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Entoloma jahnii (Fungi, *Agaricales*) reported from Slovakia and notes on differences with *E. byssisedum*

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Entoloma jahnii – a species of the *Entoloma* subgen. *Claudopus*, sect. *Claudopus* – is reported from Slovakia for the first time. Diagnostic characters are discussed, illustrated and compared with those of similar and/or misidentified *Entoloma* taxa, especially of *E. byssisedum*. Data on the ecology and occurrence of *E. jahnii* in Europe are provided.

Key words: fungi, *Claudopus*, micromorphology, ecology, Europe.

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Entoloma jahnii – druh podrodu *Claudopus* rodu *Entoloma*, sekcie *Claudopus* – uvádzame zo Slovenska prvýkrát. Hodnotíme a vyobrazujeme diagnostické znaky a porovnávame ich so znakmi podobných a/alebo zamieňaných taxónov rodu *Entoloma*, najmä *E. byssisedum*. Uvádzame aj údaje o ekológii a výskyte *E. jahnii* v Európe.

INTRODUCTION

Within the genus *Entoloma* (Fr.) P. Kumm., the crepidotoid habit of basidiomata (stipe typically eccentric, lateral or absent) is an important character used for a particular species aggregate. So-called crepidotoid *Entoloma* species used to be: 1) gathered into one morphological group without any infrageneric classification (e.g. in the *Entoloma* keys by Noordeloos 1992a, 2012); 2) classified into *Entoloma* subg. *Claudopus*, sect. *Claudopus* Noordel. (e.g. Noordeloos 2004, Mleczko & Ociepa 2007, Nita & Stefaniak 2010, Halama 2011); or 3) considered to form a separate genus *Claudopus* Gillet (e.g. Horak 1980, Largent et al. 2011).

Regardless of the different taxonomic concepts, the number of species with crepidotoid stature and spores angular in all views is still growing. The first species included in the group were *E. byssisedum* (Pers.) Donk, *E. depluens* (Batsch) Hesler and *E. parasiticum* (Quél.) Kreisel (e.g. Moser 1978, Noordeloos 1988). In the past 15 years, they were supplemented by eight other taxa: *E. albotomentosum* Noordel. & Hauskn., *E. pseudoparasiticum* Noordel., *E. ollare* E. Ludw. & T. Rödig, *E. jahnii* Wölfel & Winterh., *E. exiguum* Esteve-Rav. & M. de la Cruz, *E. alliodorum* Esteve-Rav., E. Horak & A. Ortega, *E. catalaensis* Noordel. & Contu, and *E. byssisedum* var. *microsporum* Esteve-Rav. & Noordel. (Noordeloos 2004).

Of these 11 taxa known in Europe, only *E. byssisedum* has been reported from Slovakia (e.g. Svrček 1950, Janitor 1994, Kuthan et al. 1999, Škubla 2003, Ripková et al. 2007). Our recent collections of *E. jahnii* (collected during a one-week study of beech forests in the eastern and central part of Slovakia in 2011) have drawn our attention to the previous identification of crepidotoid *Entoloma* species in Slovakia. Could *E. jahnii* have been rare, overlooked or misidentified with other species?

The aim of our paper is to present the Slovak collections of *E. jahnii*. We have also compared the microscopic structure of this species with *E. byssisedum* (another species of the group known from Slovakia) and stress more reliable characters for their delimitation. In addition, we also summarise the ecological and distributional data of *E. jahnii* in Europe.

MATERIAL AND METHODS

Entoloma material deposited in the herbaria BRA, LDM, PSG, SAV and SLO was studied. LDM is the abbreviation of the herbarium of the Museum of Forestry in Zvolen, Slovakia; PSG stands for S. Glejdura's private herbarium (Zvolen); other herbaria abbreviations follow Holmgren et al. (1990). Data of the studied specimens are presented in their original form.

The description of macromorphological characters of *Entoloma jahnii* is based on fresh material (SLO 1291 and SLO 1302). The microscopic objects were observed (from dried material) in ammoniacal Congo red after a short pre-treatment in a 3 % aqueous solution of KOH, and studied under Olympus BX41 and CX41 light microscopes under an oil immersion lens at a magnification of 1000×. Drawings of all microscopic structures were made with a 'camera lucida' using an Olympus U-DA drawing attachment at a projection scale of 2000×.

