(–2.44); (n = 22), ellipsoid to subcylindrical, smooth, amyloid. Cheilocystidia 80–110 × 6.5–12(–16) µm, hyaline, clamped, fusiform to lageniform, smooth, rarely ramified at apex into two or three short excrescences, sometimes with slightly thick walls (less than 1 µm), forming a sterile band (lamella-edge homogeneous). Pleurocystidia abundant, similar to cheilocystidia in shape and size. Hymenophoral trama strongly dextrinoid. Hyphae of pileipellis –5 µm wide, clamped, densely diverticulate, with cylindrical excrescences 2–8(–15) × 1–3 µm, tending to grow out to much longer and profusely branched structures, not embedded in gelatinous matter. Hyphae of the stipitipellis 2.5–4 µm wide, covered with fairly numerous excrescences 2–17 × 1.5–3 µm, clamped, not embedded in gelatinous matter. Terminal cells of the cortical layer of the stipitipellis not observed.

Habitat — On needles of *Pinus pinaster* Aiton.

Material studied. SPAIN: Ávila, Casavieja, UTM 30TUK502665, alt. 1590 m, leg. M. Villarreal & M.A. Jiménez, 26 Nov. 1995, AH 19360 holotype; isotype: no. 996.157-396 (L).

Mycena gilvipes, a member of sect. *Fragilipedes*, possesses several characters similar to those of two other species of this section, such as clamped hymenial elements, densely diverticulate hyphae of the pileipellis with cylindrical excrescences which are not embedded in gelatinous matter, and a yellowish brown stipe. These are *M. alcaliniformis* (Murrill) Murrill and *M. citrinomarginata* Gillet, but both differ in lacking a strong nitrous smell and pleurocystidia.

Because of the unusual olivaceous tints of the stipe *Mycena gilvipes* may be thought to be similar to *M. cyrnea* Maas G. (Maas Geesteranus, 1993), a species described from Corsica. Moreover, both share the presence of long and lageniform cheilocystidia, which are nevertheless shorter in *M. cyrnea*. The differences between both species under discussion are tabulated below (Table I).

Table I. A comparison between *M. cyrnea* and *M. gilvipes*.

	cespitose habit	pileus margin	mean Q value	cheilocystidia length	hyphae of the stipitipellis
Mycena cyrnea	no	dingy pink	1.75	40–70 µm	very sparsely diverticulate
Mycena gilvipes	yes	without pink tinge	1.91	80–110 µm	densely diverticulate

Mycena scirpicola Villarreal, Heykoop, Esteve-Rav. & Maas G., *spec. nov.* — Figs. 11–15

Basidiomata gregaria. Pileus 6–20 mm latus, conicus vel conico-campanulatus, haud umbonatus, paulo hygrophanus, striatus, subsulcatus, siccus, palide brunneus vel griseus, centro obscure griseobrunneus, omnino albopulverulentus. Caro tenuis, pallide brunnea, odore saporeque nullis. Lamellae 15–27 stipitem attingentes, c. 2,5 mm latae, molles, adscendentes, adnatae vel dente decurrentes, albae vel griseae, margine convexae, concolores. Stipes 35–60 × 1–2,5 mm, cavus, cylindraceus, aequalis, fragilis, albo vel griseolo-pulverulentus, griseobrunneus, siccus, basi obscure griseus vel ater, basi fribrillis crassis albidis munitus.

Basidia 23–30 × 7–9 µm, clavata, 4-sporigera, fibulata, sterigmatibus usque ad 4,5 µm praedita. Sporae 7,70–***8,54***–9,50 × (4,20–)4,25–***4,90***–5,50 µm, ellipsoideae vel subcylindraceae, leves, amyloideae. Cheilocystidia 30–65 × 8–15 µm, hyalina, levia, fibulata, lageniformia, sublageniformia, fusiformia, interdum apice subcapitata. Pleurocystidia margine solum observata. Trama hymenophori paulo dextrinoidea. Hyphae pileipellis 2–4 µm latae, fibulatae, dense diverticulatae, haud in materiam gelatinosam immersae. Hyphae stipitipellis 1,5–3 µm latae, fibulatae, leves vel raro diverticulatae, caulocystidibus longis, interdum furcatis instructae.

Ad *Scirpi* folii vaginam putridam.

Holotypus: no. 20882 (AH); isotypus: no. 996.157-334 (L).

