

## Studies in *Entoloma* 14. Some new species and new records

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**Key words:** *Basidiomycetes*, *Agaricales*, *Entoloma*. - New taxa, taxonomy.

**Abstract:** Full descriptions and illustrations are given of the new species *Entoloma jennyi* NOORDEL. & TEN CATE from Ireland, *Entoloma lidbergii* NOORDEL. from Sweden, and new records of the very rare species *E. henrici* HORAK & AEBERHARDT, *E. transvenosum* NOORDEL., and *E. reade* (MAIRE) NOORDEL.

**Zusammenfassung:** Ausführliche Beschreibungen und Abbildungen werden gegeben von *Entoloma jennyi* NOORDEL. & TEN CATE, einer neuen Art aus Irland, *Entoloma lidbergii* NOORDEL. aus Schweden und von Neufunden der äußerst seltenen Arten *Entoloma henrici* HORAK & AEBERHARDT, *E. transvenosum* NOORDEL. und *E. reade* (MAIRE) NOORDEL.

### *Entoloma jennyi* NOORDEL. & TEN CATE, spec. nova (Fig. 1)

Basidiomata subgregaria. Pileus 40-70 mm latus, semiglobosus demum convexus, leviter depressus vel leviter umbonatus, margine involuto demum recto, haud hygrophanus, haud translucide striatus, initio ferro-griseus demum coeruleo-violaceus centro obscurior, pruinosis, glabrescens. Lamellae L = 50-70, l = 0-1, distantes, liberae vel adnexae, ventricosae, albiae demum roseae acie concolor. Stipes 25-50 x 9-13 mm, cylindraceus, albidus, glabrus; caro alba.

Sporae 8,0-10,5 x 6,5-8,0 µm, 5-(6-7-)angulatae. Basidia tetrasporigera, fibulata. Acies lamellarum fertilis. Pileipellis irregulari-hymeniformia cellulis clavatis constitutis pileicystidiis interspersis et pigmentis intracellulosis. Fibulae abundantia.

**Holotypus:** "Fungi of Ireland/R. TEN CATE/16 Sept. 1990/County Galway, Kilmore" (L).

Basidiomata in small groups. Pileus 40-70 mm, hemispherical soon convex, somewhat irregular, sometimes slightly depressed at centre or weakly umbonate, with involute then straight margin, not hygrophanous, not translucently striate, steel-blue when young then blue-violaceous, often darker blue at centre, very finely pruinose to almost glabrous. Lamellae, L = about 50-70, l = 0-1, fairly crowded, free or very narrowly adnexed, broadly ventricose, up to 10 mm wide, white then purely pink with more or less entire, concolorous edge. Stipe 25-50 x 9-13 mm, cylindrical, white or very pale yellow, innately fibrillose, smooth, glabrous. Context white. Smell and taste indistinct.

Spores 8.0-10.5 x 6.5-8.0 µm, average 9.0-10.0 x 7.0-7.5 µm, Q = 1.1-1.5, average Q = 1.2-1.3, mostly 5-, sometimes 6(7)- or 4-angled, thin-walled. Basidia 25-40 x 10-

15 µm, 4-spored, clamped. Lamella edge fertile. Cheilo- and pleurocystidia absent, but in some specimens hymenium very irregular, with fusiform to clavate basidioles between mature basidia. Hymenophoral trama regular, made up of relatively short, inflated elements, 50-110 x 10-30 µm. Pileipellis a true trichoderm with transitions to a hymeniderm, made up of clavate elements, 30-40 x 10-15 µm, interspersed with pileocystidia, up to 90 x 10-20 µm, fusiform to lageniform or with strangulate apex; transitions between "normal" elements and pileocystidia occur frequently. Pigment pale bluish brown, intracellular in pileipellis. Clamps present in all tissues.

**Habitat:** terrestrial on wet, peaty soil in atlantic bog with *Calluna vulgaris* (L.) HULL, *Erica cinerea* L., *Narthecium ossifragum* (L.) HUDS., *Potentilla erecta* (L.) RÄUSCHEL, and *Polygala vulgaris* L.

**Collections examined:** Irish Republic, County Galway, Kylmore, 16 Sept. 1990, R. TEN CATE (holotype, L); - 11 Aug. 1992, R. TEN CATE (L).

**Etymology:** named after JENNY WHILE, the granddaughter of the second author, who was the first collector of this new species.

*Entoloma jennyi* is a very striking species that has no close relatives in Europe. The basidiocarps remind somewhat of a *Russula* species in the *Griseae* group with its tender blue-grey to violaceous-blue tinges and free lamellae with hardly any lamellulae. The structure of the pileipellis, which is almost hymeniform place it in sect. *Calliderma*. HORAK (1980) described some similar species from SE Asia, viz. *Entoloma colombianum* CORNER & HORAK, which is macroscopically more or less similar, but differs by having more isodiametrical spores, and very large, utriform cheilocystidia; *E. divum* CORNER & HORAK which differs by having a blue stipe, and more elongate, 5-7-angled spores; *E. rugosopruinatum* CORNER & HORAK which has similarly shaped, but smaller spores (7.5-8.5 x 6.0-7.5 µm), and a blue-green stipe; *E. generosum* CORNER & HORAK with different colours and more complex, almost cruciform spores. *Entoloma callidermum* (ROMAGN.) NOORDEL. from tropical Africa differs by having a more brown-tinged pileus and smaller spores.

