

New and interesting *Entoloma* species from Central Europe

MACHIEL E. NOORDELOOS

National Herbarium of the Netherlands
Leiden University Branch, P. O. Box 9514
NL-2300 RA Leiden, The Netherlands
Email: Noordeloos@nhn.leidenuniv.nl

ANTON HAUSKNECHT

Fakultätszentrum für Biodiversität der Universität Wien
Rennweg 14
A-1030 Wien, Österreich
Email: ahausknecht.oemg@aon.at

Accepted 22. 10. 2009

Key words: *Agaricales*, *Entolomataceae*, *Entoloma*. – New species. – Mycoflora of Austria, Germany, Hungary, and Italy.

Abstract: Four new taxa of the genus *Entoloma* from Central Europe, viz. *Entoloma polyangulatum*, *E. cuboidoalbum*, *E. paradoxale*, and *E. sanvitalense* var. *cystidium* are described and fully illustrated. Furthermore, recent records of the rare species *E. pluteisimilis*, *E. kallioi* and *E. aff. malençonii* are presented. Colour plates of six taxa are given.

Zusammenfassung: Vier neue Taxa der Gattung *Entoloma* aus Mitteleuropa, nämlich *Entoloma polyangulatum*, *E. cuboidoalbum*, *E. paradoxale* und *E. sanvitalense* var. *cystidium* werden beschrieben und voll illustriert. Weiters werden aktuelle Funde von seltenen Arten, wie *E. pluteisimilis*, *E. kallioi* und *E. aff. malençonii* vorgestellt. Sechs Taxa werden farbig abgebildet.

During the last years, some *Entoloma* collections of the second author remained unidentified, due to his engagement with other genera, viz. *Bolbitiaceae*. Therefore, the last common publication of both the authors on *Entoloma* species from Europe is seven years old (NOORDELOOS & HAUSKNECHT 2002). Later, three further Central European taxa of the genus were described in NOORDELOOS (2004).

Herbarium material is deposited in the herbaria WU and L.

New taxa

Entoloma polyangulatum NOORDEL. & HAUSKN., spec. nova (Figs. 1, 7)

MycoBank MB 515311

Latin description: Pileus 5-14 mm latus, hemisphaericus ad convexus margine involuto, hygrophanus, translucente striatus et griseo-brunneus in statu humido, pallidior in statu sicco, ochraceo-griseus, pallide griseus, micaceus, subtiliter fibrillosus. Lamellae late adnatae vel dente decurrentes, moderate distantes, valde ventricosae, brunneae acie lamellarum concolora integrae. Stipes 15-22 × 1-2 mm, cylindricus, ochraceo-griseus, apice subtiliter pruinosis, deorsum glaber, politus. Odor indistinctus. Sporae

7,0-9,5 × 6,5-8 µm, Q = 1,0-1,15, isodiametricae, multiangulatae angulis infirmis, tenuitunicatae. Basidia 20-30 × 7-9 µm, tetrasporigera. Acies lamellarum heterogeneis. Cheilocystidia 20-42 × 5-11 µm, abundantia, clavata, fusiformia vel lageniformia, tunicis refringentibus. Pileipellis cutis ex hyphis septatis, cylindricis, 4-10 µm latis, constituta. Pigmentum brunneum, valde incrustans hyphas pellis et tramae pilei. Pileitrama regularis, ex elementis mediocribus usque ad 25 µm latis constituta. Fibulae desunt. Habitat in sylvis frondosis thermophilis.

Holotypus: Austria, Niederösterreich, Mistelbach, Wolkersdorf im Weinviertel, Münichsthal (MTB 7664/2), 29. 7. 2001, leg. T. BARTA (WU 27147; isotypus in L).

Etymology: named after the remarkably polyangular, isodiametric spores.

