

Notes on some taxa of *Conocybe* (*Bolbitiaceae*, *Agaricales*) from Hungary

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Summary: Four interesting taxa of *Conocybe* collected by the second author in Hungary are documented macro- and microscopically. *Conocybe papillata* is described as new. Microscopical drawings of all species are presented as well as colour plates of three species are given.

Zusammenfassung: Vier interessante *Conocybe*-Arten, die der Zweitautor in Ungarn gesammelt hat, werden makro- und mikroskopisch dokumentiert. *Conocybe papillata* wird als neue Art beschrieben. Von allen Arten werden Mikrozeichnungen präsentiert, Farbfotos von drei Arten werden gegeben.

In the present paper, some results of the mycological inventory of Hungarian sandy regions made by the second author are presented. These localities proved to have very valuable mycobiota (BABOS 1999, RIMÓCZI 1994, NAGY 2004) due to often extreme environmental conditions: arid and hot climate (annual rainfall under 550 mm) and continental dune or steppe like vegetation that evolved on calcareous soils. A number of new and rare species have already been described and still remained to be described from the region (summarised in BABOS 1999; NAGY 2005, 2006). On *Conocybe* species we had very few, mainly older records, therefore in the past few years special attention has been paid to them. Four rare and one new species are presented here (a full checklist will be published soon).

List of species

Conocybe leporina (VELEN.) SINGER & HAUSKN. (Figs. 1 a-e, 3)

Characters:

Pileus: up to 15 mm broad and 8 mm high, campanulate-convex, obtusely conical, in quite dry condition pale rusty brown, similar to *Conocybe semiglobata* KÜHNER & WAT-

LING but darker, not hygrophanous, not striate; surface smooth and shiny (due to weather conditions).

Lamellae: nearly free to narrowly adnate, rather crowded, slightly ventricose, up to 1.5 mm broad, rusty brown with paler lamellar edge.

Stipe: 15-25 mm long, 0.6-1 mm thick, cylindrical with distinct pseudorhiza (up to 10 mm), entirely pale ochraceous, surface pruinose.

Context: Smell and taste not recorded.

Exsiccate: pileus and stipe yellowish brown, lamellae somewhat darker, rusty brown.

Spores: 10-12.5 × 6.5-7.5 µm, mean 11.6 × 7.0 µm, quite variable in shape and size, mostly ellipsoidal, but also fusiform-limoniform, subnaviculate, not lentiform, with thin, slightly double wall and 1-1.5 µm wide germ-pore, rusty yellow to brownish yellow in KOH.

Basidia: 2-spored, 13-17 × 7-10 µm, very rarely 1-spored immixed.

Clamp connections: absent.

Cheilocystidia: lecythiform, 13-18 × 6.5-9.5 µm, with capitulum 2-4.5 µm wide.

Stipitipellis: consisting of capilliform and elongate-fusiform to lageniform elements (up to 35 × 10 µm), in between not rare especially at stipe apex lecythiform caulocystidia (15-22 × 5-10 µm).

Pileipellis: hymeniform consisting of globose to sphaeropedunculate elements (up to 40 × 25 µm), pileocystidia not observed.

Habitat: in mown lawn on sandy soil.

Collections examined: Hungary: Bács-Kiskun, Kecskemét, Szivárvány street, 3. 8. 2006, leg. L. NAGY (WU 26995, herb. NAGY); - - 11. 8. 2007, leg. L. NAGY (herb. NAGY).

Remarks: The Kecskemét record of three fruit-bodies is the first for Hungary and was found up to now only in the Czech Republic (holotype), Austria and Siberia. Our find differs from the holotype in presence of strictly 2-spored basidia and less variable, often more ellipsoidal spores.

