

NEW TAXA OF ENTOLOMA (BASIDIOMYCETES, AGARICALES)  
FROM ESTONIA AND KARELIA

MACHIEL E. NOORDELOOS<sup>1</sup> & VELLO LIIV<sup>2</sup>

Nine new species of *Entoloma* are described from the Islands of Saaremaa and Vormsi, Estonia, viz. *E. conocybecystis*, *E. leochromus*, *E. mutabilipes*, *E. ochromicaceum*, *E. politoflavipes*, *E. rhynchocystidium*, *E. roseotinctum*, *E. viiduense*, and *E. violaceozonatum*. *Entoloma lactarioides* is described as new from Karelia.

The present paper is the result of many years of collecting and painting *Entoloma* species by the second author, who lives on the Island of Saaremaa, Estonia in an area extremely rich in *Entoloma* species. Saaremaa has the same geological origin as some other islands in the gulf of Bothnia, viz. Öland and Gotland, and is characterized by highly basic calcareous bedrock. On the island various vegetation types occur, among others also the Alvar type of open grassy vegetation with scattered Juniper trees, and a range of deciduous and coniferous or mixed forests on dry to fairly damp soil. Many taxa of *Entoloma* have been observed in these habitats, and studied and depicted over the years. The present paper gives diagnoses and full descriptions of ten new species of *Entoloma*, collected by Vello Liiv in Estonia and Karelia. Full descriptions and illustrations of all new taxa will be published in the European monograph of the whole genus *Entoloma* (Noordeloos, 1992), that will be accompanied by coloured plates of about 120 species, made by Vello Liiv.

1. *Entoloma violaceozonatum* Noordel. & Liiv, *spec. nov.*

Pileus 20–55 mm latus, truncato-conicus vel conicus, umbilicatus, haud hygrophanus, haud translucido-striatus, coeruleo-violaceus vel violaceobrunneus, zonatus, toto fibrilloso-squamulosus, opacus. Lamellae adnatae vel decurrentes, sordide brunneae demum brunneo-roseae acie concolore. Stipes 40–95 × 4–8 mm, violaceo-griseus, glaber, politus. Carne violaceo-griseus. Odore saporeque subfarinaceis. Sporae 10.0–11.5 × (7.0–)7.7–8.5 μm, Q = 1.25–1.4–1.5, heterodiametricae, 5–6-angulatae. Basidia 35–54 × 8–12(–14) μm, 4-sporigera, fibulata. Acies lamellarum sterilis. Cheilocystidia, 60–125 × 5–14 μm, clavata. Pileipellis trichodermatis elementis inflatis, 40–70(–120) × 8–20 μm pigmentis intracellulosis. Fibulae abundantae. Habitat in graminosis ad terram calcaream. Holotypus: *Vello Liiv* 275, 29-VII-1990, Viidumae, Saaremaa, Estonia (L; isotypus TAM).

Pileus 20–55 mm broad, truncate conical to convex with slightly to distinctly umbilicate centre and involute margin at first soon expanding to applanate or concave with irregularly undulating marginal zone, not hygrophanous, not translucently striate, when young blue-violaceous, then violaceous grey-brown, very strongly and coarsely radially fibrillose, in older specimens fibrillose-squamulose with uplifted squamules, especially in

1) Rijksherbarium / Hortus Botanicus, P.O. Box 9514, 2300 RA Leiden, The Netherlands.

2) Oismae 44-25, Tallinn EE 0035, Estonia.

central part, dull or shining. Lamellae adnate to decurrent, segmentiform to ventricose, sordid beige-brown when young then reddish brown (chocolate) with fimbriate, concolorous edge. Stipe 40–95 × 4–8 mm, usually distinctly broadened towards base, violaceous-grey more or less concolorous with expanded pileus, smooth, finely striate. Context violaceous-grey like surface. Smell en taste not distinctive to subfarinaceous.

Spores 10.0–11.5 × (7.0–)7.7–8.5 μm, average spore 10.8 × 7.8 μm, Q = 1.25–1.4–1.5, heterodiametrical, 5–6-angled in side-view with rather pronounced angles. Basidia 35–54 × 8–12(–14) μm, 4-spored, clamped. Lamella edge entirely sterile with dense clusters of very long, (sub)cylindrical cheilocystidia, 60–125 × 5–14 μm. Hymenophoral trama regular, made up of subcylindrical elements, 130–300 × 5–15 μm. Pileipellis a cutis with transitions to a trichoderm, made up of septate, cylindrical hyphae, 6–15 μm wide with cylindrical to narrowly clavate terminal elements, 40–70(–120) × 8–20 μm. Pigment very abundant, brown, diffusely and granulose-intracellular in pileipellis. Pileitrama regular, made up of long, cylindrical to slightly inflated elements, up to 500 × 4–30 μm. Clamps abundant.