Statistics for measurements of micromorphological characters are based on 20 measurements of basidia and 30 measurements of all other micromorphological structures per specimen, and are given as minimum, maximum (in parentheses),

average +/– standard deviation and average values. We selected the specimens PSG 723, SLO 508, SAV F 3439 of *E. jahnii* and SLO 297, LDM 900 of *E. byssisedum* (for details, see Material studied below). Abbreviations: L = number of lamellae reaching the stipe, l = number of lamellulae between each pair of lamellae, Q = ratio of length and width of spores. Descriptive terminology follows Vellinga (1988).

RESULTS

During our study, we re-examined 20 specimens of *Entoloma* with crepidotoid habit of basidiomata from the Slovak herbaria BRA, LDM, PSG, SAV and SLO. We excluded five incorrectly identified specimens (belonging to the genera *Clitopilus*, *Crepidotus* and *Lentinellus*) and five not yet definitely identified *Entoloma* specimens. Of the remaining material, we confirmed the identification of two specimens as *E. byssisedum*. Microscopic structures of the remaining eight specimens correspond to *E. jahnii*: two of them were originally identified as *Entoloma* sp. and three as *E. byssisedum* (see Material studied). *Entoloma jahnii* had not been reported from Slovakia to date, thus the present collections are the first ones in the country. Micromorphological characters of *E. jahnii* are described and compared with those of *E. byssisedum*, with which it is most often confused.

Entoloma jahnii Wölfel & Winterh. Figs. 1–3

Macrocharacters. Basidiomata (Figs. 1, 2) in small groups. Pileus ca. 2–10 mm in diam., irregularly circular or rounded flabelliform, plano-convex; margin inflexed, straight, becoming undulate with age, not translucently striate; white (also distinct in dried material), pinkish with age by maturing spores and lamellae showing through, surface of juveniles hairy, then tomentose; not hygrophanous. Stipe ca. 0.5–3 mm long and up to 1 mm wide, excentric to lateral, cylindrical, curved, white, tomentose. Context very thin, smell indistinct, taste not recorded. Lamellae L = 8–18, l = 1–3, up to 3 mm wide, emarginate, ventricose, white when young, ageing to pinkish, pinkish brown when dried; edge entire, concolorous. Spore print pinkish.

Microcharacters. Spores (9)10.4–12.9(14.8) × (7.5)8.1–9.4(10.8) µm, av. 11.7 × 8.8 µm, Q = (1.14)1.22–1.45(1.63), av. Q = 1.33, angular, in side view with 5–6(7) angles, possessing a suprahilar depression, with pinkish hue in 10 % KOH, wall distinctly thickened (ca. 0.5–0.7 µm), usually containing a well-delimited, large central vacuole. Basidia (25)28.5–36(41) × 11.5–13(15) µm, av. 32 × 12.4 µm, 4-spored, rarely 2-spored, broadly clavate; usually distinctly narrower at the base,

Fig. 1. *Entoloma jahnii*: basidiomata (Slovakia, Štiavnické vrchy Mts., locality called Obyce, 24 July 2008, SLO 1241). Photo by P. Marstad.

Fig. 2. *Entoloma jahnii*: basidiomata (Slovakia, Vihorlatské vrchy Mts., Vihorlat National Nature Reserve, 27 Sept 2011, SLO 1291). Photo by S. Jančovičová.