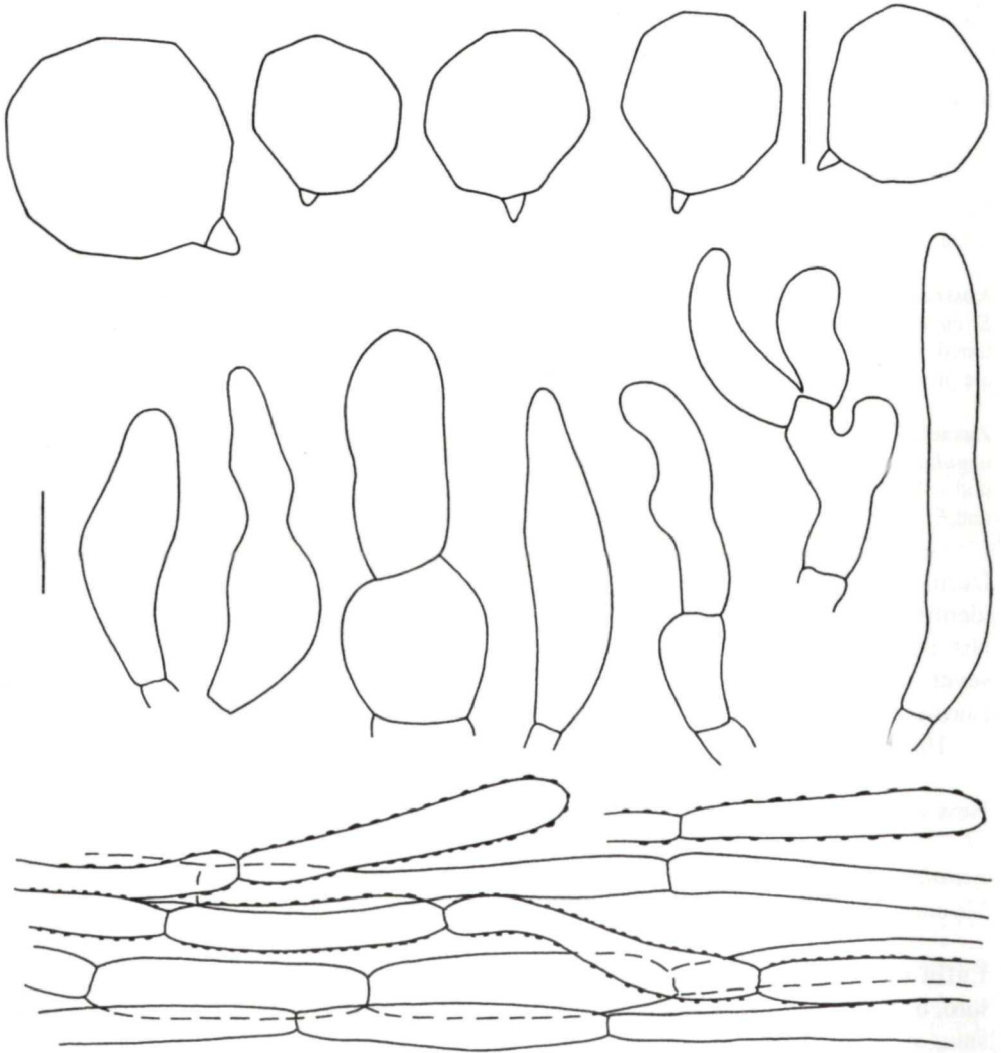


Fig. 1. *Entoloma polyangulatum*. Spores, cheilocystidia and pileipellis. – Bars: 10 µm.

Characters:

Pileus: 5-14 mm wide, up to 7 mm high, hemispherical to convex with involute margin, hygrophanous, translucently striate when moist, grey-brown when fresh, (KÖRNERUP & WANSCHER 1975: about 6D3-4, 6D3), paler when dry, ochraceous-grey, pale grey (5-6C3, 6C2, 5BC2), micaceous, finely fibrillose.

Lamellae: broadly adnate or decurrent with tooth, moderately distant, very broadly ventricose, brown with entire, concolorous lamellar edge.

Stipe: 15-22 × 1-2 mm, cylindrical, ochre-grey, finely pruinose at apex, downwards glabrous, polished.

Context: smell indistinct.

Spores: 7.0-9.5 × 6.5-8 µm, Q = 1.0-1.15, isodiametrical, polyangular with weak angles, thin-walled.

Basidia: 20-30 × 7-9 µm, 4-spored.

Clamp connections: absent.

Cheilocystidia: 20-42 × 5-11 µm, abundant, clavate, fusiform or lageniform, with refringent walls. Lamellar edge heterogeneous.

Pileipellis: a differentiated cutis of septate, cylindrical, 4-10 µm wide hyphae. Pigment brown, strongly incrusting the hyphae of pileipellis and pileitrama. Pileitrama regular, made up of medium-sized hyphal elements, up to 25 µm wide.

Habitat: in thermophilous deciduous wood.

Collection examined: holotype.

Entoloma polyangulatum is a remarkable species, which belongs to sect. *Undati* on account of the habit, adnate to shortly decurrent lamellae, and strongly incrusting hyphae of the pileipellis. The polyangular spores and presence of cheilocystidia differentiate it from all other known European species (NOORDELOOS 2004).

Entoloma cuboidoalbum NOORDEL. & HAUSKN., spec. nova (Figs. 2, 8)

Mycobank MB 515312

Latin description: Pileus 10-18 mm latus, hemisphaericus, demum plano-convexus centro leviter depresso margine involuto, non hygrophanus, non translucente striatus, peralbus, omnino tomentosus ad tomentosus-fibrillosus. Lamellae L = 22-26, l = 1-3, decurrentes, moderate distantes, angustatae, crassiusculae, furcatae, peralbiae acie lamellarum concolora integrae. Stipes 30-63 × 2-3 mm, cylindricus, albus, hyalinus, glaber praeter apicem pruinose. Contextus albus. Odor et sapor indistincti. Sporae 9-11,5 × 7,5-10,5 µm, Q = 1,0-1,3, Q_{av} = 1,1, cuboideae usque ad quinqueangulatae e latere visae. Basidia 25-34 × 8-12 µm, tetrasporigera, fibulata. Acies lamellarum heterogeneis. Cheilocystidia abundantia, 30-65 × 7-15 µm, variabilia, cylindrico-clavata usque ad lageniformia vel fusiformia, interdum mucronata. Trama lamellarum regularis, ex elementis brevis, cylindricis, 40-100 × 6-20 µm, constituta. Pileipellis cutis ex hyphis 4-10 µm latis, elementis terminalibus cylindricis constituta, subpellis a trama vix differens. Pileitrama regularis, hyphis angustis cylindricis, 4-15 µm latis, constituta. Stipitipellis cutis hyphis cylindricis, 3-10 µm latis, constituta. Caulocystidia adsunt apice stipitis, cylindrica usque ad clavata apice rotundato, 20-50 × 4-9 µm. Granula lucentia absentia. Fibulae abundantes. Habitat in solis humidis limosis sub *Al-*

nus incanam.