Conocybe leporina differs from *C. microrrhiza* HAUSKN. var. *microrrhiza* by paler pileus colour and more variable, not lentiform, paler spores. *C. bispora* (SINGER) HAUSKN. has similar spores, but a bulbous stipe base without pseudorhiza and a slightly different stipitipellis where lecythiform elements are extremely rare. Finally, *C. ambigua* KÜHNER & WATLING can be distinguished from *C. leporina* by non-rooting stipe base, larger, paler spores and a different stipitipellis with a higher number of lecythiform elements, especially at stipe apex.

***Conocybe ochrostriata* HAUSKN.** (Fig. 1 f-i)

Characters:

Pileus: 5-25 mm broad, 4-7 mm high, campanulate-convex, mostly with conical apex, but also completely hemispherical; pale ochraceous brown when moist, fading to ochraceous-cream or almost whitish when dry and old, also with slightly purplish shades; margin translucently striate when moist, slightly sulcate when dried out, surface smooth, glimmery.

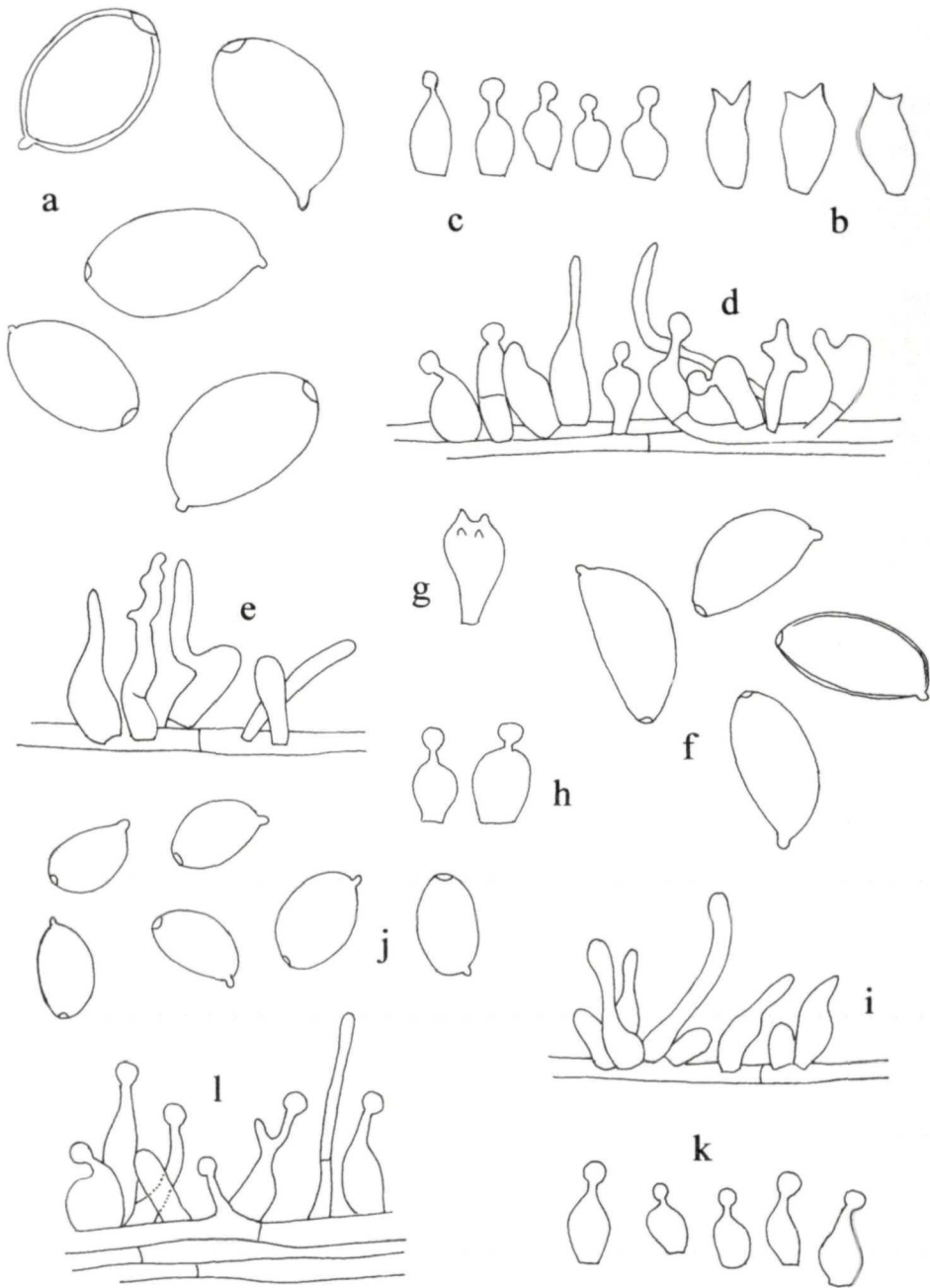


Fig. 1 a-e. *Conocybe leporina* (WU 26995). a spores, $\times 2000$, b basidia, $\times 800$, c cheilocystidia, $\times 800$, d stipitipellis from top of stipe, $\times 800$, e stipitipellis from middle part of stipe, $\times 800$. f-i. *Conocybe ochrostriata* (28. 8. 2005). f spores, $\times 2000$, g basidium, $\times 800$, h cheilocystidia, $\times 800$, i stipitipellis, $\times 800$. j-l. *Conocybe* aff. *roberti* (14. 10. 2006). j spores, $\times 2000$, k cheilocystidia, $\times 800$, l stipitipellis, $\times 800$.

Lamellae: narrowly adnate to free, moderately crowded to distant, slightly ventricose, up to 2.5 mm broad, unusually pale yellowish when young, more rusty yellow when mature, with paler fimbriate edge.

