

ENTOLOMA SUBGENUS *POUZAROMYCES* EMEND. IN EUROPE

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(With 58 Text-figures)

Entoloma (Fr.) Kumm. emend. Donk subgenus *Pouzaromyces* (Pilát) Moser is emended by including *Rhodophyllus* Quél. section *Versatilis* Romagn. 1974. A revision of the European taxa is given based on all collections and additional information available in the major European herbaria. Eleven taxa are recognized of which three are new: *Entoloma dysthaloides*, *E. romagnesii* and *E. dysthales* f. *acystidiosum*. Four new combinations are introduced, viz. *E. strigosissimum*, *E. hirtum*, *E. araneosum* f. *fulvostrigosum* and *E. nodosporum*.

In 1953 Pilát erected in the Rhodophyllaceae the monotypical genus *Pouzaromyces*, typified by *Nolanea fumosella* (Wint.) Sacc. sensu Pilát (= *N. strigosissima* Rea = *Rhodophyllus babingtonii* (Blox. apud Berk. & Br.) Quél. sensu Quél., Kühn. & Romagn., non auct.). In Pilát's concept the genus is well suited to accommodate the same species as *Rhodophyllus* Quél. sect. *Induti* Kühn. apud Kühn. & Romagn. (1953: 186).

Pouzaromyces covers then a small group of entolomatoid fungi formerly placed in *Nolanea* (Fr.) Kumm., characterized by a mycenoid stature, non-hygrophanous cap with metallic-shining, fibrillous-hairy or subsquamulose surface and with encrusting pigments in all tissues. Most members are tiny and rare, and consequently easily overlooked.

Moser (1973) attempted to disentangle the taxonomical and nomenclatural confusion in the group but succeeded only partly, mainly because of the lack of properly documented collections. Mazzer (1976) monographed the group of fungi concerned, but paid little attention to the European species. The present revision is based on as much information as was available in herbaria, private collections and from personal observation. However, probably because most species are rather rare, much information on the variability, particularly of macroscopical characters, is still lacking.

Pouzaromyces Pilát will be treated in this paper as a subgenus of *Entoloma* (Fr.) Kumm. emend. Donk. The concepts of Romagnesi, 1974 and 1978, and Moser, 1978, are emended by including *Rhodophyllus* section *Versatilis* Romagn., typified by *Agaricus versatilis* Fr.¹

¹ Romagnesi (1978: 48) emended the concept of *Inopilus* by changing the type from *Rhodophyllus versatilis* (Fr.) Moser to *R. inocephalus* Romagn., because he wanted as a type species a more typical representative for the, mainly tropical, taxon *Inopilus*. This is, however, against the rules of the International Code of Botanical Nomenclature. In this paper *Inopilus* is treated in its original concept, and considered a synonym of section *Versatilis*.

It should be noted here that the Introduction of the work of Romagnesi & Gilles (1979) has been pre-published by Romagnesi in 1978. Unfortunately the pagination of the pre-publication differs from that of the Introduction of the definite book. In the present paper there is always referred to the pre-publication (Romagnesi, 1978).

Though the differences between section *Pouzaromyces* and section *Versatilis* are considerable, the resemblances in pigmentation-pattern, spore-shape, tramal structure (especially of the lamellae, including the cellular subhymenium and distinctly developed hymenopodium), and the presence of so-called 'abortive' basidia (Mazzer, 1976) are so striking, that a distinction on subgeneric level does not seem justified.

Pouzarella Mazzer (1976), published as a new name for *Pouzaromyces*, is considered a nomen superfluum. In this respect McVaugh (1968: 460) is followed in the opinion that the type of a genus is the species the author had in mind in creating the genus, not the mere name applied to it. Pilát typified *Pouzaromyces* with '*Nolanea fumosella* Wint.', a misapplication of Winter's epithet to *Nolanea strigosissima* Rea. As Pilát mentioned Rea's species in the synonymy and preserved the type-collection in PRM, the genus *Pouzaromyces* is clearly defined and should not be rejected. This opinion is shared with Romagnesi (1978), Moser (1978) and Pegler (1977).

A critical evaluation of the taxonomic position of *Pouzaromyces* within the genus *Entoloma* will be published in a future paper (Noordeloos, 1980).

MATERIAL, METHODS AND PRESENTATION

Of the eleven taxa recognized here I studied only three in fresh condition. Most of the collections studied were dried, exceptionally they were preserved on liquid.

The descriptions in this work are composed of (i) data derived from observations on the collections cited, (ii) data taken from labels, collectors' notes and accompanying drawings and colour-slides and (iii) data derived from publications and illustrations relevant to the collections I studied myself. It should be noted that no information was available from all these sources on the colour of the fresh (or dried) spore-print. That may be due to the rareness of most species and to the fact that usually only a few carpophores are found. The mycenoid, thin-fleshed stature does not guarantee of getting a good spore-print without spoiling the specimen used.

Colours of fresh carpophores were usually compared with Munsell Soil Colour Charts, Baltimore.

Microscopical structures were observed and measured in water (fresh carpophores) or in 10% NH_4OH solution or in an ammoniac 1% Congo Red solution (dried specimens), usually under oil-immersion.

Spores, basidia and cystidia were observed and measured in squash preparations of minute parts of the lamellae. Hymenophoral trama was observed both in squash preparations and in transversal sections. The pileipellis was observed on radial sections of the cap. The stipeipellis was observed on longitudinal sections through the cortex of the stipe, respectively one at the apex, one in the middle and one at the base of the stipe.

Drawings were made with the aid of a drawing prisma. The magnifications of the figures are: carpophores, natural size; spores, $\times 1000$; all other microscopical details, $\times 670$.

The following abbreviations are used:

Q.—Length-width ratio, usually given as follows: $Q = 1.2-1.3-1.4$ which means Q between 1.2 and 1.4 with an average of 1.3. The size of the spores relates to the largest length and width, excluding the apiculus.

L-D = 1-2-3 μm .—Length minus width between 1 and 3 μm with an average of 2 μm .
 Lamellae L = 20-25, 1 = 1-3.—20-25 entire lamellae with 1-3 lamellulae between each pair.

ACKNOWLEDGMENTS

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ENTOLOMA (Fr.) Kumm. *emend.* Donk subgenus POUZAROMYCES (Pilát) Moser *emend.* Noordeloos

Pouzaromyces Pilát in Acta Mus. Nat. Prag. (b) 9(2): 60. 1953. — *Entoloma* (Fr.) Kumm. subgen. *Pouzaromyces* (Pilát) Moser in Gams, Kl. KryptogFl. 4. Aufl., 2(b/2): 191. 1978. — *Rhodophyllus* Quéél. subgen. *Pouzaromyces* (Pilát) Romagn. in Beih. Nova Hedwigia 59: 50. 1978. — Type: *Nolanea fumosella* (Wint.) Lange sensu Pilát = *Entoloma strigosissimum* (Rea) Noordeloos.

Pouzarella Mazzer in Biblca mycol. 46: 69. 1976 (nom. illeg.). — Type: *P. nodospora* (Atk.) Mazzer.
Rhodophyllus Quéél. subgen. *Inopilus* Romagn. sect. *Inopilus* in Bull. Soc. linn. Lyon 43: 329. 1974. — *Entoloma* subgen. *Inopilus* (Romagn.) Moser in Gams, Kl. KryptogFl. 4. Aufl. 2(b/2): 191. 1978. — Type: *R. versatilis* (Fr.) Quéél.

Rhodophyllus Quél. sect. *Luctuarii* Romagn. emend Romagn. in Bull. Soc. linn. Lyon 43: 330. 1974. — Type: *R. babingtonii* (Blox. apud Berk. & Br.) Quél. sensu Quél., Romagn.

Rhodophyllus Quél. sect. *Induti* Kühn. & Romagn., Fl. anal.: 186. 1953. — Type: *R. indutus* (Boud.) Romagn.

Carpophores mycenoid, rarely tricholomoid. Pileus conical to campanulate, sometimes truncate, usually only slightly expanding, not or weakly hygrophanous, translucently striate at margin or not, metallic-shining, fibrillose, fibrillose-hairy to fibrillose-squamulose. Lamellae adnate, emarginate or nearly free, narrow to ventricose, mostly (dark) grey to grey-brown with slight pink tinge. Stipe filiform or cylindrical, concolorous with cap or slightly paler, entirely covered with fibrillose or arachnoid longitudinal striation, sometimes distinctly hairy to sub-squamulose; base strigose with radiating hairs.

Spores angular or gibbose, medium-sized to large, 9–21 μm long, ellipsoid to elongate in outline, with weakly or well developed basal facet.¹ Basidia large, broadly clavate, abortive basidia present. Cheilocystidia mostly abundant, rarely lacking, lageniform or subcylindrical, subglobose to clavate, frequently encrusted. Subhymenium cellular. Hymenophoral trama usually with strongly developed hymenopodium of narrow, cylindrical, strongly encrusted hyphae and with mediostratum of broader, cylindrical or inflated hyphae. Pileipellis a cutis with transitions to a trichodermium of repent or ascending hairs. Pigment abundant, membranal-encrusting in trama and covering layers, rarely accompanied by intracellular pigment in pileipellis. Clamp-connections absent. Type of development of carpophore unknown.

HABITAT & DISTRIBUTION. — Terrestrial, rarely on decayed wood in damp, shady places, usually in deciduous forests, rarely in grasslands. Solitary or in groups. Wide-spread, both in lowlands as well in submontaneous or subboreal habitats. Appearing from May to November with an optimum in late summer and early autumn.

KEY TO THE SECTIONS OF SUBGENUS *POUZAROMYCES*

- 1a. Pileus fibrillose-hairy to fibrillose-squamulose. Pileipellis with long, septate, mostly attenuate, encrusted hairs. Pigment exclusively membranal-encrusting in all parts of carpophore. Cheilocystidia subglobular to clavate or subcylindrical, with rounded or conical tip. Section *Pouzaromyces*, p. 210
- b. Pileus with metallic sheen, subglabrous or radially fibrillose. Pileipellis with long cylindrical to fusiform hairs, with diffuse or granular intracellular pigment, and not or only minutely encrusted walls. In entire carpophore membranal pigment predominant, but accompanied by fine encrustations. Cheilocystidia lageniform. Section *Versatilis*, p. 229

SECTION *POUZAROMYCES*

Rhodophyllus Quél. sect. *Luctuarii* Romagn. emend Romagn. in Bull. Soc. linn. Lyon 43: 330. 1974. — Type: *R. babingtonii* (Blox. apud Berk. & Br.) Quél. sensu Quél., Romagn. = *E. strigosissimum* (Rea) Noordeloos.

Rhodophyllus Quél. subgen. *Pouzaromyces* (Pilát) Romagn. in Beih. Nova Hedwigia 59: 50. 1978. — *Entoloma* (Fr.) Kumm. subgen. *Pouzaromyces* (Pilát) Moser in Gams, Kl. KryptogFl. 4. Aufl. 2(b/2): 191. 1978.

Pouzarella Mazzer sect. *Pouzarella*.

Pouzarella Mazzer sect. *Dysthales* Mazzer in Biblca. mycol. 46: 92. 1976. Type: *P. nodospora* (Atk.) Mazzer.

¹ Pegler & Young (1978) proposed a new classification of spore-types in *Entoloma*. In subgenus *Pouzaromyces* they recognized the so-called '*Pouzaromyces*'-type in *E. strigosissimum* and *E. dysthales*; 'Y-base'-type mixed with 'Common'-type in *E. araneosum* and 'Simple-base'-type in *E. versatilis*.

Pileus fibrillose-hairy to fibrillose-squamulose. Pileipellis a cutis with transitions to a trichodermium with long, septate, attenuate hairs. Pigment exclusively membranous-encrusting. Cheilocystidia rarely absent, subcylindrical, subglobular or clavate, mostly brown-encrusted, with rounded or conical tip.

KEY TO THE SPECIES OF SECTION POUZAROMYCES

- 1a. Spores on the average more than 15 μm long; $Q=1.7$ or more. 2
 b. Spores on the average considerably less than 15 μm long; $Q=1.7$ or less. 4
 2a. Carpophore densely covered with red or red-brown setiform hairs with uniformly coloured, thickened, not encrusted walls. Pileus not translucently striate when moist. *E. strigosissimum*, p. 211
 b. Pileus fibrillose-squamulose. Stipe more sparsely hairy with long, multiseptate, attenuate but not setiform, minutely to coarsely encrusted hairs. Pileus usually translucently striate at margin when moist. 3
 3a. Cheilocystidia present. *E. dysthales*, p. 215
 b. Cheilocystidia absent. *E. dysthales* f. *acystidiosum*, p. 219
 4a. Spores rather obtusely angular and relatively thin walled; $Q=1.3-1.4-1.6$ 5
 b. Spores more pronouncedly angular and slightly thick-walled; $Q=(1.3-1.4)-1.6-1.8$ 6
 5a. Spores 7.8–10.8(–11.8) \times 6.4–7.4 μm , L–D = 1–3(–4) μm . Pileus and stipe sepia-brown ('bistre') Hairs on stipe 1–2-celled, cylindrico-clavate with pale, not encrusted walls. *E. romagnesii*, p. 225
 b. Spores 10.2–12.5(–13) \times 7–8(–8.7) μm , L–D = 2.1–4.7 μm . Pileus and stipe pale grey-brown. Hairs on stipe 2–4-celled with brown, minutely encrusted walls. *E. pulvereum*, p. 226
 6a. Spores (10.2–)11–15(15.5) \times 6.8–8(–9.9) μm , L–D = 3.0–6.0 μm . Pileus and stipe ash grey, on pileus sometimes with sepia flush in centre. Hairs on stipe 2–4-celled with pale, not encrusted walls. *E. hirtum*, p. 223
 b. Spores 10.3–13.5(–15) \times 6.8–8.2(8.7) μm , L–D = 3.5–7 μm . Pileus and stipe rather dark grey-brown. Hairs on stipe 2–4–6-celled with brownish-yellow encrusted walls. *E. dysthaloides*, p. 219

Entoloma strigosissimum (Rea) Noordeloos, *comb. nov.*

Figs. 1–6

Nolanea strigosissima Rea in Trans. Br. mycol. Soc. 6: 325, pl. VII. 1920. — *Leptonia strigosissima* (Rea) P. D. Orton in Trans. Br. mycol. Soc. 43: 178. 1960. — *Rhodophyllus strigosissimus* (Rea) Horak apud Moser in Gams, Kl. Kryptogfl. 3. Aufl., 2(b/2): 164. 1967. — *Pouzaromyces strigosissimus* (Rea) Horak, Syn. Gen. Ag.: 502. 1968. — *Pouzarella strigosissima* (Rea) Mazzer in Biblita mycol. 46: 125. 1976.

MISAPPLIED NAMES.—*Pouzaromyces fumosellus* (Wint.) Pilát sensu Pilát non Wint., nec J. Lange, in Acta Mus. Nat. Prag. (B) 9 (2): 60. 1953.

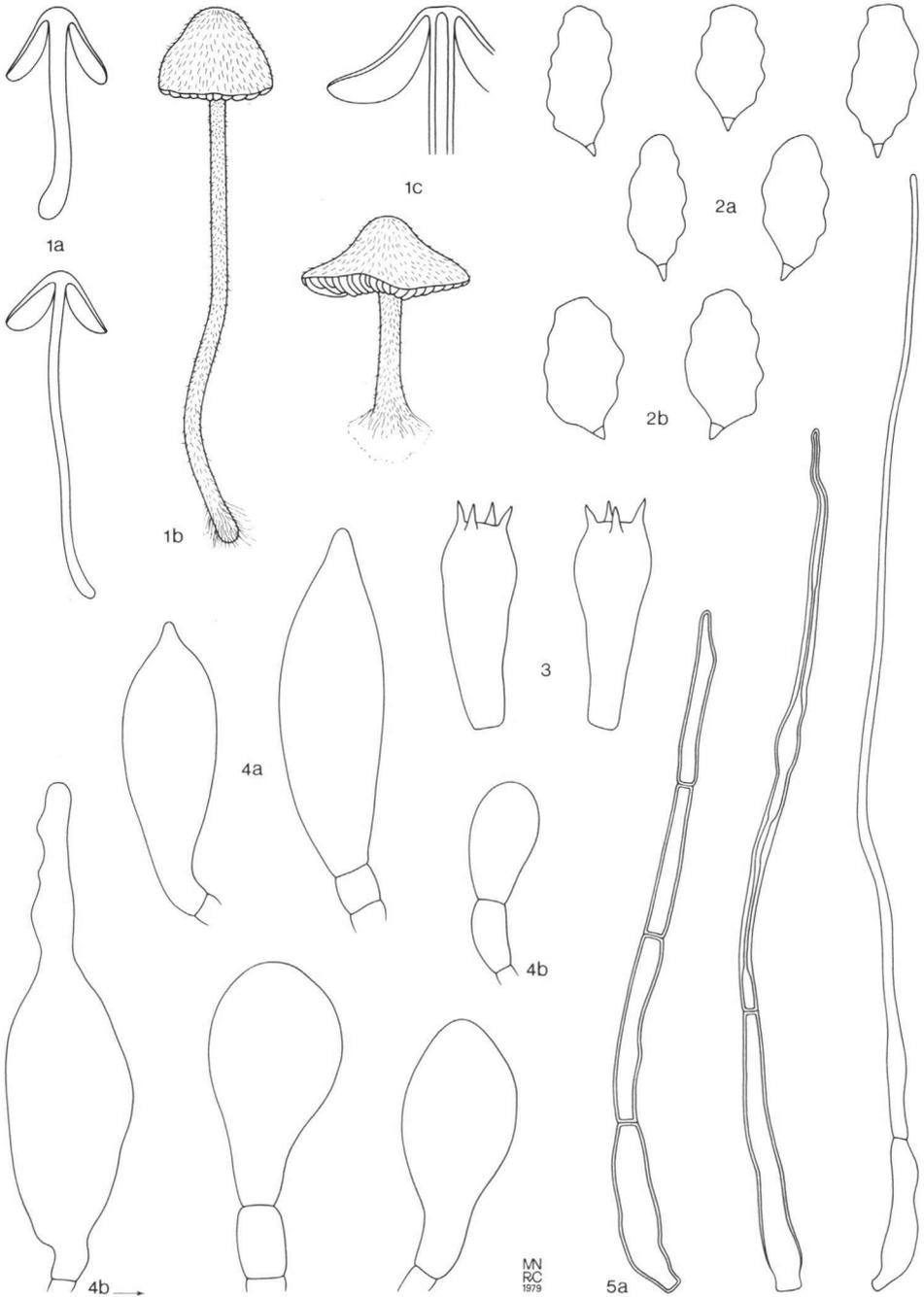
Rhodophyllus babingtonii (Blox.) Quél. sensu Quél., Kühn. & Romagn., non auct., nec Pat., nec Orton, nec Moser.