*Habitat.* In grassy places on calcareous soil.

*Collection examined.* Estonia, Saaremaa, Viidumae, 29 July 1990, *Vello Liiv* 275 (holotype, L; isotype, TAM).

*Entoloma violaceozonatum* belongs to section *Leptonia* on account of the clamped setae and pileipellis that is made up of long, septate hairs. The fibrillose-zonate aspect of the pileus is very distinctive and reminds of the pileal surface of *E. undatum*. *Entoloma dichroum* and *E. allochroum* are very close, but differ among other things by the pale lamellae and a heterogeneous lamella edge with differently shaped cheilocystidia. *Entoloma allochroum* differs furthermore by having encrusting pigments in the pileipellis.

## 2. *Entoloma viiduense* Noordel. & Liiv, *spec. nov.*

Pileus 20–70 mm latus, truncato-conicus vel convexus, margine involutus, centro depressus vel umbilicatus, haud hygrophanus, haud translucido-striatus, coeruleo-griseus vel violaceo-griseus, demum violaceo-brunneus, toto squamulosus. Lamellae adnato-decurrentes, sordide roseae acies concolorae. Stipes 40–130 × 5–12 mm, cylindraco-flexuosus vel compressus, coeruleus vel griseus, demum violaceo-griseus vel violaceo-brunneus, glaber, politus. Sporae 9.3–12.5(–15) × 7.2–9.3 μm, 5–7(–8) angulatae. Basidia 44–65 × 14–17 μm, 4-sporigera, efibulata. Acies lamellarum fertilis. Pileipellis cutis vel trichoderma hyphis ad 25 μm lata, pigmentis intracellulosis. Fibulae adsunt. Habitat ad terram in silvis. Holotypus: *Vello Liiv* 178, 263, Viidu, Saaremaa, Estonia (L; isotypus in TAM).

Pileus 20–70 mm broad, truncate conico-convex or convex with involute margin at first then irregularly appanate with undulating marginal zone, with depressed to umbilicate centre, not or only weakly hygrophanous, blue-grey to violaceous grey, fading to violaceous brown with age, not translucently striate, strongly radially fibrillose becoming squamulose with more or less concentric circles of suberect, pointed squamules. Lamellae adnate or with small decurrent tooth, segmentiform to broadly ventricose, up to 12 mm broad, sometimes strongly curled, sordid pink with concolorous, entire edge. Stipe 40–130 × 5–12 mm, flexuose, often compressed with longitudinal groove, often gradually broadened towards base, in upper part initially blue, lower part blue-grey, often turning violaceous-blue or violaceous-brown with age, smooth, glabrous, polished, base white tomentose. Context blue-grey in cortex, inner parts pale. Smell and taste indistinct.

Spores  $9.3\text{--}12.5(-15) \times 7.2\text{--}9.3 \mu\text{m}$ , average spore  $11.5 \times 8.7 \mu\text{m}$ ,  $Q = 1.2\text{--}1.4\text{--}1.8$ , rather pronouncedly  $5\text{--}7(-8)$ -angled in side-view. Basidia  $44\text{--}65 \times 14\text{--}17 \mu\text{m}$ , 4-spored, clampless. Lamella edge fertile, rarely some scattered cylindrical sterile cells found, no real cheilocystidia present. Hymenophoral trama regular, made up of long, inflated elements,  $140\text{--}250 \times 10\text{--}22 \mu\text{m}$ . Pileipellis a transition between a cutis and a trichoderm, made up of inflated hyphae with subcylindrical to clavate terminal elements,  $55\text{--}140 \times 15\text{--}25 \mu\text{m}$ . Pigment abundant, greyish, intracellular in pileipellis. Brilliant granules abundant. Clamps absent.

*Habitat.* Terrestrial in large groups in mixed forest on calcareous soil.

*Collections examined.* Estonia, Saaremaa, Viidu, nature reserve, 14 Aug. 1985, *Vello Liiv 178* (L); ditto, 27 July 1990, *Vello Liiv 263* (holotype, L; isotype, TAM).