*Entoloma henrici* HORAK & AEBERHARDT, the only other European species in sect. *Calliderma*, differs in colour, simple pileipellis without pileocystidia, clampless hyphae, and two-spored basidia. It was until recently only known from the type-locality, but a redescription can be given on account of two recent collections from Scotland and Italy.

***Entoloma henrici* HORAK & AEBERHARDT, Cryptog. Mycol. 4: 21. 1983. (Colour fig. IV, Fig. 2)**

Pileus up to 60 mm across, applanate with very slight umbo, with reflexed margin, not hygrophanous, not translucently striate, relatively thin-fleshed, moderately dark grey-brown rugulose on slightly paler greyish yellow-brown background, with darker centre. Lamellae, L = 40, l = 1-5-8, moderately distant, almost free, ventricose, sordid white to pale pink with very irregularly serrate, concolorous edge. Stipe 67 x 7 mm, cylindrical, slightly flexuous, very pale grey-brown, white at base, rather strongly fibrillose striate with paler fibrils, giving it an almost white impression. Context thin, white, fibrous in stipe. Smell and taste indistinct.

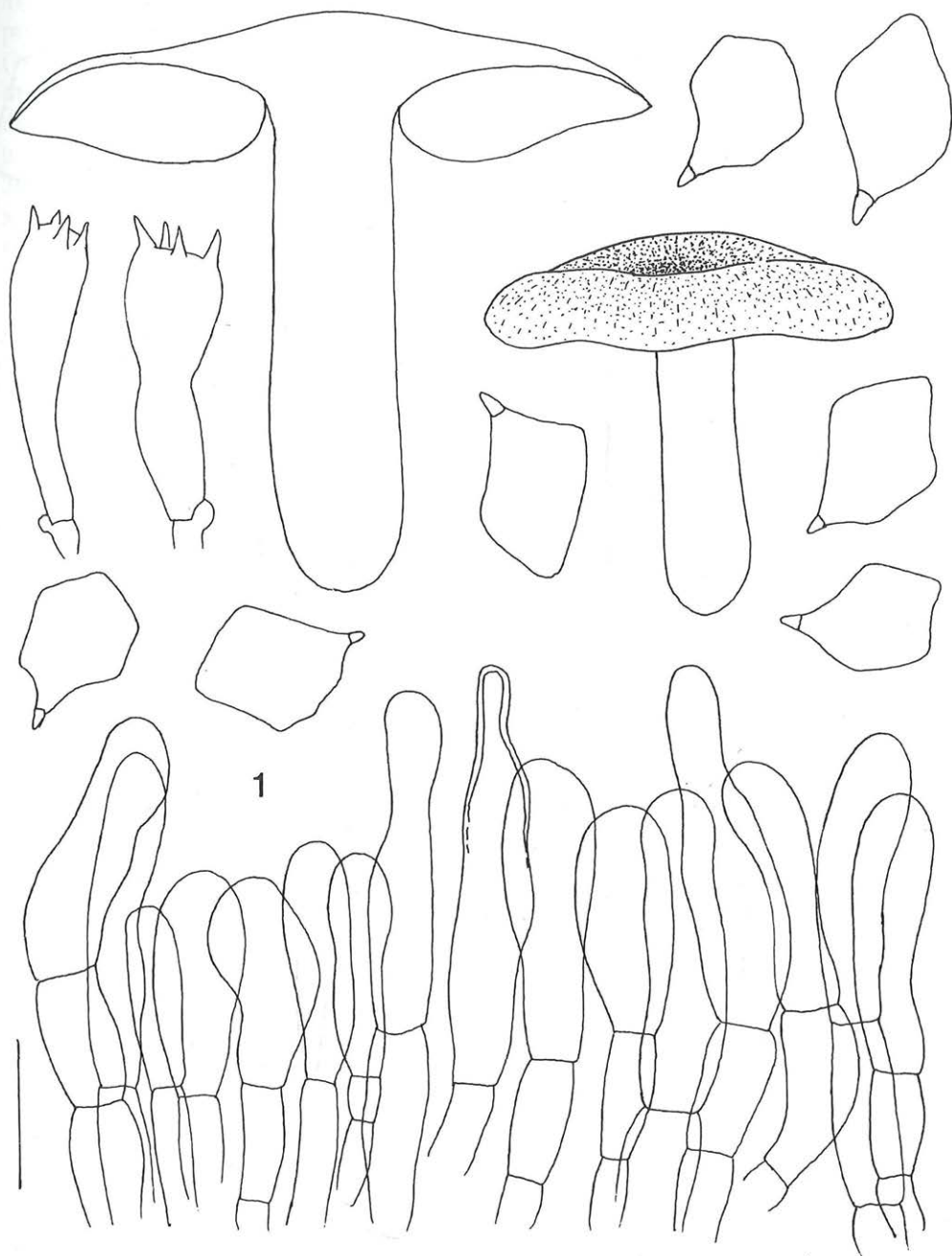


Fig. 1. *Entoloma jennyi*. Habit, spores, basidia and pileipellis. All figures from holotype. Bar: 10  $\mu$ m (spores), 15  $\mu$ m (all other microscopical details), 1.5 cm (basidiocarps).