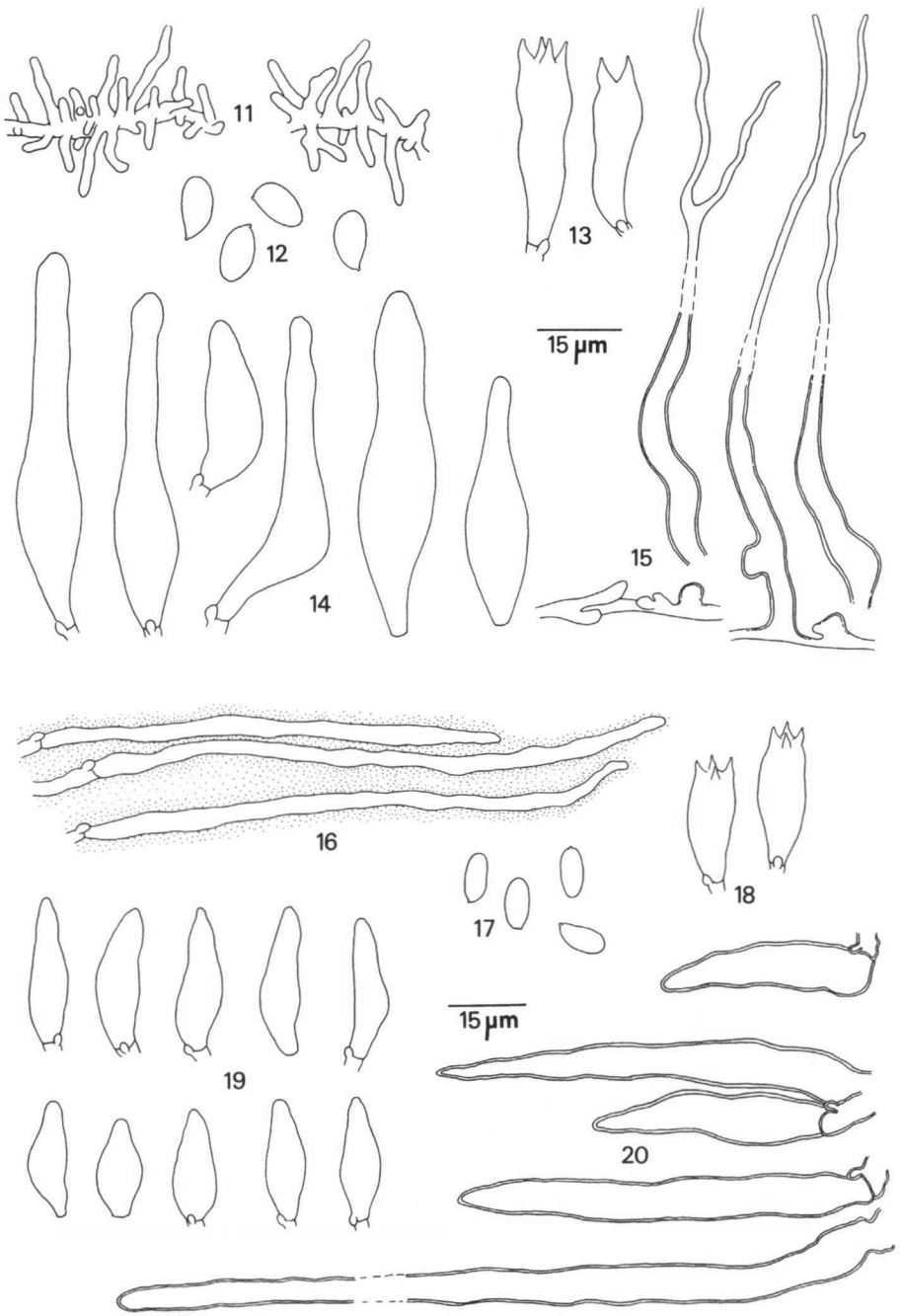
Etymology: because of its typical habitat on *Scirpus holoschoenus* L.

Basidiomata gregarious. Pileus 6–20 mm in diam., conical to conical-campanulate, not umbonate, slightly hygrophanous, striate, dry, slightly sulcate, very pale brown to light grey (Munsell 10 YR 8/3, 8/4 to 10 YR 7/2, 7/3), dark grey or dark greyish brown (10 YR 4/1–2) at the disc, completely covered with a whitish powdery 'bloom' which is easily removed with the slightest contact. Flesh thin, very pale brown (10 YR 7/4). Smell and taste not characteristic (none). Gills 15–27 reaching the stipe, aprox. 2.5 mm broad, tender, ascending, adnate to decurrent with a small tooth, white to greyish (between 10 YR 8/1 and 10 YR 7/1), lamella-edge convex, concolorous; lamellulae present. Stipe 35–60 × 1–2.5 mm, cylindrical, hollow, equal, very slightly wider towards the base, fragile, completely covered with whitish-greyish powdery 'bloom' (similar to that in the pileus), greyish brown (10 YR 5/2) becoming very dark grey at the base (5 YR 3/1) to black (2.5 YR N 2/) when drying, the base covered with scarce, short, coarse, straight and appressed whitish fibrils.