Stipe: 15-50 mm long, 0.7-1.2 mm thick, cylindrical with small bulb at base, pale cream when young, brown (with purplish shade) especially at stipe base when mature, entirely faintly pruinose, fistulose, fragile.

Context: smell and taste not recorded.

Exsiccate: very pale ochre-brownish.

Spores: 9.5-12 × 4.5-6 µm, mean 10.4 × 5.2 µm, elongate-ellipsoidal, slightly amygdaliform, not lentiform, with slightly double wall and distinct germ-pore, pale brownish-yellowish in KOH.

Basidia: 4-spored, 18-22 × 9-11 µm.

Clamp connections: present, rare.

Cheilocystidia: lecythiform, 18-20 × 8-10 µm, with up to 4.5 µm wide capitulum.

Stipitipellis: consisting of only non-lecythiform caulocystidia and hairs (up to 30 × 8 µm); no lecythiform elements seen.

Pileipellis: hymeniform, made up of spheropedunculate elements (up to 50 × 22 µm); no pileocystidia seen.

Habitat: growing repeatedly in a yearly flooded floodplain-forest, four to six weeks after drawback of the water, on bare clayey soil overlaid by forest litter.

Collections examined: Hungary: Csongrád, Szeged, Boszorkánysziget, Leucojo aestivi-Salicetum albae, 18. 7. 2005, leg. L. NAGY (herb. NAGY); - - 28. 8. 2005, leg. L. NAGY (herb. NAGY); - - 10. 8. 2006, leg. L. NAGY (herb. NAGY).

Additional collection: Pest, Csobánka, Kevély, 30. 4. 1951, leg. G. BOHUS (BP, as *Naucoria tenera*).

Remarks: The specimens collected at this locality show consistently very pale lamellae in young stages, shape and size of the fruitbodies varying considerably – hemispherical pileus is often correlated with small to very small fruitbodies, larger specimens show often distinctly conical pilei. Further, the pileus colour is paler, drying out to nearly whitish. The habitat and also the colours of the fruitbodies differ from typical collections, but the microscopical characters totally agree with many other specimens examined by the first author.