Holotypus: Austria, Vorarlberg, Bregenz, Sibratsgfall, Renkknie (MTB 8526/3), 2. 9. 1995, leg. A. HAUSKNECHT (WU 14611; isotypus in L).

Etymology: from Latin cuboideus = cuboid and albus = white, referring to the white basidiocarps and cuboid spores.

Characters:

Pileus: 10-18 mm wide, up to 6 mm high, hemispherical then plano-convex with slightly depressed centre and involute margin, not hygrophorous, not translucently striate, purely white, tomentose-felted to tomentose-fibrillose all over.

Lamellae: L = 22-26, l = 1-3, decurrent, moderately distant, narrow, thickish, forked, purely white with entire, concolorous lamellar edge.

Stipe: 30-63 × 2-3 mm, cylindrical, white, hyaline, glabrous except for pruinose apex.

Context: white. Smell and taste indistinct.

Spores: 9-11.5 × 7.5-10.5 µm, Q = 1.0-1.3, Q_{av} = 1.1, cuboid to 5-angled in side-view.

Basidia: 25-34 × 8-12 µm, 4-spored, with clamp connections.

Clamp connections: abundant.

Cheilocystidia: abundant, 30-65 × 7-15 µm, variable in shape from cylindrico-clavate to lageniform or fusiform, sometimes mucronate. Lamellar edge heterogeneous.

Caulocystidia: present at apex of stipe, cylindrical to clavate with rounded apex, 20-50 × 4-9 µm.

Lamellar trama: regular, made up of short, cylindrical elements, 40-100 × 6-20 µm.

Stipitipellis: a cutis of cylindrical, 3-10 µm wide hyphae.

Pileipellis: a differentiated cutis of 4-10 µm wide hyphae with cylindrical terminal elements, subpellis hardly differentiated from trama.

Pileitrama: regular, made up of narrow, cylindrical, 4-15 µm wide hyphae.

Brilliant granules: absent.

Habitat: terrestrial on moist slope with wells, on muddy soil under *Alnus incana*.

Collection examined: holotype.

The purely white basidiocarps and tomentose surface of pileus are distinctive for subgenus *Alboleptonia* and the group of *Entoloma sericellum* (FR.) P. KUMM. This group is represented with three taxa in Europe, none of which has cuboid spores. The extra-European white taxa with cuboid spores, viz. *Entoloma overeemii* E. HORAK and *E. minutoalbum* E. HORAK, both differ by having considerably smaller spores.