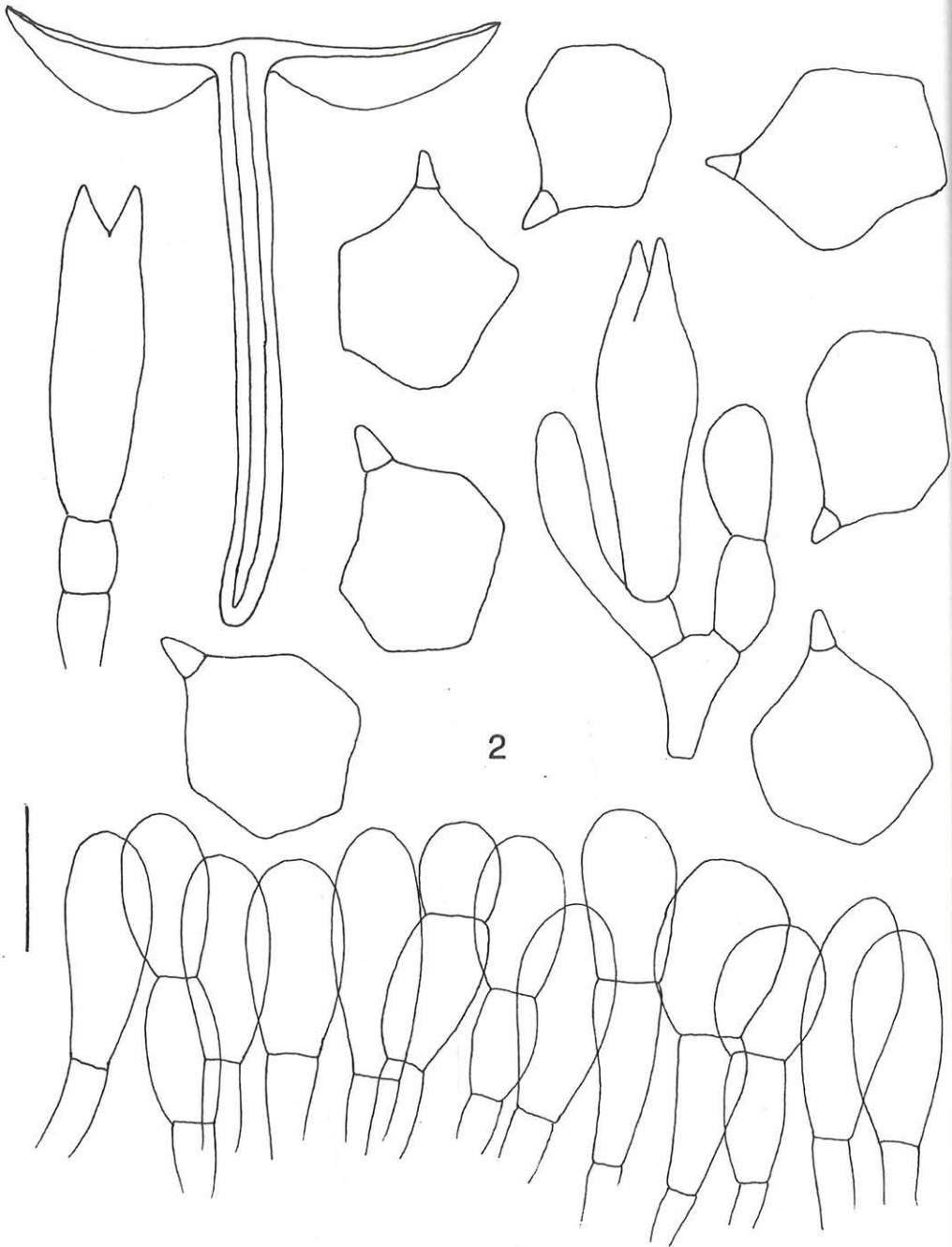


Fig. 2. *Entoloma henrici*. Habit, spores, basidia and pileipellis. All figures from J. SCHREURS 793. Bar: 10  $\mu$ m (spores), 15  $\mu$ m (all other microscopical details), 1.5 cm (basidiocarps).

