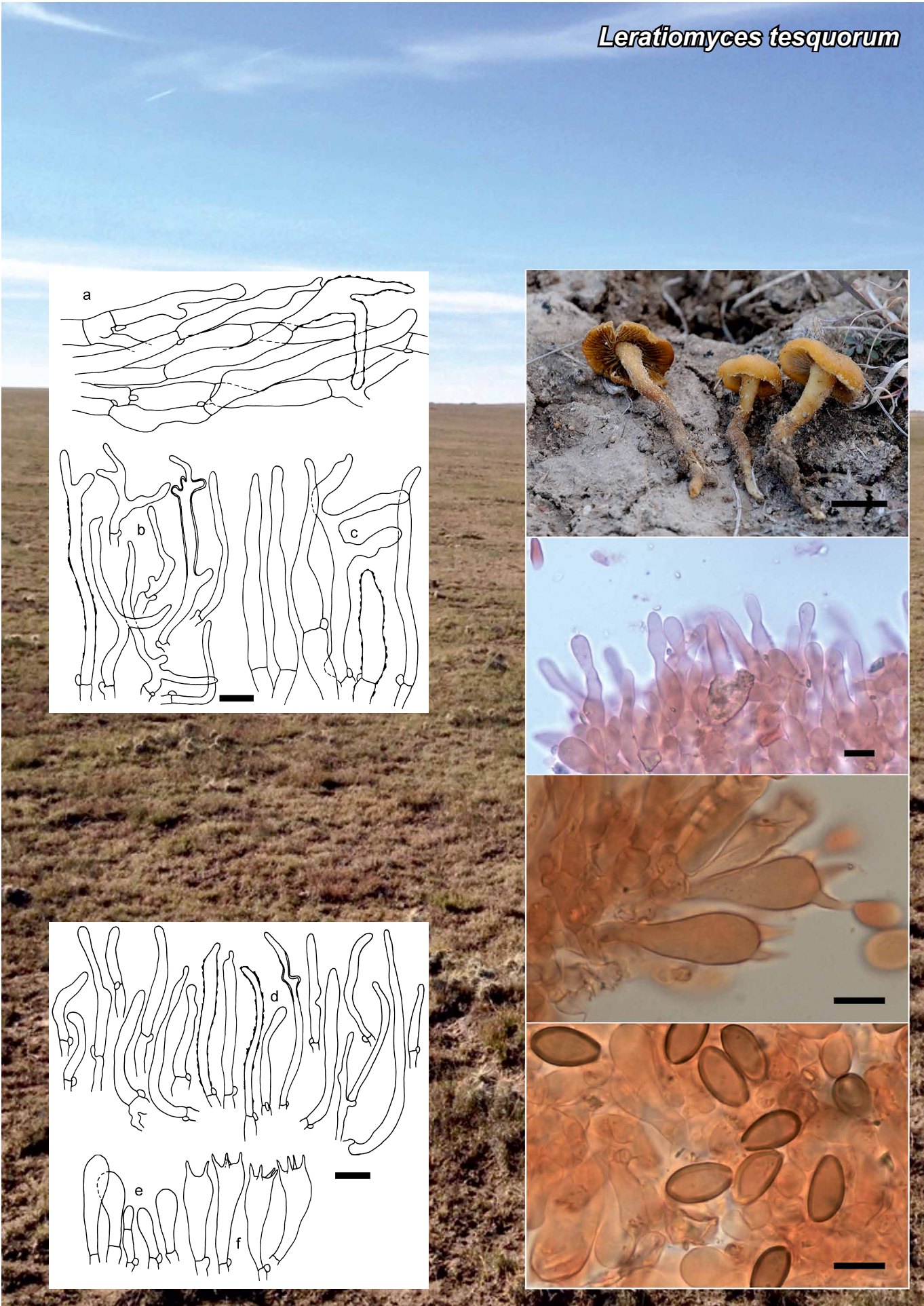


Leratiomyces tesquorum



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***Leratiomyces tesquorum* Adamčík & Vizzini, sp. nov.**

Etymology. The specific epithet is the genitive plural of the Latin word *tesquum* (= desert place) and refers to the growing of the fungus in desert and arid areas.

