

Sporae 8.9–14.2 × 5.8–7 µm, plerumque 12.6 × 6.6 µm, Q = 1.75–2.03, in fronte ellipsoideae apice fusiformi vel conico vel cylindrico atque basi obtusa, a latere fusiformes vel cylindricae, haud lentiformes, mediocriter rubrobrunneae, poro germinativo valde excentrico, 2–2.3 µm lato atque parvo hilo praeditae. Basidia tetrasporigera, biformia, clavata vel in medio constricta, 23–30 × 8–10 µm. Pleurocystidia absunt. Cheilocystidia haud notata, verisimiliter globosa-clavata. Pileocystidia numerosissima, delicata, lageniformia collo cylindrico vel saepe sinuoso atque basi parva, elata, apice paene eadem latitudine, rotundato-inflato, interdum capitato, 62–93 × 9–18 µm, saepe luteola refractiva substantia praedito; intermixtis nonnullis robustis firmioribus cystidiis (110 × 15 µm), plerumque versus pilei centrum. Caulocystidia numerosa, lageniformia, collo cylindrico, plerumque sinuoso atque apice inflato-clavato, cuspidate delicate rotundata, 55–88 × 17–29 µm. Sclerocystidia absunt. Velum abest. Fibulae absunt.

Pileus 3–6(7) × 3–4 mm when young and closed, up to 10–20 mm broad when fully expanded, ellipsoid-subglobose, then convex, flattened when mature, weakly deliquescent, translucently striate up to center when moist, radially grooved, plicate when expanded, the surface is covered with fine glimmering hairs, veil not seen, pale ochraceous to pale grayish, fading to almost whitish, pale grayish ochraceous when mature; lamellae free, crowded, ventricose, up to 1–1.5 mm broad, whitish when young, then grayish, finally blackish, with minutely fimbriate whitish edge; stipe 0.5–1 × 30–80 mm, slender, fistulose, fragile, cylindrical or insignificantly broadening toward base, surface covered with fine whitish pruinose hairs, whitish to pale ochraceous when mature. Context insignificant, brittle, with no noticeable odor or flavor.

Basidiospores 8.9–14.2 × 5.8–7 × 6.2–6.7 µm, on average 12.6 × 6.6 × 6.5 µm, Q = 1.75–2.03, in frontal view ellipsoid with fusiform, conical or cylindrical apex and obtuse base, in lateral view fusiform to cylindrical, slightly lentiform, medium red-brown, with 2–2.3 µm wide, strongly eccentric germ pore and small a hilum; basidia four-spored, bimorphic, clavate or with median constriction, 23–30 × 8–10 µm; pleurocystidia absent; cheilocystidia not seen, probably globose-clavate; pileocystidia abundant, delicate, lageniform with cylindrical, or often sinuous, neck and a small slender base and almost equally broad rounded-enlarged, sometimes capitate apex, 62–93 × 9–18 µm, apex often filled with yellowish refractive material; interspersed with the before-mentioned type, a small number of robust, firmer cystidia (110 × 15 µm) mainly toward the center of the pileus; caulocystidia abundant, lageniform, with cylindrical, mostly sinuous neck and enlarged-clavate apex with delicate rounded tip, 55–88 × 17–29 µm; sclerocystidia absent; veil absent; clamp connections absent.

**HOLOTYPE.** HUNGARY, Kecskemét, Kistemető: on wood chips along a path, 5 Aug 2006, L. Nagy & Zs. Gorliczai, NL-1556 (HOLOTYPE, BP);

*Additional specimens examined.* HUNGARY, Szeged, Népliget, in mown lawn, 14 May 2008, L. Nagy, NL-4218, SZMC; Szeged Botanical Garden, among grass on clay-like soil, 9 May 2008, L. Nagy, NL-0625, SZMC.

*Habitat and distribution.* So far known from humid places with mossy, clay-like soil from three localities in Hungary.

*Remarks.* The pale colors and the slender, capitate pileocystidia with frequently sinuous neck are distinctive for this species. Capitate or subcapitate pileocystidia also are found in other species of *Coprinellus*, such as *C. curtus*, *C. plagioporus*, *C. marculentus*, *C. heterothrix*, *C. velatopruinatus*, *C. subdisseminatus* and *C. cinereopallidus*. Of these *C. curtus* differs in having strongly flattened spores, more vivid colors and a rich coverage of velar spherocysts on the pileus; the fruiting bodies of *C. plagioporus* and *C. marculentus* are dark brown and pileocystidia are broader. *C. heterothrix* possesses diverticulate veil elements on the pileus surface unlike *C. pallidus*, which can vanish quickly from the maturing fruiting bodies. In such cases the fusiform spores and the narrow, slender pileocystidia are indicative of *C. pallidus*.

