

A new subspecies of *Mycenastrum corium* from Colorado

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Abstract: During field work in Colorado an unusual form of *Mycenastrum corium* with a deep rusty red to reddish orange gleba was found. The species exists worldwide and lacks a previous description of the gleba at maturity other than olive brown, brown to purple brown. A subspecies is proposed for this unusual population found in an area where normal populations with the typical glebal color are found.

Key words: Basidiomycetes, Lycoperdales, Mycenastraceae

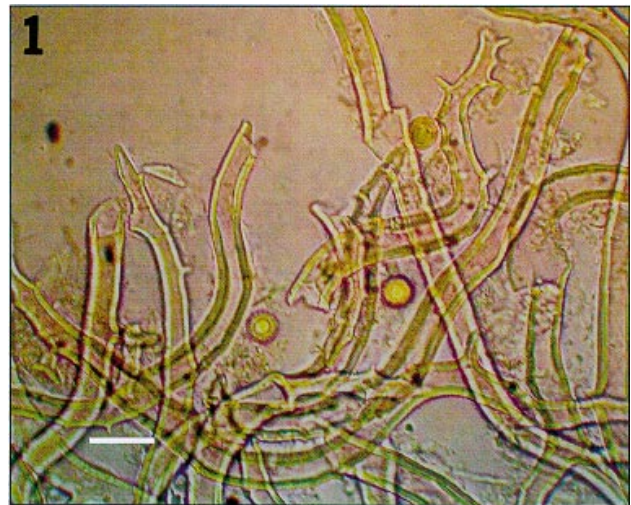
INTRODUCTION

Recent molecular studies by Krüger et al (2001) have supported the inclusion of *Mycenastrum corium* in the Lycoperdales where it has been placed traditionally (Miller and Miller 1988).

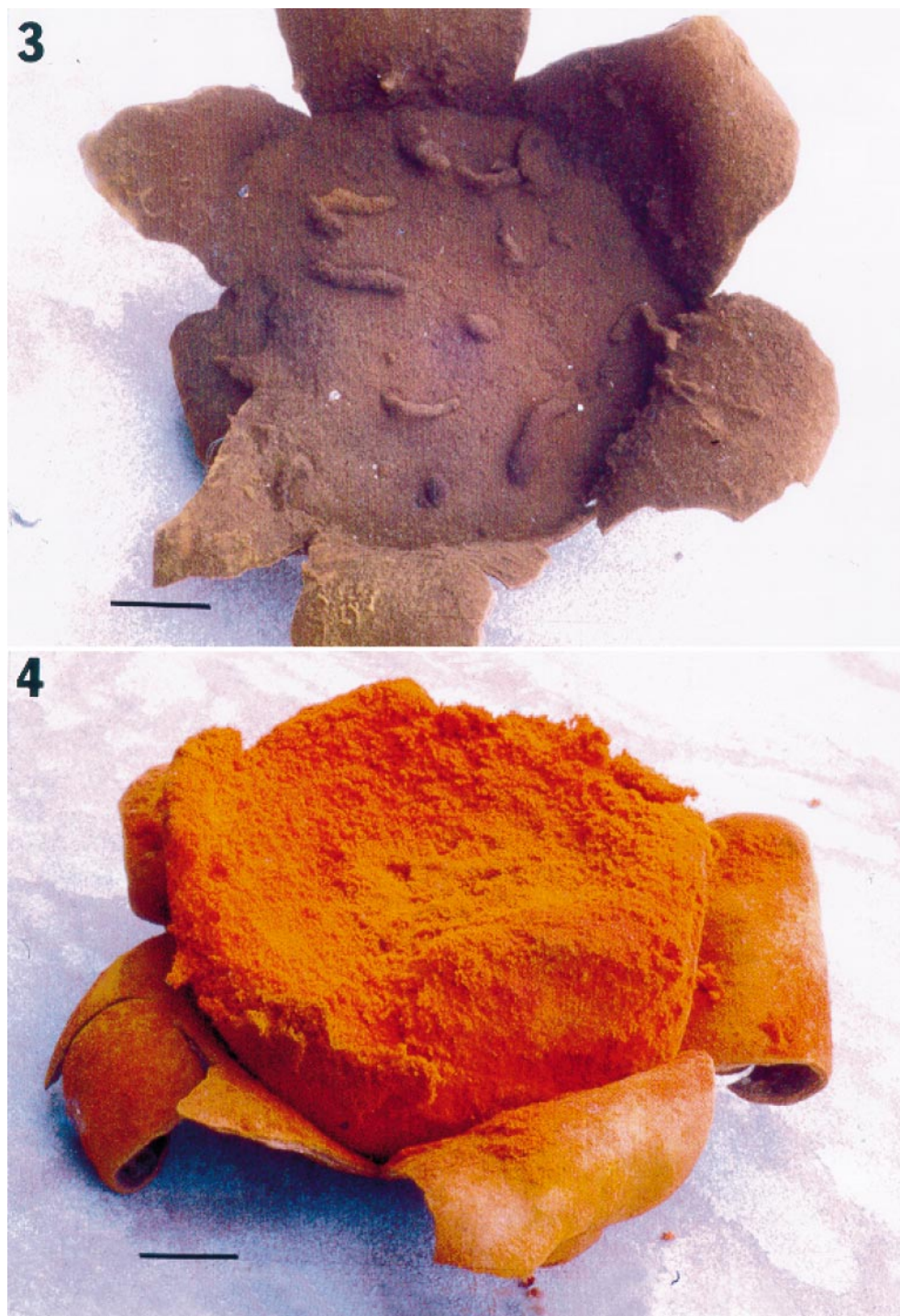
Dring (1973) mentions two species in the genus but Pilát (1958) in Europe lists only *Mycenastrum corium* (Guers. ex DC.) Desv. Grgurinovic (1997) provides a long list of synonyms but states that *Mycenastrum* contains a single cosmopolitan species. Bottomley (1948) in South Africa, Cunningham in Australia and New Zealand (1944), Hollós (1904) in Hungary as well as Smith and Smith (1973) in the United States also list a single species. In Europe it is found in southern Scandinavia (Hansen and Knudsen 1997) and widespread to the south but not in the United Kingdom (Pegler et al 1995).