Spores (9-)9.5-11.5 x 7.5-11.0  $\mu\text{m}$ , average 10.0-11.0 x 9.0-10.0  $\mu\text{m}$ ,  $Q = 1.0-1.35$ , average  $Q = 1.1-1.2$ , iso- to subisodiametrical, 5-7-angled in side-view, with rather pronounced angles. Basidia 26-40 x 10-13  $\mu\text{m}$ , two-spored, occasionally thick-walled ("sclerobasidia"), clampless. Lamella edge fertile. Hymenium very irregular, with filamentous, cylindrical and clavate basidioles, that sometimes resemble true cheilocystidia. Hymenophoral trama regular, made up of cylindrical elements, 60-140 x 10-20  $\mu\text{m}$ . Pileipellis a hymeniderm of globose or broadly clavate elements, 15-25(-40) x 10-20  $\mu\text{m}$ . Pileitrarma regular, made up of cylindrical to slightly inflated elements, 60-200 x 10-20  $\mu\text{m}$ . Pigment pale brown, intracellular in pileipellis and upper pileitrarma. Clamps absent.

**Habitat:** in moist grassland on poor, acid soil.

**Collections examined:** United Kingdom: Scotland, Glen Navis near Fort William, 15 Sept. 1983, J. SCHREURS 793 (L). Italy: Udine, Nimis, 14 Sept. 1993, G. BRAIOTTA (L).

The collection from Scotland was filed under *Dermoloma* spec. in the Rijksherbarium, because of the grey-brown, somewhat rugulose pileus and general shape of the fruitbody. Dr E. ARNOLDS, revising all *Dermoloma* material in Leiden for the Flora agaricina neerlandica noted that this collection represented an *Entoloma* species unknown to him. A closer examination by Dr BAS and the present author revealed that the single fruitbody of this collection represents *Entoloma henrici* HORAK & AEBERHARDT, so far the second locality known of this very striking species. The third collection of *E. henrici* was received through Mr G. BRAIOTTA from Northern Italy, who kindly permitted me the publication of the coloured photograph.

*Entoloma henrici* has originally been described from a pasture in Graubünden, Switzerland (HORAK 1983). The additional collections are similar to the description of HORAK (1983) and NOORDELOOS (1987, 1992). The hymeniform pileipellis makes it a good species of sect. *Calliderma*. The differences from *Entoloma jennyi*, the only other species of sect. *Calliderma* in Europe, are very evident: colour of the fruitbody, two-spored, clampless basidia, different structure of the pileipellis, and larger spores.

***Entoloma transvenosum* NOORDEL., Nordic J. Bot. 2: 155. 1982. (Fig. 3)**

Pileus 10-40 mm, convex expanding to applanate or concave, often with small umbo, with deflexed then straight margin, hygrophanous, when moist dark brown with reddish tinge (MUNSELL 7.5 YR 3-4/2; 10 YR 3-4/2), uniformly coloured or with paler margin (10 YR 6/4), translucently striate at margin, strongly pallescent on drying to grey-brown (10 YR 6-7/3), smooth, becoming rather strongly innately radially fibrillose on drying. Lamellae,  $L = 25-35$ ,  $l = 3-7$ , moderately distant, adnate-emarginate, (sub-)ventricose, distinctly transvenose, grey then dark grey-pink (10 YR 8-6/2-4 then 7.5 YR 5/4-4/2), hygrophanous, pallescent on drying, with strongly eroded, concolorous edge. Stipe 20-50 x 2.5-6 mm, cylindrical or compressed with groove, pale grey with silvery white fibrillose covering, white tomentose at base. Context very brittle, grey in cortex, white in inner part. Smell and taste farinaceous-rancid.

Spores 9.5-13.0 x 7.0-9.5  $\mu\text{m}$ ,  $Q = 1.1-1.5$ , average  $Q = 1.3-1.4$ , heterodiametrical, 6-8-angled in side-view. Basidia 25-42 x 8-13  $\mu\text{m}$ , 4-spored, clamped. Lamella edge fertile. Cystidia absent. Pileipellis a cutis of cylindrical hyphae, 8-15  $\mu\text{m}$  wide. Pigment brown, intracellular in pileipellis and upper pileitrarma. Pileitrarma regular, made

up of inflated elements, 40-110 x 10-35  $\mu$ m. Stipitipellis a cutis of loosely arranged, cylindrical hyphae, 4-12  $\mu$ m wide. Caulocystidia absent. Clamp-connections abundant in all tissues.