Basidia 23–30 × 7–9 µm, clavate, 4-spored, but also 2-spored (presumably immature), clamped, sterigmata up to 4.5 µm long. Spores 7.70–***8.54***–9.50 × (4.20–)4.25–***4.90***–5.50 µm; Q = (1.37–)1.46–***1.74***–1.93; (n = 21); ellipsoid to subcylindrical, smooth, amyloid. Cheilocystidia 30–65 × 8–15 µm, hyaline, smooth, clamped, lageniform, sublageniform to fusiform, sometimes with subcapitate apex. Lamella-edge homogeneous and sterile. Pleurocystidia only observed with certainty near to the lamella-edge. Hymenophoral trama slightly dextrinoid. Hyphae of the pileipellis 2–4 µm wide, densely diverticulate with short to long excrescences up to 35 × 2–3 µm, clamped, not embedded in gelatinous matter. Hyphae of the stipitipellis 1.5–3 µm wide, clamped, smooth or with some isolated thick excrescences (3–10 × 2–3.5 µm), covered with long caulocystidia tapering towards the apex, –300 × 4–7 × 1–1.5 µm (length × width at base × width at apex), with slightly thickened walls at the base (up to 1.5 µm), and sometimes with apical furcations or lateral excrescences.

Habitat — On dead culms of *Scirpus holoschoenus* L.

Material studied. SPAIN: Ávila, Casavieja, UTM 30TUK512631, alt. 650 m, leg. M. Heykoop, F. Esteve-Raventós & M. Villarreal, 19 Nov. 1996, AH 20882 holotype; isotype: no. 996.157-334 (L).



Figs. 11–15. *Mycena scirpicola* (holotype). 11. Hyphae of the pileipellis; 12. spores; 13. ba: ia; 14. cheilocystidia; 15. stipitipellis. — Figs. 16–20. *Mycena rubescens* (holotype). 16. Terminal ce. of the pileipellis; 17. spores; 18. basidia; 19. hymenial cystidia; 20. caulocystidia.

Mycena scirpicola is a typical member of sect. *Fragilipedes* of which it is the only known species fruiting on *Cyperaceae* and, more specifically, on *Scirpus holoschoenus*, a mediterranean plant. Besides, it is characterized by the strong blackening of the stipe which is completely covered by long and very characteristic caulocystidia.

Mycena section **Rubescentes** Villarreal, Esteve-Rav., Heykoop & Maas G., *sect. nov.*

Basidiomata statura media. Pileus flavus, centro striisque pallide olivaceobrunneis, margine aetate rubroaurantiaca. Caro odore raphanoideo. Lamellae molles, adscendentes, albae, margine concolores. Stipes fragilis, siccus, pruinosus, flavus, basi fibrillis praeditus.

Basidia subfusiformia, 4-sporigera, fibulata. Sporae ellipsoideae, leves, inamyloideae. Cheilocystidia fusiformia vel subutriformia, levia, fibulata. Pleurocystidia nulla. Trama hymenophori dextrinoidea. Hyphae pileipellis fibulatae, leves, cellulis terminalibus elongatis instructae, in materiam gelatinosam immersae. Hyphae stipitipellis leves, fibulatae, haud in materiam gelatinosam immersae; caulocystidia subincrassata, elongata.

Humicola.

Species typica: *Mycena rubescens*.

Basidiomata medium-sized. Pileus yellow, translucent-striate, with the disc and striation light olive-brown, and the margin staining strongly reddish orange in mature specimens. Smell raphanoid. Gills tender, ascending, white, with convex and concolorous lamella-edge. Stipe fragile, dry, pruinose, yellow, and rooting.

Basidia subfusiform, 4-spored, clamped. Spores ellipsoid, smooth, non-amyloid. Cheilocystidia fusiform to subutriform, smooth, clamped. Pleurocystidia absent. Hymenophoral trama strongly dextrinoid. Hyphae of the pileipellis clamped, smooth, with elongate terminal elements, embedded in gelatinous matter. Hyphae of the stipitipellis clamped, not embedded in gelatinous matter. Caulocystidia narrowly fusoid to subcylindrical, with slightly thick walls.

Humicolous.

Type species: *Mycena rubescens*.

Mycena rubescens Villarreal, Esteve-Rav., Heykoop & Maas G., *spec. nov.* — Figs. 16–20

Basidiomata caespitosa. Pileus 4–6 mm latus, e hemisphaerico convexus, haud umbonatus, hygrophanus, sublubricus, esulcatus, striatus, flavus, disco striisque pallide olivaceobrunneis, margine aetate rubroaurantiaca. Caro tenuis albida, odore raphanoideo. Lamellae 18–22 stipitem attingentes, haud 1 mm latae, molles, adscendentes, adnatae, albae vel pallide flavae, margine convexae, concolores. Stipes 19–35 × –1 mm, cavus, radicans, cylindraceus, aequalis, fragilis, siccus, dense pruinosus, e pallide flavo olivaceobrunneus, basi fibrillis brunneis munitus.