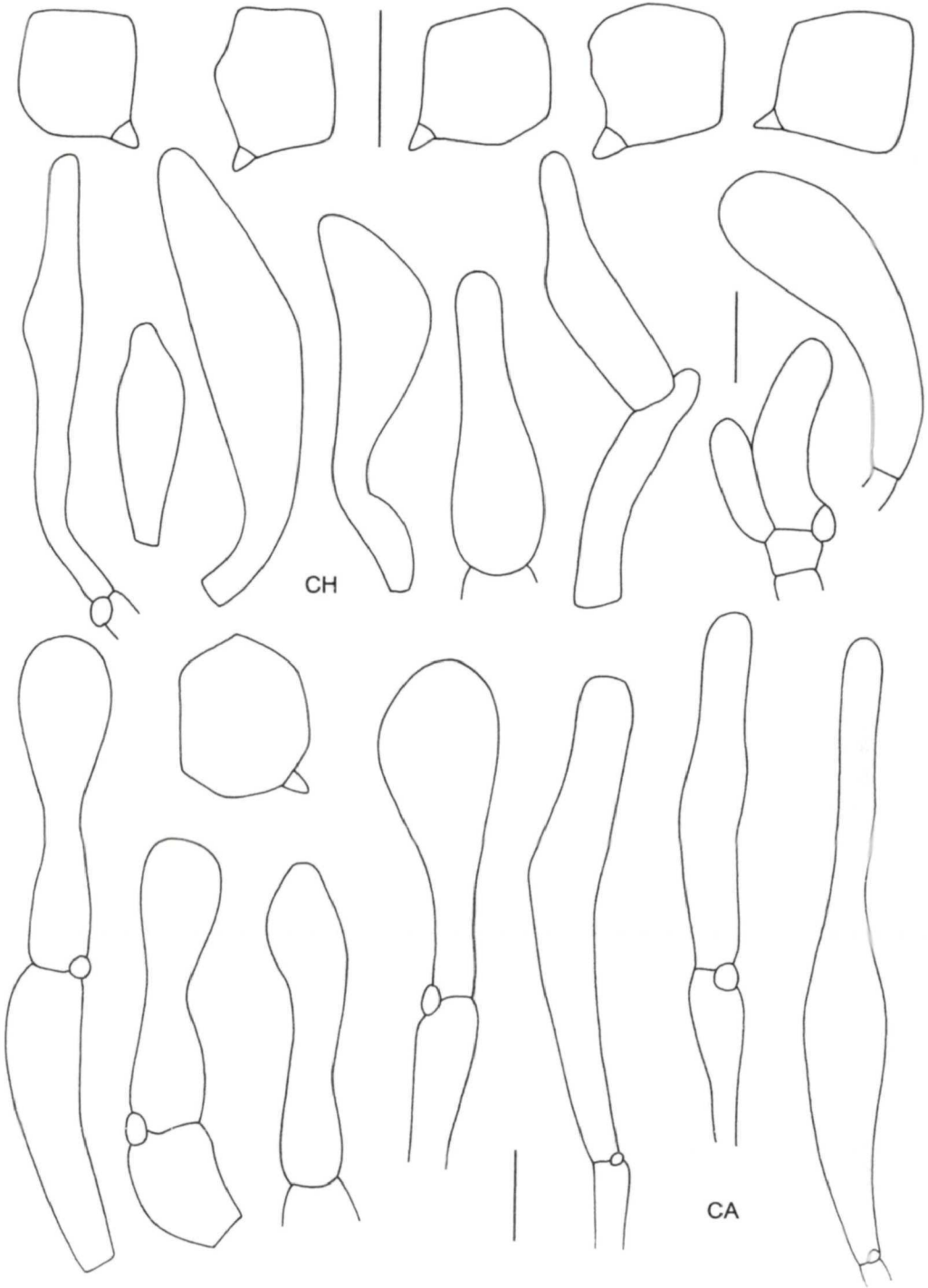


Fig. 2. *Entoloma cuboidoalbum*. Spores, cheilocystidia (CH) and caulocystidia (CA). – Bars: 10 μ m.

***Entoloma sanvitalense* NOORDEL. & HAUSKN. var. *cystidiatum* NOORDEL. & HAUSKN., var. nova** (Figs. 3, 9)
MycoBank MB 515313

Latin diagnosis: A typo differt aciebus lamellarum heterogeneis.

Holotypus: Austria, Kärnten, Spittal an der Drau, Malta, Schlatzingerau, 28. 8. 2008, leg. M. NOORDELOOS, A. HAUSKNECHT & al. (WU 28766; isotypus in L).

Etymologie: from Latin cystidiatus = presence of cheilocystidia.

Characters:

Pileus: 8-13 mm wide, up to 11 mm high, conical with distinctly marked umbo and involute margin, hygrophanous, when moist slightly translucently striate in marginal zone, blackish brown to brownish black when moist, when old dark grey-brown, pallescent on drying to brownish grey; surface finely pruinose, upon drying becoming radially streaked-fibrillose.

Lamellae: narrowly adnate, distant, subventricose, pale greyish brown, when old with pink tinge, with irregular, concolorous lamellar edge.

Stipe: 35-50 × 1.2-2 mm, cylindrical, pale grey, pale brownish grey, darker grey-brown when old, entirely fibrillose-pruinose; with white mycelial base.

Context: pallid greyish-watery. Smell none.

Spores: 8-11 × 6.5-7.5 μm, on average 9.6 × 6.9 μm, Q = 1.3-1.6, 5-7-angular.

Basidia: 4-spored, with clamp connections.

Clamp connections: rare in trama.

Cheilocystidia: 35-75 × 4-8.5 μm, cylindrical, scattered among basidia. Lamellar edge heterogeneous.

Caulocystidia: 25-100 × 4-7 μm, cylindrical, abundant.

Pileipellis: a cutis with transitions to a trichoderm, made up of long, cylindrical elements, up to 65 × 11 μm. Pigment coarsely incrusting.

Habitat: in small groups, terrestrial in a poorly manured, subalpine meadow on calcareous soil.

Collections examined (besides holotype): **Austria:** Kärnten, Spittal an der Drau, Malta, Schlatzingerau, 27. 8. 2008, leg. P. KARASCH & R. REICHEL (WU 28782).

Entoloma sanvitalense is a very rare species, so far only known from Italy and Spain; in a submediterranean and a subalpine grassland, respectively. The present collections were also made in a subalpine, poorly manured meadow in the southern Alps in Austria. They strongly resemble the type macroscopically, in particular by the very dark, radially fibrillose pileus and pruinose-hairy stipe surface. However, the present collections have very distinct protruding cheilocystidia scattered along the lamellar edges.

