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NOTULAE AD FLORAM AGARICINAM NEERLANDICAM–XV
Marasmius, Marasmiellus, Micromphale, and Hohenbuehelia

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The present paper gives descriptions and notes on various white-spored agarics. Two species are new to science, viz.: *Marasmius cornelii* and *Marasmiellus ornatissimus*. *Micromphale bisporigera* is provisionally described as new. The following new combinations are made: *Marasmius setosus* (Sow.) Noordel. to replace *M. recubans* Quél., and *M. bulliardii* forma *acicola* (Lundell) Noordel. to replace *M. wettsteinii* sensu auct. eur. *Hohenbuehelia culmicola* is described as new to the mycoflora of the Netherlands. Type-studies are made of *Marasmius pruinatus* Rea and *M. suaveolens* Rea. A key is given to the European species of *Marasmius* sect. *Gloiocephala* and sect. *Epiphylli*. Some critical species, viz. *Marasmius saccharinus*, *M. siccus*, *M. anomalus*, *M. buxi*, *M. hudsonii*, *Marasmiellus tricolor*, and *Marasmiellus rosellus*, are fully described and illustrated.

I. MARASMIUS

Section Gloiocephala

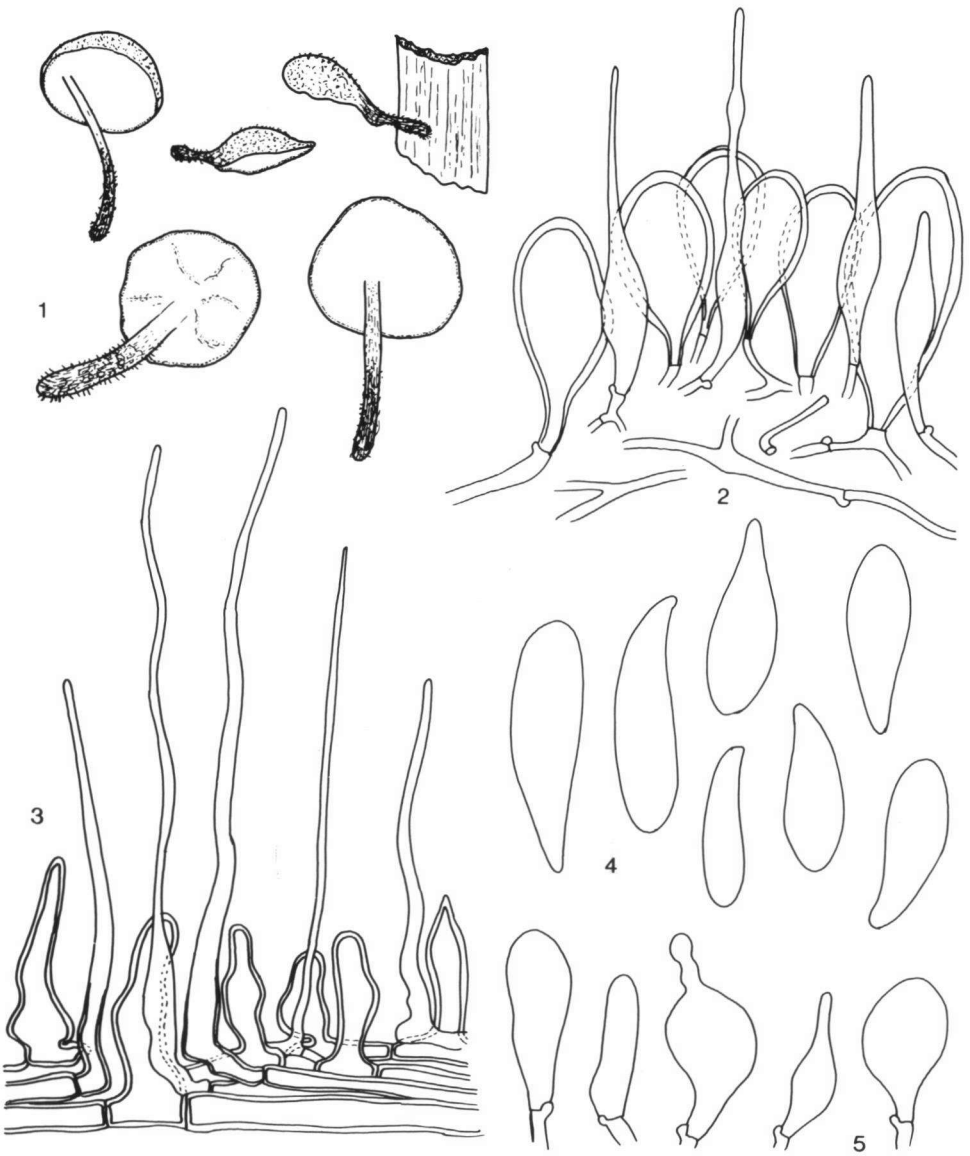
1. Marasmius cornelii Laessöe & Noordel., *spec. nov.*—Figs. 1–5

Gloiocephala spec. Bas in Persoonia 2: 86. 1962.

Misapplied name.—*Marasmius menieri* sensu Corner in Trans. Br. mycol. Soc. 19: 285. 1934.

Description & illustration.—Bas in Persoonia 2: 86–87, figs. 26–30. 1962.

Basidiomata parva. Pileus convexus vel applanatus, albidus vel cremeus, versus margine brunneus, leviter rugosus, pruinosus. Hymenium glabrum vel leviter rugosum, griseo-album. Lamellae absentes. Stipes excentricus vel lateralis, raro subcentralis, apicem albus, basim brunneus vel atrobrunneus, toto hirtus. Odor nullis. Sporae 12.5–18 × 3.5–6.5 µm, ellipsoidae vel lacrymoidae, tenuiparietales, inamyloideae. Basidia 35–52 × 10–12.5 µm, tetrasporigera, clavata, fibulata. Cystidia hymenii clavata, vesiculosa vel lageniformia, 20–35 × 6–20 µm, sparsa prope marginem pilei. Pileipellis hymeniformia elementis clavatis vel vesiculosis 22–50 × 11–30 µm, crassiparietalibus. Pileocystidia 55–90 (–110) × 7–15 µm ad basim et 2–4.5 µm ad apicem, lageniformia, tenuiparietalia. Pileitrama gelatinosa. Caulocystidia diversa, clavata vel vesiculosa vel cylindracea usque ad 110 µm longa, ad apicem 1.5–5 µm crassa. Fibulae presentes. Habitat ad vaginis foliorum putridis Cladii mariscus in palude. — Holotypus: *Thomas Laessöe 0981*, 15 Oct. 1984, 'Keldsnor, Lunden, Island Langeland, Denmark' (C, isotypus in L).



Figs. 1–5. *Marasmius cornelii*. — 1. Fruitbodies (× 5). — 2. Pileipellis (× 500). — 3. Stipitispellis (× 500). — 4. Spores (× 1500). — 5. Cheilocystidia (× 1000). (All figs. from holotype.)

Basidiocarps very small. Pileus 1–2.5(–4) mm broad, relatively robust, tough, convex to applanate, white to cream colour, turning brown at margin, discolouring reddish brown on drying several hours after collecting, sometimes wrinkled, with scattered short hairs all over. Lamellae absent. Hymenium smooth, in some specimens wavy to grooved, pale gray white. Stipe up to 4 × 0.3 mm, lateral or excentrical, rarely almost central, white at apex, reddish brown below to blackish brown at base, entirely white pubescent hairy, at base with some hairs attached to substrate. Smell absent.

Spores 12.5–18 × 3.5–6.5 μm, average 15 × 5 μm, Q = 2.3–3.4, average Q = 2.75, slenderly ellipsoid to lacrymoid, thin-walled, colourless, inamyloid. Basidia 35–52 × 10–12.5 μm, 4-spored, slenderly clavate, clamped. Hymenial cystidia 20–35 × 11–30 μm, slenderly clavate to broadly vesiculose or lageniform, thin-walled, very scarce and most frequently found near margin of pileus. Pileipellis a hymeniderm of clavate to vesiculose elements, 22–50 × 11–30 μm with thickened, colourless or yellow walls. Pileocystidia 55–90(–110) × 7–15 μm at base and 2–4.5 μm at apex, numerous, slenderly lageniform, thin-walled, colourless. Pileitrama distinctly gelatinized, made up of more or less radially orientated, 2.5–7 μm wide cylindrical to inflated hyphae. Stipitispellis a cutis. Caulocystidia very abundant, of two types, one 25–60 × 8–20 μm, clavate to vesiculose, thick-walled with yellowish walls, the other type 60–120 × 3–10 μm at base and 1.5–5 μm at apex, with thin or slightly thickened walls, colourless or pale yellow. Clamp-connections abundant in all tissues.

Habitat & distribution.—On rotten leaf sheets of *Cladium mariscus* in marshes, just above the water line. United Kingdom and Denmark. Rare.

Collection examined.—DENMARK, Langeland, Keldsnor, Lunden, 15 Oct. 1984, *Thomas Laessöe 0981* (holotype, C; isotype, L).

Marasmius cornelii is named after Dr. Cornelis Bas, curator of Agaricales at the Rijksherbarium, Leiden for his great stimulance of Agaricology, and for being the nestor of many young Dutch Mycologists.

Bas (1962) in his excellent monograph of the genus *Gloiocephala* in Europe, described an unnamed species on account of manuscript notes and drawings by Corner, who recorded the species for the first time (Corner, 1934) under the misapplied name *Marasmius menieri*. Bas (l.c.) suggested that Corner's species most likely represented a taxon new to science, but since dried material was lacking, it was impossible to give a formal description of the species.

During a collecting-trip of some Danish mycologists to the island of Langeland in the late autumn of 1984, Thomas Laessöe and Steen Elborne collected a fairly great number of small basidiocarps of Corner's species on *Cladium mariscus* in a marsh, a habitat quite comparable with that of Corner. They sent it to the Rijksherbarium for confirmation, where it came under the present author's attention. It was decided to name the new species after C. Bas, and in accordance with the author's view on the status of the genus *Gloiocephala* (Noordeloos, 1981), it was placed in the genus *Marasmius* section *Gloiocephala*.

Marasmius cornelii is distinguished from the other species in sect. *Gloiocephala* by the rather long, narrow pileo- and caulocystidia (see also the key below). The species of sect. *Gloiocephala* show a strong resemblance with those of sect. *Epiphylli*, from which they mainly differ by having reduced basidiocarps with excentric, lateral, or absent stipe and vein-like or wanting lamellae.

Section Epiphylli

2. Marasmius saccharinus (Batsch: Fr.) Fr.—Figs. 6–9

Agaricus saccharinus Batsch, Elench. Fung. cont. primo: 93. 1786. — *Agaricus pterigenus β saccharinus* Batsch: Fr., Syst. mycol. 1: 160. 1821. — *Marasmius saccharinus* (Batsch: Fr.) Fr., Epicr.: 386. 1838.

Selected literature.—Orton in Trans. Br. mycol. Soc. 43: 304, fig. 434. 1960.

Pileus 9 mm broad, expanded slightly umbonate, white, pellucidly striate at margin when moist, dull, opaque on drying. Lamellae distant, free, subventricose, rather thick, white with entire, concolorous edge. Stipe up to 9 × 1.5 mm, slightly swollen above base, white above, pale tawny rusty at base, scattered white pruinose under lens, fistulose. Context concolorous with surface, rusty tawny in stipe base. Smell slightly acrid.