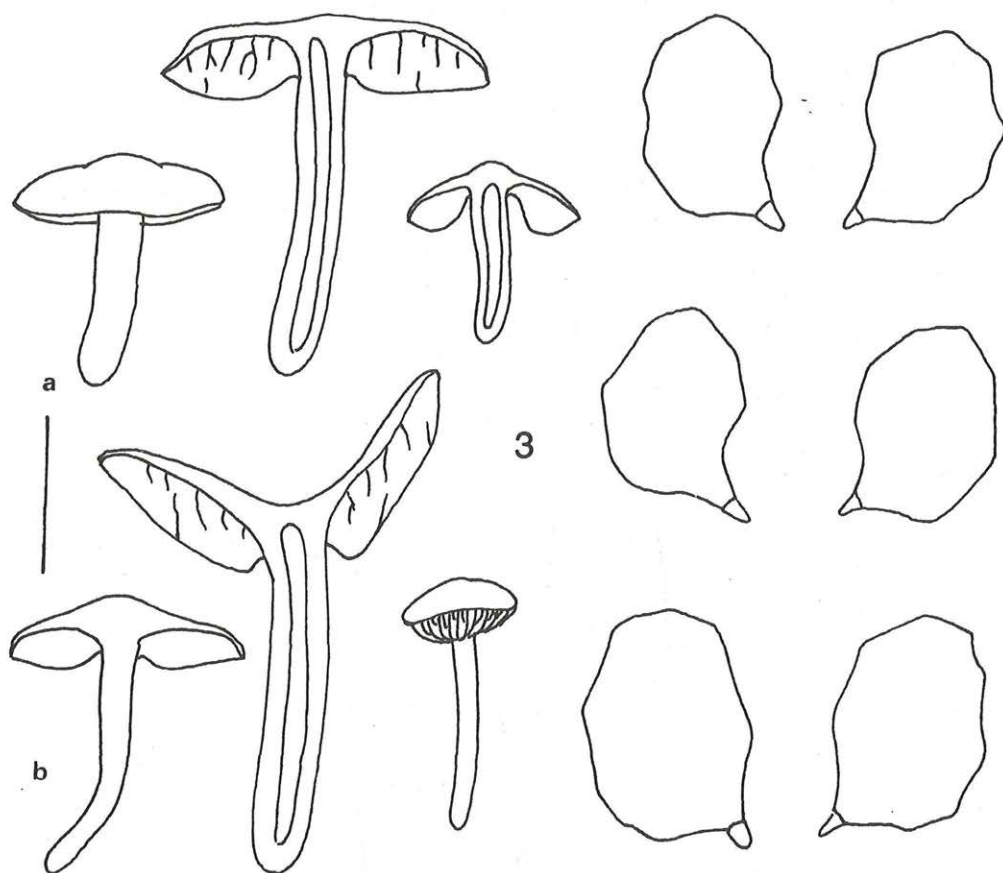


Fig. 3. *Entoloma transvenosum*. Habit (a = MEN 88193, b = MEN 8683) and spores (MEN 8683). Bar: 1.5 cm and 10  $\mu$ m resp.

**Habitat:** among grass near *Quercus* and *Betula*.

**Collections examined:** United Kingdom: Gloucestershire, Forest of Dean, Cannop Fonds, 22 Oct. 1988, M. E. NOORDELOOS 88103 (L). Sweden: Medelpad, Selånger, Hällom, 24 Aug. 1986, M. E. NOORDELOOS 8683 (L).

