Two remarkable species of *Bolbitiaceae* (*Agaricales*) from Croatia

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Abstract: Two remarkable species of *Bolbitiaceae*, *Conocybe thermophila* and *Pholiotina intermedia*, are described and illustrated by microscopical drawings and colour photographs. *Conocybe thermophila* is new to science, *Pholiotina intermedia* is reported for the first time in Europe.

Zusammenfassung: Zwei bemerkenswerte Arten der *Bolbitiaceae*, *Conocybe thermophila* und *Pholiotina intermedia*, werden beschrieben und mit Mikrozeichnungen und Farbfotos illustriert. *Conocybe thermophila* ist neu für die Wissenschaft, *Pholiotina intermedia* wird erstmals für Europa nachgewiesen.

In autumn 1999, the Croatian Mycological Society started the long-term project "Recording and Mapping of Croatian Fungi". Hitherto, around 70 specimens of taxa belonging to the genera *Conocybe* and *Pholiotina* have been collected and deposited in the Croatian National Fungarium (CNF). During recent identification and revision of the first 22 collections, two very interesting species have been found which we describe in the present paper. *Conocybe thermophila* is new to science, and *Pholiotina intermedia* is new for Europe.

***Conocybe thermophila* HAUSKN., MEŠIĆ & TKALČEC, spec. nova** (Figs. 1 a-e, 2)

Latin diagnosis: Pileus 9-17 mm latus, mox expansus, primum pallide brunneus, mox cremeus ad albidus centro obscuriore; stipes albus, flocculoso-tomentosus, juveniliter basi volvati velo albo evanescenti. Sporae 8,5-11 × 6-6,5 × 5-6 µm, lentiformes, subhexagonales, poro germinativo saepe eccentrico. Cheilocystidia lecythiformia, pseudoparaphyses praesentes. Stipitipellis ut in sectione *Pilosellae*, caulocystidia lecythiformia rarissima. Pileipellis hymeniformis. Terra nuda in pascuo.

Typus: Croatia, Dalmacija, insulae Hvar, Jelsa, 43°09'53''N, 16°41'04''E, 30 m s. m., 3. 8. 2006, leg. A. MEŠIĆ & M. ČERKEZ (CNF 1/4017, holotypus; isotypus in WU).

Characters:

Pileus: 9-17 mm broad, at first parabolic, soon expanding to conico-convex, plano-convex or applanate; in young stages entirely light brown with centre darker, ± brown, later light brown only at centre, fading to cream or whitish towards the margin, old basidiocarps distinctly two-coloured; hygrophanous, but not translucently striate; surface dry, in centre glabrous, towards margin slightly plicate-sulcate, often shortly splitting.

Lamellae: narrowly adnate, narrow, moderately distant, pale brown to rusty brown with whitish edge.

Stipe: 15-30 mm long, 1-2 mm wide, cylindrical, with slightly swollen base (up to 3 mm), with slightly swollen base, white to pale cream, pruinose-flocculose in upper part, more pubescent towards base, with a small, volva-like, evanescent veil zone at the base (visible at two basidiocarps on the colour photograph).

Context: colour, taste and smell not recorded.

Exsiccatum: Pileus whitish to cream-white, lamellae rusty brown, stipe white, with white veil remnants well visible at the base of one young basidiocarp.

Spores: 8.5-11 × 6-6.5 × 5-6 µm, average 9.5 × 6.2 × 5.5 µm, Q = 1.4-1.7, sub-hexagonal to submitriform in front view, ellipsoidical in lateral view, distinctly lentiform, with double wall and distinct, partly eccentrical germ-pore (up to 1.5 µm wide), orange-yellow to rusty yellow in KOH.

Basidia: 4-spored, 18-22 × 9.5-12 µm, with sterigmata up to 3.5 µm long.

Ammoniacal reaction: absolutely negative.

Clamp connections: present, not rare.

Pseudoparaphyses: present and well developed.

Cheilocystidia: lecythiform, 16-22 × 7.5-12 µm, with 3-4 µm wide capitula.

Stipitipellis: predominantly consisting of piliform, cylindrical, lageniform to spherical elements (15-45 × 2.5-8 µm); only one lecythiform caulocystidium seen at the upper part of stipe.

Pileipellis: hymeniform, consisting of sphaeropedunculate to pyriform elements (25-40 × 15-20 µm) with slightly incrusting pigment; pileocystidia not seen.

Habitat and distribution: nursery with chrysantemums, partially exposed to atmospheric conditions, on soil fertilised with sheep dung; up to now only known from the type locality.

Material examined: Type collection.

Remarks:

The macroscopical description is based on one collection comprising 13 young to mature basidiocarps.