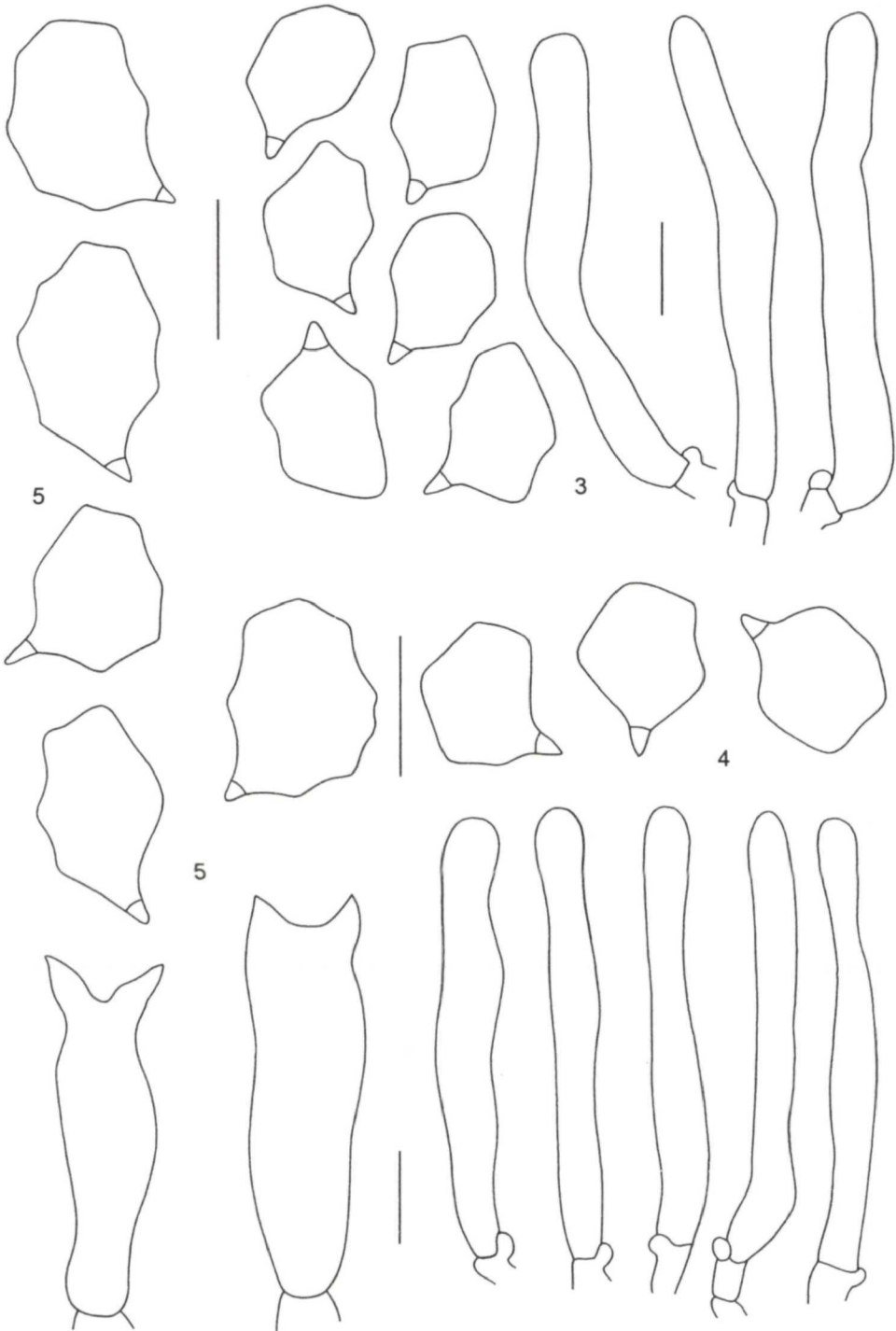


Fig. 3. *Entoloma sanvitalense*. Spores and cheilocystidia. – Fig. 4. *Entoloma kallioi*. Spores and cheilocystidia. – Fig. 5. *Entoloma paradoxale*. Spores and basidia. – Bars: 10 μ m.

***Entoloma paradoxale* NOORDEL. & HAUSKN., spec. nova** (Figs. 5, 10)

MycoBank MB 515314

Latin description: Pileus 14-25 mm latus, plano-convexus centro depresso, hygrophanus, in statu humido distincte translucente striatus usque ad centrum, primum rubello-brunneus, rubello-griseus usque ad rubello-ater violaceotinctus, postea centro atro-brunneo, marginem versus griseo-brunneus, brunneus usque ad atro-brunneo-striatus, vetuste omnino griseo-brunneus, pallidiore brunneus marginem versus, in statu humido et juvenile superficies minute pruinoso-tomentosa, demum glabrescens. Lamellae adnato-emarginatae, confertae, ventricosae, juvenile quasi albae, postea pallide roseae, acie lamellarum concolora integraque. Stipes 25-35 × 1,5-3 mm, cylindricus, primum atroviolaceus ad pallide violaceus, deinde pallescens usque ad pallide brunneus leviter violaceotinctus, glabrescens, politus. Odor et sapor indistincti. Sporae 11-13 × 8,5-10 μm, in medio 12,2 × 9,1 μm, Q = 1,2-1,4, 6-9-angulatae e latere visae. Basidia 24-40 × 7-11 μm, bi-, raro etiam tetrasporigera, fibulae desunt. Acies lamellarum sterilis vel prope sterilis. Cheilocystidia 30-50 × 6-10 μm, cylindrica usque ad gracile clavata. Trama lamellarum regularis, ex elementis cylindricis, 5-20 μm latis, constituta. Pileipellis cutis transiens ad trichodermam, elementis inflatis, 30-75 × 8-15 μm, constituta. Pigmentum brunneum, intracellularis. Pileitrama regularis, ex hyphis cylindricis, 5-22 μm latis, constituta. Granula lucentia presentia. Hyphae vasculares in pileitrama adsunt. Fibulae absentes. In pratis exilibus ad solum calcareum.