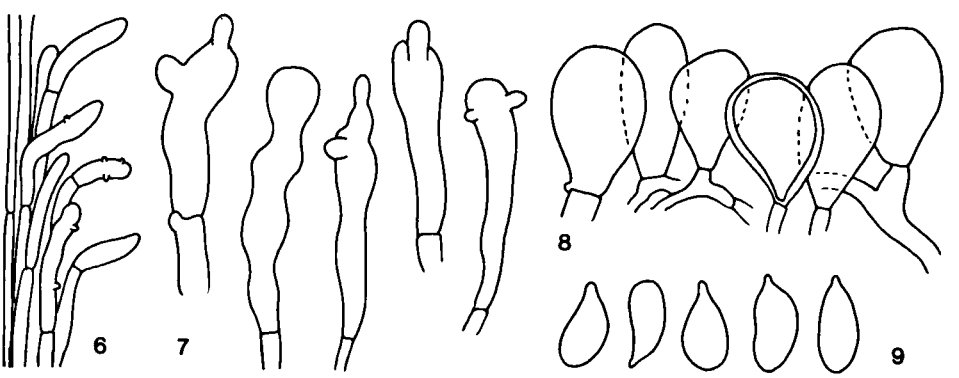
Spores 6.0–7.5 × (3.0–)3.5–4 μm, average 6.5 × 3.5 μm, Q = 1.6–2.0, ellipsoid to somewhat lacrymoid in side view. Basidia 4-spored, clamped. Lamella edge almost sterile. Cheilocystidia 15–35 × 5–10 μm, irregularly clavate with one or more finger- or bladder-like excrescences at the top. Pileipellis a hymeniderm, made up of clavate, vesiculose or semiglobose elements, 10–30 × 7.5–16 μm with colourless, hyaline, sometimes thickened walls. Pileocystidia not found. Stipitispellis a cutis with transitions to a trichoderm with clustered caulocystidia. Caulocystidia 10–50 × 2–10 μm, irregularly coralloid, colourless. Clamp-connections numerous in all tissues.

Chemical reactions.—No part of basidiocarp amyloid nor dextrinoid in Melzer's reagent.

Habitat & distribution.—In forest on *Fagus* leaves. Europe. Very rare.

Collection examined.—UNITED KINGDOM, England, Surrey, Glenrose, Mickleham, 19 Nov. 1954, *P. D. Orton 240* (E).

Marasmius saccharinus has often been cited in literature, but poorly known until recently. Orton (1960) gave a redescription of this taxon, but on account of this description I was unable to place this tiny white *Marasmius* in one of the sections of the genus.



Figs. 6–9. *Marasmius saccharinus*. — 6. Stipitispellis (× 500). — 7. Cheilocystidia (× 1000). — 8. Pileipellis (× 1000). — 9. Spores (× 1500). (All figs. from *Orton 240*.)

Therefore the collection was asked on loan for closer study. On account of the white pileus, hymeniform pileipellis with smooth, hyaline elements, insititious stipe, and chemical reactions *Marasmius saccharinus* has to be placed in sect. *Epiphylli* subsect. *Epiphylli*. The small spores and size and shape of cheilocystidia distinguish it from all other species of that section in Europe: *M. epiphyllus* and *M. tremulae*. Macroscopically *M. saccharinus* resembles *M. setosus* (= *M. recubans*), that grows also on leaves of *Fagus*, but that species clearly differs in having long hairs on the stipe and by the larger spores.

The distribution of *M. saccharinus* in Europe is not well known. Besides the recent find in England it was listed by Clémençon (1982), who did not give information on distribution. It will probably be clear in future that *M. saccharinus* is a rare, but overlooked species.

3. Marasmius setosus (Sow.) Noordel., *comb. nov.*

Agaricus setosus Sow., Col. Figs. Engl. Fungi 3: 25, pl. 302. 1801 (basionym). — *Mycena setosus* (Sow.) Gillet, Hymenomyc. Fr.: 281. 1876.

Marasmius recubans Quél. in Mém. Soc. Emul. Montbéliard, ser. II, 5: 355. 1873 (Champ. Jura Vosges 2).

Androsaceus eufoliatus Kühner in Bull. trimest. Soc. mycol. Fr. 43: 111. 1927. — *Marasmius eufoliatus* (Kühner) Kühner in Botaniste 25: 94. 1933.

Misapplied name.—*Marasmius saccharinus* (Batsch: Fr.) Fr. sensu Quél. in Mém. Soc. Emul. Montbéliard, sér. II, 5: 224. 1872 (Champ. Jura Vosges 1).

Selected descriptions & illustrations.—J. Lange, Fl. agar. dan. 2, pl. 48E. 1937. — Sowerby, l.c. pl. 302. 1801. — Kühner, in Bull. trimest. Soc. mycol. Fr. 43: 111–112. 1927. — Kühner, in Botaniste 25: 93–94. 1933.

Characteristics.—Fruitbodies small, growing on dead leaves of *Fagus*; pileus purely white; lamellae well developed; stipe with long, hyaline hairs; pileipellis with smooth elements.

While looking for old names for Mycenoid fungi, Dr. Maas Geesteranus, emeritus staffmember of the Rijksherbarium, drew my attention to the plate and description of *Agaricus setosus* Sow. He definitively felt that Sowerby's fungus had to be excluded from the genus *Mycena*, and asked me to give my opinion. Considering the habit with long hyaline hairs on the stipe, and the habitat on leaves of *Fagus sylvatica*, I have no doubt that Sowerby depicted a *Marasmius* that long has been known as *M. recubans* in European literature. Since Sowerby's name is older, it has priority, and the new combination has been made.

KEY TO THE SPECIES OF MARASMIUS SECTIONS GLOIOCEPHALA AND EPIPHYLLI IN EUROPE

1. Pileus white or almost white.
   2. Basidia 2-spored.

3. Clamp-connections present; stipe excentrical, sometimes lacking; hyphae of pileipellis with gelatinized walls; spores (14.5–)17.5–21.5 × (4.5–)5.5–6.0 µm; on dead leaves of *Carex* in swamps (Persoonia 2: 82. 1961) . . . . . *M. caricis*
3. Clamp-connections absent; stipe excentrical or central: spores 11.0–14.0 × 2.5–4 µm; on dead leaves of *Populus tremula* . . . . . *M. tremulae*

2. Basidia 4-spored.
4. Stipe central or excentrical: lamellae absent; pileus and stipe with up to 120 µm long, slenderly lageniform cystidia; spores 12.5–18.0 × 3.5–6.5 µm; on stem of *Cladium mariscus* in swamps . . . . . *M. cornelii*
4. Stipe central; lamellae present.
5. Lamellae well developed.
6. Spores more than 10 µm long; stipe with up to 1 mm long, hyaline hairs; on dead leaves of *Fagus sylvatica*, rarely on other substrates (*Betula, Fraxinus*) *M. setosus*
6. Spores 6.0–7.5 µm long; stipe without long hairs; on *Fagus* leaves . *M. saccharinus*
5. Lamellae poorly developed, usually only ridges or wrinkles at underside of pileus, often forked and/or anastomosing.
7. Pileipellis with smooth elements; spores 8.5–9.5(–11.0) × 3.5–5.0 µm; on branches, leaves etc. . . . . *M. epiphyllus*
7. Pileipellis with elements 'en brosse'; spores 11.0–15.5(–18.0) × 2.0–3.5 µm; on dead leaves of *Hedera helix* . . . . . *M. epiphylloides*

1. Pileus distinctly coloured, at least at centre.
8. Pileus pale brown to reddish/ochraceous brown; stipe reduced, almost always excentric or lacking; pileipellis with two types of elements, and with capitate pileocystidia; on leaf-sheats of *Typha* in swamps (Persoonia 2: 78. 1961) . . . . . *M. menieri*
8. Pileus pinkish/ochraceous; stipe almost always central, sometimes slightly excentrical, never lateral or lacking; pileipellis with one type of elements and fusiform to lageniform cheilocystidia; on *Carex* in swamps (Persoonia 11: 373. 1981) . . . . . *M. pseudocaricis*

Section Marasmius

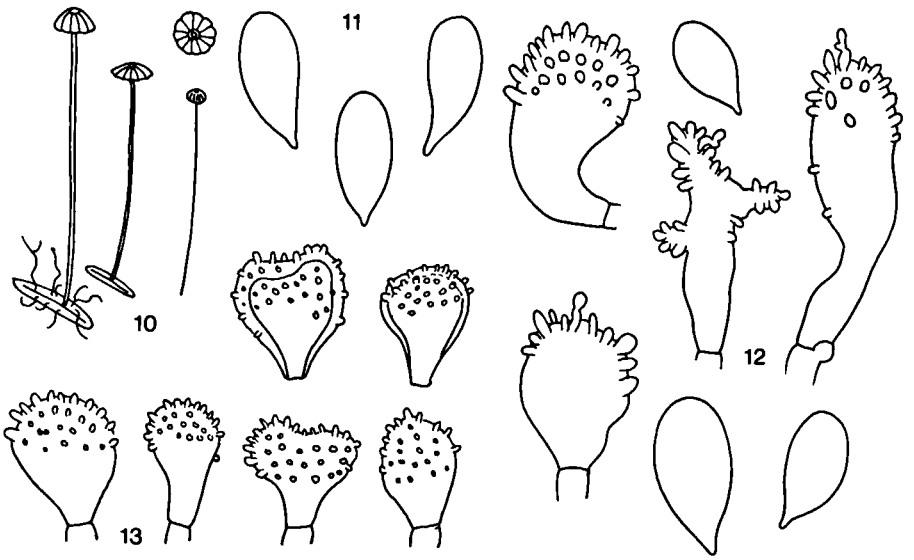
4. **Marasmius bulliardii** Quél. forma **acicola** (Lundell) Noordel., *comb. nov.*—Figs. 10–13

Marasmius rotula forma *acicola* Lundell, Fungi Exs. Suec. 49–50: 39. 1957 (basionym). Holotype.—*S. Lundell*, 3 Oct. 1935, Bondkyrka, E. slope of Asen towards the river Fyris, Uppsala, Uppland, Sweden (Fungi Exs. Suec. 431, UPS).

Misapplied name.—*Marasmius wettsteinii* Sacc. & Sydow sensu Favre in Ber. schweiz. Bot Ges. 62: 408–410. 1952; sensu Ryman & Holmåsen, Svampar: 327. 1984.

Pileus 1–6 mm broad, convex or hemispherical, usually umbilicate, sometimes with small papilla within umbilicus, radially grooved to sulcate on back of the lamellae, dark beige or brown (10 YR 6/6–7/4) with slightly to distinctly darker (blackish) brown centre, slightly granulose under lens. Lamellae (L = 12–20, l = 0) with wide, distinct collarium, pale cream almost white (10 YR 8/4) with concolorous or white, entire edge. Stipe 20–60 × 0.2–0.5(–1) mm, filiform, white or pale brown at apex, downwards via dark red-brown to blackish brown (7.5 YR 3/2 to 10 YR 2/1), polished, shining, smooth, with fine longitudinal grooves lengthwise. Smell none.

Spores 6.5–10.0(–11.5) × (2.5–)3.5–5.5(–6.5) µm, average 7.2–8.6 × 4.0–4.5 µm, Q = 1.4–2.2, average Q = 1.7–2.0, ellipsoid to lacrymoid, thin-walled, hyaline, inamyloid. Basidia 24–35 × 6–9 µm, 4-spored, clamped. Lamella edge sterile. Cheilo-



Figs. 10–13. *Marasmius bulliardii* forma *acicola*. — 10. Fruitbodies (× 1). — 11. Spores (× 1500). — 12. Cheilocystidia (× 1000). — 13. Pileipellis (× 1000). (All figs. from *Bendiksen*, 18 Aug. 1986.)

cystidia 15–35 × 5–20 μm, clavate with numerous 1–3 μm long wart-like projections in apical part ('en brosse'). Hymenophoral trama irregular, made up of 2.5–6 μm wide, inflated hyphae. Pileipellis hymeniform, made up of clavate elements, 10–30 × 5–17 μm, with 1–4 μm long brown wart-like projections ('en brosse'). Clamp-connections numerous in all tissues.

Habitat.—On needles of *Picea*, rarely *Pinus* in oligotrophic to mesotrophic coniferous or mixed coniferous-deciduous forest.

Distribution.—Wide spread in boreal and montane/subalpine regions in Europe.