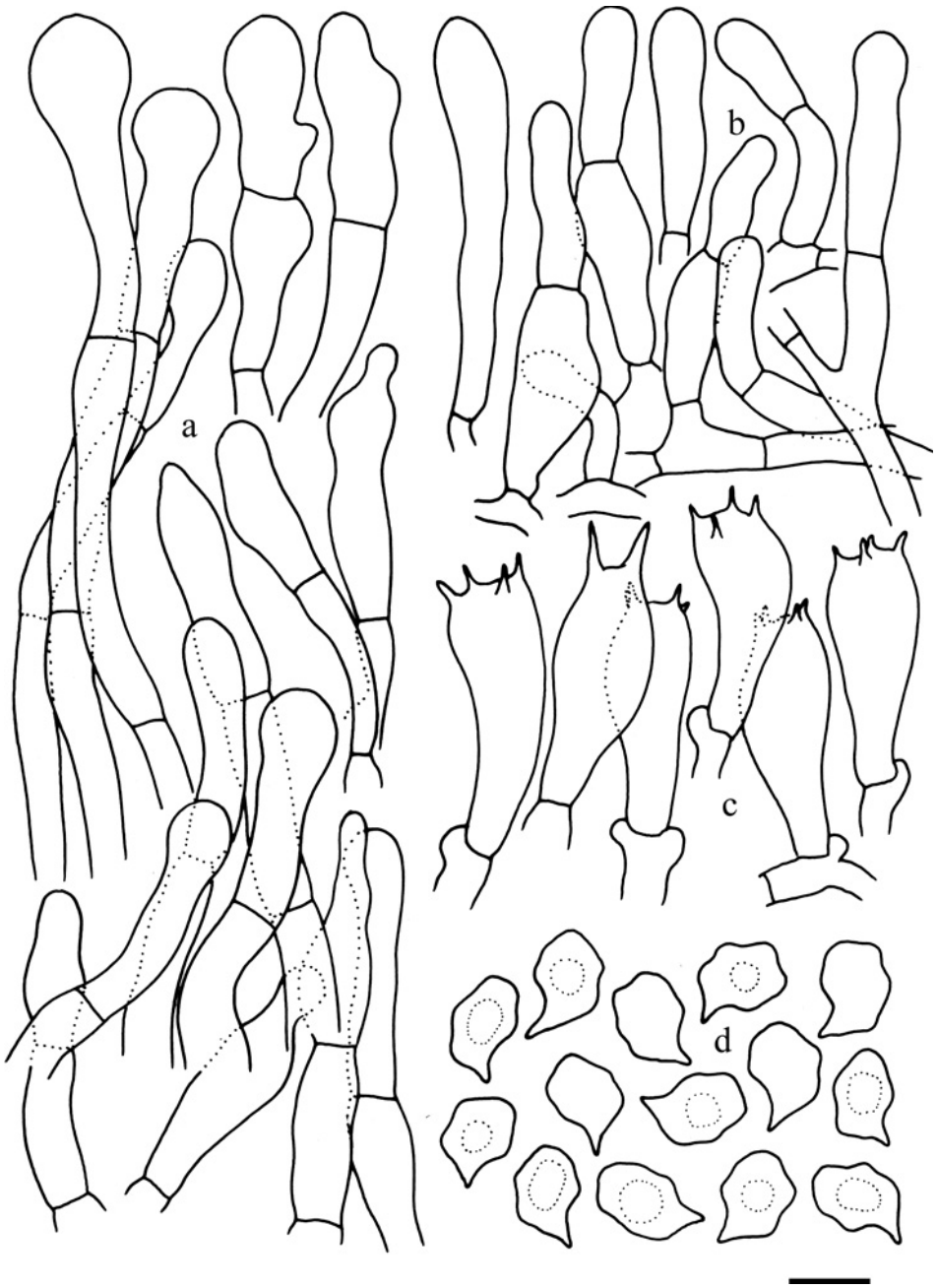

Fig. 3. *Entoloma jahnii*: **a** – hyphal ends in the pileipellis (trichoderm type), **b** – hyphal ends on the surface of the stipe, **c** – basidia, **d** – spores (Slovakia, Veporské vrchy Mts., Klenovský Vepor Nature Reserve, 30 Sept 2011, SAV F 3439). Scale bar = 10 µm.