*Entoloma viiduense* is a fairly robust species of *Leptonia*, sect. *Cyanula*. A very distinctive feature of this taxon is the colour that changes from blue or blue grey in young and fresh specimens to violaceous-brown in old and weathered specimens. Old stages may be confused with *E. nigroviolaceum*, but that species is violaceous-black or violaceous brown already from the beginning, and its stipe is fibrillose-striate, often also apically flocculose. Also the ecological range of *E. nigroviolaceum* is different, as it grows under fairly acid conditions in meadows and *Sphagnum*-bogs. *Entoloma scabrosum*, that also has been found in the forests of Viidu, has a grey-brown, translucently striate pileus, and a innately fibrillose stipe.

### 3. *Entoloma rhynchocystidium* Noordel. & Liiv, *spec. nov.*

Pileus  $30\text{--}60 \text{ mm}$  latus, conicus demum applanatus, subumbilicatus, margine involutus demum deflexus, haud hygrophanus, haud translucido striatus, griseo-brunneus tincto ochraceus, centro obscurior, margine tincto violaceo, toto fibrilloso squamulosus. Lamellae confertae, emarginatae, ventricosae, sordide roseae acie concolores. Stipes  $30\text{--}75 \times 3\text{--}6 \text{ mm}$ , cylindraceus, griseo-violaceus, politus. Odore saporeque inconspicuis. Sporae  $(8.0\text{--})8.5\text{--}11.0(-11.5) \times 7.0\text{--}8.5 \mu\text{m}$ ,  $5\text{--}7$ -angulatae. Basidia  $24\text{--}40 \times 8\text{--}14 \mu\text{m}$ , 2- vel 4-sporigera, efbulata. Acies lamellarum sterilis. Cheilocystidia,  $25\text{--}45(-70) \times 7\text{--}15(-20) \mu\text{m}$ , clavata apice mucronata vel rostrata vel lageniformibus. Pileipellis trichoderma elementis inflatis,  $30\text{--}80(-110) \times 10\text{--}25 \mu\text{m}$  pigmentis intracellulosis. Fibulae nullae. Habitat in vegetazione nominatur 'Alvar'. Holotypus: *Vello Liiv 220*, 9-IX-1986, Svybi, Saaremaa, Estonia (L; isotype TAM).

Pileus  $30\text{--}60 \text{ mm}$  broad, convex to applanate, slightly depressed at centre, with involute then deflexed margin, with undulating marginal zone with age, not hygrophanous, grey-brown with ochraceous tinge, darker at centre and margin with distinct violaceous tinge, entirely radially fibrillose-squamulose with fine, pointed squamules. Lamellae moderately crowded, adnate-emarginate, ventricose, sordid pink with concolorous edge. Stipe  $30\text{--}75 \times 3\text{--}6 \text{ mm}$ , cylindrical, flexuose, slightly broadened at base, grey with distinct violaceous tinge, smooth, polished, base white tomentose. Context grey. Smell and taste indistinct.

Spores  $(8.0\text{--})8.5\text{--}11.0(-11.5) \times 7.0\text{--}8.5 \mu\text{m}$ , average spores  $9.4 \times 8.2 \mu\text{m}$ ,  $Q = 1.1\text{--}1.2\text{--}1.3(-1.5)$ ,  $5\text{--}7$ -angled in side-view with rather weak angles, thin-walled. Basidia  $24\text{--}40 \times 8\text{--}14 \mu\text{m}$ , 2- and 4-spored, clampless. Lamella edge entirely sterile with masses of densely clustered cheilocystidia,  $25\text{--}45(-70) \times 7\text{--}15(-20) \mu\text{m}$ , clavate with mucronate to rostrate apex or lageniform. Hymenophoral trama regular, made up of medium-sized, subcylindrical to inflated elements,  $150\text{--}220 \times 6\text{--}25 \mu\text{m}$ . Pileipellis a

trichoderm of inflated terminal elements, 30–80(–110) × 10–25 µm. Pigment brownish, intracellular in pileipellis. Pileitrama regular, made up of inflated elements, 100–230 × 4–30 µm. Clamps absent.

*Habitat.* In *Juniperus*-heath on calcareous soil.

*Collections examined.* Estonia, Vormsi, near the village Svybi, 9 Sept. 1986, *Vello Liiv* 220 (holotype, L; isotype, TAM).

*Entoloma rhynchocystidium* belongs to subgenus *Leptonia*, sect. *Rhamphocystotae* (Largent) Noordel. on account of its large, rostrate cheilocystidia. No similar species is known from Europe. *Entoloma subcorvinum* from North America differs by having deep blue colours in pileus and stipe, and larger cheilocystidia.