Collections examined.—FINLAND, Tavastia australis, Korpilahti, Rimminjärvi, 18 Aug. 1986, *E. Bendiksen* (L). — GERMAN FEDERAL REPUBLIC, Bayern, Bayerisches Wald, Bodensee, Schwarzbach, 11 Sept. 1978, *C. Bas 7313* (L). — FRANCE, dept. Ain, Hauteville, 19 July 1957, *H. S. C. Huijsman* (L). — SWITZERLAND, kanton Neuchatel, near Couvet, 16 Aug. 1966, *H. S. C. Huijsman* (L); kanton Bern, Emmental, Schüpfheim, 13 Aug. 1955, *H. S. C. Huijsman* (L). — AUSTRIA, Tirol, Paznauntal, Ischgl, 16 July 1960, *R. A. Maas Geesteranus 13161* (L). — CZECHOSLOVAKIA, Slovenia, Low Tatra, Bystrá Dolina, N. of Brezno, 7 Sept. 1960, *C. Bas 2104* (L).

Favre (1952) described a small *Marasmius* from the rotula group growing on *Picea* needles as *M. wettsteinii*. I have seen this taxon in abundance in Scandinavia, and studied in addition some collections from central Europe, and come to the conclusion that Favre's taxon is very similar to *M. bulliardii*. The only differences found are the absence of sterile side-branches on the stipe and the substrate. *Marasmius bulliardii* forma *bulliardii* grows on leaves of deciduous trees, mainly *Fagus*, and has almost always small side-

branches bearing a sterile pileus at the end. Consequently I came to the conclusion, like Moser (1983), that *M. wettsteinii* sensu Favre is a synonym of *M. bulliardii*. I prefer, however, to give Favre's taxon the rank of forma. Lundell (1957) considered the same taxon as a form of *Marasmius rotula*.

The identity of *Marasmius wettsteinii* is a bit obscure: it was described by Saccardo & Sydow (1899) to replace *Marasmius tenerrimus* Wettstein (non *M. tenerrimus* Berk. & Curt.). The original diagnosis clearly indicates that Wettstein's taxon belongs to section *Marasmius:*

'Pileus membranaceous, convex or almost hemispherical, 2–4 mm broad, umbilicate, plicate, glabrous, whitish-ochraceous; lamellae few (10–16), broad, distant, united in a collarium, concolorous with pileus; stipe straight, with black rhizomorphs, 16–35 mm long, tough, glabrous, brown-black, apex whitish; spores globose or ellipsoid, 5–7 μm diameter, hyaline, smooth. On cones of *Abies pectinata* in Austria. *M. rotula* and *M. graminis* affinis.'

The small, globose spores make clear that, if Wettstein's observations were right, his fungus is not identical with ours and remains doubtful until it has been rediscovered.

Section Sicci

5. Marasmius siccus (Schwein.) Fr.—Figs. 14–22

Agaricus siccus Schwein., Schrift. Nat. Forst. Ges. Leipzig 1: 84. 1822. — *Marasmius siccus* (Schwein.) Fr. Epicr.: 382. 1838.

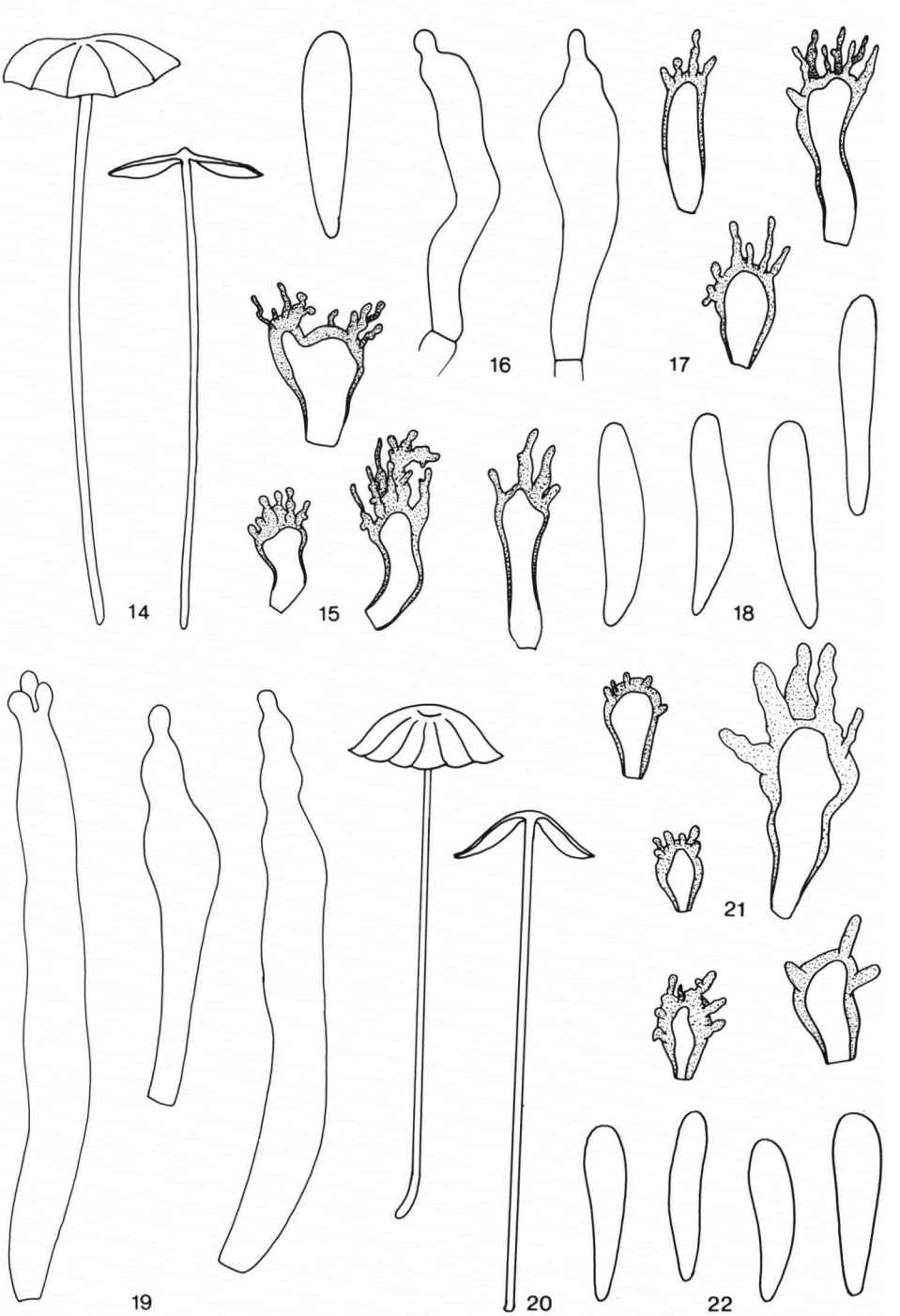
Misapplied name.—*Marasmius borealis* sensu Moser in Windahlia 14: 65. 1984.

Selected literature.—S. Jacobsson & S. Muskos in Jordstjärnan 6(3): 24–26. 1985.

Pileus 5–25 mm broad, campanulate, conical or hemispherical, expanding with age to plano-convex, with slightly truncate, papillate or depressed centre, with deflexed or straight often crenate margin, rather strongly radially sulcate from margin almost up to centre, vividly orange to ochraceous or yellowish ochraceous (centre 5 YR 5/8, rest 7.5 YR 6–7/8, when old more like 7.5 YR–10 YR 8/4–6), minutely pruinose all over (sub lente). Lamellae (L = 10–20, l = 0–1(3)) distant, almost free, thickish, narrowly ventricose, white to cream colour (10 YR 8/6), sometimes with brownish edge, particularly in dried specimens. Stipe 15–70 × 0.2–1 mm, cylindrical, tough, pale yellow at apex, below via red brown to blackish brown at base, smooth, glabrous, shining. Context white in pileus, brown in stipe. Smell none. Taste mild.

Spores 15–23 × 4–5 μm, average 16–18.5 × 4–5 μm, Q = 2.4–5, average Q = 3–5, fusiform, thin-walled. Basidia 20–30 × 5–6 μm, 4-spored, clamped. Lamella edge sterile. Cheilocystidia 8–20 × 3–10 μm, clavate to vesiculose, en brosse with numerous, 3.5–6 μm long, yellow brown excrescences. Hymenial cystidia 25–70 × 5–10 μm, clavate to

Figs. 14–22. *Marasmius siccus*. — 14. Fruitbodies (× 1). — 15. Elements of pileipellis (× 1000). — 16. Pleurocystidia (× 1000). — 17. Cheilocystidia (× 1000). — 18. Spores (× 1500). — 19. Pleurocystidia (× 1000). — 20. Fruitbodies (× 1). — 21. Cheilocystidia (× 1000). — 22. Spores (× 1500). (14–18 from *Muskos*, 28 Aug. 1985; 19–22 from *Noordeloos 84301*.)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fusiform or lageniform, thin-walled, with yellowish contents, scattered to fairly abundant. Subhymenium branched, made up of 2.5 μm wide hyphae. Pileipellis a hymeniderm, made up of broadly clavate to vesiculose elements 'en brosse' with numerous 2–7 μm long, brown-coloured finger-like excrescences in upper part. Pileocystidia absent. Pileitrama subregular to irregular, made up of 3–10 μm wide, branching, inflated hyphae. Stipitispellis a compact cutis of brown-coloured, cylindrical, 2–7 μm wide hyphae. Caulocystidia absent. Clamp-connections abundant.

Habitat.—Gregarious on litter, sometimes on wood, in mixed boreal and subarctic forest, usually with *Betula, Alnus* and *Picea.*

Collections examined.—FINLAND, Oulu district, Oulu, Pirkkarala, Turkansaari, 30 July 1981, *T. Ulvinen* (OULU); Muhos, Poikajoki, Isterinkoski, 8 Aug. 1966, *T. Ulvinen* (OULU), Muhos, Suokylä, 25 Sept. 1971, *E. & M. Ohenoja* (OULU); Muhos Muhosperä, Pekkala, 18 Aug. 1967, *M. Ohenoja* (OULU); Muhos, Muhosperä, Poikajoki, 18 Aug. 1967, *M. Ohenoja* (OULU); Yli-Ii, Yli-Tannila, Kynkäänniemi, Siuruanjoki, 15 July 1974, *T. Ulvinen* (OULU); Kliminki, Huttukylä, Kiiminkijoki, Hevossaari, 21 Apr. 1968, *M. Ohenoja* (OULU); Inari Lapland, Utsjoki, Kevo, Tsharsjoki, 24 Aug. 1961, *L. Harmoinen* (OULU); ditto, 16 Aug. 1965, *T. Ulvinen* (OULU). — NORWAY, Finnmark, Alta, Kåfjord, Sakkobadne, 22 Aug. 1966, *T. Ulvinen* (OULU); Troms, Storfjord, Skibotn, 24 Aug. 1966, *T. Ulvinen* (OULU). — SWEDEN, Medelpad, Borgsjö, S. Sillre, 28 Aug. 1985, *Siw Muskos* (L). — CANADA, Quebec, Gatineau National Park, 11. Sept. 1984, *M. E. Noordeloos 84301* (L).

