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Bovista helenae - new puffball from Russia

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Abstract

A new *Bovista* from dry steppes of the European part of Russia is described. This species is situated in ser. *Globisporae*. It has a subhypogeous basidiomes with basal incrusted "cup" like in *Disciseda*, globose to subglobose asperulate spores 3.2–3.8×3.5–4.5 µm with straight not acute pedicels 5–7 µm and *Bovista*-type capillitium with small, straight or funnel-shaped pores which are rare on the main stem but usual on the ends. The key for *Bovista* species with basal incrusted "cup" is provided.

Key words – Agaricaceae – *Bovista tomentosa* – gasteroid basidiomycetes – gasteromycetes – Lycoperdaceae – puffballs – systematics – taxonomy

Introduction

The gasteromycetous genus *Bovista* Pers. comprises about 60 species in the world (Kirk et al., 2008). There are 16 species known for Russia. One of them, *Bovista tomentosa* (Vittad.) De Toni, is widely distributed and known from the Mediterranean to the Arctic-alpine zone in Europe, in Asia and probably in N. America (as *B. minor* Morgan). The peculiar feature of this species is "cup" on the base of basidiomes which incrusted by substrate patches. It may lead to misidentifications with species of the related genus *Disciseda*. Some specimens in own collection which have a similar "cup", were identified primarily as *Bovista tomentosa*, but have straight differences in micromorphology and represent a new species.

Materials & Methods

Morphology

Bovista tomentosa-like specimens from Komarov's name Botanical Institute of RAS (LE), as well as from own collection (YuR) with a wide geographic distribution range in Europe and Asia were studied. The examination of microstructures under the light microscope Mikmed-6 was made after boiling for a short time in lactophenol cotton blue. Scanning electronic microphotographs (SEM) were taken using the Carl Zeiss EVO-40 XVP in the South Science Center RAS. Microscopic measurements were made in the specialized program Scandium 5.0. Light microphotographs as well as photographs of the fruitbodies were taken using equipment of the Core Facility Center "Cell and Molecular Technologies in Plant Science" at the BIN RAS. Spore measurements are given excluding the ornamentation. The type material is deposited in the BIN RAS (LE). Facesoffungi number are added (Jayasiri et al. 2015).

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Results

Bovista helenae Rebriev, **sp. nov.** Fig. 1

Facesoffungi Number: FoF 02641

Etymology – the species is named in honor of Elena V. Rebrieva.

Fruitbodies globose, depressed-globose or ovoid, 0.5–1.2 cm diam., subhypogeous. Exoperidium whitish, incrusted in sands and separated from endoperidium, loosing rapidly in maturity at upper part but saving in lower part as thick firm "cup", without mycelial strands. Endoperidium dark-brown to blackish but discoloring to light-brown or whitish, thin, elastic; mouth roundish 1–3(4) mm diam. or sometimes slit-like, with recurving margins. Gleba olive- to dark-brown. Subgleba absent. Basidiospores globose to subglobose, brown, 3.2–3.8×3.5–4.5 µm, asperulate in LM but with small warts in SEM; pedicels straight, not acute, 5–7 µm. Eucapillitium of Bovista-type, brown to dark-reddish-brown, branched (3–7 forks), elastic, up to 8–14 µm diam., without any septa; walls thin to medium, pores small, straight or funnel-shaped, rare on the main stem but usual on the ends.

Material examined – Russia, Asrakhan region, Bogdinsko-Baskunchaksky state reserve, dry steppe with Poaceae and Artemisia, 21 Oct 2008, Y.A. Rebriev (LE 253875, **holotype;** isotype YuR 1914); same place, 21 Sept. 2014 (YuR 2986).

Discussion

Bovista helenae belongs to the ser. *Globisporae* on the base of globose-subglobose spores and capillitium with abundant small pores. There are 5 species reported in this series by Kreisel (1967): *Bovista brunnea* Berk., *B. dubiosa* Speg., *B. echinella* Pat., *B. leucoderma* Kreisel, *B. verrucosa* (G. Cunn.) G. Cunn. All these species have an epigeous basidiomes without any incrusted basal "cup". This "cup" may lead to misidentifications with the *Disciseda* species, but this can be resolved by studying microscopic characters. *Bovista hollosii* Jeppson, Finy & E. Larss. with *Disciseda*-like basidiomes was newly described from Hungarian sand steppes (Jeppson, Finy & Larsson, 2016). The latter differs from *B. helenae* in having larger spores (4–4.8 µm) with longer pedicels (up to 11 µm) and more robust capillitium up to 20 µm.