SELECTED ICONES.—Rea, l.c., pl. VII. 1920.

SELECTED DESCRIPTIONS.—Horak, l.c., 1968. — Moser, in Persoonia 7: 286. 1973. — Mazzer, l.c., 1976.

CHARACTERISTICS.—Small, slender mycenoid fruitbodies, entirely covered with red to red-brown setiform hairs, particularly when young. Spores large, 15–20 μm long.

Pileus 4–22 mm broad, conical then conico-campanulate, never expanding, obtuse, rarely umbonate, with margin sub-involute then straight, not striate when moist, (dark) grey-brown to dark reddish brown, entirely and densely covered with red-brown hairs sometimes forming small, radially arranged squamules sometimes becoming subglabrous with age. Lamellae L = about 20, l = 1, adnate, sometimes emarginate, rarely nearly free, narrowly segmentiform to



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Figs. 1–6. *Entoloma strigosissimum*. — 1. Habitus. — 2. Spores. — 3. Basidia. — 4. Cheilocystidia. — 5. Hairs of stipe (5a from lower and 5b, c from upper part). — 6. Pileipellis. (Figs. 1a, 3 and 4b from *Haxe, Oct. 1976*; 1b from *J. Daams, Aug. 1956*; 1c from *Bas 5840*; 2a and 5a from type; 2b, 4a and 5c from *Jansen, Aug. 1968*; 5b and 6 from *Bas 2144*).

slightly ventricose, flesh-coloured grey then reddish brown with pruinose edge concolorous with sides or slightly paler or darker than sides. Stipe 25–60 × 1–3.5 mm, cylindrical or sometimes filiform, sometimes flexuous, with or without longitudinal groove, cartilaginous, dark brown, entirely woolly with red-brown hairs (similar to those on pileus), at base with ochraceous-reddish radiating hairs. Flesh rather dark blackish to reddish brown. Smell spontaneously none, slightly unpleasant-spermatial when bruised. Taste not recorded. Spore-print dark reddish brown.

Spores (12.7–)14–19(–20.3) × (7.0–)7.8–9.5(–11) μm; Q = 1.5–1.9–2.3; L–D = 5.7–7.2–10.2 μm; rather strongly nodulose-angular, brownish in H₂O. Basidia (35–)40–58 × 12.5–18 μm; Q = 2.4–3.3; 4-spored. Abortive basidia rather frequent. Cheilocystidia (24–)47–92 × (15–)20–34 μm, rather variable in shape, slenderly to broadly clavate, obpyriform or subglobose, sometimes, particularly those near margin of cap, with conical appendix, often yellowish brown-encrusted, especially in middle part, sometimes with brown intracellular pigment, at margin of cap passing into setiform hairs of pileipellis. Subhymenium thin, cellular, colourless. Hymenopodium strongly developed; hyphae 2–6 μm wide, cylindrical, coarsely brown-encrusted. Mediostratum consisting of inflated brown-encrusted elements, e.g. 100–270 × 15–35 μm, near edge of lamellae often more strongly inflated and supporting cheilocystidia. Pileipellis a trichodermium with cylindrical to clavate, up to 25 μm broad cells often in bundles, intermixed with multiseptate setiform hairs, up to 1000 × 10–20 (base) × 2.5–5 (apex) μm, with broadly swollen base, abruptly passing or gradually tapering into very long neck with attenuate, sometimes forked apex, often with irregularly thickened, hyaline, red-brown, not encrusted walls. Pileitrama regular; hyphae 12–20 μm wide, cylindrical in subpellis but deeper in trama slightly inflated, brown-encrusted. Stipitepellis two-layered: subpellis a cutis of 8–12 μm wide, thick-walled, brown-encrusted, cylindrical hyphae; suprapellis a trichodermium with long, setiform hairs as on pileus. Clamp-connections absent.

HABITAT.—Originally described from rotten coniferous wood, but later found also in other habitats: e.g. terrestrial on bare soil in deciduous forests (*Fagus sylvatica*), with *Salix repens* in damp valley in coastal dunes: June–October.

COLLECTIONS EXAMINED.—NORWAY: Nordland, Rana, Storaltern, 10 Sept. 1976, *H. Knudsen* (O). — GREAT BRITAIN: Surrey, St. George's College, Weybridge, 9 Oct. 1919, *Ph. J. Alexander* (Holotypus, K); Surrey, Mickleham Downs, 11 Aug. 1965, *P. D. Orton* 2827 (E). — NETHERLANDS: prov. Noord-Holland, 's-Gravenland, Hilverbeek, 30 Aug. 1956, *J. Daams* (L); prov. Zuid-Holland, Isl. Voorne, 'Parnassia-valley', 28 June 1972, *C. Bas* 5840 (L); Eastern Flevopolder, Bremerbergbos, Oct. 1968, *P. Haxe* (L); prov. Noord-Brabant, Dorst, 31 Aug. 1968, *P. B. Jansen* (L). — GERMAN FEDERAL REPUBLIC: Bayern, 1962, *Dreher & Pilát* (PRM). — FRANCE: dept. Oise, Chaumontel, 17 Aug. 1945, *H. Romagnesi* (Herb. Romagn., PC); dept. Seine & Oise, Luzarches, 26 Aug. 1946, *H. Romagnesi* 275 (Herb. Romagn., PC). — CZECHOSLOVAKIA: Low Tatra, Bystrá Dolina, N. of Brezno, 8 Sept. 1960, *C. Bas* 2144 (L); Bohemia, Srbsko prope Beroun, 8 Sept. 1951, *Z. Pouzar* (PRM, type-collection of Pouzaromyces Pilát); Bohemia, Praha-Kinského sady, 15 Sept. 1966, *Wichánský & Pilát* (PRM).

The setiform hairs on pileus and stipe are highly characteristic for *E. strigosissimum*, and confusion with other species is therefore unlikely as far as the European situation is concerned. In contradiction with Mazzer (1976: 127) the type has not been lost, but is present at K in a relatively good state (see Figs. 2a, 5a).

Noteworthy are the transitions between cheilocystidia and pileal hairs, to be found in some specimens at the lamellar edge near margin of pileus (Fig. 4b). Also at the apex of the stipe one finds simple clavate cells, reminding of the cheilocystidia, with transitions to the setiform hairs found downwards (Fig. 5c). This is also observed in other species, e.g. in *E. dysthales* (Fig. 10b).

Mazzer (1976: 71) places *E. strigosissimum* and the closely related *E. nodosporum*¹ from N. America in the section *Pouzarella*² on account of the setiform hairs. These setiform hairs are the only difference with sect. *Dysthales*. Considering the variation in stipe-covering found in *Pouzaromyces* I do not follow this suggestion and place all species from sect. *Dysthales* and *Pouzarella* in one section: section *Pouzaromyces*.

Entoloma strigosissimum is wide-spread in Europe and relatively one of the more common members of *Pouzaromyces*. The species has probably a wide ecological range as it has been found in rather different habitats. Unfortunately most collections studied were badly annotated on the habitat. As a consequence the knowledge of the ecology of *E. strigosissimum* is still incomplete.

ENTOLOMA DYSTHALES (Peck) Sacc. f. DYSTHALES—Figs. 7–12

Agaricus dysthales Peck in Ann. Rep. N.Y. State Mus. 32: 28. 1879. — *Entoloma dysthales* (Peck) Sacc., Sylloge Fung. 9: 83. 1891. — *Nolanea dysthales* (Peck) Murrill in North Am. Fl. 10: 101. 1917. — *Rhodophyllus dysthales* (Peck) Romagn. in Bull. Soc. mycol. Fr. 53: 328. 1937. — *Leptonia dysthales* (Peck) Konr. & Maubl., Les Agaricales 2: 184. 1953. — *Pouzarella dysthales* (Peck) Mazzer in Biblta mycol. 46: 105. 1976.

Inocybe bucknallii Mass. in Ann. bot. 18: 473. 1904. — *Astrosporina bucknallii* (Mass.) Rea, Brit. Bas.: 213. 1922.

MISAPPLIED NAMES.—*Nolanea babingtonii* (Blox.) Sacc. sensu R. W. G. Dennis in Trans. Br. mycol. Soc. 31: 206. 1948. — *Leptonia babingtonii* (Blox.) Orton in Trans. Br. mycol. Soc. 43: 177. 1960 (see p. 240, excl. names).

Rhodophyllus fumosellus (Wint.) J. Lange in Dansk bot. Ark. 2(11): 36. 1921.

EXCLUDED NAMES.—*Nolanea dysthales* (Peck) Murrill sensu T. Nathorst-Windahl in Acta Horti Goeburg. 16: 142. 1946 (= *Entoloma dysthaloides*).

Rhodophyllus dysthales (Peck) Romagn. sensu O. v. Schulmann in Karstenia 5: 31. 1960 (= *Entoloma dysthaloides*).

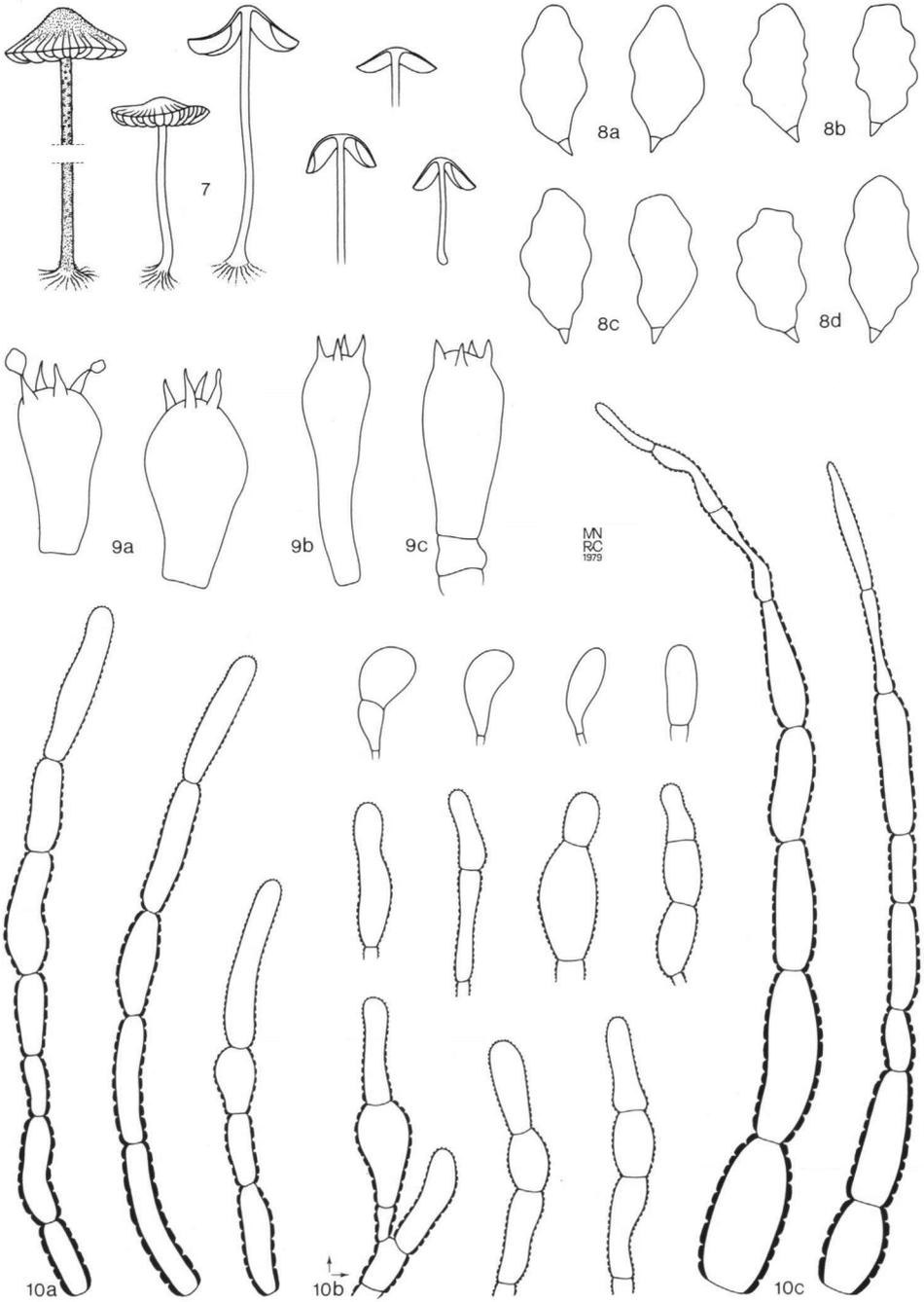
SELECTED DESCRIPTIONS AND ILLUSTRATIONS.—Heim, Genre Inocybe: 360, fig. 206. 1931 (as *I. bucknallii* Mass.). — Moser in Persoonia 7: 283. 1973. — Mazzer in Biblta mycol. 46: 105, figs. 27, 31, 35, 53–57. 1976.

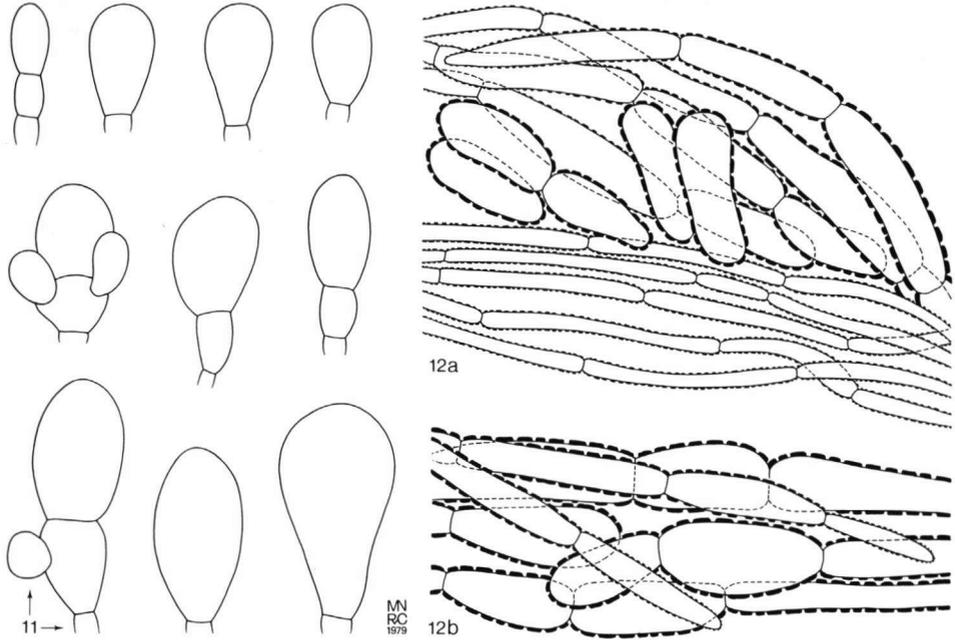
CHARACTERISTICS.—Rather slender agaric; stipe often filiform; pileus and stipe dark grey-brown; pileus pale to brownish fibrillose-squamulose; stipe flocculose; spores 14–20 μ m long.