6. Marasmius anomalus Lasch—Fig. 23–27

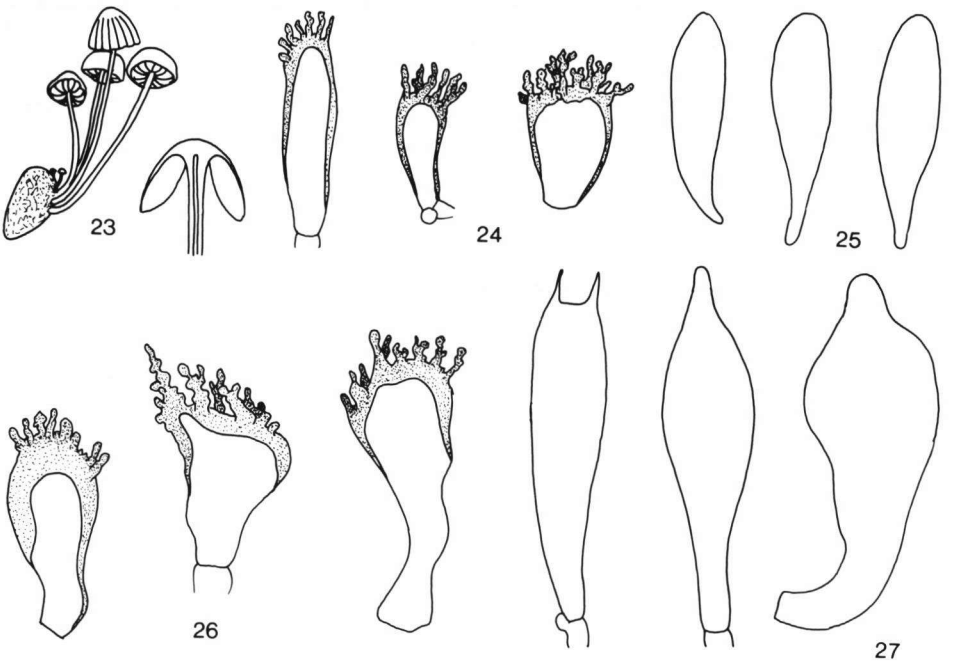
Marasmius anomalus Lasch in Klotzsch Herb. vivum mycol. 1806, pl. 17, fig. 97. 1854; not *Marasmius anomalus* Peck in Rep. N. Y. State Mus. nat. Hist. 24: 72. 1872.

Marasmius littoralis Quél. in Bull. Soc. Amis Sci. nat. Rouen, ser. II, 15: 169, pl. 3, fig. 11. 1880.

Selected descriptions & illustrations.—Battetta in Bull. trimest. Soc. mycol. Fr. 50: 67–71, fig. 1. 1934 (as *M. epodius*); Benkert in Mykol. MittBl. 22(2/3): 50–52. 1978; Kühner in Botaniste: 101–102. 1933 (as *M. epodius* var. *microsporus*); Pearson in Trans. Br. mycol. Soc. 35: 104–105. 1952 (as *M. littoralis*); Singer in Sydowia 18: 288. 1964.

Pileus 4.5–10(–15) mm broad, broadly hemispherical or conical at first then convex, usually with distinct papilla, finally plano-convex with small papilla; translucently striate and grooved to sulcate on back of lamellae from centre to margin, pale orange, ochraceous or brown with darker centre (7.5 YR 5–6/6–8), pallescent with age (10 YR 8/3), glabrous or subpruinose (lens). Lamellae (L = 10–20, l = 0(1)) equal, rarely 1 or 2 lamellulae per fruitbody, distant, free or narrowly adnexed, broadly ventricose, usually extending under pileus, pale cream to pale brown with distinctly darker brown, granulose edge. Stipe 15–30 × 0.2–0.5(–1.0) mm, filiform, cylindrical, tough, at apex pale cream to lemon yellow, then passing through yellow or orange to red-brown or blackish brown towards base (base 5 YR 3/2), glabrous, shining, finely grooved lengthwise, attached to substrate with red-brown, hairy disc. Context thin, concolorous with surface in cortex of pileus and stipe, pallid in inner part of pileus. Smell none. Taste mild. Spore print white.

Spores 12.0–19.5(–22.0) × 4.0–6.5(–7.0) μm, average 15–17.5 × 4.9–5.4 μm, Q = 2.7–4.0, average Q = 2.9–3.5, ellipsoid to fusiform with long apiculus, thin-walled, colourless, hyaline, inamyloid. Basidia 25–36 × 8.5–10 μm, 4-spored, clavate. Lamella edge sterile. Cheilocystidia 15–30 × 5–10 μm, clavate to broadly clavate or obpyriform,



Figs. 23–27. *Marasmius anomalus*. — 23. Fruitbodies (× 1, section × 2). — 24. Cheilocystidia (× 1000). — 25. Spores (× 1500). — 26. Elements of pileipellis (× 1000). — 27. Pleurocystidia (× 1000). (All figs. from *Bas 4025*.)

with numerous warts and finger-like protuberances at apex, with brown, often thickened wall, especially in upper part, warts massif, brown. Pleurocystidia 40–60 × 12–14 μm, fusiform to clavate, often constricted or moliniform at apex, with colourless, granular content, rare to frequent. Subhymenium ramose, made up of 2.5–5 μm wide hyphae. Hymenophoral trama subregular, made up of inflated, often anastomosing or branched hyphae, 3–12 μm wide. Pileipellis a hymeniderm, made up of broomcells, 6–15 × 5–10 μm, with thin or thickened, brown walls and warts. Pileitrama compact in upper layer, made up of rather thick-walled, brownish hyphae, 2–8 μm wide, in lower part irregular, made up of inflated, hyaline, colourless, 3–10 μm wide hyphae. Stipitispellis a cutis of narrow, brown, thick-walled hyphae, 3–6 μm wide, at apex with some patent 5–10 μm wide, hyaline, colourless terminal elements. Stipitistrama regular, made up of cylindrical to slightly inflated hyphae, 5–12 μm wide. Clamp-connections abundant in most tissues, but rare in stipitistrama.

Chemical reactions.—Walls of hyphae in stipe strongly dextrinoid and metachromatic. All other parts inamyloid, not metachromatic.

Habitat.—On grass and grass debris, sometimes also on roots, frequently found on rabbit dung, in rather dry, open vegetations like dune-grasslands, xerophytic grasslands, sometimes in rather saline habitats, often gregarious, sometimes caespitose.

Distribution.—Europe. Fairly common in the coastal dune area in the Netherlands. July–November.

Collections examined.—THE NETHERLANDS, prov. Friesland, Isl. Schiermonnikoog, Nov. 1975, *E. J. M. Arnolds* (L); prov. Noord-Holland, Isl. of Texel, Hoorn, 27 Oct. 1968, *P. B. Jansen* (L); Amsterdam, 15 Sept. 1951, *W. J. Reynders* (L); Castricum, 10 Nov. 1954, *G. D. Swanenburg de Veye* (L); ditto, 6 Oct. 1967, anon. (L); Santpoort, 9 Nov. 1963, *C. Bas 4025* (L); Bloemendaal, 30 Sept. 1967, *C. de Boer* (L); Vogelenzang, 20 Oct. 1973, *C. Bas 6220* (L) & 24 Oct. 1967, *J. Daams* (L); prov. Zuid-Holland; Wassenaar, Meyendel, 8 & 28 Oct. 1954, *Fehr de Wal* (L); ditto, 2 Nov. 1957, *C. Bas 1356* (L); Isl. of Voorne, Oostvoorne, 20 Oct. 1963, *P. B. Jansen*; ditto, 31 Oct. 1967, *F. Benjaminsen*; ditto, 20 Oct. 1968, *E. J. M. Arnolds*; Isl. of Goeree, 13 Oct. 1973, *C. Bas* (L); prov. Zeeland, Isl. of Schouwen, 22 Oct. 1966, *C. Bas 4840* (L); Isl. of Noord-Beveland, Onrustpolder, 15 Sept. 1958, *W. G. Beeftink*; Isl. of Walcheren, Vrouwenpolder, 18 Aug. 1963, *P. B. Jansen* (L). — GERMAN FEDERAL REPUBLIC, Klotzsch Herb. viv. mycol. 1806 (Isotype of *M. anomalus*). — GERMAN DEMOCRATIC REPUBLIC, Fährinsel, 9 Nov. 1973, *J. J. Barkman 9716* (WBS).

Marasmius anomalus belongs to a group of rather closely related species that are widely distributed in boreal and temperate regions of Europe and North America. Gilliam (1975) described a number of new species in this group, mainly based on microscopical differences, such as thick- or thin-walled elements in pileipellis and presence or absence of coloured pleurocystidia. In Europe at least two species are known, viz. *M. siccus* and *M. anomalus*, that are very closely related, and distinguished mainly on habit and habitat characters: *Marasmius anomalus* is the smallest of the two with well developed lamellae, growing on grasses, and *M. siccus* is usually more luxurious, has less broad, sometimes slightly reduced lamellae, and grows on forest litter. Some more species appear in the European literature, viz. *Marasmius epodius* Bres., *M. littoralis* Quél., and *M. ventallonii* Sing. The latter seems to be well characterized by the green tinges in the stipe and habitat on needles of *Pinus pinaster* in Mediterranean areas. *Marasmius littoralis* is usually considered as a synonym of *M. anomalus*, but the original diagnosis of Quélet is somewhat aberrant, since it describes a fungus with a pale, almost white pileus and red-brown stipe, growing on sticks. Without Quélet's notice of large spores (15–20 μm), it could easily have been *Marasmius epiphyllus*. *Marasmius epodius* Bres. remains somewhat doubtful. Jacobsson (1985) studied some original collections of Bresadola's a species in the Stockholm herbarium, and reports spores 14–20 × 3–4 μm, and pleurocystidia similar to those of *M. siccus*.

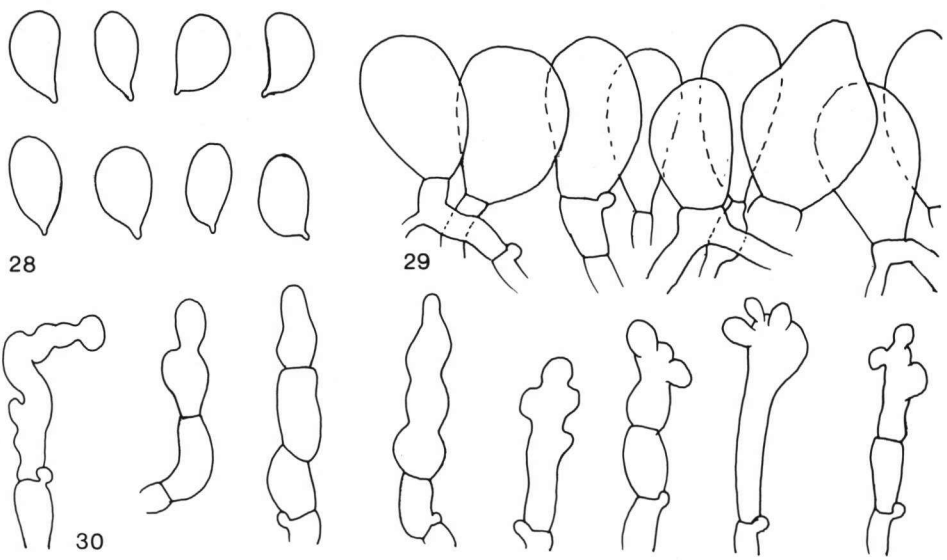
Section **Globularini**

7. Marasmius suaveolens (Rea) Rea.—Figs. 28–30

Marasmius argyropus var. *suaveolens* Rea in A. L. Smith & Rea in Trans Br. mycol. Soc. 2: 129 1906. — *Marasmius suaveolens* (Rea) Rea, Brit. Basidiom. 523. 1922.

Pileus 45–60 mm broad, convex then applanate or depressed, flesh colour becoming paler on drying, striate at margin. Lamellae crowded, adnexed, separating, 6–8 mm broad, ventricose, pallid then fuscous. Stipe 60–70 × 2–3 mm, cylindrical, twisted, reddish, paler at apex, covered with a white tomentose pruina. Context tough. Smell pleasant, like that of *Marasmius oreades*.

Spores 6.5–7.5(–8.5) × 3.5–6.0 μm, average 7 × 4 μm, Q = 1.4–1.7, ellipsoid to pip-shaped, colourless, inamyloid. Basidia 4-spored with clamp. Lamella edge hetero-



Figs. 28–30. *Marasmius suaveolens*. — 28. Spores (× 1500). — 29. Pileipellis (× 1000). — 30 Cheilocystidia (× 1000). (All figs. from holotype.)

geneous. Cheilocystidia 22–35 × 10–15 μm, irregularly cylindrical to coralloid, scattered among basidia. Pileipellis hymeniform, made up of globose, thin-walled elements, 35–50 × 10–30 μm. Stipitispellis a trichoderm, made up of cylindrical, colourless hairs. Clamp-connections abundant in all tissues.