The distribution of *Conocybe ochrostriata* is poorly known, as the species has often been misinterpreted in the past or mixed with closely related taxa such as *C. rostellata* (VELEN.) HAUSKN. & SVRČEK, *C. sienophylla* (BERK. & BROOME) SINGER or *C. velutipes* (VELEN.) HAUSKN. & SVRČEK. It seems to be one of the more common species in Central Europe, but was collected before only once in Hungary.

***Conocybe papillata* HAUSKN. & L. NAGY, spec. nova** (Figs. 2 a-e, 4)

Latin diagnosis: Species *Conocybi alboradicanti* affinis sed ab ea differt fructificationibus minoribus coloribusque pallidioribus, lamellis distantibus et sporis tenuitunicatis minoribus nonnullisque lentiformibus.

Holotypus: Hungary, Csongrád, Szeged, Boszorkánysziget, 8. 8. 2006, L. NAGY (WU 26996, holotypus; isotypus in BP).

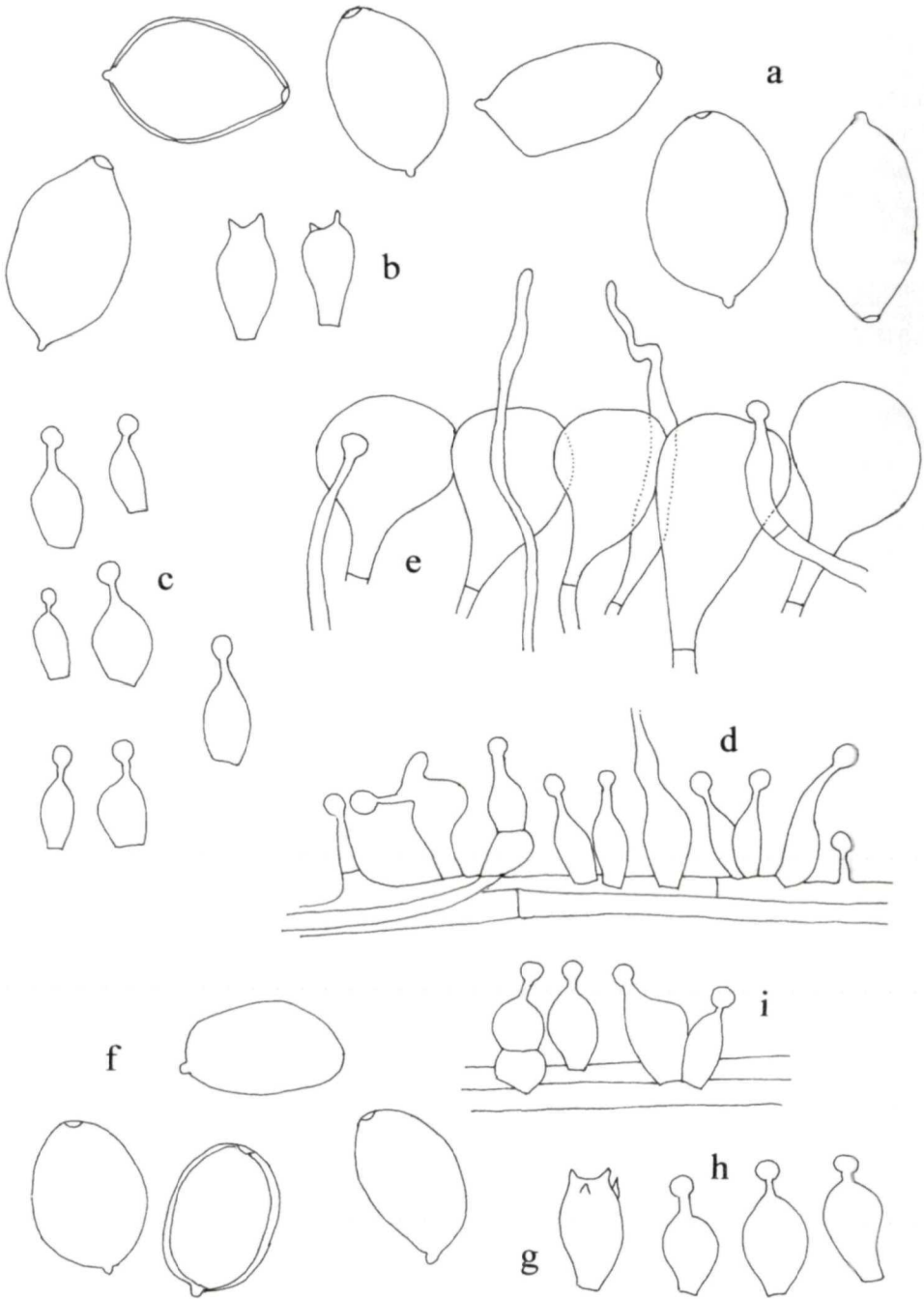


Fig. 2 a-e. *Conocybe papillata* (holotype). a spores, $\times 2000$, b basidia, $\times 800$, c cheilocystidia, $\times 800$, d stiptipellis, $\times 800$, e pileipellis with pileocystidia, $\times 800$. f-i. *Conocybe subxerophytica* (3. 8. 2006). f spores, $\times 2000$, g basidium, $\times 800$, h cheilocystidia, $\times 800$, i stiptipellis, $\times 800$.

Characters:

Pileus: 3-15 mm wide, up to 9 mm high, young campanulate with broad, obtuse umbo, later expanding, flat convex, flat hemispherical with distinct, almost acute papilla; young and fresh ochraceous-stramineous, papilla slightly darker, pale ochre-brownish, dry pale yellow, pale ochre-yellow; hygrophane, moist up to $\frac{1}{3}$ radius striate, striation soon vanishing; surface smooth, margin obtuse.

Lamellae: narrowly adnate, rather distant, ventricose, pale yellow to yellow, with inconspicuous lamellar edge.