Classification — *Strophariaceae*, *Agaricales*, *Agaricomycetes*.

Basidiomata pileostipitate, with lamellar hymenophore. **Pileus** 14–18 mm wide, plano-convex, without or with low indistinct umbo in the centre, margin not striated (not even when wet), long involuted, surface hygrophanous, matt and shiny when wet, not viscid, near the pileus margin smooth and becoming rugulose towards centre, when wet Sahara-brown (6D5; Kornerup & Wanscher 1974) to yellowish brown (5D8) and dark brown towards centre (6F8), dry uniformly pale yellowish (more reddish than 4A3–4A4), no veil remnants observed. **Lamellae** adnate-emarginate, L = 32–46, l = 1–3, c. 3 mm broad, first ivory-yellow (4B3), later grey-brown (6E3) to brown (6E4). **Stipe** 30–40 × 3.5–6 mm, tapering towards base and rooting deep (20–30 mm) in substrate (sandy soil), often fusiform, surface strongly fibrillose especially near lamellae, without veil remnants, interior hollow, above yellowish brown (4C5 – chamois to 4B6 – amber-yellow), towards base darker brown (6E5). **Context** elastic, concolorous with surface, not changing after bruising or air-exposure, without distinctive odour (or faint radish like). **Spore-print** not obtained, probably dark brown. **Spores** ($n = 32$) (11–)11.5–12.4–13(–13.5) × (6–)6.5–6.9–7.5(–8) μm , $Q = (1.63\text{--})1.7\text{--}1.79\text{--}1.90(–2.01)$, ellipsoid, oblong or amygdaloidal, in frontal view ellipsoid, smooth, dark brown in 10 % KOH solution, walls 1 μm thick, truncate with large germ pore (1–1.5 μm wide), hilar appendage inconspicuous and hyaline. **Basidia** (31–)32.5–34.5–36.5(–39) × (9.5–)10–11–11.5(–12) μm broadly clavate, mainly 4-spored, occasionally 2- or 3-spored, mainly thin-walled but occasionally with slightly thickened walls, basidiola first cylindrical, then clavate, c. 3.5–10.5 μm wide. **Subhymenium** 25–30 μm thick, of 2–5 μm wide, intricate hyphae forming a pseudoparenchymatic structure, sharply delimited from parallel hyphae of lamellae trama, composed of < 50 μm long and c. 3–10 μm wide elements, often anastomosed and occasionally branched. **Cheilocystidia** abundant, (19.5–)25.5–31.7–37.5(–40) × (4.5–)5–6–6.5(–7) μm , thin-walled or with slightly thickened walls (< 0.5 μm), narrowly lageniform to subcylindrical, often moniliform, apically mainly subcapitate rounded, occasionally tapering. **Pleurocystidia** absent. **Pileipellis** ixocutis, c. 20–30 μm thick, composed of densely packed, horizontally oriented hyphae with intracellular yellow pigments, with mainly slightly or distinctly thickened walls, near the surface gelatinised and strongly incrustated by yellow-brown pigments, terminal elements near the pileus margin dispersed, narrowly lageniform, subulate

Colour illustrations. Great Plains prairies, Pawnee National grassland, short-grass dry prairie with *Opuntia* sp. and *Bouteloua dactyloides*, where the holotype was collected. Right: Basidiomes; cheilocystidia; basidia and spores (all from holotype). Left: Structure of pileipellis near the pileus margin (a), hyphal terminations in pileipellis near the pileus centre (b) and margin (c); caulocystidia (d), basidiola (e) and basidia (f, all from holotype). Microscopic elements were observed in Congo red. Scale bars = 10 mm (basidiomes), 10 μm (microscopic structures). All photos and drawings by S. Adamčík.