Chemical reactions.—No part of basidiocarp amyloid of dextrinoid in Melzer's reagens; stipitistrama metachromatical in cresyl-blue.

Habitat.—On leaves of *Fagus* in deciduous forest.

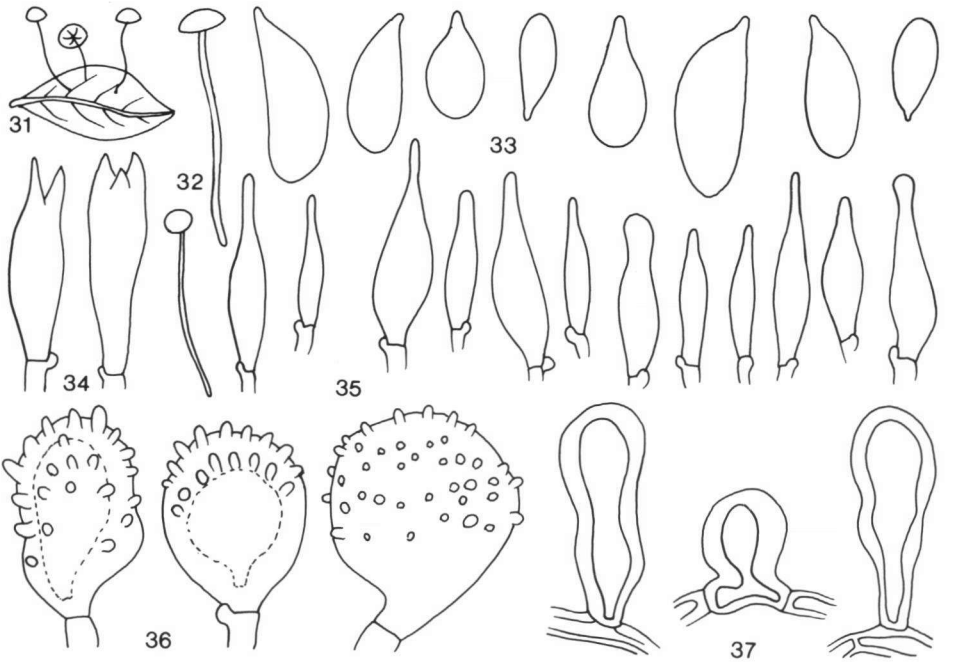
Collection examined.—UNITED KINGDOM, England, Hantshire, Swarraton, Grange Park, 30 Oct. 1904, *C. Rea* (holotype, K).

Rea (l.c.) described the spores as 'globose, 3–4 μm across', but I found larger, ellipsoid spores in the holotype. On account of this, all other microscopical characters, and the type-plate at Kew, I am convinced that *Marasmius suaveolens* is a later synonym of the well-known and wide-spread *M. wynnei* Berk. & Br. (= *M. globularis* (Quél.) Kühn. & Romagn.

Section **Hygrometrici**

8. **Marasmius buxi** Fr.—Figs. 31–37

Marasmius buxi Fr. in Quél. in Mém. Soc. Emul. Montbéliard, sér. II, 5: 224. 1872 (Champ. Jura Vosges I). — *Androsaceus buxi* (Fr. in Quél.) Pat., Essai taxon.: 141. 1900.



Figs. 31–37. *Marasmius buxi*. — 31. Fruitbodies (× 1). — 32. Fruitbodies (× 2). — 33. Spores (× 1500). — 34. Basidia (× 1000). — 35. Cheilocystidia (× 1000). — 36. Elements of pileipellis (× 1000). — 37. Caulocystidia (× 1000). (All figs. from *Noordeloos 8433* 7.)

Selected descriptions & illustrations.—Favre in Schweiz. Z. Pilzk. 11: 7–9, fig. 1. 1933; Malençon & Bertault, Fl. Champ. sup. Maroc 2: 352–354. fig. 73. 1975.

Pileus 0.5–4 mm broad, convex with straight margin, not hygrophanous, not translucently striate, dark red brown at centre (7.5 YR 4/4), almost white at margin, minutely pruinose or rugulose under lens. Lamellae (L = 3–7, l = 0–1) distant, adnate to adnexed, well developed, sometimes anastomosing, white with entire, concolorous edge. Stipe 2–15(–20) × 0.1–0.2 mm, filiform, white at apex, rest blackish brown, finely hairy at first, glabrescent, finally polished. Smell none, even when crushed. Taste mild.

Spores 7.0–12.5(–13.0) × 3.5–4.0(–4.5) µm (incl. apiculus), average 9.5 × 4.0 µm, Q = 1.8–3, average Q = 2.2, narrowly ellipsoid to almost cylindrical with long apiculus, thin-walled, colourless. Basidia 20–30 × 6–9 µm, 2- and 4-spored, clamped. Lamella edge heterogeneous. Cheilocystidia 10–35 × 3–10 µm, lageniform, rarely more or less tibiiform, fairly abundant but mixed with basidia. Pleurocystidia none. Hymenophoral trama subregular to irregular, made up of 2–15 µm wide, cylindrical hyphae. Pileipellis a hymeniderm, made up of clavate to globose broom-cells, 10–35 × 5–25 µm with thin, colourless and thick, brown walls and brown warts. Pileocystidia scattered, and usually only present near margin of pileus, similar to cheilocystidia. Pileitrama similar to hymenophoral trama. Clamp-connections abundant.

Habitat.—On dead leaves of *Buxus sempervirens* (also recorded from *B. balearica* in Maroc) (Malençon & Bertault, l.c.).

Distribution.—Wide-spread but apparently very rare in the natural distribution-area of its host in middle and southern Europe. The northernmost limit of *Buxus* reaches southern Belgium. *Marasmius buxi* has never been found on cultivated *Buxus* north of this limit.

Collection examined.—BELGIUM, prov. Namur, Nismes, 30 Sept. 1984, *M. E. Noordeloos 843 77.*

Marasmius buxi is a nice little *Marasmius*, that can easily be recognized with its reddish pileus and habitat on *Buxus* leaves. Although I have been looking for this mushroom during the last 15 years, I never succeeded in collecting it on cultivated *Buxus* in the Netherlands. The locality in Belgium mentioned above probably is the northernmost place where natural *Buxus* occurs. During the forays of the Netherlands' Mycological Society in 1984 and 1986 *Marasmius buxi* was found in abundancy on dead leaves that still were on the *Buxus* bushes.

Our collection agrees well with the description of Favre (l.c.), except for the well-developed lamellae. Favre described a form with more reduced, vein-like lamellae or even a smooth hymenium.

9. Marasmius hudsonii (Pers.: Fr.) Fr.—Figs. 38–43

Agaricus hudsonii Pers. — *Agaricus hudsonii* Pers.: Fr., Syst. mycol. 1: 139. 1821. — *Marasmius hudsonii* (Pers.: Fr.) Fr., Epicr.; 386. 1838. — *Androsaceus hudsonii* (Pers.: Fr.) Pat., Essai Taxon.: 141. 1900.

Agaricus pilosus Huds., Flora anglica 2: 622. 1778. — *Marasmius pilosus* (Huds.) Quél., Fl. mycol. Fr.: 314. 1888.

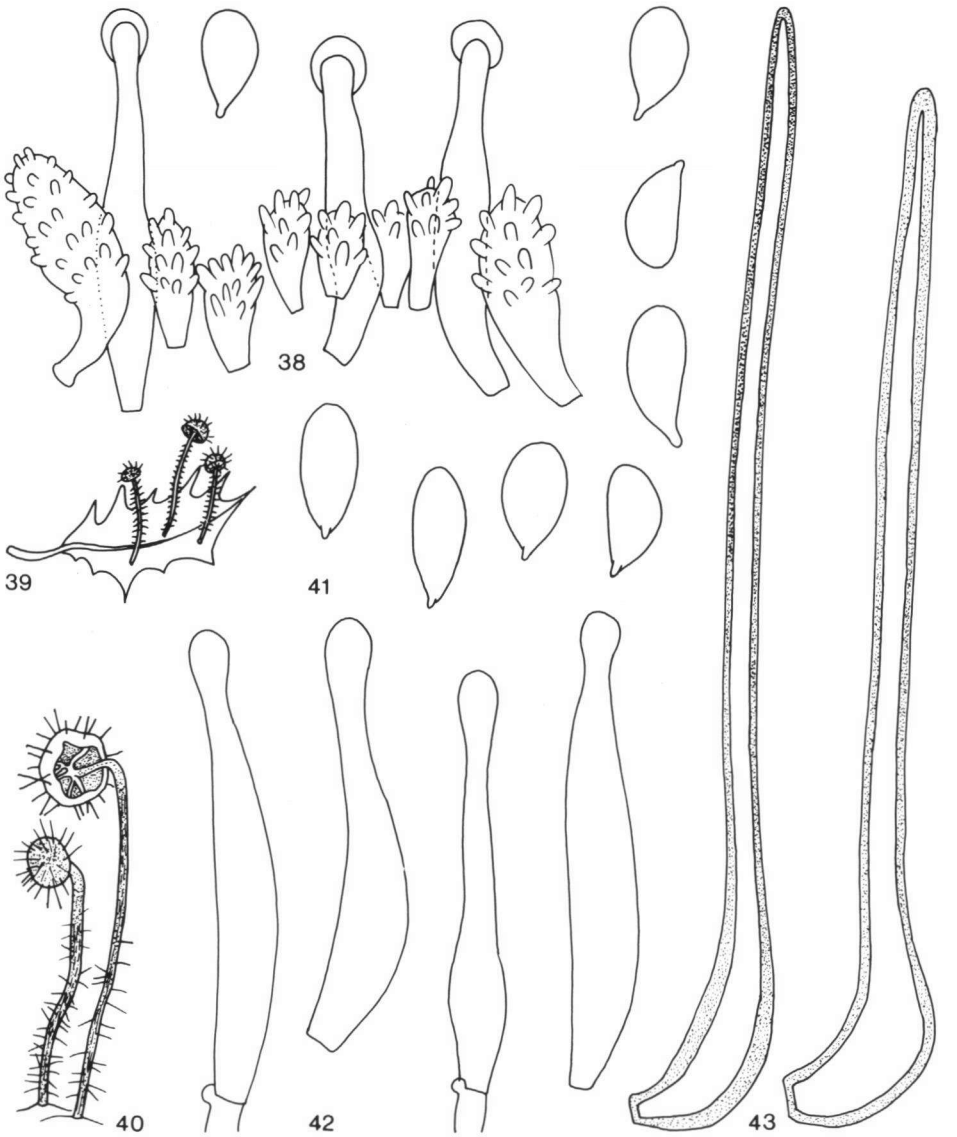
Selected descriptions & illustrations.—Cooke, Ill. Brit. Fungi, pl. 1086 (1135). 1884. — Flora Batava, pl. 2228. 1934. — Kühn. & Romagn., Fl. anal. Champ. sup.: 83, fig. 139. 1953.

Pileus 1–6 mm broad, convex, with involute or deflexed margin, sometimes weakly translucent-striate, membranaceous, white then flesh coloured, densely hairy to strigose with up to 1 mm long, brown-purple hairs. Lamellae distant, venose, not well-developed, often anastomosing and/or forked, absent in small specimens, white, with entire, concolorous edge. Stipe 115–45 × 0.1–0.5 mm, filiform, white at first then red-brown from base upwards, apex remaining white, finely pruinose all over, lower part with long, setose, red-brown hairs like those on pileus. Context very thin, concolorous with surface. Smell and taste inconspicuous.