In North America it is most common in the western United States. Smith (1951) describes the species from Michigan. He describes the development of the gleba as white when young, then yellowish olivaceous to olive-brown and finally even purplish brown. A collection made in Wyoming (Miller 1980) has a brown

gleba, one in Owyhee County, Idaho, (OKM 8350) a brown gleba, and one near Martinsdale, Montana, also a brown gleba (FIG. 1). The authors collected *Mycenastrum corium* ssp. *corium* (DBG 19038) (FIG. 3) in a grass community at Wheat Ridge Greenbelt, Jefferson County, Colorado, not far from the holotype location for *M. corium* ssp. *ferrugineum*. The gle-



FIGS. 1, 2. *Mycenastrum corium* ssp. *ferrugineum* DBG 19432. 1. Capillitium in 3% KOH shows typical spines and morphology. 2. Capillitium in water shows the encrusted orange pigmentation of the new subspecies. Bars = 10 μ m.



FIGS. 3, 4. *Mycenastrum corium*. 3. *Mycenastrum corium* ssp. *corium* DBG 19038 with typical olivaceous brown gleba collected near location of the new subspecies. Bar = 1 cm. 4. *Mycenastrum corium* ssp. *ferrugineum* DBG 19423, HOLOTYPE shows the orange gleba of the new taxon. Bar = 1 cm.

ba of *M. corium* ssp. *corium* is olive-brown (Met 5D6-7) over the margin to deep brown (Met 6E6-7) over the center of the gleba. The new subspecies described here was collected by the second author.

MATERIALS AND METHODS

Microscopic observations were made from rehydrated sections of basidiomata using alcohol and then water, mounted in 3% KOH and 1% Congo red mixed in the slide with a

drop of 3% KOH. Pigmentation studies of the gleba were made using 3% KOH. Color comparisons were made using Kornerup and Wanscher (1967) and designated (Met 7A-B 2), which indicates the plate, row and color blocks. Met is short for the Methuen Handbook of Colour (Kornerup and Wanscher 1967).

Mycenastrum corium* ssp. *ferrugineum O.K. Mill, R.