or subcylindrical, apically often attenuated or constricted, occasionally with nodules or lateral branches, often flexuous, (32–)44–62.2–80(–91) × (4.5–)6–8.7–11(–12.5) μm ; hyphal terminations near the pileus centre embedded in thick gelatinous matter that does not colour in Congo red, more attenuated, narrower and more nodulose-branched than those near the pileus margin, terminal elements look like ixohyphidia of *Flammulina velutipes*, measuring (32–)38.5–52.7–67(–92) × (2.5–)3–4.1–5(–5.5) μm . **Pileitrama** composed of irregularly oriented, branched, loose, intricate hyphae composed of c. 40–120 × 2–25(–30) μm elements, often nodulose. **Caulocystidia** present and abundant on stipe surface near just under the lamellae, (22–)32–47.3–62.5(–92) × (2.5–)3.6–4.4–5(–6) μm , often fasciculate in dense cluster, repent or ascending, subcylindrical, apically often constricted, occasionally nodulose or with lateral branches, towards apices usually flexuous, thin-walled or with slightly thickened walls, with yellow intracellular pigments and brownish yellow incrustations; caulocystidia completely disappear in lower part of the stipe. **Stipitrama** of parallel hyphae composed of c. 30–100 × 4–10(–15) μm large elements that are often nodulose, branched or anastomosed, often with thickened walls. **Clamp connections** present everywhere.

Habit, Habitat & Distribution — Solitary or gregarious, in arid and semi-arid grasslands, associated with *Poaceae* (*Bouteloua dactyloides*, *B. gracilis*, *Stipa hymenoides*). So far known only from USA, viz. Colorado (based on the presence of basidiomes), New Mexico and Utah (based on environmental sequences).

Typus. USA, Colorado, Weld Co., Great Plains prairies, Pawnee National grassland, N40°39'40" W104°5'17", short-grass prairie, cattle pasture, terrestrial on naked sandy soil, among scattered vegetation of *Opuntia* sp., buffalo grass (*Bouteloua dactyloides*) and other plants, 19 Oct. 2013, S. Adamčík (holotype SAV F-4052, ITS and LSU sequences GenBank MH043618 and MH036177, MycoBank MB 825174).

Additional material examined. ***Leratiomyces laetissimus***. CZECH REPUBLIC, Prague-Spořilov, Chodovská street, 26 Sept. 2012, J. Borovička, PRM860990, ITS and LSU sequences GenBank MH043619 and MH036178. ***Leratiomyces squamosus***. CZECH REPUBLIC, Malonty - Bělá, 28 Sept. 2008, O. Jindřich, PRM922211, ITS and LSU sequences GenBank MH043620 and MH036179. ***Pholiota squarrosa***. CZECH REPUBLIC, Bílina, Bořeň, 15 Oct. 2013, M. Kříž, PRM923259, ITS and LSU sequences GenBank MH043621 and MH036180.

Notes — A phylogenetic estimation using Maximum likelihood (ML) on the nrITS sequences revealed that a major clade, here named as the *Leratiomyces laetissimus* complex, is highlighted within the genus *Leratiomyces*. This clade encompasses the minor clades 1–3 and the *Psilocybe calongei* lineage. Clade 1 consists of environmental sequences of an uncultured root-associated (endophyte) fungus of *Bouteloua gracilis* (USA, New Mexico; Porrás-Alfaro et al. 2008); clade 2 of *L. tesquorum*, two sequences of an uncultured mycorrhizal fungus (endophyte) of *Stipa hymenoides* (USA, Utah; Hawkes et al. 2006) and several sequences of an uncultured root-associated (endophyte) fungus of *Bouteloua gracilis* (USA, New Mexico; Porrás-Alfaro et al. 2008); clade 3 of *L. laetissimus* and *Leratiomyces* sp. SC5F2-1.

For supplementary information see MycoBank.

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