Stipe: without pseudorhiza 8-25 mm long, 0.5-1 mm thick, with up to 5 mm long, ca. 1 mm thick pseudorhiza, cylindrical, towards base slightly thickened, white to yellow-white, young entirely faintly pruinose, hollow.

Context: white, smell indistinct.

Exsiccate: totally pale yellow, ochraceous yellow, only lamellae rubiginous.

Spores: $10.5-14.5 \times 6.5-9 \mu\text{m}$, mean $12.2-12.4 \times 7.8-8.2 \mu\text{m}$, $Q = 1.3-1.9$, ellipsoidal, partly slightly angular to subcylindrical, not lentiform, with ca. $1 \mu\text{m}$ thick wall and distinct, rarely papillate germ-pore, yellow to rusty yellow in KOH.

Basidia: 2-spored, $15-22 \times 8-13 \mu\text{m}$.

Clamp connections: present, but very rare.

Ammoniacal reaction: negative.

Cheilocystidia: lecythiform, $16-23 \times 6-11 \mu\text{m}$, with $2-4 \mu\text{m}$ wide capitula.

Stipitipellis: almost exclusively consisting of lecythiform caulocystidia, these very variable, $10-35 \times 3-10 \mu\text{m}$, with $2-4 \mu\text{m}$ wide capitula; in between very seldom some vesiculate to globose elements.

Pileipellis: hymeniform, consisting of sphaeropedunculate elements ($30-45 \times 20-28 \mu\text{m}$), in between abundantly capilliform pileocystidia, many with small capitula up to $4 \mu\text{m}$ wide.

Ecology and distribution: in a yearly flooded riverine forest (*Salicetum albaefragilis*) with *Salix alba* L., *Populus alba* L. and *Acer negundo* L., on bare soil and between leaf litter. Up to now only known from two different, up to c. 1 km distant places in Hungary.

Collections examined (besides holotype): **Hungary:** Csongrád, Szeged, Boszorkánysziget, 11. 8. 2006, leg. L. NAGY (herb. Nagy); - - 11. 8. 2006, leg. L. NAGY (herb. NAGY).