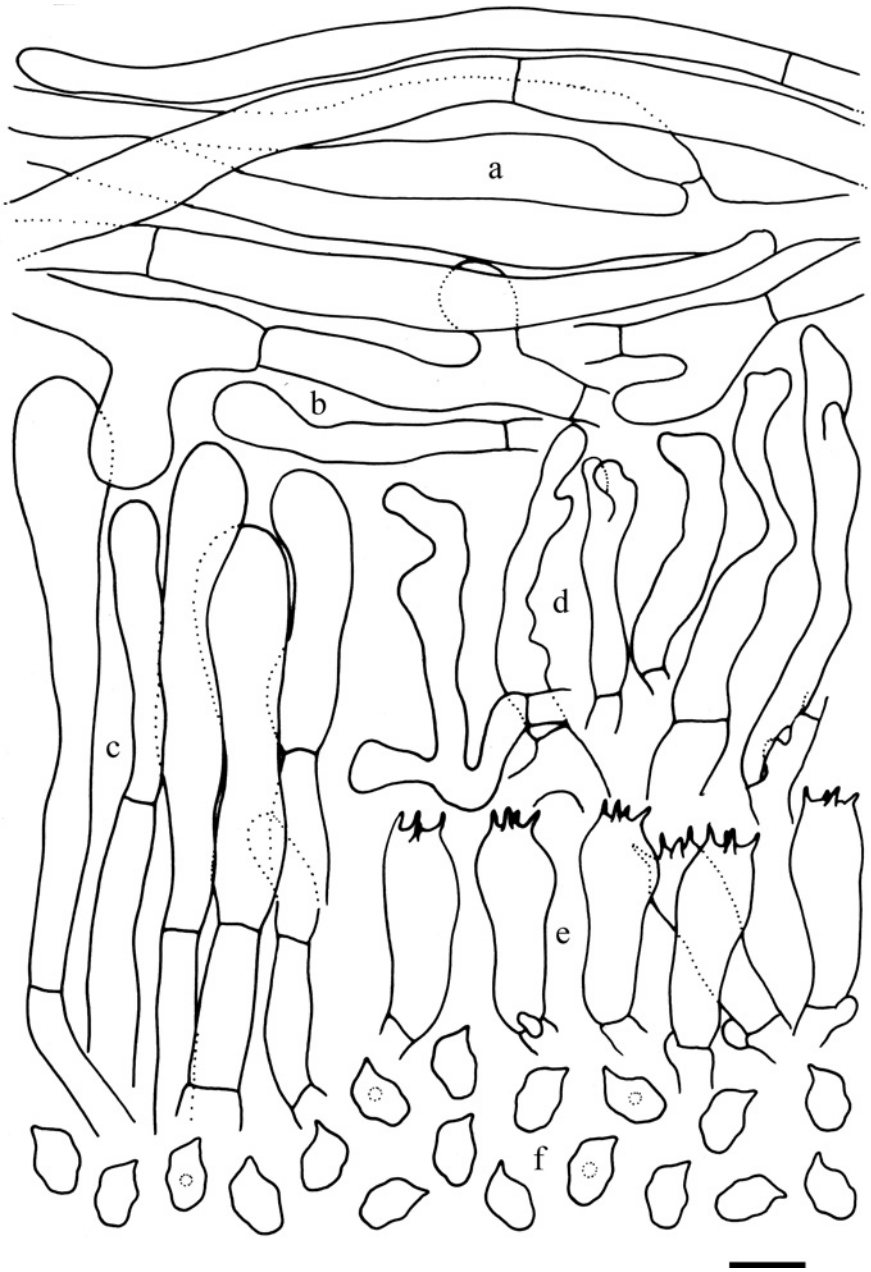

Fig. 4. *Entoloma byssisedum*: **a** – pileipellis (cutis type), **b** – lateral projections and branches on hyphae in the pileipellis, **c** – dispersed hyphal ends in the pileipellis, **d** – hyphal ends on the surface of the stipe, **e** – basidia, **f** – spores (Slovakia, Podunajská nížina Lowland, Bratislava, Sihoť Island, 18 Oct 1998, SLO 297). Scale bar = 10 µm.

5–8(10) µm wide. Subhymenium ca. 20–25 µm thick, dense, pseudoparenchymatic, composed of ca. 5–8 µm wide cells, sharply delimited from context. Cheilocystidia and pleurocystidia absent. Pileipellis an irregular trichoderm, mostly composed of ascending to erect hyphae, arranged in small, repent fascicules, but often forming large pyramidal structures; hyphal ends thin-walled and not pigmented, with terminal cells measuring (21)23.5–48.5(78) × (5)8–11.5(14) µm, av. 36 × 9.8 µm, mostly clavate to subcapitate, sometimes subcylindrical, lageniform or lecythiform, often centrally constricted; hyphae in subpellis horizontally oriented, parallel, with incrusting pigments. Surface of stipe covered by an almost hymenidermal structure, with hyphal ends ascending to erect, dispersed or in dense clusters; terminal cells measuring 14–34(55) × (5)6–8.5(9.5) µm, av. 23.4 × 7.2 µm, similar to basidioles in hymenium, clavate, subcylindrical to subcapitate; basal cells often distinctly shorter. Context composed of parallel, unbranched, 4–11(15) µm wide hyphae without incrustations or thickened cell walls. Clamps present only in hymenium and subhymenium.

Published figures and/or descriptions. Halama (2011), Læssøe (2008), Ludwig (2007a, b), Nitta & Stefaniak (2010), Noordeloos (2004), Wölfel & Winterhoff (1993).