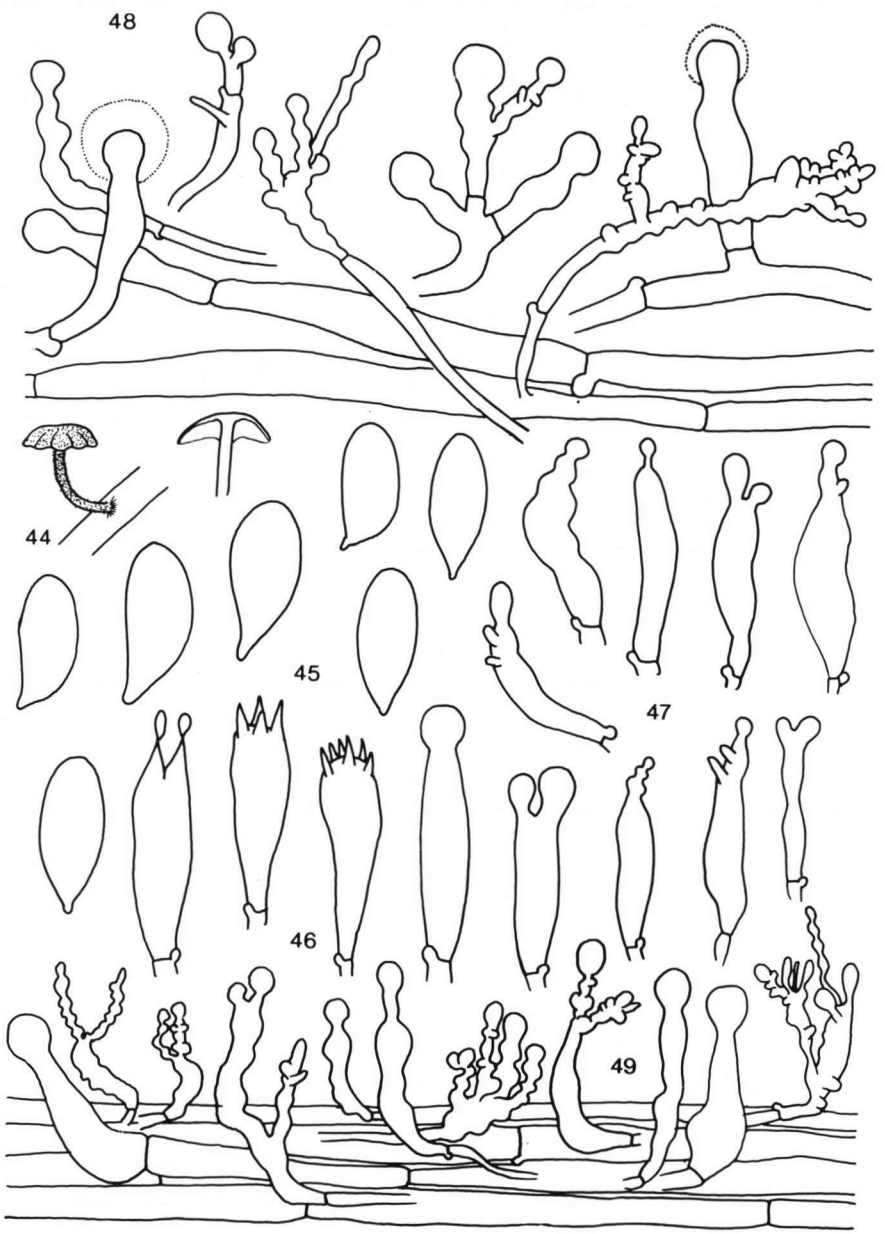
Spores 7.5–13.0 × 5.0–6.5 μm, average 9.7 × 5.7 μm, Q = 1.35–2.0, average Q 1.75, broadly to narrowly ellipsoid, sometimes pip-shaped, thin-walled, colourless. Basidia 22–30 × 5–9 μm, 4-spored, clamped. Lamella edge heterogeneous. Cheilocystidia 30–50 × 5–12 μm, lageniform to slenderly tibiiform, thin-walled, colourless, sometimes with hyaline slime-cap on top, scattered among basidia. Pileipellis hymeniform, made up of globose to clavate broom-cells, 12–30 × 5–12 μm with 0.5–2 μm long finger-like excrescences. Pileocystidia 20–50 × 4–14 μm, lageniform to slenderly tibiiform, more or less similar to cheilocystidia, fairly abundant. Hairs on pileus and stipe 150–750 × 5–20 (base) × 2–6 μm (apex), setiform with thick, red-brown walls. Clamp-connections abundant.

Habitat.—On dead leaves of *Ilex aquifolium* in deciduous forest.

Distribution.—Wide-spread, extremely rare in the Netherlands, seemingly common in England.



Figs. 38–43. *Marasmius hudsonii*. — 38. Pileipellis (× 1000). — 39. Fruitbodies (× 1). — 40. Fruitbodies (× 2.5). — 41. Spores (× 1500). — 42. Cheilocystidia (× 1000). — 43. Setae from stipe (× 500). (39, 40 after Flora Batava, pl. 2228; all other figs. from *Clark*, 29 Oct. 1975.)



Figs. 44–49. *Marasmiellus ornatissimus*. — 44. Fruitbodies (×2). — 45. Spores (×1500). — 46. Basidia (×1000). — 47. Cheilocystidia (×1000). — 48. Pileipellis (×1000). — 49. Stipitispellis (×1000). (All figs. from holotype.)

Collection examined.—UNITED KINGDOM, England, Devonshire, Slapton near Nature reserve, 29 Oct. 1975, *M. C. Clark* (K).

Marasmius hudsonii has been recorded once from the Netherlands by Lütjeharms (Warmond, 8 Nov. 1930, on dead leaves of *Ilex aquifolium*) and depicted in the Flora Batava, pl. 2228. No material is left of this collection. Since then it has been impossible to detect this little *Marasmius* again. While studying the collections at Kew I came across a fairly large number of records of *Marasmius hudsonii* from England where it occurs frequently.

II. MARASMIELLUS

10. Marasmiellus ornatissimus Noordel. & Barkman, *spec. nov.*—Figs. 44–49

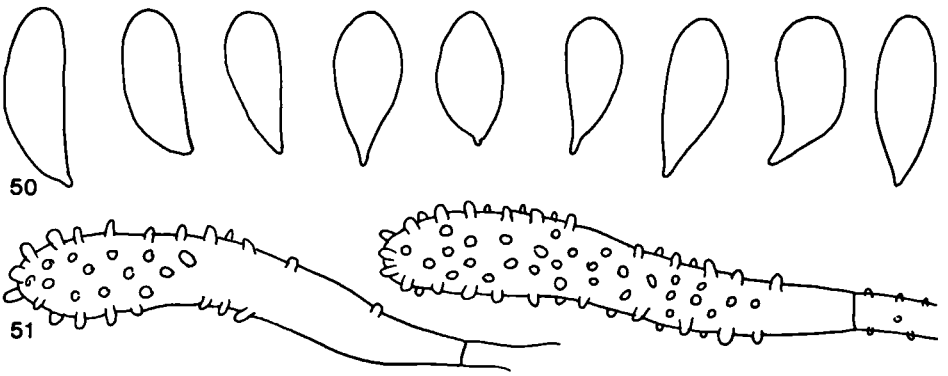
Basidiomata parva. Pileus 2–3 mm latus, campanulatus demum convexus, radialiter plicatus, haud hygrophanus nec translucido striatus, albus centro brunneolus, toto pruinosus. Lamellae distantes, adnato decurrentes, roseae. Stipes 2–5 × 0.3 mm, cylindraceus, curvatus, cremeus, basim brunneus, toto albo pruinosus, basim strigosus. Odor nulla. Sporae 11–13 × 4.5–6.5 µm, ellipsoidae vel lacrimoidae, tenuiparietales, inamyloidae. Basidia 27–40 × 9–12.5 µm, 4- raro 2- vel 6-sporigera. Acie lamellarum sterilis. Cheilocystidia 25–50 × 5–11 µm, versiformia, coralloideae vel cylindraceo-capitata. Pileipellis cutis elementis inflatis cellulis terminalibus coralloideis vel capitatis. Stipitispellis similis. Fiblae presentes. Habitat ad lignum Callunae. Holotypus: *J. J. Barkman 10500*, 25 Oct. 1984, 'Dalerpeel, prov. Drenthe, The Netherlands' (WBS; isotypus in L).

Basidiocarps small, dwarfish. Pileus 2–3 mm broad, campanulate then convex, sometimes slightly umbilicate, radially plicate, not hygrophanous, not translucent-striate, white at centre sometimes tinged brown, dull, entirely pruinose. Lamellae (L = 7–12, l = 1–3) distant, adnate-decurrent, sometimes loosening from stipe forming a pseudocollarium, segmentiform, pale pink. Stipe 2–5 × 0.3 mm, cylindrical, curved, cream coloured more brown at base, entirely white pruinose, white strigose at base with white radiating hairs. Context concolorous with surface. Smell none. Taste not known.

Spores 11–13 × 4.5–6.5 µm, average 11.7 × 5.5 µm, Q = 2–2.4, average Q = 2.1, ellipsoid to lacrymoid, thin-walled, colourless, inamyloid. Basidia 27–40 × 9–12.5 µm, 4-, rarely 2-spored, clavate, clamped. Lamella edge sterile. Cheilocystidia 25–50 × 5–11 µm, versiform from cylindrical capitate to irregularly coralloid with finger-like excrescences or one or more bladder-like heads at apex. Pleurocystidia absent. Hymenophoral trama regular, made up of inflated hyphae, elements 30–90 × 8–20(–25) µm, intermixed with 4–10 µm wide cylindrical hyphae. Pileipellis a cutis of 4–12(–18) µm wide, inflated hyphae with coralloid to diverticulate endings, mixed with pileocystidioid capitate elements, 2–10 µm wide. Pileitrama regular, made up of inflated hyphae, similar to hymenophoral trama. Stipitispellis a cutis with numerous cylindrical and capitate or coralloid to diverticulate caulocystidia, 20–45 × 2–8 µm. Clamp-connections abundant in all tissues.

Habitat & distribution.—On branchlets of *Calluna vulgaris* in open *Betula* forest on dry, peaty soil. Only known from the type locality.

Collection examined.—THE NETHERLANDS, prov. Drenthe, Dalerpeel, 25 Oct. 1984, *J. J. Barkman 10500* (holotype, WBS; isotype, L).



Figs. 50, 51. *Marasmius pruinatus*. — 50. Spores (×1500). — 51. Hyphae of pileipellis (×1000).

Marasmiellus ornatissimus keys out in sect. *Tricolores* Sing. on account of the distinctly coralloid to diverticulate hyphae of the pileipellis ('ramealis-structure'), and the large spores (Singer, 1973). In this section only a few species are known from Europe. *Marasmiellus tricolor* comes very close, especially with regard to the pink lamellae, but the microscopical characters, e.g. the structure of the covering layers, are completely different, as is the habitat. *Marasmius pruinatus* Rea shows superficial resemblance with its pruinose, white basidiocarps, but that species differs in a number of characters (see type-study below). The tropical members of sect. *Tricolores*, viz. *M. caesioater, M. berkeleyi*, and *M. cubensis*, all differ in a considerable number of characters such as colour of pileus and stipe, structure of pileipellis, size and shape of spores.

11. Marasmius pruinatus Rea—Figs. 50–51

Marasmius pruinatus Rea in Trans. Br. mycol. Soc. 5: 435, pl. 8. 1916.

Pileus 5–10 mm broad, obtusely convex or obsoletely papillate with thin, encurved margin, white becoming tinged with yellow, fleshy horny, pruinose. Lamellae decurrent, subdistant, very narrow, 1 mm broad, shining, white. Stipe 15–30 × 1–2 mm, equal, rigid, white, pruinose base white villose.

Spores 9.0–11.5 × 3.5–5.5 μm, average 10.4 × 4.9 μm, Q = 2.0–2.4, average Q = 2.2, ellipsoid, slightly broader at apex. No intact basidia nor cystidia seen. Pileipellis a cutis with transitions to a trichoderm, made up of radially arranged cylindrical hyphae with strongly developed ramealis structure. Clamp-connections not seen with certainty.