#### 4. *Entoloma leochromus* Noordel. & Liiv, *spec. nov.*

Pileus 10–40 mm latus, truncate-conicus vel convexus, margine inflexus, centro depressus vel umbilicatus, haud hygrophanus, haud translucido striatus, moderate flavo-griseus vel griseo brunneus, toto velutinus vel squamulosus. Lamellae adnatae vel decurrentes, albidae demum roseae vel roseo-brunneae acie concolore. Stipes 50–90 × 2–4 mm, cylindraceus, pileo concolor, politus. Sporae 9.0–13.0 × 7.0–8.0(–9.5) µm, 5–9 angulatae. Basidia 4-spored, efibulata. Acies lamellarum fertiles. Pileipellis trichoderma vel hymeniderma elementis late clavatis vel globosis, 20–30 µm latis pigmentis intracellulosis. Fibulae nullae. Habitat in silvis frondosis (*Fraxinus*, *Alnus*). Holotypus: *Vello Liiv* 269, Viidu, Saaremaa, Estonia (L; isotype TAM).

Pileus 10–40 mm broad, truncately conical to convex with slightly depressed to umbilicate centre, with involute then deflexed margin, not hygrophanous, not translucently striate, pale to moderately dark yellowish grey to greyish brown, entirely granulose-velutinous to distinctly squamulose with small, semi-erect squamules, then usually also with distinct calotte, dull or somewhat shining. Lamellae adnate to decurrent, arcuate to segmentiform or subventricose, white then pink finally reddish-brown, with entire, concolorous edge. Stipe 50–90 × 2–4 mm, cylindrical, usually slightly curved and broadened towards base, yellowish grey, paler or almost concolorous with pileus, smooth, glabrous, polished, base white tomentose, but slowly staining pinkish red when picked. Context pale yellowish-grey in cortex, pallid in inner parts. Smell none. Taste bitter.

Spores 9.0–13.0 × 7.0–8.0(–9.5) µm, average spore 11.1 × 7.5 µm, Q = 1.3–1.5–1.7, irregularly heterodiametrical, 5–9-angled in side-view with rather pronounced angles. Basidia 4-spored, clampless. Lamella edge fertile. Cystidia absent. Hymenophoral trama regular, made up of cylindrical to slightly inflated elements, 100–300 × 4–25 µm. Pileipellis a trichoderm at margin, a hymeniderm at centre, made up of broadly clavate to subglobose elements, 35–80 × 20–30 µm. Pigment abundant, brown, intracellular in pileipellis. Brilliant granules very abundant in trama of pileus. Clamps absent.

*Habitat.* In deciduous forest (*Fraxinus*, *Alnus*) with dense undergrowth of *Rubus*.

*Collections examined.* Estonia, Saaremaa, Viidu, nature reserve, 27 July 1990, *Vello Liiv* 265 and 28 July 1990, *Vello Liiv* 269 (holotype, L; isotype, TAM).

The most distinctive features of *Entoloma leochromus* are the yellowish grey fruit-bodies, opaque, granulose to squamulose, not translucent pileus, polished stipe and fertile lamella edge. *Entoloma turci* is similar, but has much darker colours and a sterile, often brown-coloured lamella edge. *Entoloma longistriatum* differs in colour, translucently striate pileus, and sterile lamella edge.

### 5. *Entoloma ochromicaceum* Noordel. & Liiv, *spec. nov.*

Pileus 12–35 mm latus, truncato-conicus demum convexus margine involutus, subhygrophanus, ad marginem subtiliter translucido striatus, pallide ochraceo-griseus, toto granuloso-micaceus. Lamellae adnatae, albidae demum roseae acie concolore vel in parte brunneolus. Stipes 35–65 × 1–3 mm, cylindraceus, pileo concolorus vel pallidiorus, glaber, politus. Contextus albidus. Odore saporeque nullis. Sporae 9.0–11.5 × 7.0–8.5 μm, 5–6-angulatae. Basidia 4-sporigera, efibulata. Acies lamellarum sterilis. Cheilocystidia 20–50 × 7–20 μm, clavata vel globosa, utriformia vel lageniformia. Pileipellis trichoderma elementis 8–22 μm lata pigmentis intracellulosis. Fibulae nullae. Habitat in locis graminosis in silvis. Holotypus: *Vello Liiv 295*, 22-VIII-1991, Viidu, Piskuna-house, Saaremaa, Estonia (L; isotypus TAM).