Holotypus: Austria, Niederösterreich, St. Aegydt am Neuwalde, NW Lahnsattel (MTB 8259/1), 26. 8. 1994, leg. A. HAUSKNECHT (WU 13138; isotypus in L).

Characters:

Pileus: 14-25 mm wide, up to 10 mm high, flattened convex with depressed centre, hygrophanous, when moist distinctly translucently striate to centre, when young deep reddish brown, reddish grey to reddish black with additional violaceous hue (12F3, 12F4, 12F3-4), then with blackish brown centre (10F3), towards margin grey-brown (8F3-4) to brown (7E4) with darker striation, when very old entirely grey-brown (8F3-4), paler brown (7E4) towards margin, with minutely pruinose-tomentose surface when young and fresh, glabrescent with age.

Lamellae: adnate-emarginate, crowded, broad, almost white when young, then pale pink with entire, concolorous lamellar edge.

Stipe: 25-35 × 1.5-3 mm, cylindrical, at first aubergine to pale violaceous (14EF3, 14E3), when old fading to pale brown with slight violaceous tinge, glabrous, polished.

Context: smell and taste indistinct.

Spores: 11-13 × 8.5-10 μm, in average 12.2 × 9.1 μm, Q = 1.2-1.4, with 6-9 angles in side-view.

Basidia: 24-40 × 7-11 μm, 2-, rarely in addition 4-spored, without clamp connections.

Clamp connections: absent.

Cheilocystidia: 30-50 × 6-10 μm, cylindrical to slenderly clavate. Lamellar edge sterile or almost sterile.

Hymenophoral trama: regular, made up of cylindrical elements, 5-20 μm

wide.

Pileipellis: a cutis with transitions to a trichoderm, made up of inflated elements, $30\text{-}75 \times 8\text{-}15 \mu\text{m}$. Pigment brown, intracellular.

Pileitrama: regular, made up of cylindrical hyphae, $5\text{-}22 \mu\text{m}$ wide.

Brilliant granules: present.

Vascular hyphae: present in pileitrama.

Habitat: in poor meadows on calcareous soil.

Collections examined (besides holotype): **Austria:** Niederösterreich, Lilienfeld, Mitterbach am Erlaufsee, Ötschergraben (MTB 8157/4), in grass on calcareous soil, 31. 7. 1998, leg. A. HAUSKNECHT & al. (WU 18251). Steiermark, Liezen, Landl, Großreifling, Salzatal (MTB 8354/1), in meadow, 18. 8. 1993, leg. J. HÄFFNER (WU 13059).

Italy: Trentino-Alto Adige, Trento, Borgo, Valle di Sella, in meadow, 25. 7. 1994, leg. A. HAUSKNECHT (WU 13099). Emilia-Romagna, Ravenna, Pineta San Vitale, Fossatone, 18. 10. 1991, leg. A. ZUCCHERELLI (WU 29617).

The new species offers problems for the identification. Macroscopically it resembles *Entoloma porphyrogriseum*, but is distinctly different by predominantly 2-spored basidia and larger spores with six to nine more rounded angles.

New Central European records of rare or poorly known taxa

Entoloma pluteisimilis NOORDEL. & HERMOSILLA 2004, *Fungi Europei* 5 a: 918.

Characters:

Pileus: 10-28 mm wide, flattened-hemispherical to convex, finally plano-convex, without umbo, with deflexed to straight, crenulate margin, hygrophanous, translucently striate when moist, yellow-brown with paler margin, glabrous, shining.

Lamellae: adnate-emarginate, moderately distant, subventricose, greyish beige with concolorous, subentire lamellar edge.

Stipe: $20\text{-}30 \times 2\text{-}3.5$ mm, cylindrical, somewhat curved towards base, pale brown, somewhat paler than pileus, striate with longitudinal fibrils; slightly yellowing at base.

Context: greyish beige. Smell none. Taste subfarinaceous.

Spores: $5.5\text{-}7.0 \times 4.5\text{-}5.5 \mu\text{m}$, $Q = 1.1\text{-}1.35$, $Q_{av} = 1.1$, subisodiametrical, thin-walled, polyangular in side view with rather weak angles.

Basidia: $18\text{-}23 \times 6\text{-}9 \mu\text{m}$, 4-spored, with clamp connections.

Clamp connections: present in all tissues.

Cystidia: absent. Lamellar edge fertile.

Hymenophoral trama: regular, made up of relatively short, sausage-shaped or cylindrical elements, $40\text{-}90 \times 4\text{-}11 \mu\text{m}$.

Pileipellis: a thin cutis of narrow, cylindrical, $4\text{-}8 \mu\text{m}$ wide hyphae. Pigment pale brown, intracellular.

Habitat: in groups on dead lying stem of a deciduous tree, probably *Populus*, in river-plain forest.

