

Ascocoryne turficola (Ascomycota, Helotiales): first records from South Europe

Melania M. Gyosheva*, Dimitar Y. Stoykov & Rayna K. Natcheva

Department of Plant and Fungal Diversity and Resources, Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 23 Acad. G. Bonchev St, 1113 Sofia, Bulgaria; e-mail: melanygyosheva@abv.bg (*corresponding author), stoykovdimitar@abv.bg; rayna.natcheva75@abv.bg

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Abstract. *Ascocoryne turficola* (Helotiaceae, Helotiales), an extremely rare fungus in Europe and a typical inhabitant of peat bogs, is recorded for the first time in Bulgaria and South Europe. A concise description and illustrations are provided of the studied specimens, as well as notes on the species ecology.

Key words: *Ascomycota*, Balkan mycota, Bulgaria, *Helotiales*

Introduction

Helotiales are a large group of predominantly saprotrophic nonlichenized ascomycetous fungi producing ascomata of apothecium type. Only two species of the genus *Ascocoryne* J.W. Groves & D.E. Wilson (*Helotiales*, *Helotiaceae*), which develop on rotten wood or

dead bark of trees, have been recently reported and described for Bulgaria: *Ascocoryne cylichnium* (Tul.) Korf and *A. sarcoides* (Jacq.) J.W. Groves & D.E. Wilson (Dimitrova 2010).

During field studies held in 2013 in *Sphagnum*-dominated mires on Mt Vitosha, near the city of Sofia (Fig. 1), and subsequently in 2014 in the Rhodopi Mts, at lakes Smolyanski Ezera (Fig. 2), an extremely rare species, *Ascocoryne turficola* (Boud.) Korf, was recorded. These interesting finds are reported here as new records for the Balkan Peninsula and South Europe. Our collections comprise four ascomata determined by their size and coloration.



Fig. 1. *Ascocoryne turficola* habitat in Mt Vitosha.



Fig. 2. *Ascocoryne turficola* habitat in the Rhodopi Mts.

Material and methods

The macromorphological features are described on the basis of fresh material. The microscopic observations are held on dried specimens after short-time rehydration in water. The micromorphological characters of the fungus are observed and measured in water under Olympus BX-41, Nikon Eclipse 50i and Amplival LM. The amyloidity test is ascertained by the use of Melzer's reagent. Measurement values are presented below as (minimum–) mean \pm s (–maximum), and Sl/Sw ratio is given, where abbreviations are as follows: s – standard deviation, Sl – spore length, Sw – spore width. Ascospores are measured additionally with the help of specialized software for digital images, Carnoy 2.0. Identification was confirmed by referring to Moser (1963), Dennis (1968), Nuss & Oertel (1972), Hansen & Knudsen (2000), Stasińska & Sotek (2004), and Buniard & al. (2008). The specimens examined herein are kept in the Mycological Collection of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, Sofia (SOMF). Ascospores are measured in water mounts; in every two cases 25 spores are selected.