Pileus 12–35 mm broad, truncate conical at first then convex finally irregularly plano-convex with involute then deflexed margin, with undulating marginal zone when old, slightly hygrophanous, when moist tender beige-ochraceous, only very slightly translucently striate at margin only, granulose on limb, minutely squamulose in central part, shining, micaceous. Lamellae narrowly adnate, narrowly ventricose, white then purely pink with in part brownish edge. Stipe 35–65 × 1–3 mm, cylindrical, slightly curved and bent towards base, concolorous with pileus or paler, smooth, glabrous. Context purely white. Smell and taste not distinctive.

Spores 9.0–11.5 × 7.0–8.5 μm, average spore 10.1 × 7.5 μm, Q = 1.2–1.35–1.5, rather pronouncedly 5–6-angled in side-view. Basidia 26–40 × 9–13 μm, 4-spored, clampless. Lamella edge entirely sterile of serrulatum-type; cheilocystidia 20–50 × 7–20, clavate to globose, utriform to lageniform, thin-walled, sometimes with brown, intracellular pigment, especially in lower strand of hyphae on which the cheilocystidia are born. Pileipellis a cutis with transitions to a trichoderm, made up of inflated hyphae, 8–15 μm wide with clavate terminal elements, 45–120 × 8–22 μm. Pigment abundant, brown, intracellular in pileipellis. Pileitrama regular, made up of more or less cylindrical hyphae, 9–22 μm wide. Brilliant granules very abundant in pileitrama. Clamps absent.

*Habitat.* In groups on grassy spot in deciduous forest.

*Collection examined.* Estonia, Saaremaa, Viidu, near the Piskuna house, 22 Aug. 1990, *Vello Liiv 295* (holotype, L; isotype, TAM).

*Entoloma ochromicaceum* clearly belongs in the group of *E. longistriatum*, from which it differs by the pale coloured, hardly striate, entirely granulose-micaceous pileus, and structure of the lamella edge. The poorly known species *Rhodophyllus caliginosus* Romagn. & Favre is also close, but has a darker brown, striate, smooth or slightly granulose pileus, brown lamellae and a grey stipe.

### 6. *Entoloma lactarioides* Noordel. & Liiv, *spec. nov.*

Habitus Lactarii species revocat. Pileus 15–35 mm latus, convexus demum concavus, umbilicatus, paulisper hygrophanus, haud translucido striatus, modice griseo-brunneus roseo-tinctus, fibrillosus. Lamellae moderate distantes, adnato-decurrentes, pallide griseae demum griseo-roseae. Stipes 20–40 × 2–5 mm, cylindraceus, roseus griseo-tinctae, politus. Odore saporeque nullae. Sporae 7.5–9.2 × 7.5–8.5 μm, 5–6-angulatae. Basidia 30–46 × 8–15 μm, 4-sporigera, fibulata. Acies lamellarum fertiles. Cystidia nulla. Pileipellis cutis hyphis cylindraceis, 2–7 μm latis interdum cum elementis terminalis clavatis, 7–21 μm latis, pigmentis intracellulosis interdum in additione incrustatis. Fibulae abundantes. Habitat in pratis. Holotypus: *Vello Liiv 217*, 16 IX-1991, Otradnoje, Karelia (L; isotypus in TAM).

Pileus 15–35 mm broad, convex to concave, umbilicate to infundibuliform, with involute then deflexed margin, slightly hygrophanous, when moist moderately dark grey-brown with pinkish tinge, not translucently striate, entirely covered with fine fibrillose patches, slightly pallescent on drying. Lamellae, L = 25–35, l = 3–7, moderately distant, adnate-decurrent, segmentiform to ventricose, greyish white then sordid pink with concolorous, entire edge. Stipe 20–40 × 2–5 mm, cylindrical, sometimes flexuose or curved at base, pinkish with grey or brown tinge, smooth, glabrous. Context pallid. Smell and taste none.

Spores 7.5–9.2 × 7.5–8.5 μm, average 8.2 × 7.7 μm, Q = 1.0–1.15–1.25, 5–6-angled in side-view with rather pronounced angles. Basidia 30–46 × 8–15 μm, 4-spored, clamped. Lamella edge fertile. Cystidia absent. Hymenophoral trama regular, made up of short, inflated elements, 30–170 × 7–21 μm. Pileipellis a cutis of narrow, cylindrical hyphae, 2–7 μm wide, with scattered tufts of inflated, repent or ascending terminal elements, 30–90 × 5–15(–20) μm. Pileitrampa regular, made up of short elements, 60–150(–200) × 10–25 μm. Pigment pale brown, intracellular, in addition finely encrusting on a few hyphae in pileipellis and upper pileitrampa. Clamps abundant.