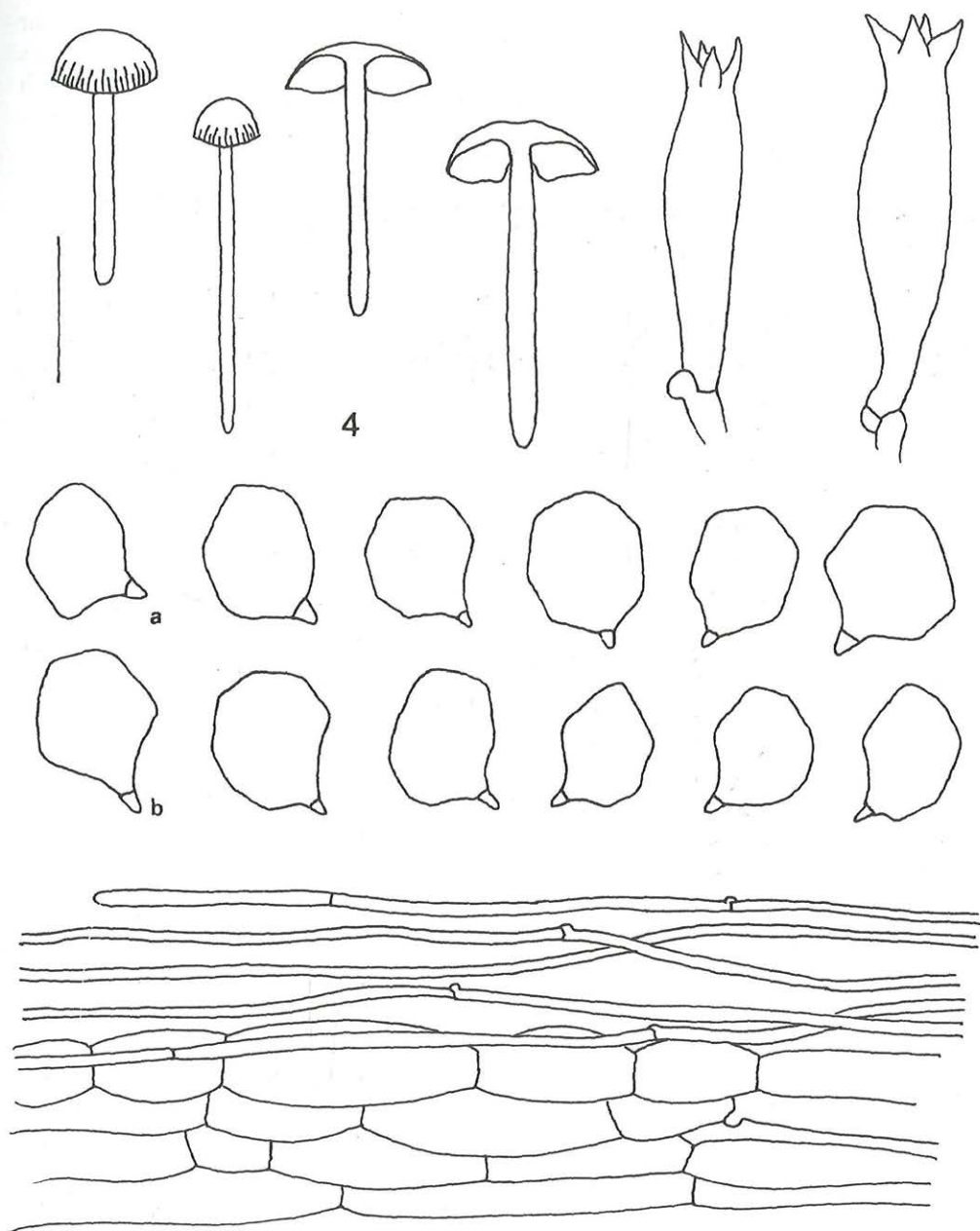


Fig. 4. *Entoloma reae*. Habit, spores, basidia and pileipellis. Basidia and spores with "a" from holotype, all other figures from MEN 88104. Bar: 10  $\mu$ m (spores), 15  $\mu$ m (all other microscopical details), 1.5 cm (basidiocarps).



*Entoloma transvenosum* is characterized by the rather brittle, grey basidiocarps, transversely veined lamellae, strong farinaceous-rancid smell and taste, very brittle context, and fairly large spores. It belongs to subg. *Entoloma* sect. *Rhodopolia*. So far it was only known from the type-locality in Denmark (NOORDELOOS 1982). It has been re-found in Britain and Sweden, and an emended description is given. The British collection slightly deviates by having more distinctly heterodiametrical spores. *Entoloma transvenosum* seems to prefer rather open woodland, and relatively heavy soil.

***Entoloma reaae* (R. MAIRE) NOORDEL., Fungi Europei 5: 201. 1992. (Fig. 4)**

*Leptonia reaae* R. MAIRE, Trans. Brit. Mycol. Soc. 3: 170, pl. 11. 1910.

Pileus 6-15 mm broad, convex, with straight margin, hygrophanous, when moist translucently striate up to centre, blue-grey (KORNERUP & WANSCHER 1975: 19DE4-5), slightly pallescent on drying, smooth, glabrous, becoming finely innately radially fibrillose upon drying. Lamellae, L = 20-25, l = 3-5, distant, emarginate, broadly ventricose, sordid pink (Mu. 5 YR 7-6/3) with concolorous, entire edge. Stipe 20-45 x 1-2 mm, cylindrical, blue-grey concolorous with pileus, turning slate yellow-brown with age, smooth, polished. Context blue-grey, concolorous with pileus, pale blue in inner part. Smell and taste indistinct.

Spores 7.0-10(-11.0) x 6.0-8.0(-9.0)  $\mu\text{m}$ , average 8.5-9.5 x 7.0-7.5  $\mu\text{m}$ , Q = 1.1-1.4, average Q = 1.2, (sub-)isodiametrical, 6-7-angled in side-view. Basidia 30-42 x 7-10  $\mu\text{m}$ , 4-spored, clamped. Lamella edge fertile. Cystidia absent. Pileipellis an ixocutis of very narrow, cylindrical hyphae, 2-7  $\mu\text{m}$  wide, subpellis well-differentiated, made up of inflated elements, 15-40(-60) x 7-20  $\mu\text{m}$ . Pigment bluish, intracellular in pileipellis and pileitrama. Pileitrama regular, made up of inflated elements, 80-150 x 8-20  $\mu\text{m}$ . Clamp connections abundant in all tissues.

**Habitat:** in moist grassland.

**Collections examined:** United Kingdom: Derbyshire, Grindleford, 28 Sept. 1909, R. MAIRE (holotype, MPU); - Gloucestershire, Forest of Dean, Laymoore Quac, 22 Oct. 1988, M. E. NOORDELOOS 88104 (L).