Collection examined: **Hungary:** Szabolc-Szatmár-Bereg, Nyíregyháza, Bátorliget, Fényi erdő, 26. 10. 2006, leg. A. HAUSKNECHT (WU 26939, L).

This is the third record of this extremely rare species, which so far has been known only from two different localities in Spain (NOORDELOOS 2004). The extremely small and thin-walled spores remind of those of some *Rhodocybe* species. However, SEM studies demonstrate that the spore wall is composed of ridges and (incomplete) facets, typical for true *Entoloma* species, which is also confirmed by phylogenetic studies using three different genes (CO & al. 2009). *Entoloma zuccherellii* (HAUSKN. & NOORDEL.) NOORDEL. & CO-DAVID is very similar, differing mainly by the violaceous-blue tinges of the stipe. Both species grow on wood, which is rather uncommon in the genus *Entoloma*.

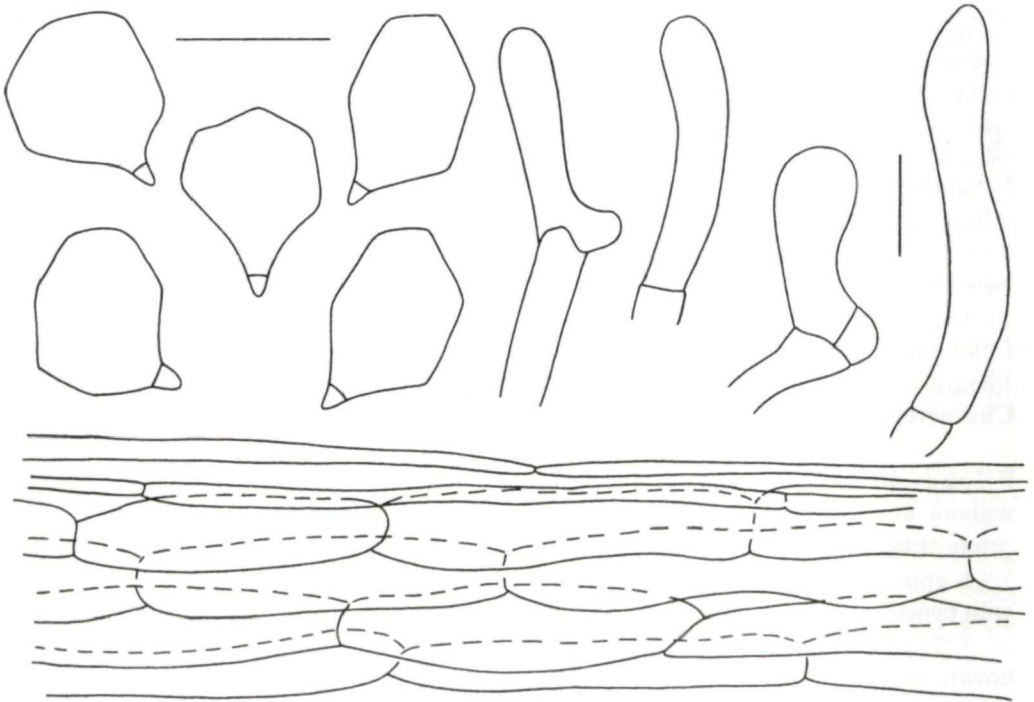


Fig. 6. *Entoloma* aff. *malençonii*. Spores, cheilocystidia and pileipellis. – Bars: 10 μ m.

Entoloma aff. *malençonii* VILA & LLIMONA 2002, Rev. Catal. Micol. 24: 97 (Figs. 6, 11)

Characters:

Pileus: 15-25 mm wide, conical to conical-convex with small, blunt papilla, with involute margin, hygrophanous, translucently striate at margin only, when moist dark brown, umber brown (7F4-6, 8F4), on drying more reddish brown, micaceous-subfelted, shiny.

Lamellae: rather crowded, adnate-emarginate, subventricose, reddish brown with slightly paler, entire lamellar edge.

Stipe: 30-45 \times 2-3.5 mm, cylindrical, brownish grey, paler beige-grey towards base, strongly longitudinally fibrillose-grooved, with white basal mycelium.



Fig. 7. *Entoloma polyangulatum*, holotype. – Phot. A. HAUSKNECHT. – Fig. 8. *Entoloma cuboidalbum*, holotype. – Phot. A. HAUSKNECHT. – Fig. 9. *Entoloma sanvitalense* var. *cystidiatum*, holotype. – Phot. K. F. REINWALD.

Context: smell not noted.

Spores: $8.0\text{-}9.0 \times 6.5\text{-}7.2 \mu\text{m}$, $Q = 1.1\text{-}1.4$, $Q_{\text{av}} = 1.23$, heterodiametrical, 5-7-angled in side-view with pronounced angles.

Basidia: $20\text{-}37 \times 8\text{-}11 \mu\text{m}$, 4-spored, with clamp connections.

Clamp connections: present in hymenium, rare to absent in other tissues.

Cheilocystidia: $29\text{-}45 \times 3\text{-}9 \mu\text{m}$, single among basidia, cylindrical to narrowly clavate. Lamellar edge heterogeneous.