Pileus (2–)6–18 mm broad, conico-campanulate or hemispherical, expanding to conico-convex, rarely plano-convex and then with small umbo, with margin straight and undulating with age, finally often reflexed, weakly hygrophanous, when moist translucently striate up to 1/2 or 3/4 of cap-radius, blackish-greyish or sepia brown (10 YR [3/1] 3/2), slightly paler at margin (10 YR 4/3–5/4), when dry slightly paler, remaining dark at centre, when young with silvery-shining hyaline to pale brown hairs (turning brown in dried specimens), later finely fluffy-scaly, at centre with fine, pointed squamules, at margin fringed and sometimes rimose, sometimes entirely minutely squamulose. Lamellae L = 10–17, 1 = 1–3, distant to moderately crowded, narrowly adnate or emarginate, narrowly segmentiform at first, then ventricose, often extending

¹ *Entoloma nodosporum* (Atk.) Noordeloos comb. nov. (basionym: *Nolanea nodospora* Atk. in J. Mycol. 8: 114. 1902).

² *Pouzarella babingtonii* (Berk. & Br.) Mazzer was also included in section *Pouzarella*; see discussion under excluded names, p. 240.





Figs. 7–12. *Entoloma dysthales*. — 7. Habitus. — 8. Spores. — 9. Basidia. — 10. Hairs of stipe (10b from upper part and 10c from lower part). — 11. Cheilocystidia. — 12. Pileipellis. (Fig. 7 from *Bas* 1472; 8a, 9a, 10a, and 12a from *Jansen, Nov. 1957*; 8b and 9b from *Moser 66/24*; 8c from *Orton 538*; 8d, 9c, 10b, 10c and 11 from *Noordeloos 841*; 12b from type).

under pileus, sometimes transversely veined, dark grey to grey-brown, finally with pink tinge (7.5 YR 3/2–4/2), with slightly paler flocculose edge. Stipe 12–48 × 0.3–2.0 mm, filiform to cylindrical, sometimes slightly broadened at base, concolorous with pileus (10 YR 3/2), longitudinally silvery striate, sparsely to densely flocculose-hairy or subsquamulose with pale to dark brown hairs, especially on basal half; base strigose with long, radiating pale yellowish brown hairs. Flesh thin in pileus, relatively firm, concolorous with surface. Smell inconspicuous (like flowers of *Primula*, acc. to Moser). Taste mild.

Spores (13.5–)14–19.5(–21.5) × (7.4–)7.9–10.3(–11) μm; Q=(1.5–)1.6–1.8–2.1; L–D=(4.5–)6–10 μm, irregularly nodulose-angular, with slightly thickened, brown walls. Basidia 33–62 × 11–20 μm, broadly clavate, 4-spored. Abortive basidia frequent. Cheilocystidia (17–)21–82 (–90) × 8–21 μm, subglobose, obpyriform or slenderly to broadly clavate, sometimes in 2–3-celled chains, often with broad supporting cell, with rounded to conical apex, rarely with finger-like apical projection, with brown, sometimes encrusted wall, numerous often mixed with basidia. Subhymenium cellular, colourless, thin. Hymenopodium strongly developed, regular, composed of (2.5–)4–12(–17) μm wide, cylindrical, coarsely brown-encrusted hyphae. Medios-tratum often thin, composed of inflated elements, e.g. 160–280 × 14.5–28 μm, with less heavily encrusted walls. Pileipellis a trichodermium with transitions to a pallisade of ellipsoid to clavate cells, 32–90 × 10–32 μm, growing out to long, multiseptate, attenuate hairs with elements measuring 45–200 × 10–35 (at base) × 9–12 (at apex) μm, with slightly thickened, brown-encrusted walls; hairs repent or erect, often in bundles. Pileitrama regular, hyphae in subpellis cylindrical, 4–14 μm wide; in deeper layers slightly more inflated and up to 21 μm wide, (coarsely)

brown-encrusted. Stipitepellis a cutis of cylindrical, 4–17 μm wide, brown-encrusted hyphae with at apex 1–3-celled, globose to cylindrical-inflated, brown-encrusted hairs with cells 20–55 \times 10–33 μm ; downwards with longer, multiseptate hairs, often in bundles and similar to hairs on pileus, with cells 25–70(–110) \times 17.5–29 (at base) \times 5–12 (at apex) μm and terminal elements frequently attenuate and with slightly thickened, refringent wall. Base of stipe with 4–12 μm wide, yellow-brown, not encrusted, cylindrical hyphae. Stipitetrama regular, consisting of 4.5–13(–22) μm wide parallel hyphae with yellow-brown, not encrusted walls. Clamp-connections absent, except on hairs at base of stipe.

HABITAT & DISTRIBUTION.—Europe and North America. In Europe usually terrestrial on moist, shady places near *Alnus*, both in *Alnus glutinosa* copses in the lowlands as well as in submontaneous or boreal *Alnus viridis* stands. Rarely with other trees (*Moser 66/24* with *Fagus*). One find in meadow dominated by *Salix repens* in coastal dunes (*Noordeloos 841*). Wide-spread but apparently overlooked; June–November.

COLLECTIONS EXAMINED.—**SWEDEN:** Bohuslän, Göteborg, Rya-Skog, 23 Aug. 1955, *T. Nathorst-Windahl* (GB). — **DENMARK:** Sjaelland, Jaegersborg Dyrehave, 25 Sept. 1976, *H. Knudsen* (C); Lindeborg Skov, 26 July 1949, *M. Lange* (C). — **GREAT BRITAIN:** Somerset, Broomfield Hill, 14 Aug. 1958, *P. D. Orton 1607* (E); Morayshire, Darnaway, 24 Sept. 1955, *P. D. Orton 538* (E); Langeliffe Wood Settle, 29 Aug. 1958, *D. N. Henderson 4138* (E); Tarn Use Place, 1 Sept. 1958, *R. Watling 1596* (E); King's Cliffe, 2 Oct. 1860, *Berkeley & Broome* (K); Wiltshire Chilmark M.O.D., Salisbury, 30 July 1974, *J. B. Hintley* (K); Gloucestershire, Bristol, Leigh Down, spring 1882, *C. Bucknall* (Type of *Inocybe bucknallii*, K). — **NETHERLANDS:** prov. Friesland, Terschelling, Oosterend, Dazenplak, 3 Nov. 1978, *M. E. Noordeloos 841* (L); prov. Noord-Brabant, Zundert, 5 Nov. 1957 & 30 July 1975, *P. B. Jansen*, 1 Aug. 1958, *C. Bas 1472* (L), 26 July 1957, *P. B. Jansen* (Herb. P. B. Jansen). — **BELGIUM:** prov. Namur, Rochefort, Fond-de-Faux, 10 Sept. 1975, *C. Bas 6633a* (L). — **GERMAN FEDERAL REPUBLIC:** Bayern, 1962, *A. Dreher* (PRM); Bayern, Garching Heide, 3 Oct. 1965, *A. Einhellinger* (M). — **AUSTRIA:** Tirol, Issanger, 7 Oct. 1961, *M. Moser 51.169* (M); Tirol, Elbuchtal, 12 June 1966, *M. Moser 66/24* (IB). — **FRANCE:** Seine & Oise, Pontpoint, 1 June 1958, *H. Romagnesi 5825* (Herb. Romagn., PC); Bellefontaine, 25 June 1958, *H. Romagnesi 5852* (Herb. Romagn., PC). — **SWITZERLAND:** Grisons, Tarasp Val-latscha, 2 Sept. 1954, *J. Favre* (CHUR); Geneva, Chambésy, 25 Oct. 1943 & 5 Nov. 1944, *S. Ruhlé* (G). — **U. S. A.:** New York, Catskill Mountains, *Peck* (Type, NYS); Michigan, Inverness, Mud Lake Bay, 12 July 1961, *D. A. Reid* (K).

In *E. dysthales* the density of the hairs on the stipe as well as the colour of the hairs on the pileus vary considerably with the degree of freshness and with the age of the carpophore. In general the hairs become darker with age, whereas hairs that are pale in fresh state, turn uniformly brown in dried specimens. In specimens with a sparsely hairy stipe it may take some time before the characteristic multiseptate hairs are found in microscopical preparations.

Size of the spores and shape vary considerably within one collection, but on the average the length considerably exceeds 15 μm . This is an important distinctive character with respect to the closely related *E. dysthaloides*, which species frequently occurs in the same habitat.

The observations of *J. Favre* (1948: 44) on *E. dysthales* are based on a mixture of this species and *E. dysthaloides*, as herbarium studies have shown. The cited Chambésy collection agrees perfectly well with *E. dysthales*, whereas the Grisons collection appeared to be a mixture, and finally the Sentier collection contains two specimens of *E. dysthaloides*.

Inocybe bucknallii Massee is a synonym of *E. dysthales*. The strongly nodulose spores, grey lamellae and squamulose-hairy, conical pileus induced Massee (l.c.) and Heim (1931: 360) to place the species in the genus *Inocybe* Fr.

Nolanea fibrillosipes Murr. described from N. America is macroscopically very similar to *E.*

dysthales. According to Mazzer (1976: 117) it differs from the latter in the presence of a subpellis of strongly inflated cells. Mazzer suggested that *E. dysthales* as described by Humblot (1926: 78–80) and Moser (1967: 164) might be identical with *N. fibrillosipes*. On account of the collections available I could not establish the occurrence of *N. fibrillosipes* in Europe. In well developed specimens of *E. dysthales* the pileipellis may be composed of 2–3 layers of clavate elements and repent hairs (Fig. 12a) but a cellular subpellis as described by Mazzer for *N. fibrillosipes* and by Romagnesi (1941: 77) for *Rhodophyllus fumosellus* var. *homomorphus* has not been observed.

ENTOLOMA DYSTHALES (Peck) Sacc. f. acystidiosum
Noordeloos, *f. nov.*—Figs. 38–40

A typo differt lamellarum acie cheilocystidiis destituta. Holotypus: R. W. G. Dennis, 18 X 1955, 'Sierra de Morao, between Amorante and Villa Real, Portugal' (K).

Macroscopical notes by Dr. R. W. G. Dennis: Cap dark grey, gills slightly ascending with decurrent tooth, broad, dark grey with whitish edge. Stipe striate with whitish fibrils.

Notes on dried specimens: Pileus 6 mm broad, conico-convex, sepia grey-brown, densely hairy-flocculose with yellowish brown hairs. Lamellae $L = 20$, $l = 1$, grey-brown, concolorous with pileus, pinkish-yellowish powdery, with slightly paler edge. Stipe up to 30×1 mm, slightly broadened at base, dark grey-brown, minutely fibrillose-hairy, at base strigose with yellowish-ochraceous radiating hairs.

Spores $13.9\text{--}17.4(-18.0) \times (7.6\text{--})8.1\text{--}9.3(-10) \mu\text{m}$; $Q = 1.6\text{--}1.9$; $L\text{--}D = 5.8\text{--}8.1(-9.0) \mu\text{m}$. Basidia $45\text{--}52 \times 12.5\text{--}15 \mu\text{m}$, 2–4-, rarely 3-spored. Subhymenium cellular, colourless. Trama and covering layers as in the typical form.

HABITAT.—Terrestrial.

DISTRIBUTION.—Only known from type locality.

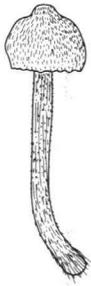
COLLECTION EXAMINED.—PORTUGAL, Sierra de Morao, between Amorante and Villa Real, 18 Oct 1955, R.W.G. Dennis (holotype, K).

This collection is perfectly identical with *E. dysthales* except for the absence of cheilocystidia. In *E. dysthales* I observed that the cheilocystidia usually cover the entire edge. However, within some collections forms with cheilocystidia scattered among basidia were also found. Therefore I am inclined to consider the collection described above as a mere forma of *E. dysthales* without cheilocystidia.

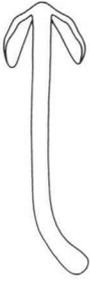
Rhodophyllus fumosellus var. *homomorphus* Romagn. from Madagascar differs in having a strongly developed cellular subpellicular layer in pileus, which characterizes it as a distinct species.

Entoloma dysthaloides Noordeloos, *spec. nov.*
Figs. 13–20

MISAPPLIED NAMES.—*Nolanea dysthales* (Peck) Murrill sensu T. Nathorst-Windahl in *Acta Horti Gotoburg.* 16: 142. 1946. — *Rhodophyllus dysthales* (Peck) Romagn. sensu O. v. Schulmann in *Karstenia* 5: 31. 1960.



13



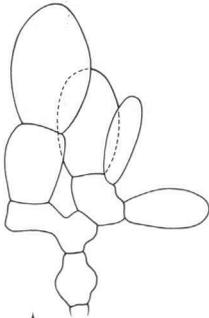
← 14a →



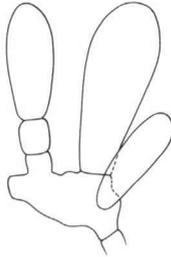
14b



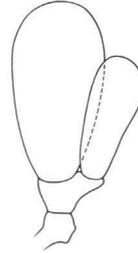
14c



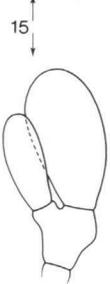
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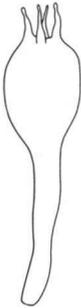
15



17a



15



16a



16b



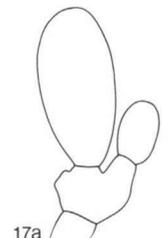
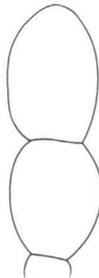
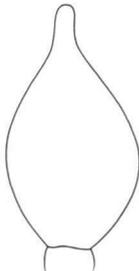
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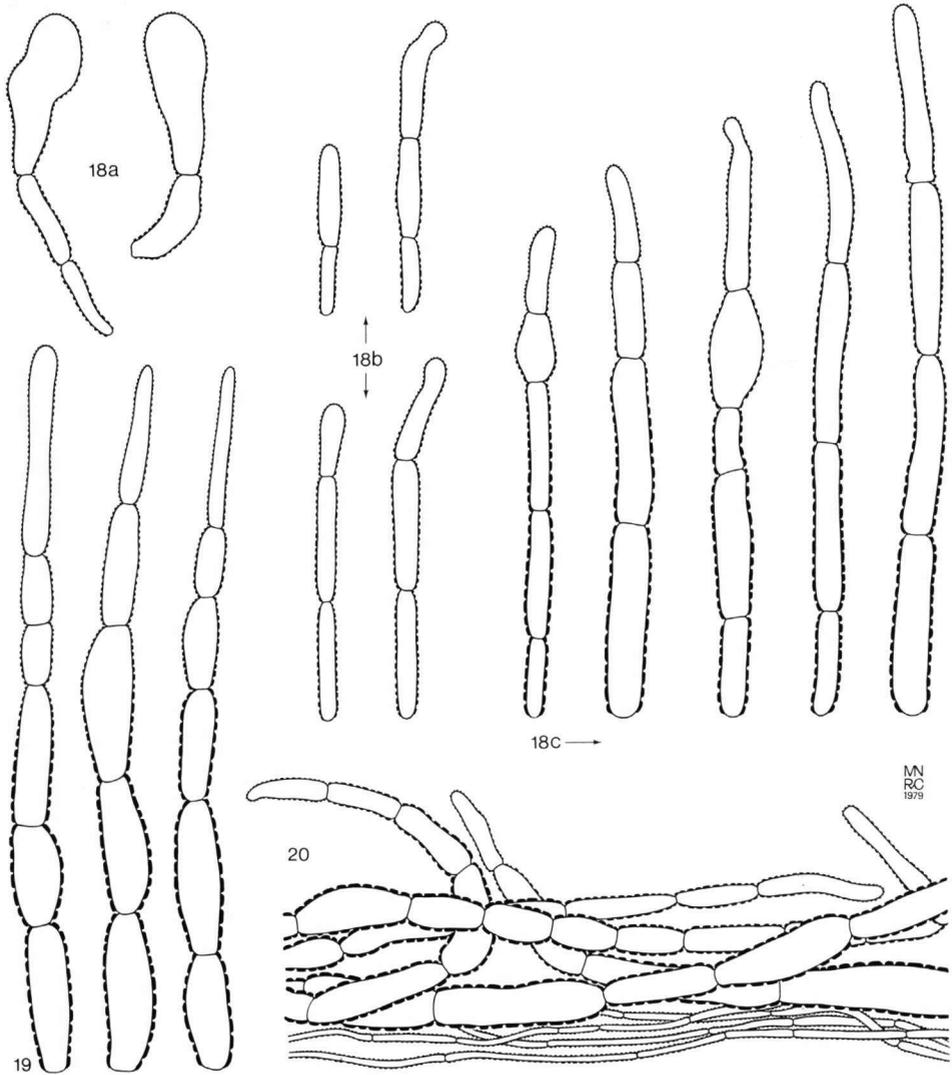
17a



17b →



17a



Figs. 13–20. *Entoloma dysthaloides*. — 13. Habitus. — 14. Spores. — 15. Basidiolae. — 16. Basidia. — 17. Cheilocystidia. — 18. Hairs of stipe. — 19. Hairs of Pileus. — 20. Pileipellis. (Figs. 13, 16d and 18a from Jansen, Oct. 1978; 14a and 18b from Bas 4996; 14b from Nathorst-Windahl 672; 14c, 15, 16a, 17b, 18c and 20 from type; 17a from Moser 73/154; 19 from Kubička, July 1948).