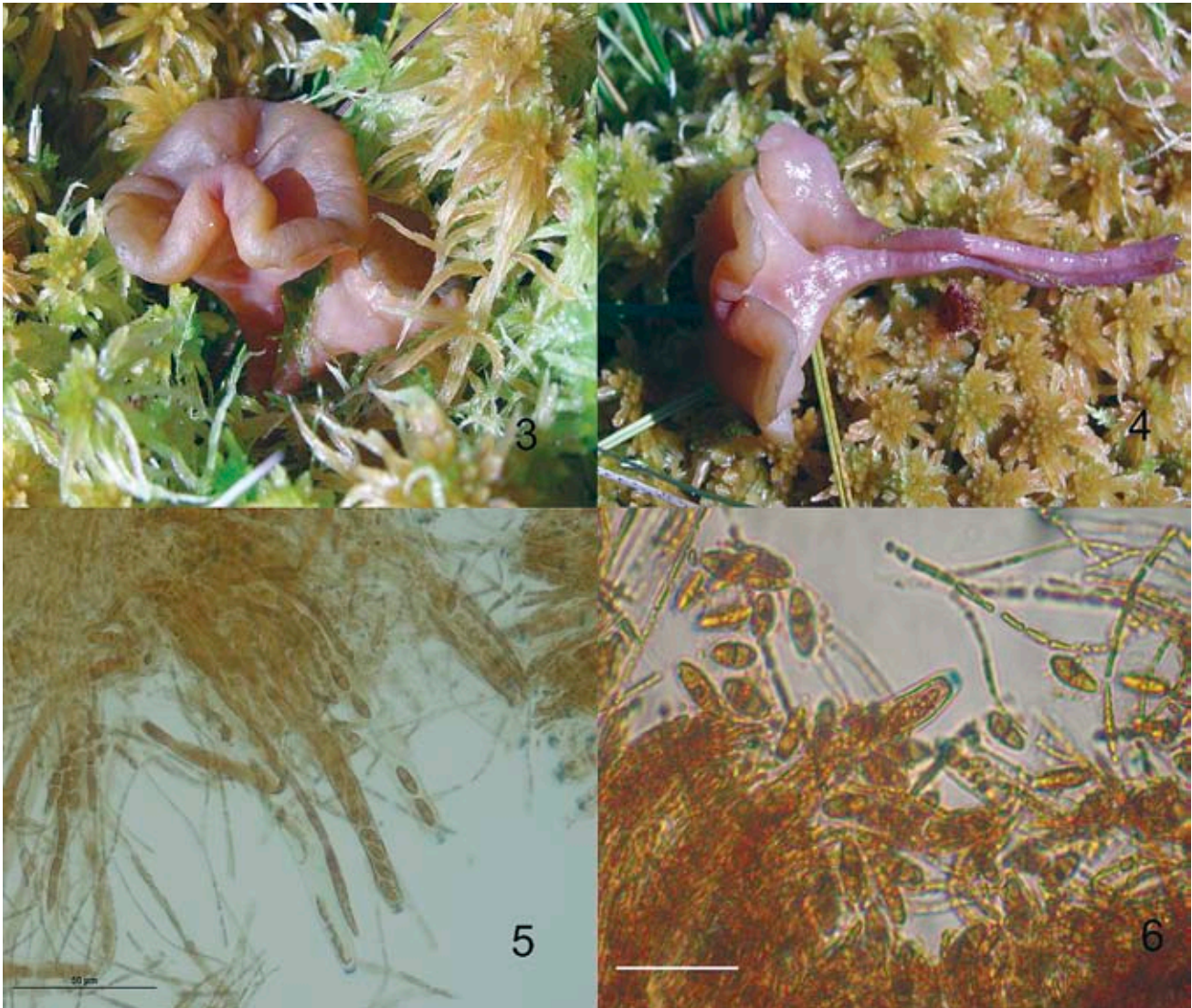
Description of the species

Ascocoryne turficola (Boud.) Korf, Phytologia 21(4): 202 (1971) (Plate I, Figs 3-6)

Coryne turficola Boud., Bull. Soc. Mycol. France 21: 71 (1905); *Ombrophila turficola* (Boud.) Svrček, Česká Mykol. 11(1): 40 (1957); *Sarcoleotia turficola* (Boud.) Dennis, Kew Bull. 25(2): 345 (1971).

Ascomata 20–40 mm high, 5–25 mm wide, initially flat at the top, subsequently becoming concave in the center or slightly cyathiform; margin involute, wavy; hyaline gelatinous, olivaceous, olivaceous-brown, to fleshly-olivaceous. Hymenial surface smooth to scrobiculate; lower sterile part ('stalk') tapering at the base, pale-olivaceous to pinkish with lilac tinge. Context gelatinous. **Asci** up to 125 (–130) \times 8–10 μ m, 8-spored, cylindrical-clavate, arising from crosiers; pore amyloid in Melzer's reagent. **Paraphyses** filiform, unbranched or branched, septate, up to 1.5–2 mm wide. **Ascospores** (10.0–) 12.2 \pm 1.2 (–16.0) \times (3.5–) 4.3 \pm 0.4 (–5.0) μ m (n=50), length/width ratio (2.2–) 2.9 \pm 0.3 (–3.6), ellipsoid to fusoid, smooth, hyaline, guttulate, occasionally with 1–3 guttules per cell, unicellular, occasionally one-septate or germinate.

Plate I.



Figs 3-4. Ascomata of *Ascocoryne turficola*, *in situ* (Rhodopi Mts); **Figs 5-6.** Asci, ascospores and paraphyses stained in Melzer's reagent with blueing of the ascus apex (Scale bar for Fig. 6 = 25 μ m).