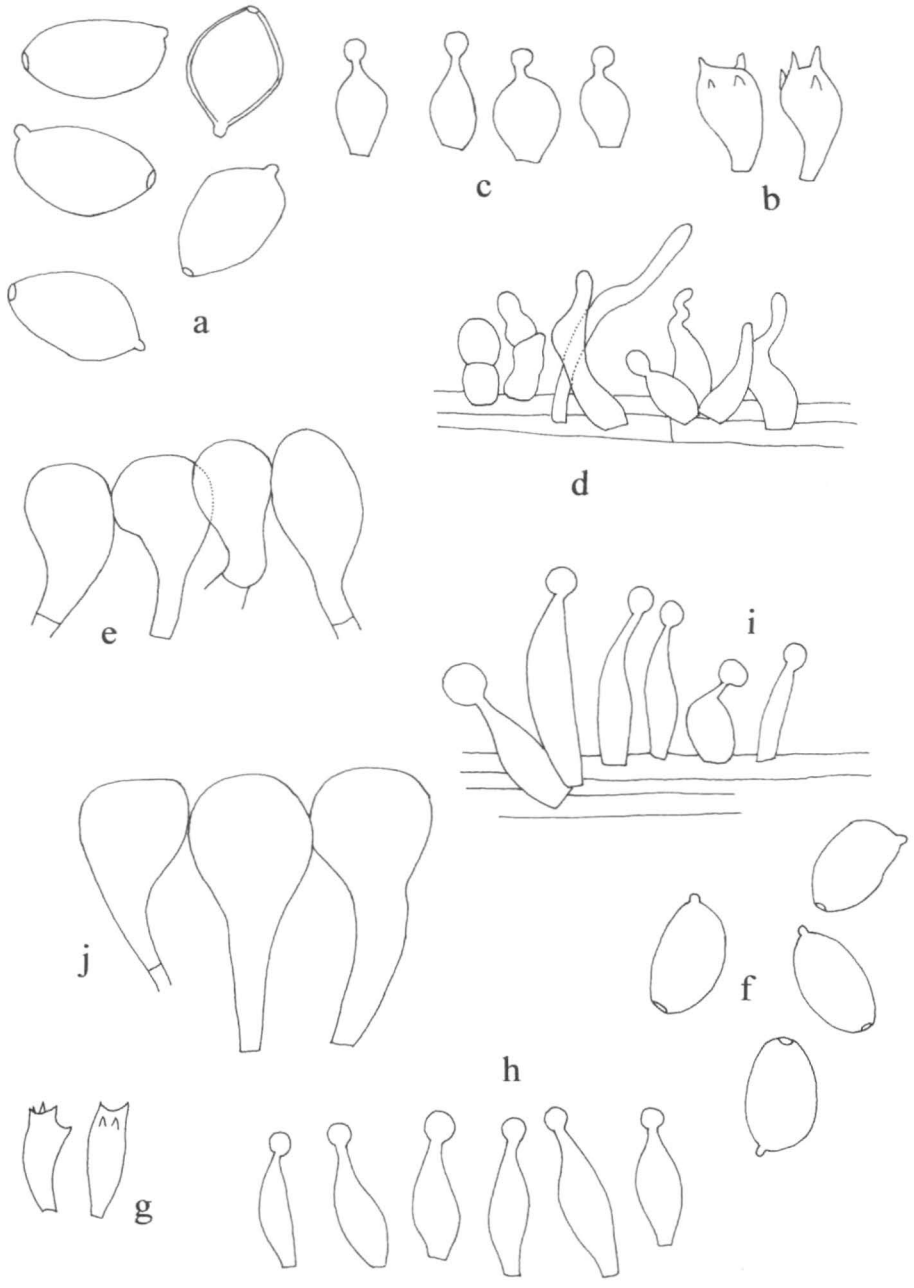

Fig. 1 *a-e. Conocybe thermophila* (type collection). *a* spores, × 2000, *b* basidia, × 800, *c* cheilocystidia, × 800, *d* stipitipellis, × 800, *e* pileipellis, × 800. *f-j. Pholiotina intermedia* (CNF 1/3579). *f* spores, × 2000, *g* basidia, × 800, *h* cheilocystidia, × 800, *i* stipitipellis, × 800, *j* pileipellis, × 800.

With its small, but distinct volva-like zone at the base of stipe, our new species is a member of sect. *Singerella* series *Locellina* (HAUSKNECHT & KRISAI-GREILHUBER 2006), which has so far been represented in Europe by a single species, *Conocybe hornana* SINGER & HAUSKN., and its variety, *C. hornana* var. *subcylindrospora* HAUSKN., VAURAS, KYTÖV. & OHENOJA. Both taxa can be distinguished by larger, stouter basidiocarps, different colours of pileus and stipe, absence of pseudoparaphyses and much larger, never subhexagonal to submitriform spores. If the volva-like zone is overlooked, confusion is easily possible with members of sect. *Candidae*, especially *C. crispella* (MURRILL) SINGER. This tropical species growing in Europe preferably in glass-houses has also pseudoparaphyses in the hymenium, but is easily distinguishable by larger, darker, never subhexagonal spores with central germ-pore.