*Habitat.* In meadow.

*Collection examined.* Russian Federation, Karelia, Otradnoje, 16 Sept. 1986, *Vello Liiv 217* (holotype, L; isotype, TAM).

The distinctive characters of *Entoloma lactarioides* are the omphalioid fruit-bodies with distinct pinkish tinges, the not striate, fibrillose pileus, and the smooth and glabrous stipe. The fibrillose patches on the pileal surface consist of tufts of inflated elements, arising from a rather simple cutis-like structure which is normally in subgenus *Entoloma*. Also the structure of the trama, with short elements, place this species in subgenus *Entoloma*. Therefore *Entoloma lactarioides* is accommodated in this subgenus. The habit and smooth stipe are distinctive for section *Polita*, in which it is provisionally accommodated, since the aspect and pigmentation of the pileal surface is rather aberrant for section *Polita*.

## 7. *Entoloma conocybecystis* Noordel. & Liiv, *spec. nov.*

Pileus 45 mm latus, plano-convexus, umbonatus, margine deflexus, haud hygrophanus, haud translucido-striatus, violaceo-ochraceus, radialiter fibrillosus. Lamellae moderate distantes, liberae, ventricosae, roseo-brunneae. Stipe 95 × 5 mm, cylindraceus, ochraceus, argenteo-striatus. Odore saporeque nullae. Sporae 8.2–10.5 × 6.2–7.7(–8.5) μm, 6–7 angulatae. Basidia tetrasporigera, fibulata. Acies lamellarum heterogeneis. Cheilocystidia 35–55 × 8–12 × 1.5–5 × 4–8 μm, lecitiformia, abundantia. Pileipellis trichoderma elementis inflatis 10–25 μm latis pigmentis intracellulosis. Fibulae in hymenio presentes. Habitat in graminosis in associacione Juniperi. Holotypus: *Vello Liiv 124*, 14-VIII-1984, Kipi, Saaremaa, Estonia (L; isotypus in TAM).

Pileus 45 mm broad, plano-convex with low umbo, with deflexed margin, not hygrophanous, not translucently striate, ochraceous with slight violaceous tinge, radially fibrillose. Lamellae, L = about 40, l = 3–5, moderately distant, free, ventricose, brown with pink tinge. Stipe 95 × 5 mm, cylindrical with slightly broadened base, ochraceous, paler than pileus, densely silvery fibrillose all over. Context white, in base of stipe yellowish. Smell and taste not distinctive.

Spores 8.2–10.5 × 6.2–7.7(–8.5) μm, average spore 9.2 × 6.7 μm, Q = 1.3–1.4–1.7, heterodiametrical, 6–7-angled in side-view. Basidia 30–36 × 10–16 μm, 4-spored,

clamped. Lamella edge (almost) sterile. Cheilocystidia  $35\text{--}55 \times 8\text{--}12$  (base)  $\times 1.5\text{--}5$  (neck)  $\times 4\text{--}8$  (capitulum), lecythiform, often with slimy cap round capitulum; numerous. Hymenophoral trama regular, made up of very long, fusoid elements, up to  $600 \times 18\text{--}35$   $\mu\text{m}$ . Pileipellis a cutis with transitions to a trichoderm, made up of long, inflated elements,  $60\text{--}260 \times 10\text{--}25$   $\mu\text{m}$ . Pigment brown, intracellular in pileipellis. Pileitrama regular, made up of long, inflated elements,  $350\text{--}550 \times 25\text{--}45$   $\mu\text{m}$ . Clamps present in hymenium, not seen in other tissues.

*Habitat.* In dry *Juniperus*-heath on calcareous soil.

*Collection studied.* Estonia, Saaremaa, Kipi, 14 Aug. 1984, *Vello Liiv 124* (holotype, L; isotype, TAM).

The distinctive characters of *Entoloma conocybecystis* are the relatively pale ochraceous-violaceous colour of the pileus, pale lamellae, pallid, ochraceous stipe, and perfectly tibiiform cheilocystidia. It belongs to subgenus *Trichopilus*, and is close to *E. elodes*, that has darker fruit-bodies, larger spores, and a completely different habitat in peatbogs among *Sphagnum*. *Entoloma jubatum* is also close, but has much darker fruit-bodies, and less distinctly lecythiform cheilocystidia. *Entoloma porphyrophaeum* has a very different porphyraceous-brown colour and larger spores. *Entoloma fuscotomentosum* has a squamulose, grey-brown pileus, pale greyish-pink lamellae, and less distinctly lecythiform cheilocystidia.