Entoloma byssisedum (Pers.) Donk Fig. 4

Macrocharacters. We did not have fresh material to describe macrocharacters; dried basidiomata were up to 6 mm in diam. and pilei had a grey-brown colour. For complete description, see e.g. Noordeloos (1992b).

Microcharacters. Spores (8.9)9.3–10.6(11.5) × (5.7)6–6.6(7) µm, av. 10 × 6.3 µm, Q = (1.38)1.47–1.68(1.92), av. Q = 1.58, angular, in side view with 5–7 angles, possessing a suprahilar depression, with pinkish hue in 10 % KOH, cell walls thin or indistinctly thickened (up to 0.5 µm), usually containing a small and/or weakly delimited vacuole or not. Basidia (25)26.5–30(32) × (8)9–11(12) µm, av. 28.5 × 10.1 µm, 4-spored, broadly clavate to almost cylindrical, at the base (5.5)6–8(8.5) µm wide. Subhymenium ca. 20–25 µm thick, dense, pseudoparenchymatic, composed of ca. 4–7 µm wide cells, sharply delimited from context. Cheilocystidia and pleurocystidia absent. Pileipellis a cutis, mostly composed of horizontally oriented, parallel, 5–11 µm wide, often thick-walled hyphae with incrusting pigments, possessing occasional lateral projections or branches; hyphal ends repent, dispersed, individual or in fascicules of 2–3(5), thin-walled and not pigmented, with terminal cells measuring (18)28–78(130) × (6)7.5–13(14.5) µm, av. 53.3 × 10.2 µm, clavate to subcylindrical, occasionally subcapitate, often centrally constricted. Surface of stipe covered by irregular repent hyphae, with often flexuous, nodulose or branched terminal cells, frequently forming dense clusters, measuring (25)34–64.5(76) × (5)5.5–10.5(15) µm,

av. 49.1 × 8 µm. Context composed of parallel, unbranched, 4–16(22) µm wide hyphae without incrustations or thickened cell walls. Clamps present only in hymenium and subhymenium.

Selected figures and/or descriptions. Breitenbach & Kränzlin (1995), Hagara et al. (2005), Noordeloos (1992b).

DISCUSSION

Delimitation and morphological variability of the studied species

The studied species – *E. jahnii* and *E. byssisedum* – share three characters: absence of a distinct smell, presence of clamps (in hymenium and subhymenium) and absence of cheilocystidia [Noordeloos (2004, fig. 385) illustrated cheilocystidia of *E. jahnii*, but this is probably a mistake because he did not mention such structures in the accompanied description]. On the other hand, the species clearly differ in several other characters: white cap surface, trichodermal pileipellis and larger spores in *E. jahnii* versus grey-brown cap surface, pileipellis being a cutis and smaller spores in *E. byssisedum* (Tab. 1, Figs. 1–4). These differences make both species morphologically more similar to other crepidotoid *Entoloma* species rather than to each other.

Observing the spores, we have confirmed the Q value as a good character for distinguishing both species (Tab. 1). The Q value of *E. byssisedum* ranges from 1.47 to 1.68 compared to *E. jahnii* with a range of 1.22–1.45. In addition, the form of the vacuoles also seems to be a useful spore-character: the vacuoles of *E. jahnii* are distinct and fill a major part of the spore content, while those of *E. byssisedum* are less delimited from the spore cytoplasm, smaller in size and sometimes visually absent.

Although hyphal ends in the pileipellis of both species are of similar shape and size, the structure of their pileipellis is different. Hyphal ends are dispersed, repent and form a cutis in *E. byssisedum*, whereas in *E. jahnii* they form a trichoderm of erect and dense clusters. Noordeloos (2004) considered the presence of capitate pileo– and caulocystidia the unique character for *E. jahnii*. He used these terms (pileo– and caulocystidia) only in the identification key, but not in the descriptions. A similar terminology was also adopted in some later publications (e.g. Noordeloos 2012, Largent et al. 2011). As mentioned above, hyphal ends in pileipellis of *E. byssisedum* are of similar shape as in *E. jahnii* (Figs. 3 and 4). They were not, however, recognised as cystidia in earlier literature (e.g. Noordeloos 1992b). In our opinion, there is no reason to describe the terminal cells of hyphae in the pileipellis and stipitipellis as cystidia: they are represented only by a single type of thin-walled elements and have not been recognised in other related *Entoloma* species although they are often similar.