Rhodophyllus araneosus Quél. sensu A. Einhellinger in Ber. Bayer. Bot. Ges. 43: 40. 1973.

? *Nolanea fulvostrigosa* Berk. & Br. sensu Bresadola, Iconogr. mycol. pl. 591. 1929.

SELECTED DESCRIPTION.—*Rhodophyllus* spec., Moser in Persoonia 7: 286–287, figs. 1a, 2c, 3c–2. 1973.

Pileus 3–15(–20) mm latus, conico-campanulatus demum explanatus, conico-convexus vel plano-convexus, leviter umbonatus, margine rectus, translucido-striatus, haud hygrophanus, fuscus vel fuliginosus, argenteo-fibrillosus vel hirtus demum fibrilloso-squamulosus. Lamellae L = 14–24, l = 1(–3), adnatae, interdum uncinatae, arcuatae demum ventricosae, badio-fuscae, acie concolore. Stipes 15–50 × 0.5–2 mm, filiformis vel cylindraceus, fuscus vel fuliginosus, albo-striatulus, pallide brunneo-flocculosus, basi ferrugineo-strigosus. Caro membranacea, pallide vel obscure brunnea vel fusca. Odore et sapore inconspicuis. Sporae 10.5–13.5(–15) × 6.8–8.2(–8.7) μ m, noduloso-angulatae. Basidia 40–54 × 14–19 μ m, clavata, 4-sporigera. Cheilocystidia 26–60 × 15–28 μ m, clavata vel subcylindracea vel obovata, pallide testaceo-incrustata. Pileipellis cutis aspectu trichodermatis; pilis multiseptatis, attenuatis, incrustatis. Stipitepellis cutis aspectu trichodermatis, pilis multiseptatis, attenuatis, incrustatis. Fibulae nullae. Habitat: in locis paludosis in vicinitate *Alni* (locis eisdem ac *E. dysthales*). Holotypes: *M. Moser* 77/44, 6 VII 1977, Austria, Bludenz, in silvis (IB).

Pileus 3–15(–20) mm broad, conico-campanulate then expanding to conico-convex rarely plano-convex with small umbo, with straight margin, not hygrophanous, when moist translucently striate up to 1/2 or 3/4 of cap-radius or not, dark brown or fuliginous (centre 5 YR 2.5/2; margin 10 YR 4/3), when young silvery-white or greyish, radially fibrillous-hairy becoming concentrically squamulose with minute, pointed squamules with brownish tips. Lamellae L = 15–24, l = 1(–3), moderately crowded, adnate or emarginate, narrowly to broadly ventricose, brown to grey-brown, sometimes darker than pileus (e.g. 7.5 YR 4/2), tinged pink, with slightly eroded edge, concolorous with sides. Stipes 15–60 × 0.5–2 mm, filiform to cylindrical, sometimes flexuous, concolorous with or slightly paler than pileus (e.g. 7.5 YR 4/2), longitudinally silvery striate, minutely hairy-flocculose with pale hairs turning brown with age, strigose at base with yellowish to rusty brown, radiating hairs. Flesh pale to dark brown, sometimes with grey tinge, membranaceous in pileus, firm in stipe of large specimens. Smell and taste inconspicuous.

Spores 10.5–13.5(–15) × 6.8–8.2(–8.7) μ m; Q = 1.4–1.6–1.8; L–D = 3.5–7 μ m, nodulose-angular with pronounced angles and large apiculus, pale brown. Basidia 40–54 × 14–19 μ m, broadly clavate, 4-spored. Abortive basidia frequent. Cheilocystidia 26–60 × 15–28 μ m, slenderly to broadly clavate, subcylindrical or obovate, with rounded or attenuate-conical tip, frequently with brown encrusted walls, with broad supporting cell. Subhymenium cellular, colourless, thin. Hymenopodium distinct; hyphae 4.5–6 μ m wide, cylindrical, coarsely brown encrusted. Mediostratum with inflated elements, 85–170 × 12–20 μ m, brown-encrusted. Pileipellis a cutis with transitions to a trichodermium with repent or erect, multiseptate, attenuate hairs, often in bundles, with cells 28–110 × 10–36 (at base) × 7–11 (at apex) μ m, with brown-encrusted walls. Pileitrama regular, consisting of cylindrical, 3.5–10 μ m wide, coarsely brown-encrusted hyphae. Stipitepellis a cutis of 4.5–10 μ m wide, cylindrical, brown-encrusted hyphae, with scattered bundles of up to 400 μ m long, cylindrical, usually slightly attenuate, septate hairs with cells 22–110 × 12–15(–21) (at base) × 7–10(–20) (at apex) μ m; terminal cells usually conical-attenuate, clavate or rarely slightly swollen. Clamp-connections absent.

HABITAT & DISTRIBUTION.—Terrestrial, often in groups in moist, shady places, particularly near *Alnus* (the same habitat as *E. dysthales*), wide-spread; June–September. Europe.

COLLECTIONS EXAMINED.—S W E D E N : Bohuslän, Ellesbu, 3 Aug. 1937, *T. Nathorst-Windahl* 672 (GB). — N E T H E R L A N D S : prov. Noord-Holland, Castricum, 30 Sept. 1975, *E. Kits van Waveren* (L); prov. Noord-Brabant, Dorst, 24 Aug. 1968, *C. Bas* 4996 (L), 24/31 Aug. 1968, 26 June 1972, 16 July 1974, 25 Oct. 1978, *P. B. Jansen* (L); Breda, Ulvenhoutse bos, 28 July 1961, *P. B. Jansen* (L). — G E R M A N F E D E R A L R E P U B L I C : Bavaria, Isarau bei Ismaning, 13 Sept. 1970, *A. Einhellinger* (M). — S W I T Z E R L A N D : St. Gallen, Rheinauen bei Sargans, 28 Sept. 1973, *M. Moser* 73/154 (IB); Jura vaudois, Sentier, 12 Sept. 1940,

J. Favre (G). — A U S T R I A : Kärnten, oberhalb Gölttschach, Sattnitz, 26 Sept. 1966, *M. Moser* 66/257 (IB); Auenwald bei Bludenz, 6 Aug. 1977, *M. Moser* 77/43 (Holotypus, IB). — C Z E C H O S L O V A K I A : Rusyné, 23 July 1948, *J. Herink* (PRM); Turnov, 7 Aug. 1948, *J. Herink* (PRM); Turnov, July 1948, *J. Kubička* (PRM); Bohemia, Cernosice, 6 Aug. 1950, *V. Vacek* (PRM).

Entoloma dysthaloides occurs in the same habitat as *E. dysthales* and is macro- and microscopically very close to the latter. The main difference lies in the consistently smaller spores. In Europe several closely related species with small spores occur. *Entoloma hirtum* differs in the ash grey colour of pileus and stipe, the different type of covering of the stipe and perhaps also in the habitat: grassy, xerophytical, sunlit places. *Entoloma romagnesii* differs in the subglabrous stipe with scattered, clavate, not encrusted hairs and in the smaller, more broadly ellipsoid spores. *Entoloma pulvereum* differs in the paler colours of pileus and stipe, the robust stature and the differently shaped spores. *Rhodopyllus babingtonii* sensu Moser differs in the lack of cheilocystidia, but this might be an aberrant specimen of our species (see also p. 241 under excluded taxa).

Judging from the description *E. dysthales* sensu O. v. Schulmann is identical with our species. The collection at H, labelled as this find, contains however specimens of a species close to *E. clandestinum* belonging to the subgenus *Nolanea*; it is likely that material from another find erroneously has been put under this label.

Entoloma hirtum (Velen.) Noordeloos, *comb. nov.*

Figs. 21–26

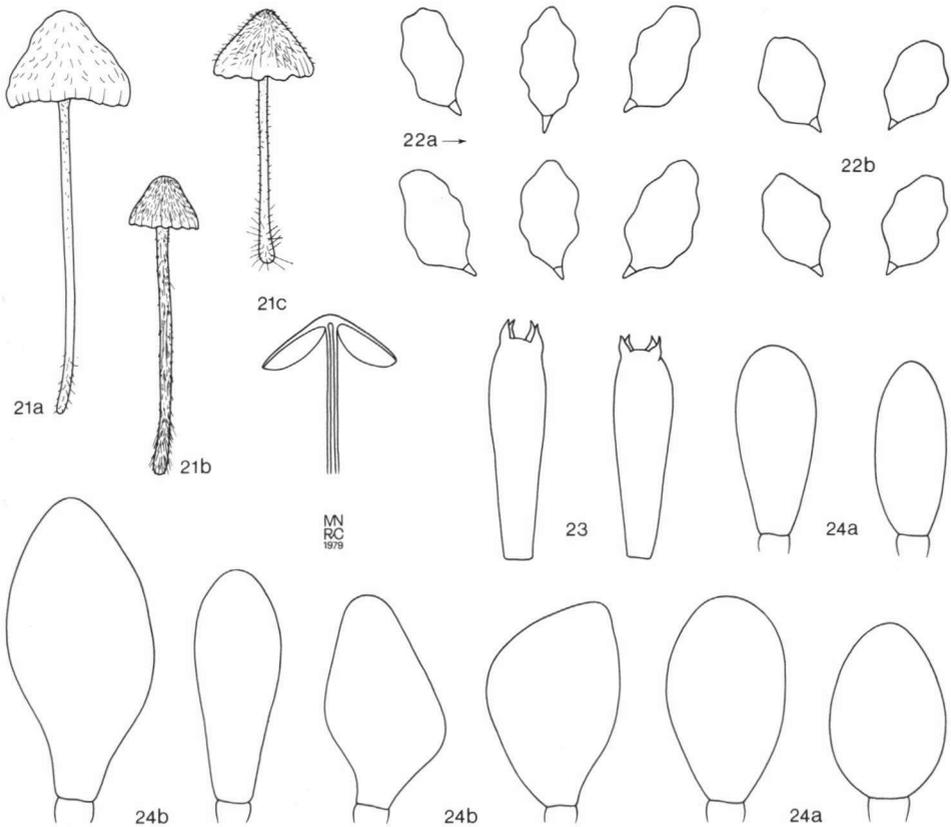
Nolanea hirta Velen. in *Mykologia* 6: 28. 1929. — *Pouzarella hirta* (Velen.) Mazzer in *Bibltca mycol.* 46: 99. 1976.

Nolanea setulosa Velen., *Novitates mycologicae*: 147. 1939. — *Pouzarella setulosa* (Velen.) Mazzer in *Bibltca mycol.* 46: 108. 1977.

CHARACTERISTICS.—Pileus ash grey, sometimes with sepia flush at centre; stipe ash grey with pale, not encrusted, simple cylindrical hairs.

Pileus 4–20 mm broad, conical, sometimes truncate, never depressed, expanding to convex with umbo, margin straight, sometimes crenulate, not hygrophanous, not or only at margin striate, ash grey with centre blackish, sometimes with sepia flush, entirely fibrillose-squamulose, with triangular squamules from erect at centre to adpressed on limb. Lamellae L = up to 24, l = 1–3, moderately distant, adnate-emarginate, often almost free, ventricose, dark grey-brown with pinkish flush, with edge nearly entire or flocculose and concolorous with sides or slightly paler. Stipe 30–70 × 1–3 mm, cylindrical or slightly tapering downwards, solid then narrowly fistulose, concolorous with pileus or slightly paler, with pale, sometimes brownish arachnoid covering, glabrescent, at base strigose with yellow-brown radiating hairs. Flesh very thinly membranaceous, concolorous with surface, in disk of cap slightly paler. Smell none. Taste bitter (according to Bon in field-note).

Spores (10.2–)11–15(–15.5) × 6.8–8(–9) μm; Q = 1.3–1.55–1.7(–1.8), 6–8-angled in side-view, with pronounced angles, pale brown. Basidia 34–46 × 10.5–15(–20) μm, broadly clavate, 4-spored. Abortive basidia scattered. Cheilocystidia 20–60(–75) × (9–)12–25(–36) μm, numerous, usually slenderly to broadly clavate with rounded or conical apex, rarely subglobose or subcylindrical, with thin or slightly thickened brownish walls often with brown encrustations. Subhymenium cellular, hyaline, colourless. Hymenopodium often very distinct and broad, composed of cylindrical, 2.5–12 μm wide coarsely encrusted hyphae. Mediostratum made up of



Figs. 21–24. *Entoloma hirtum*. — 21. Habitus. — 22. Spores. — 23. Basidia. — 24. Cheilocystidia. (Fig. 21a from *Bon 780616*; 21b and 22b from *Noordeloos 531*; 21c, 22a, 23 and 24a from type; 24b from *Svrček, June 1944*).

slightly inflated elements, $55\text{--}220\text{--}(300) \times 8\text{--}22\ \mu\text{m}$, less heavily encrusted. Pileipellis a cutis with transitions to a trichodermium with long, multiseptate, brown-encrusted, attenuate hairs with cells $46\text{--}110 \times 11\text{--}20$ (at base) $\times 4\text{--}7$ (at apex) μm . Pileitrama regular, consisting of cylindrical hyphae, distinctly constricted at septae and coarsely brown-encrusted. Stipitepellis a cutis of narrow up to $14\ \mu\text{m}$ wide, brown, sometimes slightly encrusted hyphae with scattered 1–3-septate, yellow-brown, not encrusted, cylindrical hairs up to $170\ \mu\text{m}$ long, up to $16\ \mu\text{m}$ wide. Clamp-connections absent.

HABITAT & DISTRIBUTION.—Terrestrial in sun-lit, xerophytic, grassy vegetations on calcareous soils with *Prunus spinosa* and/or *Juniperus communis*. Rare. Known from Czechoslovakia, France, The Netherlands and Denmark; June–September.

COLLECTIONS EXAMINED.—DENMARK: Isl. of Mön, Judeleiet, 16 Oct. 1976, *M. E. Noordeloos 531* (L). — NETHERLANDS: prov. Limburg, Gronsveld, Savelsbos, 11 Sept. 1977, *J. Schreurs & T. Kuyper* (L). — FRANCE: Francheville, 16 June 1978, *M. Duchemin* (ex Herb. *Bon 780616*, L). — CZECHOSLOVAKIA: Bohemia, Radotin, June 1926, *J. Velenovský* (Holotypus, PRM); Bohemia, Mnichovice, Jidasky,

June 1931, *J. Velenovský* (Type of *N. setulosa*, PRM); Bohemia, Kostoř near Prague, 25 June 1944, *M. Svrček* (PRM); Bohemia, Slivenec near Prague, 10 June 1946, *M. Svrček*. (PRM).

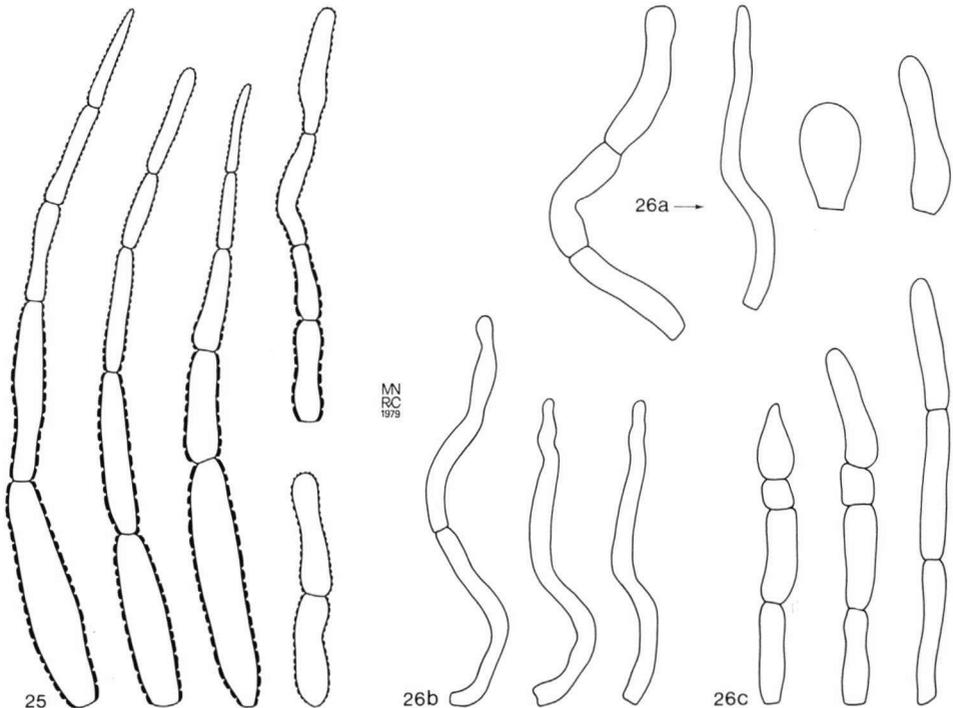
Entoloma hirtum differs from the closely related *E. dysthaloides* in the ash grey colour of pileus and stipe and in the covering of the stipe. Perhaps also the habitat is different. *Entoloma romagnesii* has smaller spores, and *E. pulvereum* has a more robust stature and differently shaped spores. *Leptonia cinerea* Velen. might be identical with *E. hirtum*, but on account of the sparse information on the variation of characters within *E. hirtum*, *L. cinerea* is placed among the insufficiently known taxa below (see p. 241).