Most members of sect. *Singerella* outside Europe have a membranaceous, persistent volva and thereby are sufficiently distinguishable. *Conocybe locellina* (MURRILL) WATLING from North America, the type species of series *Locellina*, differs by a well developped, but not membranaceous volva, darker colours, striate pileus and much larger, never lentiform or subhexagonal spores (see HAUSKNECHT & al. 2004).

***Pholiotina intermedia* (A. H. SM.) SINGER 1936,** Beih. Bot. Centralblatt B, **56**: 170 (Figs. 1 f-j, 3)
= *Pholiota intermedia* A. H. SM. 1934, Ann. Mycol. 32: 479
(for further synonyms, see HAUSKNECHT & al. 2004: 190)

Characters:

Pileus: 25-58 mm wide, applanate to slightly depressed at maturity, dark ferrugineous in centre when moist, near margin more yellowish brown, with irregular dark ferrugineous brown spots, drying pale ochraceous; hygrophanous, translucently striate up to ½ radius of the pileus; surface smooth or slightly wrinkled at centre, viscid and shining in wet weather; no velar remnants present at margin of pileus.

Lamellae: narrowly adnate to adnexed, ventricose, very crowded, dull ochre brown to light rusty brown with white, flocculose lamellar edge.

Stipe: 47-95 mm long, 3-6 mm wide, cylindrical with thickened base (up to 9 mm wide), fistulose, pale brown to dark reddish brown towards base, below the annulus fibrillose-squamulose; annulus distinct, persistent, membranaceous, pale brown, striate-sulcate above, smooth below.

Context: pale yellowish brown in pileus, dark brown in stipe, with sweetish-fungoid smell after cutting, taste somewhat sweetish.

Exsiccatum: Pileus ochre yellow, lamellae pale rusty brown, stipe ferrugineous to dark brown.

Spores: 6.5-8 × 4-4.5 µm, average 7.5 × 4.3 µm, Q = 1.6-1.9, ellipsoidical, partly slightly phaseoliform in lateral view, not lentiform, thin-walled with distinct, small germ-pore, yellow in KOH.

Basidia: 4-spored, 15-20 × 6-8 µm.

Clamp connections: present, not rare.

Cheilocystidia: skittle-shaped, ventricose with apex drawn out into a thin neck up to 2 µm broad, 25-40 × 5.5-10 µm, with capitula 3-5.5 µm broad; lamellar edge heterogeneous.

Fig. 2. *Conocybe thermophila* (CNF 1/4017). – Phot. Z. TKALČEC & A. MEŠIĆ.

Fig. 3. *Pholiotina intermedia* (CNF 1/3579). – Phot. Z. TKALČEC & A. MEŠIĆ.

Stipitipellis: above annulus consisting of fascicles of caulocystidia similar to cheilocystidia, but often larger and more variable, 20-55 × 3-10 µm, with capitula up to 8 µm wide.

Pileipellis: hymeniform, consisting of predominantly pyriform elements (35-50 × 18-25 µm), without pileocystidia.

Habitat and distribution: found in an old beech forest on humous soil, close to a large fallen log of *Fagus sylvatica* L.; the Slovakian collection was found directly on decaying *Fagus*-wood, also in North America, the preferred substrate is on or near rotten logs of hardwood, preferably *Fagus*. *P. intermedia* is not rare in North America, especially in the Great Lakes Region (WATLING 1971), it is new for Europe.

Material examined: Croatia: Zagreb, Gornja Vas, Žumberak-Samoborsko gorje Nature Park, 2. 10. 2004, A. MEŠIĆ & Z. TKALČEC (CNF 1/3579).

Slovakia: Prešovský kraj, Nová Sedlica, Príkrý, Stužica, 27. 9. 1988, J. KUTHAN (BRA CR 8863).

USA: Michigan, Emmet County, Harbor Springs, Blisswood, on rotting maple wood, 19. 8. 1933, A. H. SMITH (MICH, part of holotype).

Remarks:

The macroscopical description is based on the Croatian collection, which comprises ten mature basidiocarps. The Slovakian material was not accompanied by field notes, but the exsiccata of two basidiocarps showed the typical, striate-furcate annulus.

Pholiotina intermedia is closely related to *P. brunnea* (WATLING) BON, from which it differs especially by veil conditions (appendiculate, never annuliform, in the latter). WATLING (1971) cites additional differences (colour and density of the lamellae), which are fully confirmed in the European collections. Further, the basidiocarps of *P. intermedia* seem to be much larger, at least in the material we have seen from Europe and North America. Therefore, we follow WATLING (1971) in distinguishing two closely related, but independent species.

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