Tab. 1. European *Entoloma* species with crepidotoid basidioma habit.
• – Data source [according to Noordeloos (1992b and/or 2004) or our own observations], * – data added/modified by Mleczko & Ociepa (2007) in *E. ollare*, by Vila & Caballero (2007) in *E. byssisedum* var. *microsporum*, by Noordeloos (1988) in *E. byssisedum* and *E. depluens*, by Noordeloos (2004) in *E. pseudoparasiticum*, by Halama (2011) in *E. jahnii*, **?** – interpretation of the character is confusing comparing Noordeloos (1992b: clamps present) and Noordeloos (2004, 2012: clamps absent), **+** – character present, **-** – character absent, **angles** – number of spore angles, **av.** – arithmetic mean value, **b** – basidiomata, **cc** – clamp connections (at least at the base of basidia), **ce** – capitate hyphal ends in pileipellis, **ch** – cheilocystidia, **d** – debris (dead organic material), **l** – leaves, **m** – mosses, **n** – lichens, **Q** – ratio of length and width of spores, **s** – soil, **w** – wood, **wc** – white pileus colour (at least when young), **x** – character not mentioned.

	spore length (µm)	**spore width (µm)**	**Q**	**av. Q**	**angles**	**cc**	**ch**	**ce**	**wc**	**smell**	**substrate**	**·**
E. ollare	8.5–13	6–9	1.2–1.8	1.5*	5–7(8) *	–	–	–	–	farinaceous	s	2004
E. albotomentosum	9–12	6.5–8	1.1–1.5	1.3	4–6	–	–	–	+	none	l, d	1992b
E. pseudoparasiticum	7.5–10(10.5)	6–7.5	x	x	5–6	?	+*	–	–	x	b	1992b
E. depluens	8.5–11	7–7.5	1.1–1.5	1.3*	5–7	?	+	–	–	x	w	1992b
E. byssisedum	9.5–12(12.5)	6.5–8	1.3–1.8	1.45*	x	+	–	–	–	farinaceous	w, d, s	1992b
E. byssisedum	**(8.9)9.3–10.6(11.5)**	**(5.7)6–6.6(7)**	**(1.38)1.47–1.68(1.92)**	**1.58**	**5–7**	**+**	**–**	**+**	**–**	**x**	**w, s**	**own**
E. catalaensis	8–10	5.5–7	1.2–1.5	1.3	x	+	–	–	–	of fish	s	2004
E. byssisedum var. *microsporum*	7.5–9.5	5.5–7.5	1.15–1.5	1.3	5–6	+	–	–	–	of musty flour*	d	2004
E. parasiticum	9.5–12.5	8–10.5(11)	1.1–1.4	x	5–6	+	–	–	+	none	b, m, w, s	1992b
E. exiguum	(9.5)10–12	6.5–8.5	1.15–1.8	1.5	6–8	+	–	–	+	none	s	2004
E. alliodorum	8.8–9.8–10.9	6.2–7–7.7	x	1.44	6–7	+	–	–	+	of garlic	d, w	2004
E. jahnii	(9)10–14(15)	7.5–11(11.5)	1–1.5(1.55)	1.2–1.3	5–6	+	–	+	+	indistinct	w, l*	2004
E. jahnii	**(9)10.4–12.9(14.8)**	**(7.5)8.1–9.4(10.8)**	**(1.14)1.22–1.45(1.63)**	**1.33**	**5–6(7)**	**+**	**–**	**+**	**+**	**indistinct**	**w**	**own**

Noordeloos (1992, 2004) mentioned membranal and finely incrusting pigments only for the pileipellis of *E. byssisedum*. According to our observations, both species contain pigments in the pileipellis and, moreover, distinct pigments and more thickened cell walls on the subpellis hyphae.

We have found only a few mentions on the stipitipellis structure in published descriptions of both species (Noordeloos 2004), probably because the stipe is so small. According to our observations, the stipe surface of *E. jahnii* is almost hymenidermal with the terminal cells of the hyphae being similar to the basidioles. The stipe surface of *E. byssisedum* is covered by clusters of intricate irregular hyphal ends bearing frequent lateral projections. Considering the clear difference between both species in pileipellis structure, the stipe surface seems to be of little use for recognising them (because of difficulties to obtain the right structures from such subtle stipes). However, it may have importance for the delimitation from other members of the section.