***Entoloma romagnesii* Noordeloos, *spec. nov.*—Figs. 35–37**

MISAPPLIED NAMES.—*Rhodophyllus subnigrellus* Romagn. sensu Romagn. in *Rev. Mycol.* 2: 86. 1937. — *Rhodophyllus dysthales* f. *subnigrellus* (Romagn.) Kühn. & Romagn., *Fl. anal.*: 186. 1953.

Pouzarella nigrella (Velen.) Mazzer sensu Mazzer, non Velen. nec *Eccilia nigrella* Pers. in *Bibliotheca mycol.* 46: 96. 1976.

Pileus 10–12 mm latus, conico-campanulatus demum leviter expansus, margine involutus, obscure sepiaceus, leviter tomentosus-velutinus. Lamellae distantes, adnatae, emarginatae, obscure brunneae roseo-



Figs. 25–26. *Entoloma hirtum*. — 25. Hairs on pileus. — 26. Hairs on stipe. (Fig. 25 from type; 26a from Bon 780616; 26b from Noordeloos 531; 26c from Schreurs & Kuyper, Sept. 1977).

tinetae. Stipes 30–40 × 1.25–1.5 mm, cylindraceus, rigidus, fistulosus, fulvus, pileo pallidior, fibrillostriatus, sericeus, basi strigosus. Caro fulva, pallescens. Odore et sapore inconspicuis. Sporae 7.8–10.8 (–11.8) × 6.4–7.4 μm, obtusioriter angulatae, tenuitunicatae. Basidia 41–52 × 11–14.5 μm, 2- vel 4-sporigera. Cheilocystidia 20–55 × 12–25 μm, ellipsoidea vel clavata, interdum leviter incrustata. Pileipellis cutis aspectu trichodermatis; pilis multiseptatis, haud incrustatis. Pilis stipitum cylindraceis vel clavatis haud incrustatis. Fibulae nullae. Habitat: Ad terram paludosam in silvis. Holotypus: Herb. Romagnesi 139, IX 1935, Yerres, Seine & Oise, Gallia (Herb. Romagn., PC).

CHARACTERISTICS.—Slender species with dark yellow-brown pileus and stipe, short ellipsoid spores and not encrusted hairs on pileus and stipe.

Pileus 10–12 mm broad, conico-campanulate with involute margin, then expanding with small umbo, dark bistre, entirely velvety-hairy with slightly paler hairs. Lamellae distant, interspaced with lamellulae, adnate, emarginate, sometimes with decurrent tooth, broad, dark brown with slightly paler edge, tinged pink. Stipe 30–40 × 1.25–1.5 mm, cylindrical, straight, fistulose, brown, paler than pileus, shiningly longitudinally fibrillose-striate, minutely flocculose, base strigose. Flesh dark brown, expallent. Smell and taste inconspicuous.

Spores 7.8–10.8 (–11.8) × 6.4–7.4 μm; Q = 1.2–1.4–1.55; L–D = 1–3 (–4) μm, broadly ellipsoid in outline, rounded nodulose-angular, thin-walled. Basidia 41–52 × 11–14.5 μm, clavate, 2- and 4-spored. Cheilocystidia 20–55 × 12–25 μm, broadly ellipsoid to clavate, sometimes minutely brown-encrusted. Subhymenium cellular. Hymenophoral trama regular; hyphae cylindrical, brown-encrusted. Pileipellis a cutis with transitions to a trichodermium with long, septate hairs gradually tapering towards apex; cells 40–130 × 10–23 (at base) × 7–12 (at apex) μm, uniformly pale brown, not encrusted. Stipitepellis a cutis of 6–14 μm wide, cylindrical, brown, sometimes minutely encrusted hyphae with spread cylindrico-clavate, pale, not encrusted hairs, cells 30–60 × 7–20 μm. Clamp-connections absent.

HABITAT & DISTRIBUTION.—Terrestrial on moist soil along brooklet in deciduous forest. Known only from the type locality.

COLLECTION EXAMINED.—FRANCE: dept. Seine & Oise, Yerres, au bord du ruisseau 'Le Réveillon', Sept. 1935, M^{mc} A. Buffeteau (Herb. Romagn. 139, PC; holotypus).

NOMENCLATURAL OBSERVATIONS.—Romagnesi (1937: 86) created *R. subnigrellus* as a new name for *Leptonia nigrella* Velen. to avoid homonymy with *R. nigrellus* (Weinm. ex Pers.) Quél. Consequently the type of *R. subnigrellus* is the same as of *L. nigrella*. The present author studied the type of *L. nigrella* (Noordeloos, 1979: 260) and concluded that *L. nigrella* Velen. is different from the collection Romagnesi described as *R. subnigrellus*. As no legitimate name was available to replace *R. subnigrellus* Romagn. sensu Romagn., it is described here as a new species, named in honour of the excellent French mycologist Henri Romagnesi. *Pouzarella nigrella* (Velen.) Mazzer sensu Mazzer is based on *R. subnigrellus* Romagn. sensu Romagn. and therefore a misapplication.

Entoloma romagnesii is easily distinguished from the other members of subg. *Pouzaromyces* in the small, rounded-angular, thin-walled spores. *Entoloma pulvereum* has some resemblance in spore-shape but differs in the more robust stature and encrusted hairs on pileus and stipe.

ENTOLOMA PULVEREUM Rea—Figs. 27–32

Entoloma pulvereum Rea in Trans. Br. mycol. Soc. 2: 170, pl. 14. 1907. — *Leptonia pulvereae* (Rea) P. D. Orton in Trans. Br. mycol. Soc. 43: 178. 1960. — *Pouzarella pulvereae* (Rea) Mazzer in Biblca mycol. 46: 97 1976.

CHARACTERISTICS.—Rather robust species with reddish brown hairs on stipe, very obtusely angular spores and strongly inflated hyphae of pileitrama.

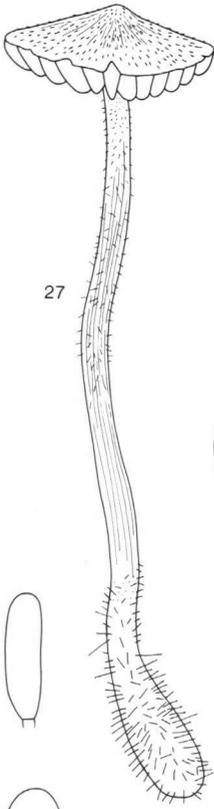
Pileus 25 mm broad, conico-convex with straight margin, not hygrophanous, not striate, pale grey-brown, densely covered with minute, yellowish brown squamules with often erect tips. Lamellae $L=24$, $I=1$, broadly adnate with small decurrent tooth, broadly ventricose, up to 6 mm broad, strongly transversely veined especially at base, intervenose, dark grey-brown with pinkish spore-dust, slightly more yellowish brown towards flocculose edge. Stipe $95 \times 2-3$ mm, cylindrico-flexuous, firm, greyish yellow, silky-shining, densely punctate with reddish brown squamules, at base strigose with radiating yellowish brown hairs becoming reddish with age. Flesh dark grey-brown. Smell none, taste not recorded.

Spores $10.2-12.5(-13.0) \times 7.0-8.1(-8.7) \mu\text{m}$; $Q=1.3-1.4-1.6$; $L-D=2.1-3.0-4.7 \mu\text{m}$, 6-8-angled in side-view, with rather obtuse angles, thin-walled, hyaline in water. Basidia $40-67 \times 12-15 \mu\text{m}$; $Q=3.2-4.0$, 4-, rarely 2-spored, some with brown intracellular granules. Cheilocystidia $(17-)25-70 \times 7.5-20(-25) \mu\text{m}$, subcylindrical to broadly clavate, with rounded or attenuate-conical apex and yellowish brown encrusted thickish walls, mostly with broad supporting cell, rarely in short chains. Subhymenium cellular, hyaline, colourless. Hymenophoral trama regular; hymenopodium consisting of 4-11 μm wide cylindrical hyphae; mediostrium composed of inflated hyphae, with coarsely brown-encrusted cells $90-240 \times (7.5-)12-29 \mu\text{m}$. Pileipellis a cutis with transitions to a trichodermium with long, repent or slightly ascending multiseptate hairs with cells $30-110(-120) \mu\text{m}$ long, $14-33 \mu\text{m}$ wide in basal elements, gradually narrowing towards apex, and there cells $2.5-14 \mu\text{m}$ wide, with brown-encrusted, often slightly thickened walls. Pileitrama regular with moderately to strongly inflated elements, $82-270 \times (7-)11-35 \mu\text{m}$, brown-encrusted. Stipitpellis a cutis of 5-14 μm wide, cylindrical, brown hyphae, covered with scattered clusters of 1-3(-5)-septate hairs with inflated-cylindrical cells $45-97(-125) \times (10-)12-23(-27) \mu\text{m}$; terminal elements usually clavate with rounded apex, with brown, often slightly encrusted walls. Hairs at base of stipe $3.5-7 \mu\text{m}$ wide, cylindrical, deep brown, not encrusted. Clamp-connections absent.

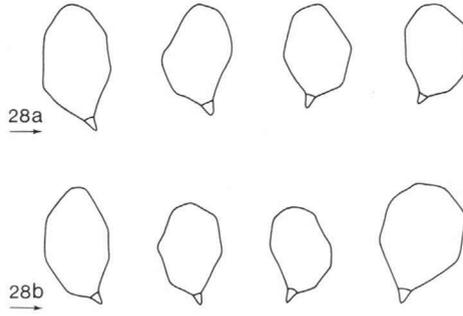
HABITAT & DISTRIBUTION.—Terrestrial in thick layer of humus near *Quercus*. Great Britain, Netherlands. Rare.

COLLECTIONS EXAMINED.—GREAT BRITAIN: Surrey, Nork, Park-Wood, 3 Oct. 1953, *P. D. Orton* (E). — NETHERLANDS: prov. Noord-Holland, Castricum, Geversduin, 21 Oct. 1956, *Chr. Maas Geesteranus* (L); Amsterdam, Amsterdamse bos, 27 July 1960, *E. Kits van Waveren* (L).

This remarkably robust member of *Pouzaromyces* could easily be taken for a robust specimen of *E. dysthaloides*. It differs however in the paler, more yellowish brown colouration, the brown to reddish brown squamules and the reddish tinged strigose hairs on stipe, the slightly smaller, differently shaped, thin-walled spores, the inflated hyphae in the trama of the pileus, and perhaps in the different habitat. The Netherlands' collections, on which the macroscopical description given above is based, agree very well with the original description and plate given by Rea (l.c.). Unfortunately the type-collection got lost.

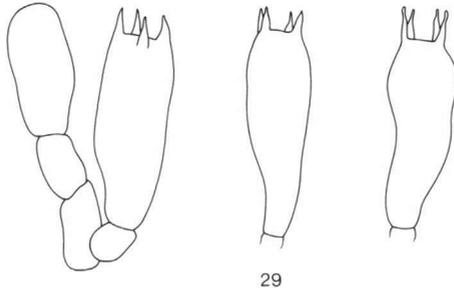


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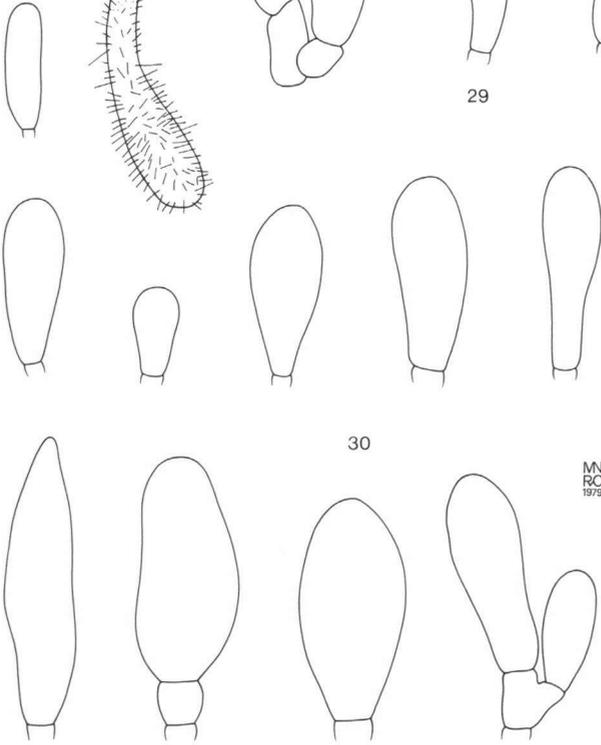


28a

28b

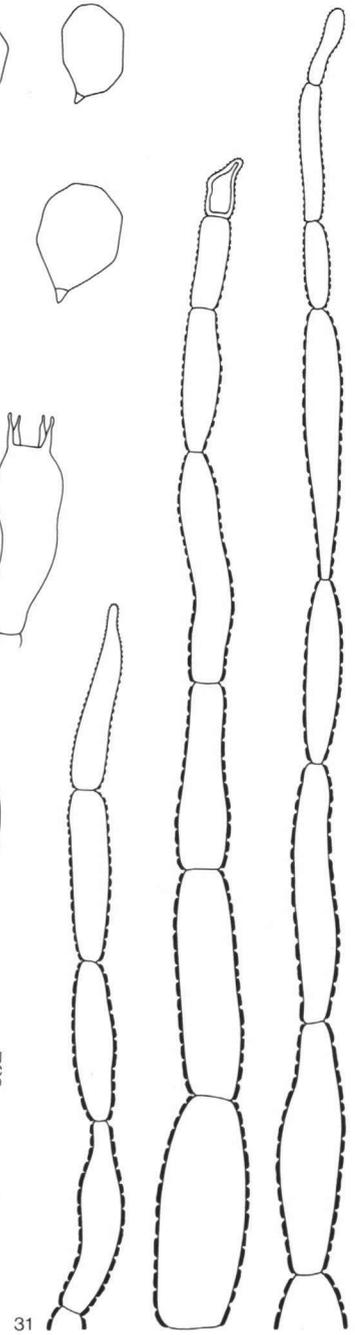


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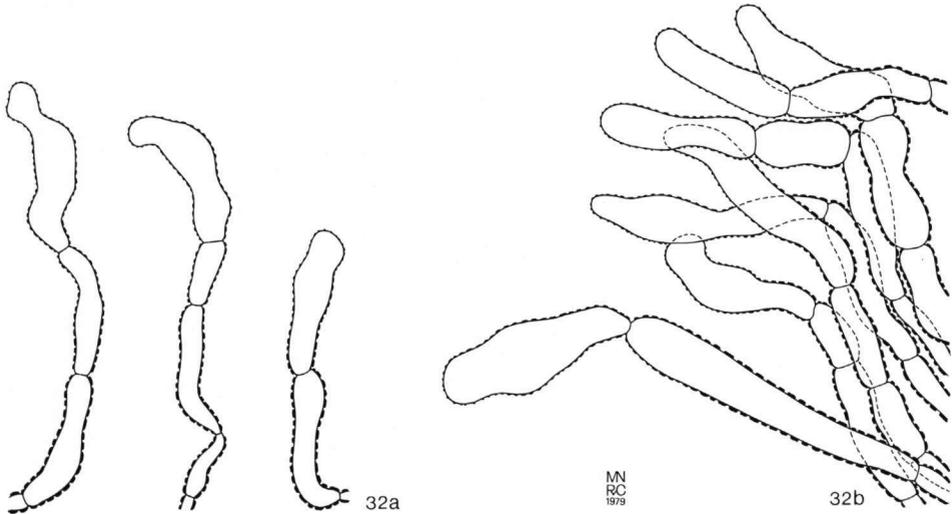


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Figs. 27–31. *Entoloma pulvereum*. — 27. Habitus. — 28. Spores. — 29. Basidia. — 30. Cheilocystidia. — 31. Hairs of pileus. — 32. Hairs of stipe. (Figs 27, 28b, 29, 30, 31 and 32b from *Chr. Maas G.*, Oct. 1956; 28a and 32b from *Orton 156*).

***Entoloma* sect. *Versatilis* (Romagn. ex Romagn.)
Noordeloos, *comb. nov.***

Rhodophyllus sect. *Versatilis* Romagn., *Rhodoph. Madag.*: 44. 1941 (nom. nud.). — *Rhodophyllus* sect. *Versatilis* Romagn. ex Romagn. in *Bull. Soc. linn. Lyon* 43: 329. 1974.

Rhodophyllus subg. *Inopilus* Romagn. in *Bull. Soc. linn. Lyon* 43: 329 non sensu Romagn. in *Beih. Nova Hedwigia* 59: 48. 1978 (see note 1, p. 207). — *Entoloma* subg. *Inopilus* (Romagn.) Moser in *Gams, Kl. KryptogFl.* 4. Aufl., 2(b/2): 191. 1978.

Pouzarella sect. *Versatilis* Mazzer in *Bibltca mycol.* 46: 71. 1976 (nom. superfl.).