Although MAIRE (1910) gave a good description and coloured illustration of *Leptonia reaae*, his species remained obscure for a long time. No species of true *Leptonia* seemed to fit with it, especially because of the isodiametrical spores. It was listed in DENNIS & al. (1960: 106), but in a note in the same publication (DENNIS & al. 1960: 200) it was stated: "retd. on account of subglobose spores and bluish colours but needs rediscovering and redescribing (no type material)". However, the holotype could be traced by the present author in MPU and has been studied during the revision of subg. *Leptonia* in Europe. The type study revealed that no true *Leptonia* species was involved, but the exsiccatum showed characters of a member of subg. *Entoloma* sect. *Polita*: e.g. simple, cutis-like pileipellis, clamped hyphae. During an *Entoloma* workshop of the British Mycological Society in the forest of Dean, Gloucestershire in October 1988, fresh material of *Leptonia reaae* was gathered, that enabled me to give the present redescription of MAIRE's taxon. The abundant clamp connections and nature of the pileipellis definitely place *Leptonia reaae* in subg. *Entoloma* sect. *Polita*, and accordingly the new combination has been made (NOORDELOOS 1992).



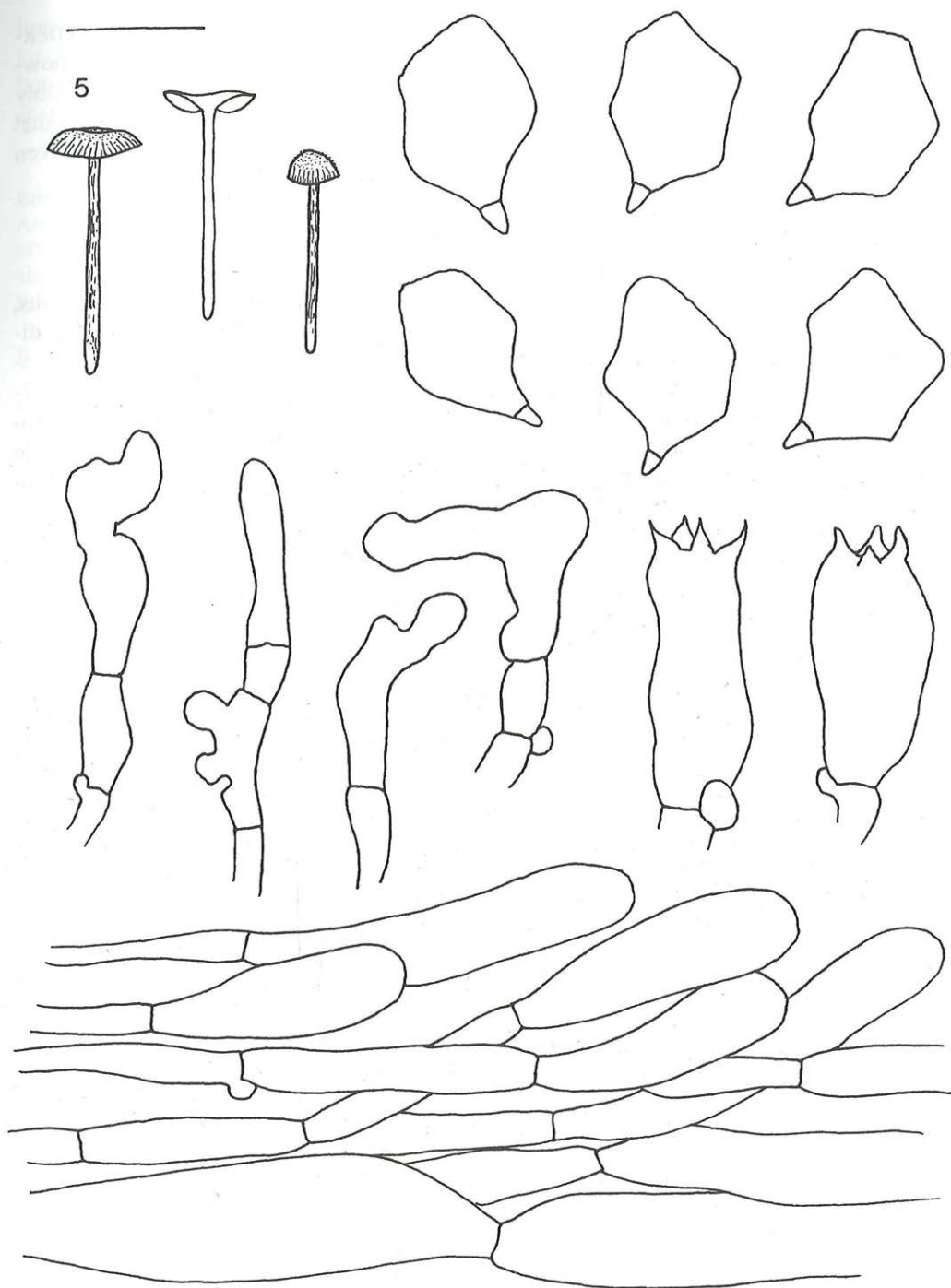


Fig. 5. *Entoloma lidbergii*. Habit, spores, basidia, cheilocystidia and pileipellis. All figures from holotype. Bar: 10  $\mu$ m (spores), 15  $\mu$ m (all other microscopical details), 1.5 cm (basidiocarps).