*Entoloma conocybecystis* is only known with certainty from Saaremaa but has also been observed in the Netherlands.

## 8. *Entoloma polito flavipes* Noordel. & Liiv, *spec. nov.*

Pileus 10–35 mm latus, semiglobosus vel convexus margine deflexus vel rectus, umbilicatus, hygrophanus, translucido striatus, flavo-brunneus vel brunneus centro obscurior, toto fibrillosus vel velutinus, centro subtiliter squamulosus. Lamellae adnato-decurrentes, segmentiformia vel ventricosae, albae demum roseae. Stipes 30–50  $\times$  1–2 mm, cylindraceus, flavidus, politus. Odore saporeque nullae. Sporae 7.0–9.5  $\times$  6.0–8.5  $\mu\text{m}$ ,  $Q = 1.1\text{--}1.3\text{--}1.5$ , heterodiametricae, 5–7-angulatae. Basidia 4-sporigera, fibulata. Acies lamellarum fertilis. Pileipellis cutis vel trichoderma elementis cylindraceus vel inflatis, ad 20  $\mu\text{m}$  latis pigmentis intracellulosis. Fibulae presentes. Habitat in pratis. Holotypus: *Vello Liiv 171*, 11-VIII-1985, Viidu, Saaremaa, Estonia (L; isotype in TAM).

Pileus 10–35 mm broad, semiglobose to convex with deflexed or straight margin, umbilicate, hygrophanous, when moist translucently striate, yellow-brown to brown with dark brown centre, slightly pallescent on drying, entirely finely fibrillose-felted, centre minutely squamulose. Lamellae broadly adnate-decurrent, broadly segmentiform to sub-ventricose, not extending under pileus, white then pink finally brownish pink, with concolorous, entire edge. Stipe 30–50  $\times$  1–2 mm, cylindrical, straight or flexuose, often slightly curved at base, yellow, much paler than pileus, smooth, glabrous, polished, base white tomentose. Context pallid. Smell and taste not distinctive.

Spores 7.0–9.5  $\times$  6.0–8.5  $\mu\text{m}$ , average spore 8.1–8.5  $\times$  6.3–6.9  $\mu\text{m}$ ,  $Q = 1.1\text{--}1.3\text{--}1.5$ , heterodiametrical, 5–7-angled in side-view. Basidia 20–35  $\times$  6–11  $\mu\text{m}$ , 4-spored, clamped. Lamella edge fertile. Cystidia absent. Pileipellis a cutis with transitions to a trichoderm, made up of cylindrical to inflated elements, up to 20  $\mu\text{m}$  wide. Pigment abundant, brown, intracellular in pileipellis. Clamps abundant.

*Habitat.* In meadow on calcareous soil.

*Collections examined.* Estonia, Saaremaa, Viidu, 11 Aug. 1985, *Vello Liiv 171* (holotype, L; isotype, TAM); ditto, 21 Aug. 1984, *Vello Liiv 135*; ditto, 26 July 1990, *Vello Liiv 259* (all in L).

*Entoloma politoflavipes* belongs to section *Griseorubida*, subsect. *Parvisporae* on account of its Leptonioid habit, clamped basidia, trichodermal pileipellis and small spores. It comes close to *E. farinasprellum*, which has dark grey-brown fruit-bodies and a farinaceous smell. *Entoloma olivaceotinctum* and *E. weholtii* differ in colour and by having a sterile lamella edge with well-differentiated cheilocystidia.

### 9. *Entoloma mutabilipes* Noordel. & Liiv, *spec. nov.*

Pileus 10–20 mm latus, convexus demum plano-convexus, umbilicatus, hygrophanus, translucidostriatus, pallide roseo-alutaceus, centro obscuriore, expallens, glabrus centro squamulosus; lamellae quasi liberae, ventricosae, albidae demum roseae; stipes 30–45 × 1–2 mm, cylindraceus, azureus demum pallide griseus, glabrus, politus. Odore saporeque nullis. Sporae 9.0–12.0 × 7.5–9.5 μm, Q = 1.1–1.3–1.5, 5–8-angulatae; basidia 23–40 × 7.5–12 μm, 4-sporigera, efibulata; acies lamellarum sterilis vel heterogeneis; cheilocystidia 24–70 × 6–15 μm, cylindracea vel clavata. Pileipellis cutis vel trichoderma elementis cylindraceis vel clavata, ad 20 μm lata pigmentis intracellulosis; fibulae desunt. Holotypus: *Vello Liiv 300*, 26-IX-1990, Viidu, Saaremaa, Estonia (L; isotypus in TAM).