Pileus micaceous-fibrillose, subglabrous to coarsely radially fibrillose-hairy. Cheilocystidia lageniform. Pigment in pileipellis of two kinds: granular-intracellular and very minutely encrusting, in rest of carpophore hyphal membranes coloured and minutely encrusted. Holotypus: *Agaricus versatilis* Fr.

KEY TO THE SPECIES OF SECT. *VERSATILIS*

- 1a. Pileus mouse grey, sometimes with brown tinge. Spores ellipsoid in outline, Q= on the average 1.4–1.6 per collection. 2
- b. Pileus with olivaceous greenish or olivaceous yellow or bluish grey tinges. Spores broadly ellipsoid in outline, Q= on the average 1.2–1.4 per collection. 3
- 2a. Pileus when young with greyish veil. Base of stipe with white to greyish, radiating hairs.
E. araneosum f. *araneosum*, p. 234
- b. Pileus without veil. Base of stipe with reddish, radiating hairs.
E. araneosum f. *fulvostrigosum*, p. 236
- 3a. Pileus brown with olivaceous greenish or olivaceous yellow tinges, metallic shining, subglabrous-fibrillose. *E. versatilis*, p. 230
- b. Pileus bluish grey ('ardoisé') with reddish flush at centre, fibrillose-squamulose, not metallic shining.
E. indutum, p. 239

ENTOLOMA VERSATILIS (Fr.) Moser—Figs. 41–46

Agaricus versatilis Fr., Monogr. 2: 297. 1863. — *Nolanea versatilis* (Fr.) Gill., Hyménom. Fr.: 418. 1874. — *Rhodophyllus versatilis* (Fr.) Quél., Enchir.: 63. 1886. — *Pouzarella versatilis* (Fr.) Mazzer in *Bibltca mycol.* 46: 76. 1976. — *Entoloma versatilis* (Fr.) Moser in Gams, K1. KryptogFl. 4. Aufl., 2(b/2): 208. 1978.

Rhodophyllus viridulus Herink in *Česká Mykol.* 9: 6. 1955 (non *Leptonia viridula* P. Henn.).

SELECTED ICONES.—Ricken, *Blätterpilze*: pl. 74 fig. 7. 1913. — Herink, l.c.: 7 (as *R. viridulus*).

SELECTED DESCRIPTIONS.—Romagnesi in *Rev. Mycol.* 2: 87. 1937. — Reijnders in *Fungus* 14: 63–64. 1943.

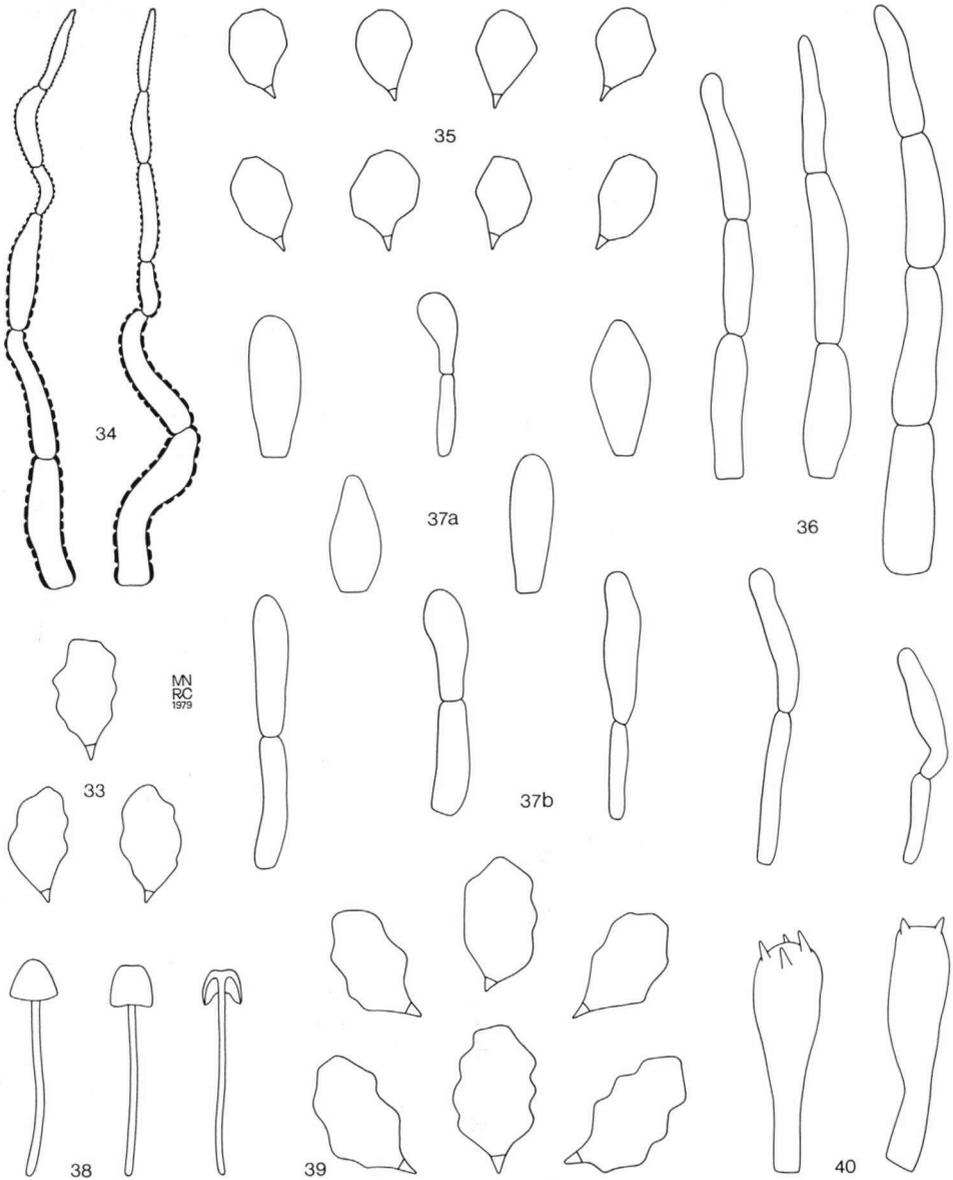
CHARACTERISTICS.—Pileus with metallic sheen, subglabrous-fibrillose, brown with olivaceous yellow tinge.

Pileus 15–30 mm broad, conical then conico-campanulate, usually umbonate, rarely truncate, with margin involute when young, then straight, weakly hygrophanous, when moist translucently striate at margin or not, olivaceous brown to olivaceous grey (2.5 Y 4/4 or 5 Y 4/2 towards 5 Y 3/2), slightly paler when dry (5 Y 6/4, 5 Y 6/2 or 5 Y 5/4), minutely radially fibrillose, with metallic sheen, finally with small, innate scales especially at centre. Lamellae L = up to 30, 1 = 1–3, narrowly adnate to nearly free, triangular when young, then ventricose, up to 4 mm broad, grey then grey-brown (10 YR 5/3, 10 YR 4/4 or 10 YR 4/2), then pinkish powdery, with edge flocculose and concolorous with sides or distinctly paler. Stipe 25–50 × 2–3 mm, cylindrical but sometimes slightly broadened at base, solid then hollow, cartilagineous, pale at apex, downwards darker to rather dark grey, sometimes with olivaceous tinge, sometimes blackish, at base often with purplish flush, entirely silvery fibrillose-arachnoid striate, at apex pruinose to flocculose, at base strigose with radiating whitish hairs. Flesh in pileus brown-grey with olive green tinge, in upper half of stipe grey-brown becoming darker downwards, firm. Smell none or spermatocal-sourish. Taste not recorded.

Spores (9–)9.5–11.7(–12.5) × 6.8–7.9(–9.0) μm ; Q = 1.2–1.35–1.5; L–D = (1.2–)2–3.5(–4.5) μm , 5–6–7-angled in side-view, simple to rather asymmetrical, variable in shape. Basidia 34–51 × 11.5–13(–15) μm ; Q = 2.6–3.8, broadly clavate, 4-spored. Abortive basidia scattered. Cheilocystidia (42–)60–110 × 10.5–25(–31) μm , narrowly to broadly lageniform, mostly with broad, swollen basal part and long, attenuate, sometimes moniliform neck, thin-walled, colourless or brown-encrusted, particularly in broadest part, usually intermixed with basidia. Pleurocystidia similar to cheilocystidia, usually scarce and only present near edge of lamellae, in many collections lacking. Subhymenium (sub)cellular, thin, colourless. Hymenopodium weakly developed, filamentous, consisting of 3.2–6 μm wide, cylindrical, minutely encrusted hyphae. Mediostratum regular; cells up to 280 μm long, cylindrical to inflated, 8–20(–27) μm wide. Pileipellis a cutis with transitions to a trichodermium of long cylindrical hairs with terminal cells 110–168(–200) × 12.5–21 μm and cylindrical or clavate with conical apex, with pale yellow-brown walls and granular intracellular pigment. Pileitrama regular; cells up to more than 300 μm long, 8–21 μm wide, with yellow-brown, minutely to coarsely encrusted walls. Stipitepellis a poorly differentiated cutis of 5–16 μm wide, cylindrical hyphae, with scattered cylindrical free tips, mostly uniformly yellow-brown, sometimes minutely encrusted. Clamp-connections absent.

HABITAT & DISTRIBUTION.—Terrestrial on bare soil in deciduous forests, parks etc. Rare, but wide-spread in Europe. August–October.

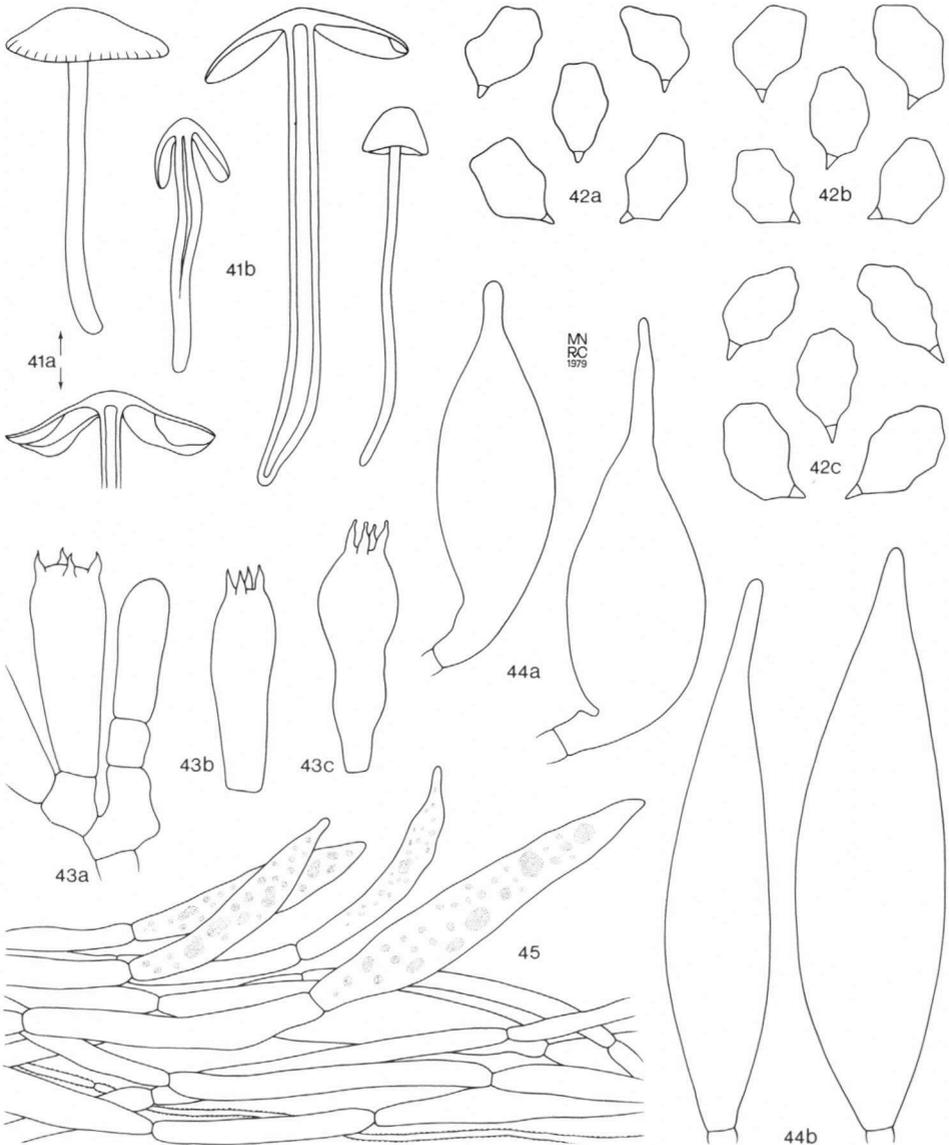
COLLECTIONS EXAMINED.—SWEDEN: Västergötland, Göteborg, Slottskog, 29 Aug. 1940, *T. Nathorst-Windahl*, in *Fungi exsicc. suec.* No. 1134 (UPS, PC, PRM, GB); idem, Oct. 1944 (O). — GREAT BRITAIN: Yorkshire, Skipton, Curren Wood, Sept. 1965, *C. Jeffrey* (K); Yorkshire, Malham, 1 Sept. 1958, *R. Wailing 1779* (E); Oxford country, Oxford, Corbury estate, 13 Sept. 1969, *E. Kils van Waveren* (L); Norfolk, Brooke, Brooke wood, 9 Oct. 1976, *P. D. Orton 4853* (E); Wales, lake Vyrnwy, 8 Sept. 1977, *E. Kils van Waveren* (L). — GERMAN FEDERAL REPUBLIC: Westphalen, Teutoburgerwald, Beller Holz,



Figs. 33–34. *Rhodophyllus babingtonii* sensu Moser. — 33. Spores. — 34. Hairs on pileus. (All Figs. from Moser 66/304).

Figs. 35–37. *Entoloma romagnesii*. — 35. Spores. — 36. Hairs on pileus. — 37. Hairs on stipe: a. at apex; b. near base. (All Figs. from type).

Figs. 38–40. *Entoloma dysthales* f. *acystidiosum*. — 38. Habitus. — 39. Spores. — 40. Basidia. (All Figs. from type).



Figs. 41–45. *Entoloma versatilis*. — 41. Habitus. — 42. Spores. — 43. Basidia. — 44. Pleurocystidia. — 45. Pileipellis. (Fig. 41a from *Bon 74092702*; 41b from *Romagnesi 46.296*.; 42a, 43a and 45 from *Bas 4567*; 42b, 43b and 44a from *Kits v. Waveren, Sept. 1977*; 42c from *Herink, Sept. 1937*; 43c and 44b from *Nathorst-Windahl, Aug. 1940*).

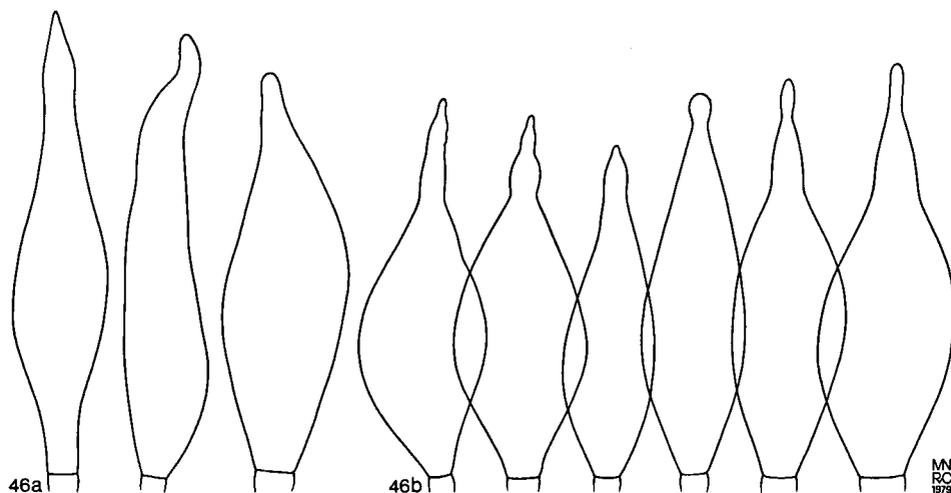


Fig. 46. *Entoloma versatilis*. Cheilocystidia. (Fig. 46a from *Nathorst-Windahl*, Aug. 1940; 46b from *Kits v. Waveren*, Sept. 1977).

1 km E. of Bad Meinberg, 25 Sept. 1969, *C. Bas 4567* (L). — FRANCE: dept. Orne, Bellême, Les Chaises, 25 Sept. 1974, *M. Bon 74092702* (Herb. Bon); dept. Oise, Cerçay, 13 Aug. 1936, *H. Romagnesi 36.99* (Herb. Romagn., PC); dept. Oise, Coye-la-Forêt, 14 Sept. 1946, *H. Romagnesi 46.296* (Herb. Romagn., PC). — CZECHOSLOVAKIA: Bohemia, Praha 18, ohera Hvezda, 1 Sept. 1937, *J. Herink* (Type of *R. viridulus*; PRM); idem, 30 Aug. 1937, *J. Herink* (PRM).