Remarks: *Conocybe papillata* is characterised by small fruitbodies, pale colours, papillate pileus, a character being extremely rare in the genus, distant lamellae and white, radicant stipe (easily overlooked). The habitat, which is untypical for the genus *Conocybe*, is also remarkable, a yearly flooded softwood riverine forest. These findings first were considered as slightly untypical, small specimens of *Conocybe alboradicans* ARNOLDS. Although closely related, the latter can be distinguished by larger fruitbodies with longer pseudorhiza, never papillate pilei, slightly darker pileus colour, hardly distant lamellae and above all distinctly lentiform, slightly larger spores with thicker walls. *Conocybe subxerophytica* SINGER & HAUSKN. has similar fruitbodies with similar colours and also distant lamellae, however not radicant, but a bulbous stipe base; the pileus also is never papillate, and the spores are distinctly lentiform. Further, the habitat (dry grassland, sand dunes) is totally different.



Fig. 3. *Conocybe leporina*. – Fig. 4. *Conocybe papillata*. – Fig. 5. *Conocybe subxerophytica*. – Phot. L. NAGY.

Conocybe* aff. *roberti* SINGER & HAUSKN. (Fig. 1 j-l)*Characters:**

Pileus: 2-4 mm broad when fully expanded, convex to campanulate with small obtuse umbo, hygrophanous, but never seen striate; colour ranging from pale ochraceous to slightly plumbous; surface mat, smooth, slightly glimmery.

Lamellae: free, moderately distant, slightly ventricose, up to 0.5 mm broad, rusty ochraceous with paler faintly fimbriate lamellar edge.

Stipe: 5-20 mm long, 0.2-0.7 mm thick, filiform, cylindrical, not radicate; whitish, faintly pruinose in entire length.

Context: smell and taste indistinct.

Exsiccatum: pileus pale brownish-grey, stipe whitish to stramineous.

Spores: 5.5-7.5 × 4-5 μm, mean 6.5 × 4.3 μm, Q = 1.4-1.55, ellipsoidal, not lentiform, thin-walled with simple wall, germ-pore small, but always present; ochre yellow in KOH.

Basidia: 4-spored, about 20 × 8 μm.

Clamp connections: at the base of basidia and in the trama present.

Cheilocystidia: lecythiform, 12-20 × 6-8 μm, with 3-4.5 μm wide capitulum.

Stipitipellis: mainly consisting of lecythiform caulocystidia, these 10-30 × 4-11 μm, with 3-4 μm wide capitulum, in between a few non-lecythiform elements.

Pileipellis: hymeniform consisting of sphaeropedunculate elements and pileocystidia similar to cheilocystidia.

Habitat: among leaf litter on rich sandy soil in Fraxino pannonicae-Alnetum.

Collection examined: Hungary: Bács-Kiskun, Kecskemét, Töserdő, 14. 10. 2006, leg. L. NAGY & Z. GORLICZAI (herb. NAGY).

Remarks: The present collection of three, somewhat dried fruitbodies resemble *Pholiotina mairei* (WATLING) ENDERLE at first sight, but the microscopical characters immediately revealed its identity as member of the genus *Conocybe*, sect. *Conocybe*. On hand of its very small spores and stipe covering of nearly exclusively lecythiform elements it has to be classified in series *Mesospora* (HAUSKNECHT & KRISAI-GREIL-HUBER 2006). Here, only one species exist with so pale colours, viz. *C. ochroalbida* HAUSKN., but it has much larger fruitbodies, also larger spores and a totally different habitat. The only taxon with nearly identical microscopical characters known worldwide is *C. roberti*, found only once in a garden in Austria. It was collected in very fresh condition with much darker pileus colours and somewhat more distant lamellae.