***Coprinellus ramosocystidiatus*** (Bender) L. Nagy, Házi, Vágvölgyi and Papp, comb nov.  
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Basionym. *Coprinus ramosocystidiatus* Bender, *Zeitschrift für Mykologie* 56:35. 1990.

***Coprinellus sabulicola*** L. Nagy, Házi, Papp & Vágvölgyi, sp. nov. FIGS. 2, 6  
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Pileus primo ellipsoideus vel etiam conicus, usque ad 3 × 2 mm in inexpando tempore, deinde campanulatus cum obtuso centro, ad postremum applanatus vel proprie revolutus, usque ad 15 mm latus, etiam in iuvenili tempore usque ad centrum radialiter sulcatus sed perluciditate non striatus, in senectute fissuratus, non deliquescens. Cuticula opaca, primo levis atque pallide ochraceofusca griseis cum varietatibus, sed etiam fuscorutilans, deinde pallidior flos lactis-ochracea griseis cum varietatibus atque austeriori papilla. Lamellae remotae, ventricosae, usque ad 1 mm latae, ex albo nigricantes, cum albidior margine. Stipes 20–45 × 0.5–0.9 mm, filiformis, haud bulbosus, fragilis, dense pruinosis, albovitreus, ad basim pallide ochraceus. Odor atque sapor nulli.

Sporae 15–21.8 × 10–13 µm, fere 17.3 × 10.9 µm, ellipsoideae-late ellipsoideae, etiam subovoideae, a latere lineamentis angulatae, ad apicem obtusissimae, hilo lato praeditae, haud vel vix lentiformes, nigriculo- vel purpureofuscae, cum externo, 2.8–3 µm lato, germinabili poro. Basidia clavata, unimorpha, bispora, fere 32.5 × 11.3 µm.