Chemical reactions.—No part of basidiocarps amyloid or dextrinoid in Melzer's reagent.

Collections examined.—UNITED KINGDOM, England, Somerset, West Prolock, 14 Oct. 1916, *G. Hadden* (holotype, K).

According to Orton (1960) and Singer (1973) *Marasmius pruinatus* is a synonym of *Marasmiellus tricolor* (Alb. & Schwein.: Fr.) Sing. My observations on the holotype of

Marasmius pruinatus show slightly different spores. Furthermore the basidiocarps of *M. pruinatus* are entirely white, whereas those of *M. tricolor* have a dark coloured stipe and pinkish lamellae. For those reasons I do not believe that *Marasmius pruinatus* Rea is a synonym of *M. tricolor* but a species in its own right, that should be placed, however, in the genus *Marasmiellus*. Because of the base state of the holotype, however, *M. pruinatus* is considered a nomen dubium.

12. **Marasmiellus tricolor** (Alb. & Schwein.: Fr.) Sing.—Figs. 52–57

Agaricus tricolor Alb. & Schwein., Conspect. fung.: 228. 1805. — *Agaricus tricolor* Alb. & Schwein.: Fr., Syst. mycol. 1: 166. 1821. — *Marasmius tricolor* (Alb. & Schwein.: Fr.) Kühn. in Botaniste: 25: 89. 1933. — *Marasmiellus tricolor* (Alb. & Schwein.: Fr.) Sing. in Pap. Mich. Acad. Sci. 32: 128. 1948.

Agaricus languidus Lasch in Linnaea 3: 385. 1828. — *Agaricus languidus* (Lasch) Fr., Epicr.: 379. 1838. — *Marasmiellus languidus* (Lasch) Sing. in Lilloa 22: 300. 1951.

Excluded: *Marasmius languidus* sensu Kühn. & Romagn., Fl. anal. Champ. sup.: 86. 1953 (= *M. vaillantii*).

Selected description & illustration.—Kühner in Botaniste 25: 89. 1933.

Pileus 2–11 mm broad, convex, usually with small, conical papilla, expanding with age to plano-convex or applanate, with enrolled margin, not hygrophanous, not translucent-striate, white or cream-coloured, minutely pruinose under lens, later sometimes more or less tomentose. Lamellae (L = 10–17, l = 0–2) distant, broadly adnate to deeply decurrent, triangular, or arcuate, white or cream-coloured, often turning flesh-pink with age or when dried, with entire, concolorous edge. Stipe 8–20 × 0.5–1.0 mm, cylindrical, sometimes broadened towards base or apex, sometimes tapering towards base, white to cream at apex, brown to black towards base, pruinose to tomentose all over. Context thin, concolorous with surface. Smell and taste inconspicuous.

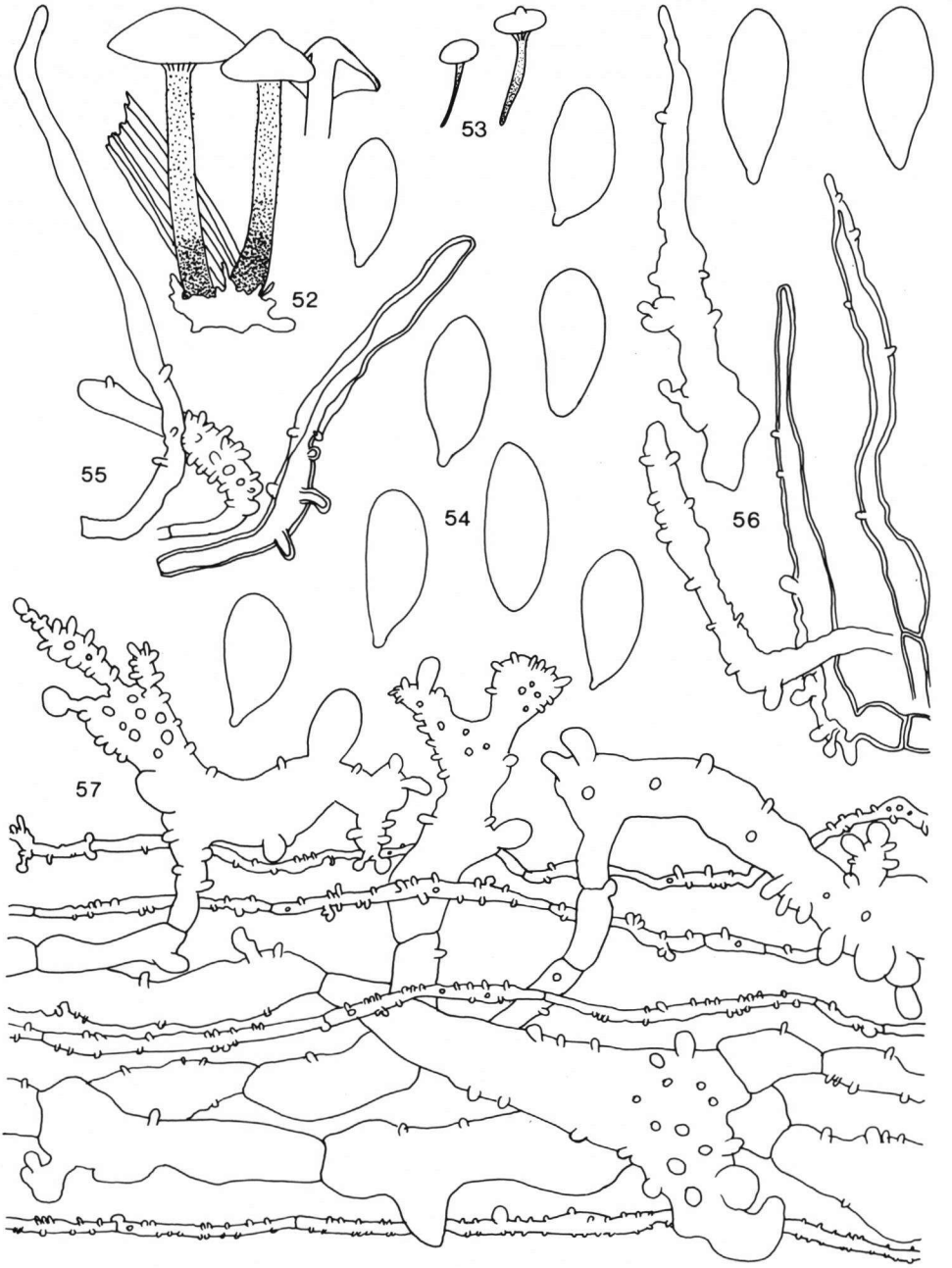
Spores (8.5–)9.0–13.5 × 3.5–6.0(–6.5) µm, average 10.0–11.2 × 5.0–5.6 µm, Q = 1.5–2.5, average Q 1.8–2.2, ellipsoid to narrowly ellipsoid, or pip-shaped, thin-walled, colourless. Basidia 25–40 × 8–11 µm, 4- and 2-spored, clamped. Lamella edge fertile or heterogeneous. Cheilocystidia absent or present, then very sparse, cylindrical to sublageniform, 20–35 × 4–10 µm. Pileipellis a cutis of inflated hyphae, 2–15 µm wide with strongly developed ramealis-structure, viz. ascending, inflated terminal elements with numerous finger- and bladder-like excrescences, with pale yellow not encrusted walls. Caulocystidia numerous along whole length of stipe, about 40–120 × 4–15 µm with ramealis-structure. Clamp-connections abundant in all tissues.

Habitat.—On roots of grass and grass-debris in grasslands of grassy spots.

Distribution.—Rare and wide-spread in Europe. Summer–Autumn.

Collections examined.—NORWAY, Vestfold, Nøtterøy, Teie, Rosanes, 6 Aug. 1985, *A. Aronsen 6/85* (L). — THE NETHERLANDS, prov. Gelderland, Groesbeek, 1 June 1937, *A. C. S. Schweers* (L); Hatert, Hatertse Vennen, 29 July 1972, *G. A. de Vries* (L); prov. Zuid-Holland, Alphen aan de Rijn, Zegerplas, 31 July 1985, *C. Uljé* (L).

Figs. 52–57. *Marasmiellus tricolor*. — 52. Fruitbodies (×5). — 53. Fruitbodies (×1). — 54. Spores (×1500). — 55, 56. Caulocystidia (×100). — 57. Pileipellis (×1000). (52, 55 from *de Vries*, 29 July 1972, all other figs. from *Aronsen 6/85*.)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Marasmiellus tricolor is a very rare, and probably also overlooked species. The only 'modern' description of European material is that of Kühner (1933), and since I recently got two well-preserved and annotated collections from Norway and the Netherlands, I decided to give a full description and illustration of this species. A character that always has been considered important, viz. the pink lamellae, is not always very clear. Cheilocystidia are usually absent, rarely present, but then very sparse. This is a good character, together with the size and shape of the spores, and the growth on grasses, to distinguish *Marasmiellus tricolor* from *M. trabutii* and *M. candidus*. *Marasmiellus ornatissimus* comes also close, but grows on *Calluna*, has well-developed cheilocystidia and different structure of the covering layers of pileus and stipe.

13. Marasmiellus rosellus (J. Lange → Mos.) Kuyper & Noordel.—Figs. 58–61

Omphalia rosella J. Lange in Dansk bot. Ark. 6: 14. 1930. — *Clitocybe rosella* J. Lange → Moser in Sydowia 4: 100. 1950. — *Omphalina rosella* (J. Lange → Mos.) Moser, Blätter- und Bauchpilze, 1. Aufl.: 58. 1953. — *Marasmiellus rosellus* (J. Lange → Mos.) Kuyper & Noordeloos in Proc. Int. Symp. Tricholomataceae, Borgo Taro: 100. 1986.

Mycena carnicolor P. D. Orton in Trans. Br. mycol. Soc. 43: 178. 1960.

Selected description & illustration.—Malençon & Bertault, Fl. Champ. sup. Maroc 2: 207–209, fig. 35. 1975.

Characteristics.—Pileus about 10 mm broad, plano-convex, umbilicate, shortly translucently striate or not, pink or pinkish lilacinous, somewhat tomentose. Lamellae arcuate-decurrent, pinkish like pileus. Stipe 10–30 × 1–2 mm, cylindrical, white or with pink tinge. Spores 8–11 × 4–6 µm, ellipsoid or lacrymoid, thin-walled, colourless, inamyloid. Basidia 2- and 4-spored, clamped. Cheilocystidia present, lageniform, 30–50 × 4–10 µm. Pileipellis a cutis with transitions to a trichoderm, of repent and ascending hyphae with modified terminal elements (pileocystidia), 30–70 × 5–15(–20) µm, somewhat lageniform or clavate. Pigment membranal and encrusting in pileipellis and upper pileitrama. Clamp-connections abundant.