*Entoloma reaae* is very close to *E. caeruleopolitum* NOORDEL. & BRANDT-PEDERSEN, which differs by having a dark violaceous-brown pileus. The differences, however, are very small. When more material of both taxa will be available, preferably with more information as to the variability and habitat, it may well be possible that they have to be considered conspecific, and better regarded as varieties or even formae of one and the same taxon. In that case, the epithet *reaae* has priority.

***Entoloma lidbergii* NOORDEL., spec. nova. (Fig. 5)**

Basidiomata parva. Pileus 4-10 mm latus, convexus demum applanatus, hygrophanus, translucido-striatus, roseo-brunneolus, granulosus demum tomentosus. Lamellae distantes, liberae, ventricosae, roseae. Stipes 12-30 x 0,5-1 mm, cylindraceus, roseo-brunneus coeruleo striatus. Odore saporeque nullis. Sporae 9,0-11,0 x 7,0-8,0  $\mu$ m, 5-7-angulatae. Basidia 16-25 x (7,0-)9,0-15,0  $\mu$ m, tetrasporigera. Acies lamellarum heterogenea. Cheilocystidia sparsa, coralloidea, 30-90 x 5,0-10,0  $\mu$ m. Pileipellis cutis in trichoderma transiens, ex elementis clavatis, 40-70 x 8-17  $\mu$ m constituis pigmentis intracellulosis. Fibulae presentes. Habitat ad terram.

**Holotypus:** "Fungi of Sweden/M. E. NOORDELOOS 86100/25 Aug. 1986/ Medelpad, Borgsjö, Julåsen" (L).

**Etymology:** named in honour of ROLF LIDBERG, one of the founders and great inspirator of the Sundsvall Mycological Society.

Pileus 4-10 mm, convex then applanate, with blunt centre, with straight margin, hygrophanous, when moist translucently striate up to half of the radius, very pale pinkish brown (MUNSELL 5 YR 5/3), paler towards margin (5 YR 7/3), very finely punctate all over, becoming paler, opaque, finely tomentose upon drying. Lamellae, L = 10-16, l = 0-1, very distant, free, ventricose, pink, with entire, concolorous edge. Stipe 12-30 x 0.5-1 mm, cylindrical, violaceous-pink, entirely finely striate with blue fibrils, base white tomentose, but slowly turning yellow when bruised. Context very thin, concolorous with surface. Smell none. Taste not tried.

Spores 9.0-11.0 x 7.0-8.0  $\mu$ m, average 9.8 x 7.3  $\mu$ m, Q = 1.2-1.6, average Q = 1.35, rather regularly to slightly irregularly 5-7-angled in side-view. Basidia 16-25 x (7.0-)9.0-15.0  $\mu$ m, 4-spored, clamped. Lamella edge heterogeneous. Cheilocystidia single or in clusters among basidia, 30-90 x 5.0-10.0  $\mu$ m, often septate, irregularly coralloid. Hymenophoral trama regular, made up of inflated elements, up to 150 x 4-20  $\mu$ m. Pileipellis a cutis with transitions to a trichoderm, made up of clavate terminal elements, 40-70 x 8-17  $\mu$ m. Pigment pallid, intracellular in pileipellis. Clamps present in all tissues.

**Habitat:** solitary, terrestrial, on gravelly soil in road-side in boreal *Picea* forest with scattered *Salix caprea*, on slightly calcareous soil.

**Collection examined:** Sweden: Medelpad, Borgsjö, Julåsen, 25 Aug. 1986, M. E. NOORDELOOS 86100 (holotype, L).

*Entoloma lidbergii* clearly belongs to sect. *Leptonia* on account of its blue striate stipe and clamped hyphae. Also the heterogeneous lamella edge with scattered coralloid cheilocystidia is very typical for this group within the genus *Entoloma*. It differs from all taxa in sect. *Leptonia* by its very small size, and pale pinkish brown, trans-

lucently striate pileus. In my recent key to the European taxa (NOORDELOOS 1994) it keys out in key C close to *Entoloma callichroum* HORAK & NOORDEL., that differs, however, not only by its larger basidiocarps, but in particular by its larger, differently shaped spores and fertile lamella edge.

The author wishes to express his gratitude to the Sundsvall Mycological Society, Sweden, and the British Mycological Society, Great Britain to invite him to give *Entoloma* workshops in the Borgsjö Area, Medelpad, and the forest of Dean, Gloucestershire, 1986 and 1988 respectively. The director of MPU is thanked for the loan of the holotype of *Leptonia readei* MAIRE. Mr G. BRAIOTTA has been so kind to send some very interesting *Entoloma* taxa from Italy for study, and gave the permission to publish his photograph of *Entoloma henrici*.

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