Caulocystidia: absent.

Stipitipellis: a cutis of $2\text{-}6 \mu\text{m}$ wide, cylindrical, minutely incrustated hyphae.

Hymenophoral trama: regular, made up of cylindrical to fusiform elements, up to $250 \times 3\text{-}19 \mu\text{m}$ with fine incrustations.

Pileipellis: a thin cutis of $2\text{-}4 \mu\text{m}$ wide, cylindrical hyphae with minutely incrustated walls.

Habitat: among mosses and *Sphagnum* at the edge of a raised peat bog on very acid soil.

Collection examined: Germany: Thüringen, Schmalkalden-Meiningen, Oberhof, Saukopf (MTB 5230), 28. 9. 2004, leg. P. KARASCH (WU 25339, L).

The present collection keys out as *E. malençonii* VILA & LLIMONA in NOORDELOOS (2004), from which it mainly differs by the lack of differentiated caulocystidia, and the more distinctly striate stipe. Also, the habitat is very different from the *Cistus* heaths in which *E. malençonii* occurs. More material is needed to evaluate these differences.

Entoloma kallioi NOORDEL. 1981, Rep. Kevo Subarctic Res. Stat. 17: 32 (Figs. 4, 12)

Characters:

Pileus: 20-50 mm wide, convex to plano-convex with low, wide umbo, hygrophamous, not translucently striate, deep brown with reddish flush, glabrous, somewhat greasy to touch when moist.

Lamellae: moderately crowded, adnate-emarginate, segmentiform to subventricose, sordid greyish white with pink tinge, with eroded, concolorous lamellar edge.

Stipe: $30\text{-}60 \times 3\text{-}8 \text{mm}$, cylindrical, slightly widened at base, white to pale creamy-grey, innately fibrous.

Context: smell and taste indistinct.

Spores: $8.5\text{-}11 \times 6.5\text{-}7.5 \mu\text{m}$, on average $9.5 \times 7.0 \mu\text{m}$, $Q = 1.3\text{-}1.5$, heterodiametrical, 6-8-angled.

Basidia: $20\text{-}37 \times 8\text{-}11 \mu\text{m}$, 4-spored, with clamp connections.

Clamp connections: abundant.

Cheilocystidia: $33\text{-}70 \times 3.5\text{-}5.5 \mu\text{m}$, flexuous-cylindrical, sometimes with a few excrescences, in clusters among basidia. Lamellar edge heterogeneous.

Pleurocystidia: absent.

Pileipellis: bilayered, suprapellis a cutis of $2.0\text{-}5.5 \mu\text{m}$ wide hyphae, subpellis regular, made up of cylindrical to slightly inflated elements, $30\text{-}90(-110) \times 6\text{-}12 \mu\text{m}$. Pigment abundant, brown, intracellular, in particular in subpellis.

Pileitrama: regular, made up of short, inflated elements, $50\text{-}90 \times 4\text{-}22 \mu\text{m}$. Brilliant granules absent.



Fig. 10. *Entoloma paradoxale*, holotype. – Fig. 11. *Entoloma* aff. *malençonii* (WU 25339, L). – Fig. 12. *Entoloma kallioi* (WU 28781, L). – Phot. A. HAUSKNECHT.

Collections examined: Austria: Kärnten, Malta, Gößfälle (MTB 9046/2), mixed forest on calcareous soil, with *Fagus*, *Corylus*, *Picea*, 28. 8. 2008, A. HAUSKNECHT & al. (WU 28781, L).

The present collection fits very well in the concept of *Entoloma kallioi*, a very rare species, that was originally described from subarctic Finland (NOORDELOOS 1981), and many years later also recorded from The Netherlands (NOORDELOOS 2004). The dark brown, not translucently striate, hygrophanous pileus, and the well-developed cheilocystidia are distinctive.

We are grateful to IRMGARD KRISAI-GREILHUBER for the Latin diagnoses and for revising the manuscript.

References

- CO-DAVID, D., LANGEVELD, D., NOORDELOOS, M. E., 2009: Molecular phylogeny and spore evolution of *Entolomataceae*. – *Persoonia* **23**: 147-176..
- KORNERUP, A., WANSCHER, J. H., 1975: Taschenlexikon der Farben, 2. Aufl. – Zürich, Göttingen: Musterschmidt.
- NOORDELOOS, M. E., 1981: Notes on *Entoloma* (*Basidiomycetes*, *Agaricales*) in Inari Lapland, Northernmost Finland. – *Rep. Kevo Subarkt. Res. Station* **17**: 32-40.
- 2004: *Entoloma* s. l. Supplemento. – *Fungi Europaei* **5 a**. – Alassio: Candusso.
- HAUSKNECHT, A., 2002: Weitere neue *Entoloma*-Arten aus Südeuropa. – *Österr. Z. Pilzk.* **11**: 117-131.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Österreichische Zeitschrift für Pilzkunde](#)

Jahr/Year: 2009

Band/Volume: [18](#)

Autor(en)/Author(s): Noordeloos Machiel Evert, Hausknecht Anton

Artikel/Article: [New and interesting Entoloma species from Central Europe. 169-182](#)