Brace & V. Evenson ssp. nov. FIGS. 1, 2 and 4

Fructificatio 5.5–7.5 cm lata, quum inexpansa ovalis vel subdepressa, sub maturitate in radios 6–9 obtusos vel acutos findens, quum plene aperta usque ad 8–10 cm lata, ovalis vel subdepressa, 3.5–4.5 cm alta. Exoperidium tenax (1–2 mm crassum) glabrum exasperatum aurantiaco-bubalinum vel colore hebeti-albescenti. Gleba firma, glomus glebale laeve distincte rubiginoso-rubrum vel rufidulo-aurantiacum formans. Columnae parvae contortae e materia glebali compositae visibiles, protrudentes vel erecto-digitiformes. Basis sterilis nulla.

Capillitium e cellulis arcte circinatis crassitunicatis compositum, 6–10 μm diametro, processibus spiniformibus plerumque 2–5 μm diametro, aliquibus partibus terminalibus ramulos apicales contortos formantibus. Partes capillitii pigmento valde aurantiaco incrustatae. Sporae globosae vel paene subglobosae, 9.0–12.6 \times 9.0–12.6 μm ($Q = 1.01: 1.0\text{--}1.1$, $n = 31$) ornamenta includentes, verrucis obtusocutis erectis 1.2–2.0(–3.2) μm ad basem reticulo infirmo ornatae, hyalinae, parietibus in aqua flavis, in 3% KOH valde flavis praeditae.

Holotypus in prato aprico in communitate graminea lectus, Jefferson County, Colorado, 14 Mar 1998. Leg. R.L. D. & R.D. Brace (DBG 19432 Holotype, CO).

Fruiting body 5.5–7.5 cm broad slightly depressed when unexpanded, at maturity splitting into 6–9 blunt to pointed rays expanding to 8–10 cm wide when fully open, oval to slightly depressed, 3.5–4.5 cm high. Exoperidium tough (1–2 mm thick) glabrous, becoming roughened pale orange-buff (Met 7A B2) to dull whitish, peeling in places to reveal a dull brown endoperidium (Met 7 D5). Gleba firm, forming a smooth distinctive rusty red to reddish orange (Met 9D 6–7, Met 8E 7–8, Met 8C 6–7 to Met 7E 6) glebal ball which does not break down readily and may become free from the peridium. When gently broken apart the gleba is powdery but does not stick to fingers. Small delicate columns of gleba are visible which protrude or stand erect finger-like. In cross section the gleba has irregular chambers caused by the finger-like projections or glebal columns. There is no sterile base, and the gleba fills the fruiting body.

Capillitium of densely coiled thick-walled cells 6–10 μm diam with spine-like projections, usually 2–5 μm diam, which are most abundant over the tapered ends. Some terminal elements have contorted end branches. Cross walls are not present, the capillitial

elements are encrusted with strong orange to orange-red pigments in water mount (FIG. 2). The pigments leach out when treated with 3% KOH (FIG. 1).

Spores globose or slightly subglobose, 9.0–12.6 \times 9.0–12.6 μm ($Q = 1.01: 1.0\text{--}1.1$, $n = 31$) including the ornamentation composed of bluntly pointed erect warts 1.2–2.0(–3.2) μm with a weak reticulum at the base, hyaline with yellow walls in water, deeply yellow in 3% KOH.

Habit, habitat and distribution.—Terrestrial, commonly gregarious and often clustered in open meadows flooded in the spring and bordered by cottonwoods, willows and elms in a grass community. Occurring singly, several or in an arc. Fruiting in February and March and known only from a meadow in the Wheat Ridge Greenbelt west of Kipling Street, Jefferson County, Colorado (39°46'49"N, 105°06'87"W, elev. 5398 ft).

Material examined.—UNTIED STATES: Colorado; Jefferson County, Coll. R.L. & R.D. Brace 2/28/98 DBG 19431; 3/14/1998 DBG 19432, holotype; 2/25/2001 DBG 21356.

Observations.—The distinct rusty red to orange-red (Met 8E 7–8 to Met 9A-B 6–7) glebal pigmentation (FIG. 4) of this new subspecies differs from all collections and reports of *Mycenastrum corium* in which the gleba is olive-brown at first (FIG. 3) and umber to purple-brown in age (Met 5D 5–7 to 6E 6–7). The finger-like columns described above are typical of the variety *corium* but usually not described as such. The glebal columns found in *M. corium* ssp. *ferrugineum* are more delicate than those in *M. corium* ssp. *corium*. *Mycenastrum corium* is a worldwide species commonly collected in Colorado and the western United States but also collected from the eastern United States (Smith 1973).

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