OBSERVATIONS.—One rather aberrant collection was met with, viz. *Nolanea versatilis* (Fr.) Gill., Malham town pasture, in Woodland, 20 Aug. 1958, *anonymus* (E). This collection differs from all other collections studied in having 2- and 4-spored basidia equally distributed in the hymenium. As a result of this two spore-classes were found: firstly spores measuring $10.8\text{--}11.7 \times 7\text{--}8.2(-9) \mu\text{m}$, $Q = 1.2\text{--}1.35\text{--}1.5$, $L\text{--}D = 1.8\text{--}3.6 \mu\text{m}$, apparently representing spores from 4-spored basidia, and secondly spores measuring $12.3\text{--}14.0 \times 8.8\text{--}9.3 \mu\text{m}$, $Q = 1.3\text{--}1.45\text{--}1.55$, $L\text{--}D = 3\text{--}5 \mu\text{m}$, which were obviously born on 2-spored basidia. The only available observation on the fresh fungus is written on the label, viz. 'cap tinged olive'.

Although Fries' *Icones* (1875, pl. 98) show a rather robust agaric which in no way fits the description given above, the original diagnosis and a later description (Fries, 1874: 206) give considerable less doubt on the identity of our species. It is well known, however, that Fries' *Icones* do not always give a typical representation of his species. Considering the descriptions cited above, I see no reason to follow Herink's suggestion (l.c.) to adopt a new name for *Nolanea versatilis* Fr. sensu Ricken, Romagnesi.

The rareness of *E. versatilis* is reflected in the lack of good descriptions. The only modern description is given by Romagnesi (1937: 87–88). The colour of the pileus seems to vary considerably, viz. from pale olivaceous brown to dark grey-brown with olivaceous tinge. Also the colouration of the stipe is rather variable (see description). The pigmentation of the trama of pileus and lamellae may vary from membranous and uniformly yellow-brown with only minute encrustations, to rather coarsely encrusted. The intensity of the pigmentation also increases from

the upper part of the trama of the pileus downwards. The size and shape of the spores is rather variable. Within one collection the side-view may vary from 5-sided symmetrical to rather irregularly 7-sided asymmetrical, with rather pronounced angles. The latter type of spores is predominant in the type of *R. viridulus*. Pleurocystidia, often used to distinguish *E. versatilis* from the most related members of sect. *Versatilis*, are usually rather scarce. In a number of collections I could not find any. The value of pleurocystidia as a distinguishing character is therefore doubtful.

Entoloma versatilis as described from North America by Mazzer (l.c.) has considerably larger spores. (It should be noted that these spores are born on 4-spored basidia.) Mazzer gives $10.8-14.4 \times 7.5-8.9 \mu\text{m}$. In a collection from Michigan in L, collected by Dr. Bas, I found spores $11.5-14 \times 7.6-8.7 \mu\text{m}$. All these spores were born on 4-spored basidia. This difference suggests that the North American *E. versatilis* represents another taxon than *E. versatilis* from Europe.

ENTOLOMA ARANEOSUM (Quél.) Moser
f. ARANEOSUM—Figs. 47–51

Nolanea araneosa Quél. in Bull. Soc. bot. Fr. 23: 327. 1876. — *Rhodophyllus araneosus* (Quél.) Quél., Enchir.: 63. 1886. — *Pouzarella araneosa* (Quél.) Mazzer in Biblta mycol. 46: 100. 1976. — *Entoloma araneosum* (Quél.) Moser in Gams, Kl. KryptogFl. 4. Aufl., 2(b/2): 208. 1978.

EXCLUDED NAMES.—*Rhodophyllus araneosus* sensu Einhellinger in Ber. Bayer. bot. Ges. 44: 40. 1973 (= *E. dysthaloides*).

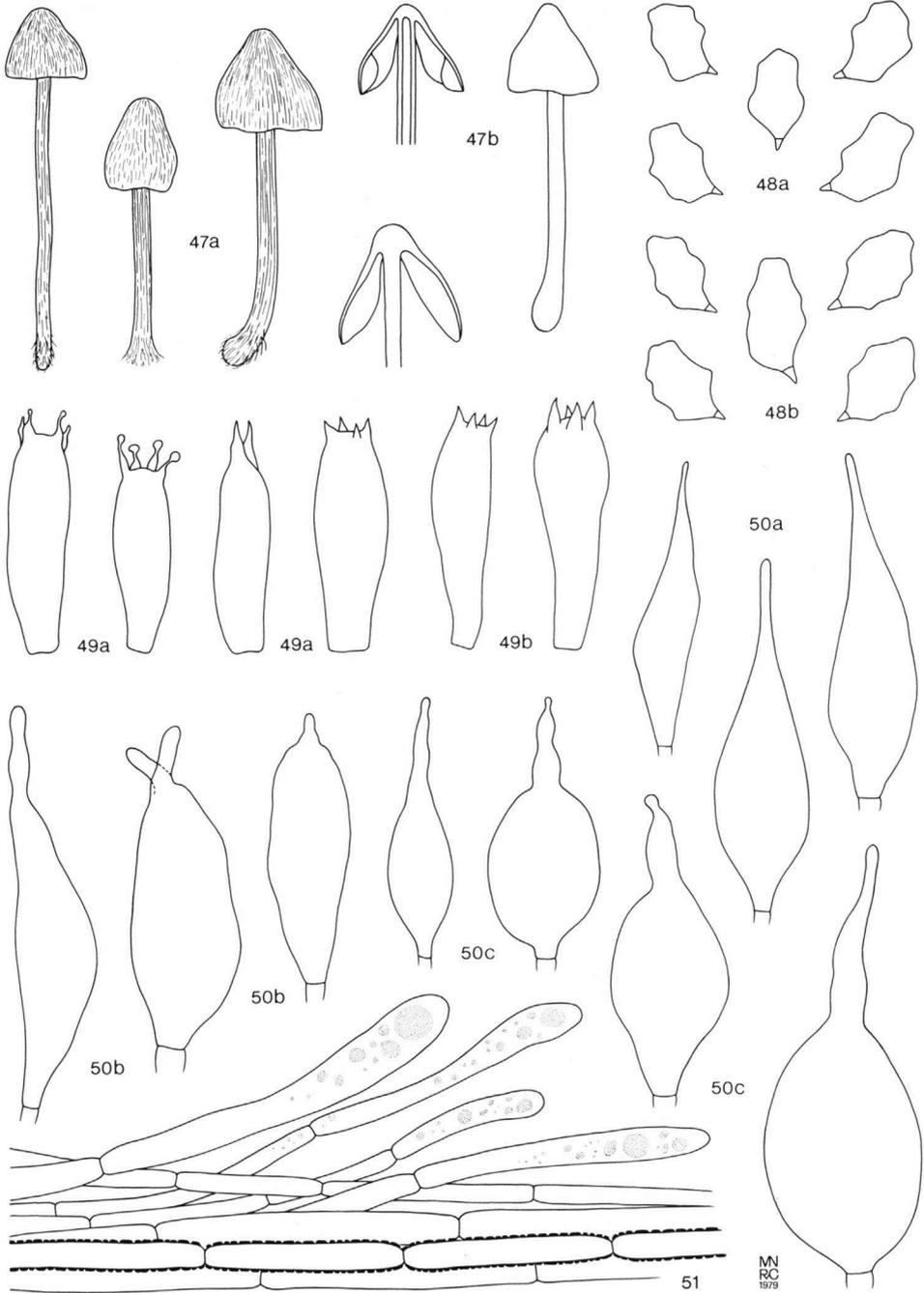
SELECTED ICONES AND DESCRIPTIONS.—Quél., 1876, l.c., pl. 2 fig. 3. — Dössing in Friesia 6: 335–337, fig. 1. 1961.

CHARACTERISTICS.—Pileus and stipe mouse-grey sometimes tinged brown; pileus strongly radially fibrillose, margin with velar remnants at least when young; stipe-base with pale greyish radiating hairs.

Pileus 9–35 mm broad, conico-campanulate, sometimes truncate, only very slightly expanding with age, then umbonate, with margin straight, finally slightly undulating, not hygrophanous, not or very obscurely striate at margin when moist but at marginal zone sometimes radially grooved, mouse grey, finally sometimes with brown tinge, densely covered with radially arranged silvery white or greyish fibrils, at margin especially when young flocculose with grey veil. Lamellae L=up to 30, l=1–2, narrowly adnate, ventricose, sometimes thickish, occasionally transversely veined, pale grey at first then pinkish grey with brown tinge, with entire or flocculose, slightly paler edge. Stipe 26–63 \times 1.5–4 mm, cylindrical with slightly broadened base, sometimes flexuous, stuffed then hollow, subcartilagineous, grey to grey-brown, paler than pileus, rarely tinged with red at base, white pruinose or flocculose at apex, entirely silvery white longitudinally fibrillose-arachnoid, at base with pale grey or whitish radiating hairs. Flesh concolorous with surfaces, firm. Smell faint: gas-like, nauseating (*Bas 6363*); farinaceous (Dössing, Romagnesi). Taste not recorded.

Spores (9.3–)10.2–14.0(–15) \times (6.8–)7–8.1(–9.0) μm ; Q=(1.2–)1.4–1.5–1.8; L–D=(1.5–)2.5–4(–7) μm , (broadly) ellipsoid to elongate in outline, 6–8-angled in side-view, relatively thin-

Fig. 47–51. *Entoloma araneosum* f. *araneosum*. — 47. Habitus. — 48. Spores. — 49. Basidia. — 50. Cheilocystidia. — 51. Pileipellis. (Figs. 47a, 48a, 49a and 50c from *Bas 6363*; 47b and 50b from *Bas 5818*; 48b, 49b and 50a from *Kuyper 1046*; 51 from *Dössing, June 1966*).



walled, pale. Basidia (35–)41–55 × 10.5–15 μm . Abortive basidia present. Cheilocystidia 45–75(–100) × 10–30 × 2.5–5.4 μm , lageniform with broad basal part and short to rather long, attenuate or moniliform neck, rarely subcapitate, hyaline, colourless or slightly brown-encrusted in broadest part. Pleurocystidia none. Subhymenium (sub)cellular, thin, colourless. Hymenopodium distinct, but thin, consisting of 3.4–5(–7) μm wide, densely entangled to subregularly arranged, rather strongly encrusted hyphae. Mediostratum regular, made up of up to 15(–21) μm wide, slightly inflated, uniformly brown, sometimes minutely encrusted hyphae. Pileipellis a cutis with transitions to a trichodermium made up of thin-walled up to 400 μm long repent and/or ascending cylindrical hairs, with slightly thick-walled, refractive apex, terminal cells (40–)65–250 × (8–)13–27 μm , cylindrical or slightly inflated or fusiform, uniformly yellowish brown by membranous but also minutely encrusting pigment together with a grey-brown diffuse or granular intracellular pigment. Pileitrama regular, composed of cylindrical to inflated hyphae up to 21 μm wide with yellow-brown walls intermixed with 2.3–5.7(–7) μm wide, cylindrical, minutely encrusted hyphae. Stipitepellis a differentiated cutis composed of 5.7–14 μm wide hyphae with reflexed cylindrical to clavate, up to 20 μm wide free ends ('hairs') with uniformly coloured, not encrusted walls. Clamp-connections absent.

HABITAT & DISTRIBUTION.—Terrestrial, solitary or in small groups on bare soil in deciduous forests rich in humus; May–November. Widespread but apparently rare. Europe.

COLLECTIONS EXAMINED.—FINLAND: Inkoo, Fagervik park, 31 Aug. 1963, *O. v. Schulmann* (H). — DENMARK: Lolland, Toreby-skov, 8 Sept. 1960, *L. Dössing* (C); Falster, Bangebro-skov, 27 Aug. 1963 & 12 June 1966, *L. Dössing* (C). — GREAT BRITAIN: Durham County, Peterslee, 18 Oct. 1971, *C. Bas 5815* (L). — NETHERLANDS: prov. Zuid-Holland, Ridderkerk, estate 'Huys ten Donk', 12 Nov. 1977, *T. Kuypers* (L). — BELGIUM: prov. Namur, Han sur Lesse, Bois Banale, 22 Sept. 1971, *C. Bas 6363* (L). — GERMAN FEDERAL REPUBLIC: Saarland, Völklingen, 11 Aug. 1973, *H. Derbsch* (M). — FRANCE: dept. Oise, Compiègne, 13 Oct. 1949, *H. Romagnesi* (Herb. Romagn., PC); dept. Oise, La Chapelle-en-Serral, 6 Oct. 1976, *H. Romagnesi* (Herb. Romagn., PC); dept. Somme, Gouy-Cahon, Sept. 1968, *M. Bon 80972* (Herb. Bon); dept. Nord, Bergues, 27 May 1976, *Bèle* (Herb. Bon); dept. Aisne, St. Gobain, Oct. 1976, *M. Bon* (Herb. Bon); dept. Pas de Calais, Auchel, Aug. 1977, *M. Bon & Jaquetant* (Herb. Bon). — CZECHOSLOVAKIA: Bohemia centralis, ad pagum Menany prope vicum Liten, 23 Aug. 1959, *M. Svrček* (PRM).

ENTOLOMA ARANEOSUM (Quél.) Moser f. *fulvostrigosum*
(Berk. & Br.) Noordeloos, *comb. & stat. nov.*—Figs. 52–55

Agaricus fulvostrigosus Berk. & Br. in *Ann. Mag. nat. Hist.*, Ser. V, 1: 19. 1878. — *Leptonia fulvostrigosa* (Berk. & Br.) P. D. Orton in *Trans. Br. mycol. Soc.* 43: 177. 1960. — *Pouzarella fulvostrigosa* (Berk. & Br.) Mazzer in *Biblita mycol.* 46: 100. 1976. — *Entoloma fulvostrigosa* (Berk. & Br.) Moser in *Gams, Kl. KryptogFl.* 4. Aufl., 2(b/2): 208. 1978.

Rhodophyllus araneosus (Quél.) Quél. sensu Kühn. & Romagn., *Fl. anal.*: 186. 1953, pro parte.

SELECTED DESCRIPTION & ICONES.—Reid, *Col. Ic. rare inter. Fungi* 3: 21–23, pl. 19C, fig. 10 a–e. 1968.

CHARACTERISTIC.—Differs from *f. araneosum* in the lack of a veil and in the reddish hairs at the base of the stipe.

Pileus 7–25 mm broad, up to 10 mm high, conico-campanulate, then expanding, subumbonate or truncate, rarely flattened with slightly depressed centre, with margin straight and somewhat crenulate in expanded caps, not hygrophanous, not striate, mouse grey then tinged brown, at centre slightly paler when dried up, entirely and densely silvery-fibrillose, shining, mostly without remnants of veil at margin. Lamellae moderately crowded with 1–3(–5) lamel-

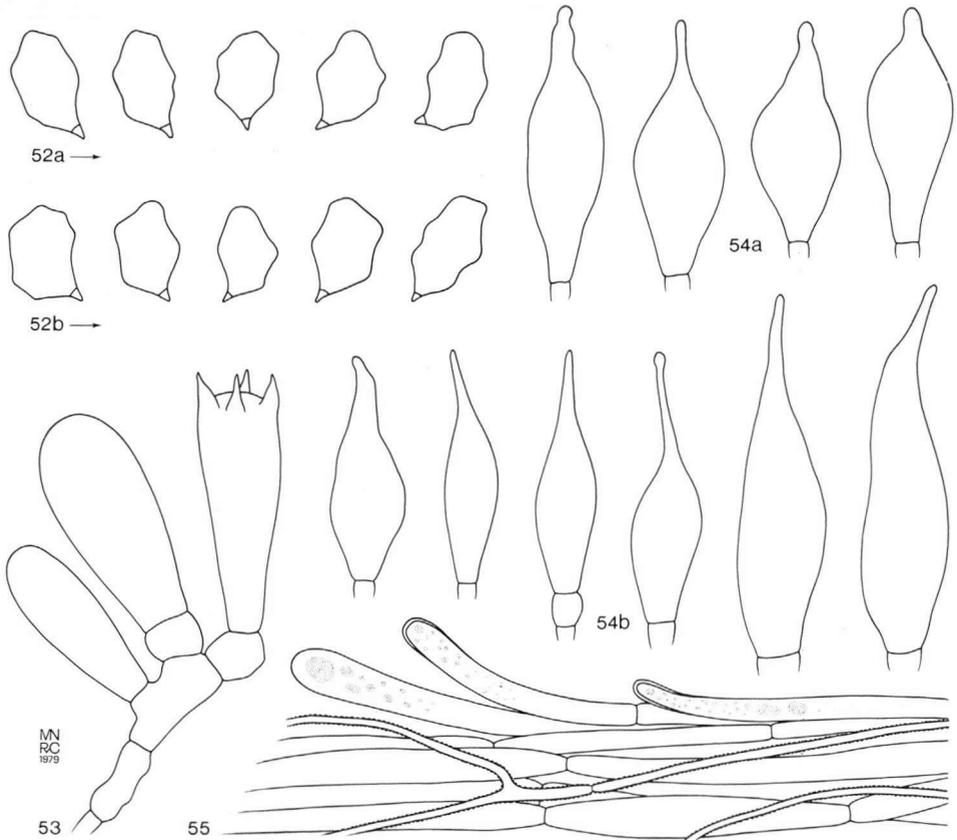


Fig. 52–55. *Entoloma araneosum* f. *fulvostrigosum*. — 52. Spores. — 53. Basidia. — 54. Cheilocystidia (Figs. 52a and 54b from type; 52b, 53 and 54a from Clark, Oct. 1975).

lulae between each pair, adnate, sometimes slightly emarginate and then with short decurrent tooth, ventricose, thin, grey then pinkish grey with edge slightly paler and pruinose. Stipe 25–55 × 1–2 mm, subcylindrical, sometimes flexuous, narrowly fistulose with age, grey, becoming purplish brown towards base, entirely longitudinally silvery fibrillose-striate, at base with radiating reddish hairs. Flesh grey-brown, in base of stipe reddish brown. Smell unpleasant-fishy (Reid), farinaceous (Romagnesi, personal communication). Taste mild, then farinaceous (Romagnesi, personal communication).