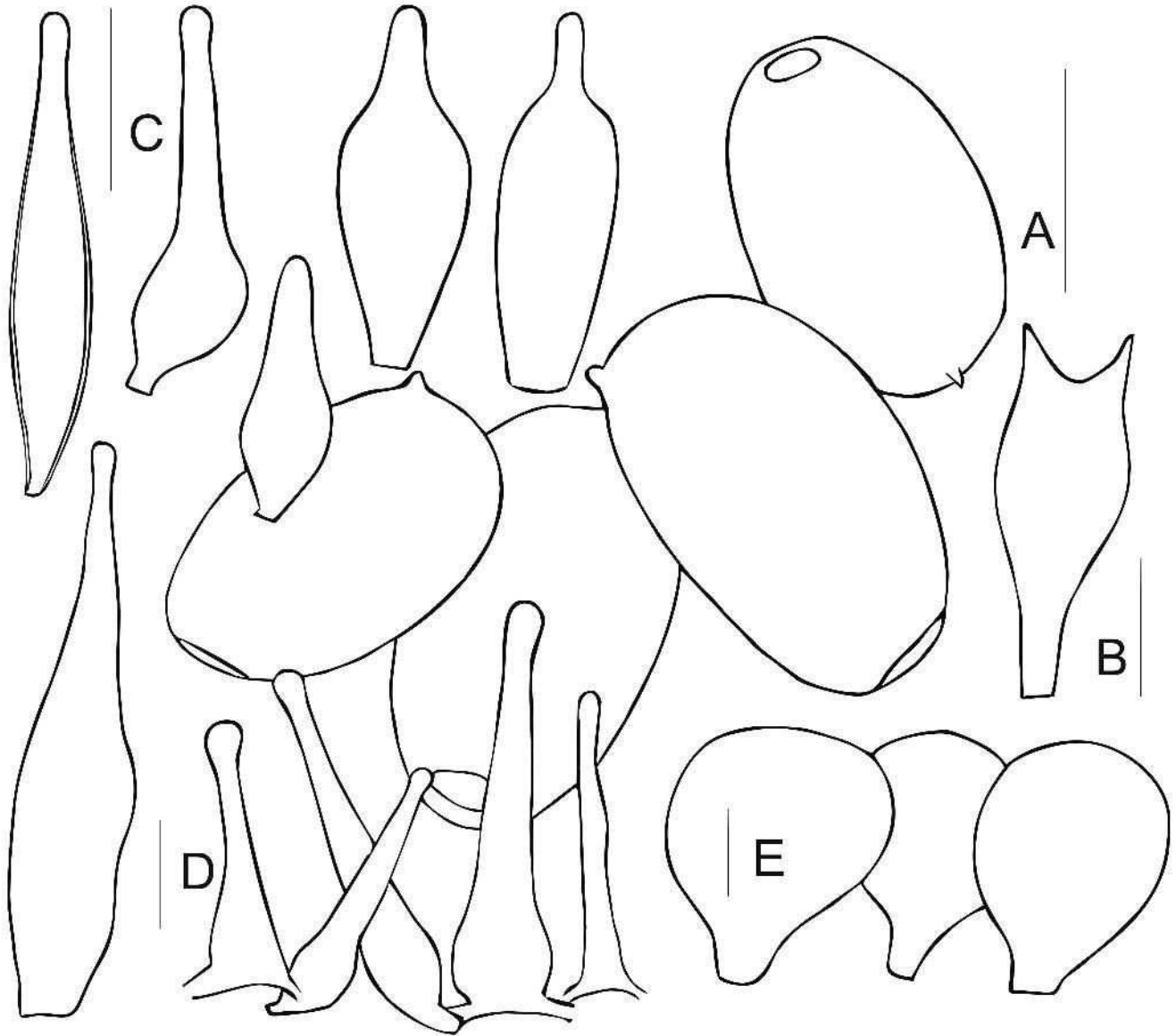


FIG. 6. *Coprinellus sabulicola*. A. Spores. B. Basidia. C. Pileocystidia. D. Caulocystidia. E. Cheilocystidia. Bars: A, B, E = 10  $\mu$ m; C, D = 20  $\mu$ m.

Cheilocystidia globosa usque ad vesiculosa vel late ellipsoidea, brevistipitata vel sessilia, 17–32  $\times$  12.5–27  $\mu$ m. Pleurocystidia absentia. Pileocystidia biformia: (i) lageniformia usque ad fusiformia, valde contracta atque capitata, plerumque crustata, 22–63  $\times$  8–19  $\mu$ m; (ii) mucronata, ad aliquando crustatam basim ellipsoidea, ad apicem obtusa atque non capitata, 30–33  $\times$  12–14  $\mu$ m. Velum haud agnitum sed nonnullae crustatae hyphae in pileipelle iacentes. Caulocystidia lageniformia usque ad fusiformia, contracta atque late capitata, 41–60  $\times$  10–20  $\mu$ m. Pileipellis anguste clavatis, plerumque aliquantum angulatis cellulis instructa. Subpellis diverticulatis atque fibulatis hyphis praedita.

Pileus ellipsoid to conical when young, up to 3  $\times$  2 mm when closed, later campanulate with more or less obtuse center, becoming applanate or, more

typically concave when mature, not or weakly deliquescent. Margin strongly radially sulcate up to center even when young, becoming strongly fissured when old, in young stages not or slightly translucently striate. Surface mat, smooth when young, veil or setules not visible to the naked eye but somewhat pruinose when very young. In young stages pale ocher-brown with grayish hue to warm reddish brown (like typical young *Parasola misera*), becoming paler ochraceous-beige with grayish hue due to maturing spores, typically with a darker button in center when mature. Rarely the mature pileus is just pale gray to almost whitish (mostly in dry environment). Lamellae free, distant (almost like *P. misera*), ventricose up to 1 mm broad, white when young,

becoming grayish-blackish with age, but the gill edge remains white for a long time, strongly contrasting with the sides of the gills. Stipe 0.5–0.9 × 20–45 mm long, slender, fistulose, fragile, equal without basal bulb, surface densely pruinose from short caulocystidia, whitish, vitreous to pale ochraceous toward base. Context thin, insignificant, odor and flavor indistinct.

Basidiospores 15–21.8 × 10–13 µm, on average 17.3 × 10.9 µm, Q = 1.43–1.74, ellipsoid-broadly ellipsoid to almost ovoid, with strongly obtuse apex and large hilum, not or slightly lentiform, dark blackish reddish brown, opaque, germ pore large, strongly eccentric, ca. 2.8–3 µm wide in lateral view often somewhat more ellipsoid with an angular outline. Basidia clavate, not bimorphic, two-spored, ca. 32.5–11.3 µm. Cheilocystidia abundant, globose to vesiculose or broadly ellipsoid, typically with short but broad pedicel or no pedicel at all, and then the cystidium ends in a broad flat base, 17–32 × 12.5–27 µm. Pleurocystidia absent. Pseudoparaphyses present. Pileocystidia of two types; (i) normal lageniform cystidia with tapering neck and capitate apex, these cystidia are small compared to other species of *Setulosi*, they have an inconspicuous neck and apex (somewhat similar to that of *C. heptemerus*), basal part sometimes inconspicuous, making the cystidium just fusiform, sometimes a more pronounced basal part is observable, incrustated with crystal not dissolving in NH<sub>4</sub>OH in most cases, 22–63 × 8–19 µm; (ii) typically mucronate with an ellipsoid basal part ending in a short neck with obtuse, noncapitate apex, basal part sometimes incrustated, 30–33 × 12–14 µm. Veil not seen but several hyphae lying on the pileipellis are incrustated. Caulocystidia abundant, lageniform to fusiform with a tapering neck and generally large capitulum, incrustation scarce, 41–60 × 10–20 µm. Pileipellis cells unusually narrowly clavate but mostly somewhat angular. Hyphae underneath pileipellis layer rather narrow (2.5–4 µm wide), richly diverticulate; veil absent; clamp connections present.