Ecology and distribution

Entoloma jahnii was described based on material from Germany and Austria (the holotype is from Germany). In Germany, it was collected on the underside of moist, fallen and rotten branches/wood of *Alnus glutinosa*, *Fraxinus excelsior* (in *Pruno-Fraxinetum*), *Populus canadensis* and *Salix* in August and September. One collection from Austria grew on rotten wood of a branch of a deciduous tree in August (Wölfel & Winterhoff 1993). Since then, *E. jahnii* has been reported from several other European countries: from Belgium and Germany by Noordeloos (2004) – on rotten wood and bark of deciduous trees of *Alnus*, *Fraxinus*, *Betula* and *Quercus*; from Sweden by Ludwig (2007a) – on deciduous wood in August; from the British Isles by Schafer (2008) – on very rotten wood in a pile along an avenue of lime (*Tilia*) trees; from Denmark by Læssøe (2008) – on the underside of rotten branch of *Quercus* in August; from Denmark and Finland by Noordeloos (2012) – on rotten wood of deciduous trees; from Poland by Nita & Stefaniak (2010) and by Halama (2011) – on a rotten log of *Betula* (in *Carici elongatae-Alnetum*), on a small piece of deciduous wood, probably of *Quercus robur* or *Carpinus betulus* (in *Galio sylvatici-Carpinetum*), on small rotten pieces of wood, bark and leaves (attached to the wood) of a deciduous tree, probably *Quercus* sp., in July, August and unspecified autumn months. In Slovakia, we know *E. jahnii* from seven localities (see Material studied). It was found on the upper side of fallen rotten logs of *Fagus sylvatica* and another (not identified) deciduous tree, on the interior layer of bark of a fallen trunk of *Quercus* sp. (in *Alnion-incanae*), and on pieces of wood of *Quercus* sp. and other deciduous trees; in July to October.

Substrate is also used as a feature in the identification keys of *Entoloma* taxa with a crepidotoid habit, e.g. by Noordeloos (2004). However, more and more collections show that these fungi are not restricted to a specific substrate; e.g. *E. parasiticum*, though described as a parasite of *Cantharellus cibarius* basidiomata, was also found on soil, living mosses and bark of conifers (Noordeloos 1992b). Another example could even be *E. jahnii*: it was known as a saprotroph of wood (e.g. Noordeloos 2004), but the latest collection from Poland (Halama 2011) comes from very rotten pieces of deciduous leaves.

Other members of *Entoloma* section *Claudopus*

All reliable characters used for delimitating taxa within *Entoloma* sect. *Claudopus* in Europe are compared in Tab 1. In the literature, species delimitation is often based on characters observed on fresh material and this is also reflected in the most recent identification key of European taxa by Noordeloos (2004). According to him, smell of the context and colour of the pileus are necessary for identification. However, while re-examining the herbarium material, we had information on these characters in only a few collections. Our study was therefore based on micromorphological characters. It was easy to exclude species having no clamps (*E. ollare* and *E. albotomentosum*) and species with cheilocystidia (*E. pseudoparasiticum* and *E. depluens*). *Entoloma catalaensis* (a species with a fishy smell of the context) and *E. byssisedum* var. *microsporum* have smaller spores not exceeding 10 µm in length. Three other species are *E. parasiticum*, *E. alliodorum* and *E. exiguum*. *Entoloma jahnii* differs from *E. parasiticum* in pileipellis structure (the latter has a cutis) and from *E. alliodorum* and *E. exiguum* by the Q of the spores (the av. Q exceeds 1.4 in the last two species). *Entoloma byssisedum* differs from *E. parasiticum* in spore size (the latter has spores similar to *E. jahnii*), but from *E. alliodorum* and *E. exiguum* only in pileus colour (there are no micromorphological characters usable for their recognition in the Noordeloos's key). As both our specimens included in Material studied had a darker pileus (in contrast to the white coloured pilei of *E. alliodorum* and *E. exiguum*), we identified them as *E. byssisedum*. In our opinion, these three narrow-spored species (*E. alliodorum*, *E. byssisedum* and *E. exiguum*) need more detailed observations of the microscopic structure supported by DNA studies to confirm the colour of pileus and smell to be reliable characters.