Habitat. Solitary, in groups or gregariously dispersed. Elsewhere in its distribution *A. turficola* occurs in peat bogs (in the open or at edges of coniferous forests), in ombrotrophic peatlands of sedge-*Sphagnum* communities amongst *Warnstorfia* spp. – *Warnstorfia fluitans* (Hedw.) Loeske, *Sphagnum* spp. – *S. cuspidatum* Ehrh. ex Hoffm., *S. jensenii* H.Lindb., *S. flexuosum* Dozy & Molk., *Eriophorum angustifolium* L., *E. vaginatum* L., on stems of *Carex* spp. – *C. rostrata* Michx., *C. limosa* L., etc. August–November (Dennis 1968; Nuss & Oertel 1972; Stasińska & Sotek 2004; Stasińska 2011; Filippova & al. 2013; Vašutová & al. 2013).

Specimens examined: BULGARIA: Vitosha region, Mt Vitosha, between the Vetrovala ski track and Ofelinite locality, in a moderately rich fen dominated by *Sphagnum teres* (Schimp.) Ångstr. and *S. russowii* Warnst. Additional vegetation is composed of *Sphagnum contortum* Shultz, *S. flexuosum* Dozy & Molk., *Warnstorfia exannulata* (Schimp.) Loeske, *Carex nigra* (L.) Reichard, *Eriophorum latifolium* Hoppe, *Juncus effusus* L., *J. articulatus* L., *Phragmites australis* (Cav.) Trin. ex Steud., etc., ca. 1520 m a.s.l., 01.08.2013, leg. R. Natcheva, det. M. Gyosheva & D. Stoykov (SOMF 29524). The main plant community in the locality is the association *Cirsio heterotrichi-Caricetum nigrae*; Rhodopi Mts – lakes Smolyanski

Ezera, on the floating peat island in lake Lagera, growing in a mat of *Sphagnum fallax* (H.Klinggr.) H.Klinggr. The major vascular plants are: *Carex curta* Good., *C. echinata* Murr., *C. limosa* L., *C. rostrata* Stokes, *C. serotina* Mérat, *Drosera rotundifolia* L., *Epilobium palustre* L., *Sphagnum flexuosum*, *S. palustre* L., *S. subsecundum* Nees, *Stramineogon stramineum* (Dicks. ex Brid.) Hedenäs, *Lycopodiella innundata* (L.) Holub, etc., ca. 1470 m a.s.l., 25.09.2014, leg. R. Natcheva & D. Ivanova, det. M. Gyosheva & D. Stoykov (SOMF 29594). The vegetation type belongs to *Sphagno-Caricion canescentis* alliance (Hájek & al. 2008).

General distribution. Europe (North, Central, West), Asia (West Siberia), North America (Newfoundland), South America (Faulkland Isles – unpublished data): Nuss & Oertel (1972); Watling & al. (2001); Stasińska & Sotek (2004); Bunyard & al. (2008); Stasińska (2011); Van Vooren (2012); Filippova & Bulyonkova (2013); Filippova & al. (2013), etc. For detailed account of the European distribution, see Van Vooren (2012).

Comments. *Ascocoryne turficola* is an extremely rare fungus with high conservation value (Filippova & Bulyonkova 2013). Its known distribution is scattered mainly across the northern, central and western parts of Europe. Our records in Bulgaria (Mt Vitosha, the Rhodopes) are so far the southernmost European localities of the species. The present locations of the fungus in Bulgaria could be a result of disjunctive processes, including parting of the common geographic area of the distribution from Central European regions (e.g. Italian Alps) towards the southeastern area (Balkan-Carpathian region), Van Vooren (2012: 42 – a map). Presumably, the species may occur also in other Balkan countries, e.g. Romania (under similar conditions – Eastern Carpathians, Neblea & Alexiu 2010), Serbia, etc. It is also likely that *A. turficola* may occur in other parts of Bulgaria, e.g. the Rila and Pirin Mts.

Our data on *A. turficola* correspond well to the data on ascomata and spore measurements presented by Bunyard & al. (2008), Filippova & Bulyonkova (2013), Filippova & al. (2013), and Vašutová & al. (2013). All these authors mention variability of the spore sizes and ascomata derived during various stages of the examined specimens.

Bulgarian findings of *A. turficola* are so far at the southern edge of the present European distribution range of the species. This makes the fungus especially vulnerable. To its vulnerability also adds the fact that its habitats, *Sphagnum*-dominated mires, in Bulgaria

are situated far south of the optimal climatic zone for peat-mire development (Petrov, 1958).

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