**HOLOTYPE.** HUNGARY, Orgoványi Ősborókás: on sand, attached to bark of *Populus nigra* 24 Oct 2009, L. Nagy and M. Jeppson, NL-0872 (HOLOTYPE, BP).

*Additional specimens examined.* HUNGARY, Alföld, Ásotthalom: *Festucetum vaginatae stipaetosum*, on herbs 2 Nov 2008, L. Nagy, NL-4140, SZMC; *ibid*: *Festucetum vaginatae stipaetosum*, on dead stems of 9 May 2007, L. Nagy & Zs. Gorliczai, NL-1147, SZMC; *ibid*: roadside, on sedges, 20 Jun 2008 L. Nagy, NL-2907, SZMC; *ibid*: *Bromo sterili-Robiniatum*, on sandy roadside, 20 Jun 2008, L. Nagy, NL-2906, SZMC; *ibid*: on vegetable debris, buried in sand, 10 Jun 2008, L. Nagy, NL-1763, SZMC; *ibid*: *Festucetum vaginatae*, on dead grasses and stems of *Euphorbia cyparassias*, 20 Aug 2005, L. Nagy, NL-1027, SZMC; Nyomási – forest:

*Cynodonti-Festucetum vaginatae*, 8 Sep 2007, L. Nagy, NL-057, SZMC 9; *ibid*: 16 May 2005, L. Nagy, NL-3063, SZMC; Nyárjas: *Artemisio-Festucetum*, on herbaceous debris, 1 Nov 2004, L. Nagy & Zs. Gorliczai, NL-1031, SZMC; Törökfái: among grass on bare sandy soil, 31 Aug 2004, L. Nagy, NL-1560, SZMC; Balázspuszta, Kunság-májor: *Cynodonti-Festucetum pseudovinae*, 6 Jun 2010, L. Nagy, NL-0825, SZMC; Fülöpháza: on rabbit dung, 6 Jun 2006, L. Nagy, NL-3536; Németkér, Látó-hegy: *Festucetum vaginatae*, 6 Nov 2009, P. Feny, FP/2009.11.06/1.

*Habitat and distribution.* Grows in sand dunes always in the vicinity of smaller open, sandy areas, often found on naked sand but is always emerging from dead sedges, grasses or dung buried in sand (*Euphorbia cyparassias*, *Artemisia absinthium*, *Stipa arenaria*); the type material was growing on bark of *Populus nigra* exposed on bare sand. Rarely found on pure dung (deer, horse). So far known only from Hungary.

*Remarks.* This species bears some spectacular features compared with other *Coprinellus* species; among these are relatively large basidiospores, the lack of a pedicel on the cystidia, a habitat in dry, sandy sites and short, capitate pileocystidia with incrustated base. These characters readily distinguish it from any other member of *Coprinellus*. Macroscopically *C. sabulicola* has superficial resemblance to *C. curtus* or *C. diminutus*, both of which differ in having much smaller basidiospores, globose veil and four-spored basidia. Furthermore, unlike in other coprinoid species, its basidia are not bi- or trimorphic. Bi- and trimorphic basidia have been found to be linked to the presence of pseudoparaphyses, plicate pileus, increased size of cystidia and autodigestion across the entire Psathyrellaceae, which has been referred to as coprinoidization (Nagy et al. 2011). Being an exception to this rule, three of these traits can be found in *C. sabulicola*, that is plicate pileus, increased cell size and pseudoparaphyses, whereas the basidia are monomorphic. Thus we hypothesize that *C. sabulicola* represents a transitional state between deliquescent and nondeliquescent species, reflecting the characteristics of ancestral members of the genus *Coprinellus*. In agreement with this assumption it has a basal, albeit somewhat uncertain phylogenetic position, either as a sister group to the eurysporoid clade, or between the Domestic + Micacei clades and the Core Setulosi + eurysporoid clade. Both alternatives received low support in the Bayesian and ML analyses. A third line of evidence for the ancestral nature of *C. sabulicola* may be the short branch it occupies, although this conclusion may be affected by potential rate variation among lineages and decoupling of the rate of morphological and molecular evolution (Pagel 1999, Rabosky et al. 2007).