Pileus 10–20 mm broad, convex to plano-convex, umbilicate, with deflexed or straight, crenate margin, hygrophanous, when moist translucently striate up to three-quarter of the radius, pale beige with slight pink tinge with darker, grey-brown centre (calotte), pallescent to pale grey with darker centre, almost glabrous at margin, at centre minutely squamulose. Lamellae almost free, ventricose, white then almost purely pink with concolorous, entire edge. Stipe 30–45 × 1–2 mm, cylindrical, sky-blue when young, soon becoming pale grey, smooth, polished, base white tomentose. Context pallid. Smell and taste indistinct.

Spores 9.0–12.0 × 7.5–9.5 μm, average 10.6 × 7.9 μm, Q = 1.1–1.3–1.5, heterodiametrical, 5–8-angled in side-view. Basidia 23–40 × 7.5–12 μm, 4-spored, clampless. Lamella edge usually entirely sterile, sometimes heterogeneous, with dense clusters of cystidia mixed among fertile basidia. Cheilocystidia 24–70 × 6–15 μm, cylindrical to clavate. Hymenophoral trama regular, made up of cylindrical to inflated hyphae, elements 110–300 × 4–20 μm. Pileipellis a cutis of cylindrical, 4–15 μm wide hyphae with scattered trichodermal tufts of ascending, clavate terminal elements, 20–70 × 12–22 μm. Pigment brownish, intracellular in pileipellis. Brilliant granules and oily guttules very abundant in trama. Clamps absent.

*Habitat.* In large group in grassy spot in deciduous forest.

*Collection examined.* Estonia, Saaremaa, Viidu, 26 Sept. 1990, *Vello Liiv 300* (holotype, L; isotype, TAM).

*Entoloma mutabilipes* belongs to stirps *Asprellum* on account of the strongly striate subglabrous pileus and blue-grey, polished stipe. It differs from all known taxa in this group in the tender pinkish yellow-grey colour of the pileus, in combination with a sterile lamella edge.

### 10. *Entoloma roseotinctum* Noordel. & Liiv, *spec. nov.*

Pileus 15–35 mm latus, convexus, umbilicatus, haud hygrophanus, haud translucido-striatus, griseo-roseus, radialiter fibrillosus vel squamulosus; lamellae liberae, ventricosae, albae demum roseae; stipes 25–50 × 2–3 mm, cylindraceus, griseus, glaber, politus. Odore saporeque nullis; sporae 9–11 × 6–7.7 μm, 5–7-angulatae; basidia 4-sporigera, efibulata; acies lamellarum steriles; cheilocystidia 25–60 × 8–13 μm, clavata vel lageniformia; pileipellis trichoderma vel hymeniderma elementis clavatis ad 30 μm latis pigment intracellulosi; fibulae desunt. Holotypus: *Vello Liiv 181*, 15-VIII-1985, Viidu, Saaremaa, Estonia (L; isotypus in TAM).

Pileus 15–35 mm broad, convex, umbilicate, with deflexed margin, not hygrophanous, not translucently striate, tender greyish pink, radially fibrillose, finely grooved in marginal zone. Lamellae free, ventricose, white then purely pink with concolorous, entire edge. Stipe 25–50 × 2–3 mm, cylindrical with distinctly broadened, almost bulbous base, grey, glabrous, polished, base white tomentose. Context pallid. Smell and taste indistinct.

Spores 9.0–11.0 × 6.0–7.7 μm, average spore 9.9 × 7.1 μm, Q = 1.2–1.4–1.6, heterodiametrical, 5–7-angled in side-view. Basidia 4-spored, clampless. Cheilocystidia 25–60 × 8–13 μm, clavate to lageniform, in dense clusters. Pileipellis a trichoderm at margin, a hymeniderm at centre, made up of (broadly) clavate terminal elements, 30–70 × 12–20 μm. Pigment intracellular in pileipellis. Clamps absent.

*Habitat.* In groups in forest.

*Collections examined.* Estonia, Saaremaa, Viidu, nature reserve, 15 Aug. 1985, *Vello Liiv 181* (holotype, L; isotype, TAM).

*Entoloma roseotinctum* is distinctive on account of its greyish-pinkish pileus, grey stipe, and sterile lamella edge.

#### REFERENCE

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