Of non-European species, *E. jahnii* is most similar to *Claudopus viscosus* Largent & Abell-Davis and *C. minutoincanus* Largent & Abell-Davis, a species recently described from Australia (Largent et al. 2011). Like *E. jahnii*, these species have white-coloured basidiomata and subcapitate to capitate hyphal ends in the pileipellis ("pileocystidia"), but the Australian species differ in smaller spores, absence of clamps, a sticky surface of the pilei and growth on the underside of granitic rock.

In conclusion, most taxa of *Entoloma* sect. *Claudopus* are so far known from just the type or a small number of localities (Noordeloos 2004). We therefore think that more collections (together with additional ecological data) and comparative studies on other characters (e.g. shape of spores, pileipellis structure and molecular characters) will bring more light into this interesting *Entoloma* group.

Material studied

Entoloma jahnii. Slovakia, Kremnické vrchy Mts., village of Kováčová, ca. 200 m SE of Stará Kováčová Hill, oak-hornbeam forest (*Quercus* sp., *Carpinus betulus*), alt. 400 m, on pieces of wood (seemingly on soil) under *Quercus robur*, 15 July 2007, leg. S. Glejdura (as *E. byssisedum*) (PSG 723). – Poľana Mts., Zvolenská kotlina Basin, Borová hora Arboretum, ca. 3 km N of the city centre of Zvolen, stand no. 9c dominated by *Carpinus betulus*, alt. 345 m, on pieces of wood of a deciduous tree, 6 Sept 1996, leg. S. Glejdura (as *E. byssisedum*) (LDM 959). – Štiavnické vrchy Mts., village of Obyce, locality called Obyce in the wide valley of the Žitava River (ca. 1 km of the River), W to SW exposition, thermophilous oak forest (*Quercus cerris* and *Q. petraea* agg.), alt. ca. 400 m, on wood of fallen rotten trunk of a deciduous tree, 24 July 2008, leg. S. Jančovičová (SLO 1241). – Slovenské rudohorie Mts., Veporské vrchy Mts., Klenovský Vepor Nature Reserve, village of Klenovec, forest stand dominated by *Fagus sylvatica* with admixed *Abies alba*, alt. ca. 1150 m, on wood of fallen rotten trunk of *Fagus sylvatica*, 30 Sept 2011, leg. S. Adamčík (SAV F 3439). – Vihorlatské vrchy Mts., Jovsianska hrabina National Nature Reserve, ca. 1.5 km NE of the church in the village of Jovsa, forest mainly formed by *Alnus glutinosa*, *Fraxinus excelsior*, *F. angustifolia* and *Quercus robur* (*Alnion-incanae* Pawlowski in Pawlowski et al. 1928), alt. 150–180 m, on interior layer of bark of fallen decaying trunk of *Quercus* sp., 11 July 2001, leg. S. Jančovičová (as *Entoloma* sp.) (SLO 508). – Vihorlatské vrchy Mts., Vihorlat National Nature Reserve, ca. 7 km NW of the church in the village of Remetské Hámre, forest with dominant *Fagus sylvatica* and frequent *Acer pseudoplatanus*, *A. platanoides* and *Fraxinus excelsior*, alt. ca. 850 m, on wood of upper side of fallen rotten trunk of *Fagus sylvatica*, 27 Sept 2011, leg. S. Jančovičová (SLO 1291). – Ibidem (SLO 1302). – Bukovské vrchy Mts., pr. Stakčín, distr. Humenné, in valle rivi Chotínka, inter collis Maňov et Mazúrov vrch, alt. 320 m, ad detr. *Quercus*, 4 Oct 1989, leg. J. Kuthan (as *E. byssisedum*) (BRA CR 12055).

Entoloma byssisedum. Slovakia, Podunajská nížina Lowland, city of Bratislava, municipal part of Karlova Ves, Sihoť Island, W part of the Island, near water well no. 29, flood plain forest (*Fraxino-Populetum*), alt. ca. 135 m, on pieces of rotten wood of a deciduous tree, 18 Oct 1998, leg. S. Jančovičová (SLO 297). – Poľana Mts., Zvolenská kotlina Basin, Borová hora Arboretum, ca. 3 km N of the city centre of Zvolen, stand no. 12f composed of *Carpinus betulus*, *Populus tremula* and *Salix* sp., alt. 320 m, on soil under *Carpinus betulus*, 28 July 1997, leg. S. Glejdura (LDM 900).

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