Spores 10.2–13.6 × 6.8–8(–8.5) μm; Q = 1.3–1.45–1.6(–1.7); L–D = (2.4–)3–5 μm, ellipsoid-elongate in outline, 6–7(–8)-angled in side-view, with pronounced angles, pale, thin-walled. Basidia 40–62 × 11.5–16 μm; Q = 3.5–4.2, 4-spored. Abortive basidia present. Cheilocystidia 35–79 × 14–21.5 × 2–4.5(–5.2) μm, lageniform, with broad, swollen basal part and long, tapering, sometimes moniliform neck, thin-walled, colourless. Subhymenium cellular, colourless, thin. Hymenopodium thin but distinct, composed of irregularly branching, minutely encrusted, 2.5–5.7(–6.2) μm wide, cylindrical hyphae. Mediostratum regular, very compact, with inflated

cells, 110–250(–300) × 12–21 μm, with yellow-brown sometimes in addition minutely encrusted walls. Pileipellis a cutis with transitions to a trichodermium, composed of cylindrical to slightly inflated hyphae with repent or ascending terminal cells up to 500 μm long and up to 20 μm wide, cylindrical to slightly inflated with rounded tip, with brown, sometimes very minutely encrusted walls and brown diffuse or granular intracellular pigment. Pileitrama regular, composed of slightly inflated up to 24 μm wide hyphae, slightly constricted at septae, intermixed with 2–5.5 (–6) μm wide, cylindrical, brown-encrusted hyphae. Stipitepellis a cutis composed of 5–11 μm wide, cylindrical, brown sometimes minutely encrusted hyphae, with scattered cylindrical or slightly inflated, pale brown, sometimes minutely encrusted free ends ('hairs'). Clamp-connections absent.

HABITAT & DISTRIBUTION.—Terrestrial in deciduous forests; August–October. Rare, up to now only known from Great-Britain, German Federal Republic and France.

COLLECTIONS EXAMINED.—GREAT BRITAIN: Durham County, Castle Eden Dene, 18 Sept. 1972, *B. Brand* (E); Yorkshire, Leeds, Branham Park Wood, 24 Sept. 1971, *M. C. Clark* (E); Warwickshire, Whichford Wood, 10 Oct. 1967, *Miss M. Holden* (K); Warwickshire, Ansty Wood, 18 Oct. 1975, *M. C. Clark* (K); Somerset, Higher Merridge Bridgewater, 26 Aug. 1958, *Mrs. Marriage* (K); Kent, Maidstone, 13 Sept. 1878, (*Berkeley?*) (Holotypus, K). —GERMAN FEDERAL REPUBLIC: Bavaria, München, Nymphenburg, Kapuziner Hölzl, 12 Oct. 1977, *A. Einhellinger* (M). —FRANCE: dept. Oise, Forêt de Fontainebleau, 13 Oct. 1937, *H. Romagnesi 37.100* (Herb. Romagn., PC).

Both forma's of *E. araneosum* appear to be rather rare. Therefore their variability has never been studied critically. The main difference between *Entoloma araneosum* and *E. fulvostrigosum* should be the presence of a weakly developed veil and the whitish-greyish hairs at the base of the stipe in the former and the lack of a veil and the reddish hairs in the latter.

Studying the collections and descriptions available I found these characters to be rather variable. In young specimens of *E. araneosum* the veil is usually distinct, but this phenomenon is not strictly correlated with whitish-greyish hairs. *Romagnesi 37.100* combines a distinct veil with reddish hairs. This collection (in Herb. Romagn.) is marked on the sheet as var. *rubrolanatus* R. Maire, an unpublished name.

In typical *E. araneosum* the colour of the cortex in the base of the stipe is greyish. In some collections, however, a purplish tone has been observed, whereas the hairs are grey. Some collections showed both types of colour of the cortex (*Bas 6363*; *Dössing, 1961*). In typical *E. fulvostrigosum* this part of the cortex is purplish.

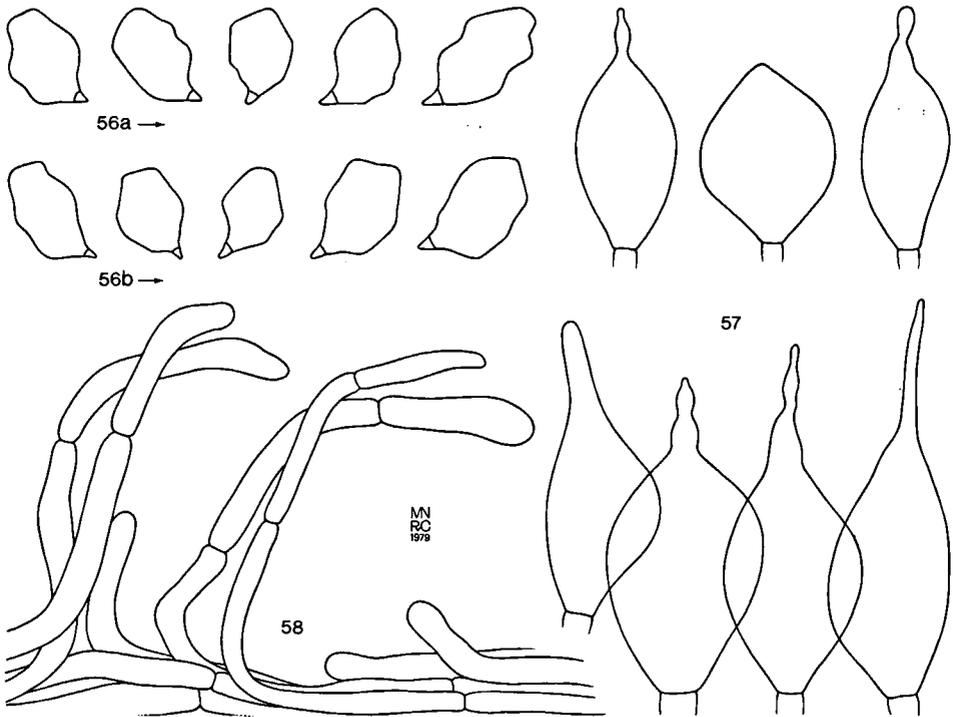
In *E. araneosum* the spores seem to vary in length more than in *E. fulvostrigosum*, but the overall length-width ratio shows no significant difference between both taxa.

As a consequence of all this I consider these taxa conspecific, and subordinate *E. fulvostrigosum* as a forma to *E. araneosum*.

Nolanea rhodoura Gilbert (1933: 253–255, pl. 11) is likely to be a synonym of *E. araneosum*. The plate shows a red of the stipe with radiating grey hairs. In this diagnosis the author does not mention cheilocystidia. As I have been unable to locate the type, the synonymy could not be verified.

Nolanea fulvostrigosa sensu Bres. (1929, pl. 591) probably represents *E. dysthaloides*; unfortunately the material under this name is lacking in Bresadola's herbarium at S.

Leptonia fulvostrigosa sensu Orton (l.c.) was based upon the Bresadola interpretation mentioned above, *Rhodophyllus dysthales* sensu Favre (1948: 44) and *Rhodophyllus araneosus* sensu Kühn. & Romagn. (1953: 186). From my point of view this is a mixed species-concept. The first



Figs. 56–58. *Entoloma indutum*. — 56. Spores. — 57. Cheilocystidia. — 58. Pileipellis. (Figs. 56a and 57 from Reid, Oct. 1970; 56b and 58 from type).

two refer to *E. dysthaloides* whereas *R. araneosus* sensu Kühn. & Romagn. represents both f. *araneosum* and f. *fulvostrigosum* of *E. araneosum* (see also Reid, 1968: 23).

ENTOLOMA INDUTUM Boudier—Figs. 57–58

Entoloma indutum Boudier in Bull. Soc. mycol. Fr. 16: 193–194, pl. 8 fig. 2 a–g. 1900. — *Rhodophyllus indutus* (Boudier) Romagn., Rhodoph. Madag.: 44. 1941. — *Leptonia induta* (Boudier) P. D. Orton in Trans. Br. mycol. Soc. 43: 177. 1960. — *Pouzarella induta* (Boudier) Mazzer in Biblta mycol. 46: 88. 1976.

CHARACTERISTICS.—Pileus slate blue with reddish tinge at centre, coarsely radially fibrillose, resembling a species of *Inocybe*.

Pileus up to 30 mm broad, conico-campanulate then expanding to convex with small umbo, pale slate blue, at centre more greyish with reddish flush, coarsely radially fibrillose. Lamellae uncinately to nearly free, ventricose, ash grey then with pink tinge. Stipe 22–27 × 5–10 mm, cylindrical, fistulose, concolorous with pileus, longitudinally fibrillose-striate. Smell and taste not recorded.

Spores 9.6–12(–12.7) × 7.4–9.3 μm; Q = 1.2–1.3–1.4(–1.5); L–D = 2–4 μm, rather rounded 6–8-angular in side-view, thin-walled. Basidia 40–52 × (11.3–)12.5–17 μm; Q = 2.6–3.8, clavate, 4-spored. Cheilocystidia 32–80 × 17–30 μm, lageniform with broad, swollen base and long, tapering neck, colourless and thin-walled, occasionally minutely encrusted on broadest part. Subhymenium thin, cellular, colourless. Hymenopodium thin, hyphae 2.5–7(–9) μm wide, cylindrical, brown-encrusted. Mediostratum of lamellae regular, elements strongly inflated, up to 20.5 μm wide, with yellow-brown, occasionally minutely encrusted walls. Pileipellis a cutis with transitions to a trichodermium, composed of 8.5–15 μm wide, cylindrical or slightly inflated hyphae with single or subfasciculate, repent or ascending 1–3-celled hairs, up to 250 μm long and up to 17.5 μm wide, with pale brown, sometimes minutely encrusted walls and pale bluish brown intracellular pigment. Pileitrama regular, composed of yellow-brown sometimes minutely encrusted hyphae. Clamp-connections absent.

HABITAT & DISTRIBUTION.—Terrestrial in deciduous forests on clayey soil. Only known from the type-locality in France and from one locality in Great Britain.

COLLECTIONS EXAMINED.—FRANCE: dept. Oise, Ecoeu, Nov. 1898, *E. Boudier* (Holotypus, PC). — GREAT BRITAIN: Sussex, Duncton Hill, 12 Oct. 1970, *D. A. & D. G. Reid* (K).

This species is unique in *Pouzaromyces* because of its blue colour and relatively firm, short stipe. In the field it could easily be taken for a species of *Leptonia* because of its blue tinges and fibrillous-scaly pileus, which is out of the question, however, considering the structure of the pileipellis, the pigmentation and the abortive basidia.

Entoloma indutum seems to be rather rare as it has only been refound once in recent years. Unfortunately no macroscopical data are available on this second collection.

Excluded or insufficiently known taxa

ambrosius.—*Rhodophyllus ambrosius* Quél. in C.r. Ass. Franc. Av. Sci. 24(2): 618. 1896. — *Pouzarella ambrosia* (Quél.) Mazzer in *Biblta mycol.* 46: 83. 1976.

This species, very distinctive by its fragrant smell like orange-blossom has recently been rediscovered and redescribed by Romagnesi (1974b: 365–368). It is quite clear that this is a species belonging to subgen. *Nolanea* and not, as Mazzer (l.c.) suggested, to sect. *Versatilis*.

autumnalis.—*Nolanea autumnalis* Velen. in *Mykologia* 6: 28. 1929. — *Pouzarella autumnalis* (Velen.) Mazzer in *Biblta mycol.* 46: 84. 1976.

No type could be found at PRC or PRM; most probably it got lost. Judging from the diagnosis it may be close to *E. hirtum* or *E. araneosum*.

babingtonii.—*Agaricus babingtonii* Blox. apud Berk. & Br. in *Ann. Mag. nat. Hist.* 2(2): 399. 1854. — *Rhodophyllus babingtonii* (Blox. apud Berk. & Br.) Quél., *Enchir.*: 61. 1886. — *Nolanea*

babingtonii (Blox. apud Berk. & Br.) Sacc., Syll. Fung. 5: 717. 1887. — *Leptonia babingtonii* (Blox. apud Berk. & Br.) P. D. Orton in Trans. Br. mycol. Soc. 43: 177. 1960. — *Entoloma babingtonii* (Blox. apud Berk. & Br.) Hesl. in Beih. Nova Hedwigia 23: 173. 1967. — *Pouzarella babingtonii* (Blox. apud Berk. & Br.) Mazzer in Biblca mycol. 46: 127. 1976. — Holotype: *A. Bloxam*, 21 Nov. 1851, Twycross (K).

The type collection is in a rather poor state. The lamellae are entirely lacking; the surfaces and layers of trama of pileus and stipe are very difficult to study. Masee (1893: 258) studied the type and stated: 'Spores subglobose or slightly oblong, apiculate, nodulose, 7–8 μ m, cystidia absent.' The latter remark suggests that in Masee's time the gills were at least partially intact. Dennis (1948: 206) who studied the same collection could not find any spores, basidia or cystidia. Another collection in K, labelled '*Ag. babingtonii* B., King's Cliffe, Oct. 2. 1860' was also studied by him and appeared to be conspecific with *Agaricus dysthales* Peck. This is the reason why Orton & al. (1960: 103) placed *A. dysthales* among the synonyms of *A. babingtonii*.

Moser (1973: 282–283) restudied both collections and found on the type spores measuring 9–12 \times 6–7 μ m. From this he concluded that Orton & al. (l.c.) incorrectly placed *A. dysthales* among the synonyms of *A. babingtonii*. Moser (l.c.) gave a redescription based on a recent collection from his own herbarium of what he believed to be the true *A. babingtonii*. This collection was studied by me. It contains one specimen which is remarkable in the absence of cheilocystidia. Macro- and microscopically it is quite close to *E. dysthaloides* (Figs. 33, 34). As there is only one specimen available I hesitate to describe this collection as an acystidiate form of *E. dysthaloides*.

Mazzer (1976: 127–130) also studied both collections at K. He found on the stipe of *A. babingtonii* spores measuring 15.1–19.2 \times 7.2–8.5 μ m. In addition he described shrivelled hairs found on the stipe, interpreting them as setiform. Consequently he placed *Pouzarella babingtonii* in the vicinity of *P. strigosissima*.

The observations on the type tend to contradict each other. Considering the bad state of the type-collection, the impossibility of interpreting important characters such as size and shape of spores, aspect of covering layers, presence or absence of cheilocystidia and form and pigmentation of tramal hyphae, I consider *A. babingtonii* a nomen dubium.

Other misapplications of *A. babingtonii*: *Rhodophyllus babingtonii* sensu Quél., Pat., Kühn. & Romagn., representing without any doubt *E. strigosissimum*; *Entoloma babingtonii* sensu Hesler (1967: 173) is a mixture of *E. dysthales* and *E. nodospora* (see Mazzer, l.c.).

cinerea.—*Leptonia cinerea* Velen., České Houby: 623. 1921. Holotypus: J. Velenovský, Mnichovice, Aug. 1919 (PRC).

This species is very close to *E. hirtum*, but on account of the slightly narrower spores I hesitate to place it among the synonyms of *E. hirtum*. For details I refer to Noordeloos (1979: 256).

fumosellus.—*Agaricus fumosellus* Wint. in Rabenhorst, KryptogFl. 2. Aufl., 1(1): 853. 1844.

It is very doubtful whether this species in its original sense is entolomatoid or not; it could easily belong to the genus *Psathyrella* as well (Mazzer, 1976: 131). Misapplications of this name are: *Rhodophyllus fumosellus* sensu J. Lange (1921: 36 and 1936: 102, pl. 78E) = *E. dysthales*; *Pouzaromyces fumosellus* sensu Pilát = *E. strigosissimum* (see p. 208).

nigrella.—*Leptonia nigrella* Velen., Česká Houby: 623. 1920. (Holo?-)typus in PRC.

The type-collection does not agree in a satisfactory way with the protologue. As a consequence I consider *L. nigrella* as a nomen dubium (Noordeloos, 1979: 260).

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