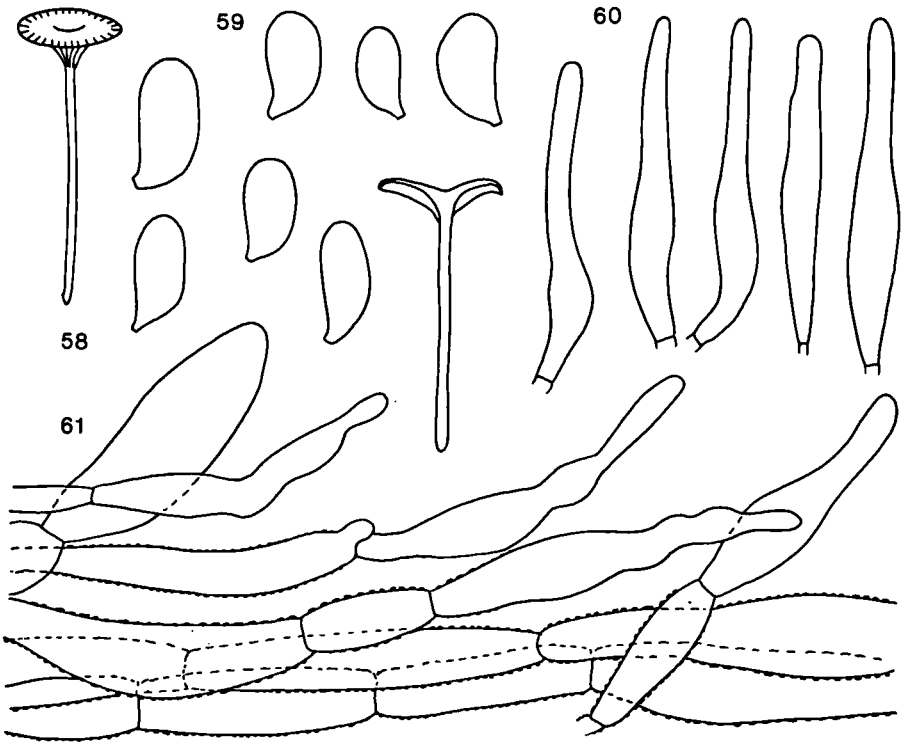
Collection examined.—THE NETHERLANDS, prov. Noord-Brabant, along Drongelens Kanaal between Helvoirt and Drunen, 23 Oct. 1983, *H. Huijser* s.n. (L).

Marasmiellus rosellus is placed in the genus *Marasmiellus* on account of the pileipellis that shows strong resemblance to that of *M. vaillantii* and *M. candidus*, and the well-differentiated cheilocystidia.

III. MICROMPHALE

14. Micromphale bisporigera, ad int.—Figs. 62–67

Basidiocarps small. Pileus 6–8 mm broad, irregularly convex to plano-convex with only the outermost margin inflexed, not distinctly hygrophanous, when moist dark yellowish brown (Muns. 10 YR 5/6), slightly paler towards margin (10 YR 6/6) and slightly darker at centre (10 YR 4/4 to 4/6), slightly translucently striate at margin (up to 1/3 of radius), colliculose at centre, glabrous, making a greyish impression. Lamellae (L = about 17, l = 1–3) rather crowded, free or very narrowly adnate, adnexed, mod-

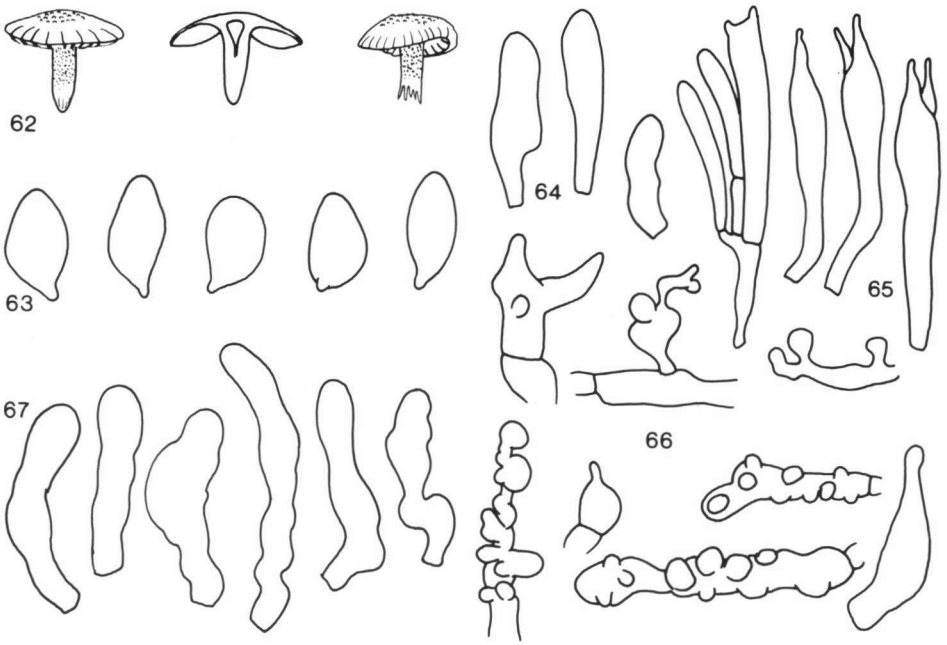


Figs. 58–61. *Marasmiellus rosellus*. — 58. Fruitbodies (×2). — 59. Spores (×1500). — 60. Cheilocystidia (×1000). — 61. Pileipellis (×1000). (All figs. from *Huijser*, 23 Oct. 1983.)

erately broad (up to 1.2 mm), sometimes tending to form anastomoses, pale cream-buff to yellowish buff (2.5 Y 8/4 to 10 YR 7/4 but slightly more yellow), with entire, concolorous edge. Stipe 5 × 1.3–1.5 mm, cylindrical slightly tapering towards base, yellow-brown (10 YR 6/8–6/6), slightly more red at base, very minutely granular or pruinose in same colour, fistulose. Context pale yellow-brown with darker zone under pileipellis. Smell not remarkable. Taste not tried.

Spores 7.0–8.5 × 4.0–5.0 μm, broadly ellipsoid, thin-walled, inamyloid. Basidia 29–39 × 5–65 μm, 2-, rarely 1- or 3-spored, clampless. Lamella edge heterogeneous. Cheilocystidia 15–25 × 5–6 μm, clavate, rare and scattered. Subhymenium ramose, probably not gelatinized. Hymenophoral trama strictly interwoven in upper part near pileus becoming more irregular downwards to perfectly regular near lamella edge. Pileipellis a 20–40 μm thick ixocutis of 5–12 μm wide, nodulose, thin-walled hyphae embedded in a gelatinous matrix, subpellis made up of inflated hyphae, up to 25 μm wide. Stipitispellis a cutis with dense clusters of caulocystidia. Caulocystidia 20–40 × 4–8 μm, cylindrical to clavate. Stipitistrama regular, made up of cylindrical elements up to 160 × 10 μm, not constricted at septae. Clamp-connections absent.

Habitat & distribution.—On bark of deciduous tree, only known from one locality in the Netherlands.



Figs. 62–67. *Micromphale bisporigera*. — 62. Fruitbodies (× 2). — 63. Spores (× 1500). — 64. Cheilocystidia (× 1000). — 65. Basidia (× 1000). — 66. Elements from pileipellis (× 1000). — 67. Caulocystidia (× 1000). (All figs. from *Uljé*, 20 Nov. 1984.)

Collection examined.—THE NETHERLANDS, prov. Zuid-Holland, Alphen aan de Rijn, near Zegersplas, 20 Nov. 1984, *C. Uljé* (L).

The tiny basidiocarps, gelatinized pileipellis with nodulose hyphae, and clampless, 2-spored basidia make this taxon a good species of *Micromphale*. The material is too scanty for designation of a holotype and therefore no formal description of a new species has been made.

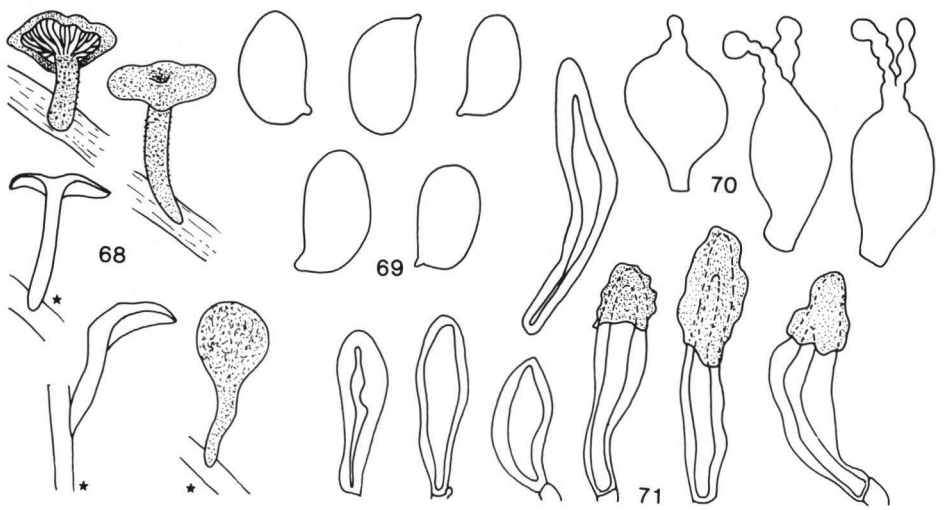
IV. HOHENBUEHELIA

15. Hohenbuehelia culmicola Bon—Figs. 68–71

Hohenbuehelia culmicola Bon in Docum. mycol. 10(37–38): 89. 1979.

Selected description & illustration.—Bon in Docum. mycol. 11(41): 51–53, fig. 3. 1980.

Pileus 9–25 mm broad, spathulate to reniform or convex with involute margin and irregularly lobed, undulating marginal zone, usually depressed at centre, not hygrophanous, not translucent-striate, densely villose all over with grey hairs on grey-black



Figs. 68–71. *Hohenbuehelia culmicola*. — 68. Fruitbodies (×1). —69. Spores (×1500). — 70. Cheilocystidia (×1000). — 71. Pleurocystidia (×1000). (68 with * from *Vellinga 741*; all other figs. from *Noordeloos 84398*.)

background (Muns. 10 YR 3/1–2, K & W 6E4), pallescent (10 YR 4/1–2) and sulcate on drying. Lamellae (L up to 50, l = 1–5) moderately crowded, decurrent, narrowly segmentiform, creamish white when young then greyish to brownish (10 YR 6/4) with brown, more or less entire edges. Stipe 8–20 × 3–4 mm, central or slightly excentrical, cylindrical, sometimes broadened towards base, concolorous or paler and more brown than pileus, covered in grey villose surface. Context pallid in pileus and stipe, with darker gelatinous layer under surface of pileus. Smell somewhat sourish fungoid. Taste mild.

Spores 9.0–11.0 × 5.5–7.0 μm, average 9.5–6.5 μm, Q = 1.35–1.7, average Q = 1.5, ellipsoid, thin-walled, inamyloid. Basidia 22–40 × 7–11 μm, 4-spored, clamped. Lamella edge sterile or heterogeneous. Cheilocystidia 15–40 × 8–25 μm, very irregular in shape, basal form usually clavate to lageniform, but apex often moliniform/capitate or with two or three apical, moniliform appendages, thin-walled, colourless. Pleurocystidia 35–70 × 5–15 μm (wall up to 4 μm thick), numerous, clavate to fusiform, thick-walled, metuloid, often with mucous mass covering the apex. Pileipellis a trichoderm of dense fascicules of 2.5–8 μm wide, cylindrical hyphae with yellow, thin or thick, often encrusted walls. Clamp-connections very numerous in all tissues.

Habitat.—Close to the ground on culms and leaf-sheats of *Leymus arenarius* in the outermost zone of coastal sand-dunes.

Distribution.—Known from France and two localities in the Netherlands. Nov.

Collections examined.—THE NETHERLANDS, prov. Friesland, Isl. of Schiermonnikoog, outer dunes, 19 Nov. 1984, *E. C. Vellinga 741* (L); ditto, 10 Nov. 1985, *E. C. Vellinga (& J. H. Ietswaart) 866* (L); prov. Zuid-Holland, Isl. of Goeree, Kwade Hoek, 11 Nov. 1984, *M. E. Noordeloos 84398* (L).

Hohenbuehelia culmicola is a very remarkable member of the genus *Hohenbuehelia* because of the habit, habitat and substratum. Most species of *Hohenbuehelia* grow on wood in deciduous or coniferous forest. It comes close to *H. atrocoerulea*, but that species never has a well-developed stipe, and the ecology is completely different.

ACKNOWLEDGEMENTS

Thomas Laessöe is gratefully thanked for providing the material of *Marasmius cornelii*. The curator of the herbarium at Oulu is acknowledged for the loan of specimens. The director of the Royal Botanic Gardens, Kew, is greatly thanked for hospitality and providing working space.

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