C. microspora (VELEN.) DENNIS, coming also close to our collection from Töserdő, differs in larger fruitbodies, distinct brown to dark brown, striate pilei, always coloured stipe and narrower spores with a Q of 1.5-2.1, mean about 1.8. The tropical *C. dennisii* HAUSKN. (= *C. microspora* ss. DENNIS, see HORAK & HAUSKNECHT 2003) differs considerably in shorter spores without germ-pore.

Although the differences, mostly in colours of pileus and stipe, are evident, we place our find near *C. roberti*. We hope that new collections will be made to prove if the macroscopical differences between *C. roberti* and our find are constant or not to evaluate the nomenclatural state of the Töserdő specimens.

Conocybe subxerophytica* SINGER & HAUSKN. (Figs. 2 f-i, 5)*Characters:**

Pileus: up to 18 mm wide, from campanulate expanding to almost applanate, without umbo, margin rather thick; hygrophanous, but found non-striate; pale rusty ochraceous, becoming paler and more brownish with age, somewhat darker at centre; surface smooth, mat.

Lamellae: narrowly adnate, quite distant, ventricose, up to 3 mm broad, in fresh condition rusty yellow, drying out quite dark rusty brown with whitish, fimbriate lamellar edge.

Stipe: 24-50 mm long, 0.5-1 mm thick, cylindrical with slightly enlarged to sub-bulbous base buried in sand, stramineous to ochraceous brownish in entire length, base not darker, pruinose at apex, somewhat longitudinally striate, fistulose, fragile.

Context: smell and taste not recorded.

Exsiccatum: whole fruitbody pale brown, lamellae not considerably darker.

Spores: $9.5-11.5 \times 6.5-8 \times 6-7 \mu\text{m}$, mean $10.5 \times 7.3 \times 6.5 \mu\text{m}$, ellipsoidal, ovoid-ellipsoidal, lentiform, but not angular, thick-walled, with $1.2-2 \mu\text{m}$ wide germ-pore, in KOH orange-brown.

Basidia: 4-spored, ca. $20 \times 11 \mu\text{m}$.

Clamp connections: present.

Ammoniacal reaction: negative.

Stipitipellis: consisting of capitate caulocystidia ($15-22 \times 6-11 \mu\text{m}$), with few vesiculose elements immixed; no hairs or non-lecythiform caulocystidia present.

Pileipellis: hymeniform, consisting of sphaeropedunculate elements (up to $30 \times 20 \mu\text{m}$), some pileocystidia similar to cheilocystidia present.

Habitat: Central part of the continental sand dunes in Hungary, on bare sand with scanty vegetation, consisting mainly of *Stipa*, *Festuca*, *Artemisia*, accompanied by *Agrocybe vervacti* (FR.) ROMAGN., *Conocybe microrrhiza* HAUSKN., *Marasmius ventalloi* SINGER, *Inocybe aeruginascens* BABOS, *I. pruinosa* R. HEIM and *I. arenicola* (R. HEIM) BON; the second collection from a mown lawn, on sandy soil.

Collections examined: Hungary: Bács-Kiskun, Fülöpháza, Kiskunság NP, 9. 6. 2006, leg. L. NAGY (herb. NAGY); - Kecskemét, Alföld Áruház, 3. 8. 2006, leg. L. NAGY & Z. GORLICZAI (herb. NAGY); - Fülöpháza, Kiskunság NP, 12. 11. 1977, leg. M. BABOS, A. FRIESZ & F. NÉMETH (BP, as *Conocybe siliginea*).

Remarks: The fruitbodies of the Kiskunság NP collection are somewhat larger than typical collections, and due to the quite dry fruitbodies, the fresh colour of the cap is unknown. The microscopical characters are fully identical with typical *Conocybe subxerophytica* var. *subxerophytica*, and the quite distant lamellae which become darker only when dried out as well as the pale colours of the exsiccate distinguish it sufficiently from *C. subxerophytica* var. *brunnea* HAUSKN. Confusion with *C. semiglobata* KÜHNER & WATLING is possible, too, but this taxon has non-lentiform spores and darker, more crowded lamellae.

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