Other species with incrusted basal "cup" are *Bovista tomentosa* and *Bovista minor* Morgan. They are placed in the ser. *Ovisporae* by ellipsoid spores and robust capillitium with the big funnel-shaped pores (Kreisel, 1967).

Key to the species of *Bovista* with incrusted basal "cup"

1. Spores ovoid-ellipsoid ……..…….2

1a. Spores globose-subglobose ……..……..……3

2. Basidiomes somewhat immersed in soil; in open dry stations ……..……***B. tomentosa***

2a. Basidiomes subhypogeous; in moist shady stations. North American species ……***Bovista minor***

3. Spores with pedicel 4–11 µm long; capillitium with main stems up to 20 µm and with scattered, small to rather large pores, particularly on thinner hyphae ……..…...***B. hollosii***

3a. Spores with pedicel 5–7 µm long; capillitium up to 14 µm diam., pores small, rare on the main stem but usual on the ends ……...……...***B. helenae***

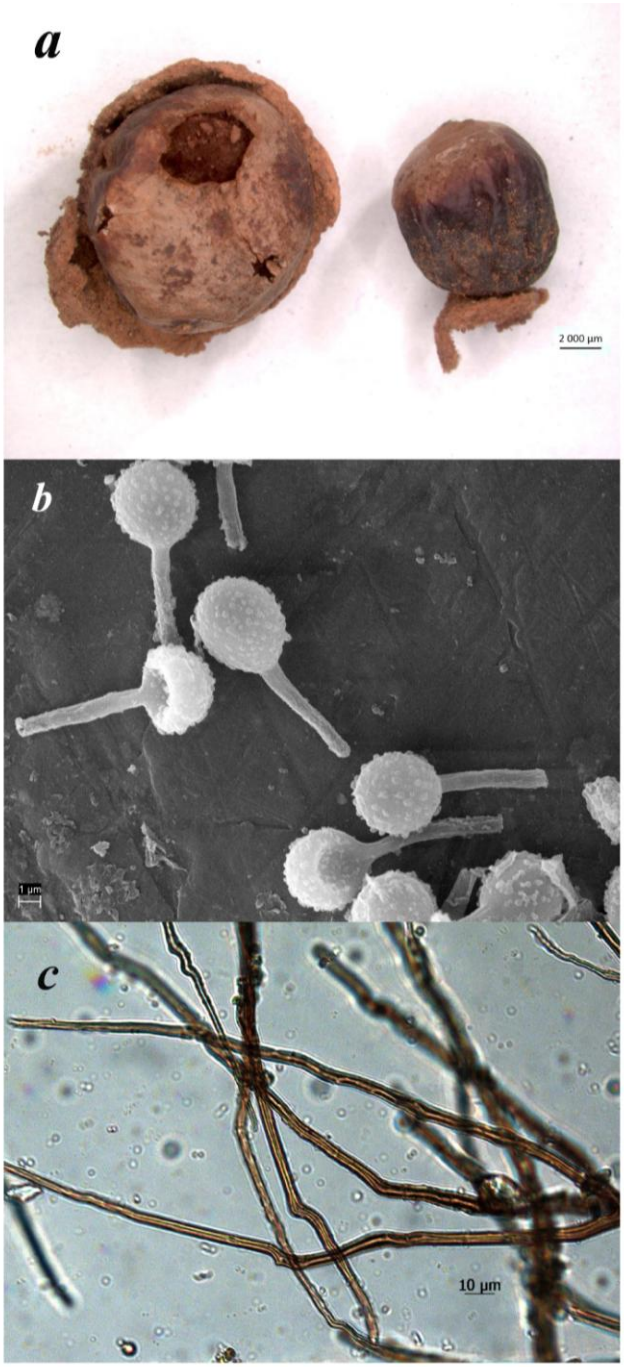

Fig. 1 – *Bovista helenae* (LE 253875, **holotype)**. a. Basidiomes. b. Spores. c. Capillitium ends with abundant pores.

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