Basidia (16–)20–23 × 8–10 µm, subfusiformia, 4-sporigera, fibulata, sterigmatibus 4 µm longis praedita. Sporae (6,50–)6,55–***8,08***–9,50 × 3,50–***4,20***–4,93(–5,10) µm, ellipsoideae vel subcylindraceae, leves, inamyloideae. Cheilocystidia (16–)20–30 × 6–7 µm, hyalina, levia, fibulata. Pleurocystidia nulla. Trama hymenophori dextrinoidea. Hyphae pileipellis 1,8–4 µm latae, fibulatae, leves, cellulis terminalibus –120 × 2–4 µm, elongatae, in materiam gelatinosam immersae. Hyphae stipitipellis 3–8 µm latae, leves, fibulatae, haud in materiam gelatinosam immersae; caulocystidia 30–215 × 9,5–12 µm, fusiformia vel subcylindracea.

Ad *Betula pendula* ssp. *fontqueri* folia decisa.

Holotypus: no. 22062 (AH).

Etymology: referring to the red-orange staining of the pileus margin.

Basidiomata cespitose. Pileus 4–6 mm in diam., at first hemispherical to paraboloid, finally becoming convex, not umbonate, glabrous, hygrophanous, somewhat lubricous when wet, not sulcate, translucent-striate nearly to the disc, yellow (between Munsell 2.5 Y 8/8 and 7/8), with the disc and striation light olive-brown (2.5 Y 5/4, 5/6), margin becoming strongly reddish orange in mature specimens. Flesh thin and whitish. Smell slightly raphanoid. Taste not recorded. Gills 18–22 reaching the stipe, less than 1 mm broad, tender, ascending, adnate, white to pale yellow (5Y 8/4–6) when dry, with convex and concolorous lamella-edge; lamellulae present. Stipe 19–35 × –1 mm, hollow, rooting, cylindrical, equal, fragile, dry, densely pruinose throughout, especially at the apex, at first pale yellow (2.5 YR 8/6) then olive-yellow (2.5 YR 6/6) to light olive-brown (2.5 YR 5/4) in dried material, the base extending into a dense 'brownish' network of mycelial cords.

Basidia (16–)20–23 × 8–10 µm, subfusiform, 4-spored, clamped, sterigmata up to 4 µm long. Spores (6.50–)6.55–***8.08***–9.50 × 3.50–***4.20***–4.93(–5.10) µm; Q = 1.62–***1.92***–2.25; (n = 24), ellipsoid, narrowly ellipsoid to subcylindrical, smooth, non-amyloid. Cheilocystidia (16–)20–30 × 6–7 µm, hyaline, smooth, clamped, fusoid to narrowly fusoid or narrowly utriform, short-stalked, with obtuse apex, forming a sterile band (lamella-edge homogeneous). Pleurocystidia absent. Hymenophoral trama strongly dextrinoid. Hyphae of the pileipellis 1.8–4 µm wide, clamped, smooth, with elongate terminal elements –120 × 2–4 µm, embedded in gelatinous matter. Hyphae of the stipitipellis 3–8 µm wide, smooth, clamped, not embedded in gelatinous matter. Caulocystidia present throughout the stipe, variable in size, 30–215 × 9.5–12 µm, narrowly fusoid to subcylindrical, short-stalked, with slightly thick walls (less than 1 µm).

Habitat — On humus of *Betula pendula* ssp. *fontqueri* G. Moreno & Peinado.

Material studied. SPAIN: Madrid, Canencia, Pto. de Canencia, UTM 30TVL3425, alt. 1400 m, leg. F. Esteve-Raventós, C. Sánchez, J.N. Campoamor & M. Villarreal, 24 Oct. 1996, AH 22062 holotype.

In the key to the sections (Maas Geesteranus, 1992), *Mycena rubescens* would fit in key 4 and, more especially, in section *Adonideae* characterized by a brightly coloured pileus, smooth hyphae of the stipitipellis, inamyloid spores, and caulocystidia with colourless contents. However, several other features of *M. rubescens* produce a very different picture that does not agree with sect. *Adonideae*. *Mycena rubescens* constitutes the type species of a new section whose differential characters are tabulated below (Table II).

Table II. A comparison between sect. *Rubescentes* and sect. *Adonideae*.

	stipe	smell	hyphae of the pileipellis	hymenophoral trama	caulocystidia
section *Rubescentes*	rooting	raphanoid	smooth	strongly dextrinoid	subcylindrical with thickened cell walls
section *Adonideae*	not rooting	not distinctive	diverticulate	not dextrinoid	clavate to fusiform without thickened cell walls

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