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Two new *Helotiales* records for the mycobiota of Türkiye

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Türkiye mikobiyotası için iki yeni *Helotiales* kaydı

Abstract: Two ascomycete taxa, *Chloroscypha alutipes* (W. Phillips) Dennis (*Gelatinodiscaceae*) and *Rutstroemia bolaris* (Batsch) Rehm (*Rutstroemiaceae*), belonging to the order *Helotiales* were reported as new records for the mycobiota of Türkiye. The former represent the first record of the genus *Chloroscypha* Seaver in Türkiye, while the latter constitutes the fifth record of *Rutstroemia* P. Karst. in the country. A brief description of each species is provided, along with the photographs illustrating their macroscopic and microscopic features.

Key words: Biodiversity, *Chloroscypha alutipes*, *Rutstroemia bolaris*, new record

Özet: *Helotiales* takımına ait iki tür, *Chloroscypha alutipes* (W. Phillips) Dennis (*Gelatinodiscaceae*) ve *Rutstroemia bolaris* (Batsch) Rehm (*Rutstroemiaceae*), Türkiye mikobiyotası için yeni kayıt olarak rapor edilmiştir. Birincisi *Chloroscypha* Seaver cinsinin Türkiye'deki ilk kaydıdır, sonraki ise *Rutstroemia* P. Karst cinsinin Türkiye'deki beşinci kaydıdır. Her bir türün kısa bir betimlemesi, makroskobi ve mikroskobilerine ilişkin fotoğraflarıyla birlikte verilmiştir.

Anahtar Kelimeler: Biyoçeşitlilik, *Chloroscypha alutipes*, *Rutstroemia bolaris*, yeni kayıt

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1. Introduction

Helotiales Nannf is one of the largest order within the class Leotiomycetes. The order includes 10 families, (including *Gelatinodiscaceae* S.E. Carp. and *Rutstroemiaceae* Holst-Jensen, L.M. Kohn & T. Schumach.), 501 genera and approximately 3880 taxa which are saprophytic, plant parasites and few lichenized or lignicolous (Hansen and Knudsen, 2000; Kirk et al., 2008; Kaya et al., 2018).

Chloroscypha Seaver (*Gelatinodiscaceae*) and *Rutstroemia* P. Karst. (*Rutstroemiaceae*) are two genus within the order *Helotiales*. Members of *Chloroscypha* are characterized by small, sessile or stipitate, fleshy, yellow, yellow-green to blackish-green apothecia; broadly clavate, 8-spored asci with a more or less distinct apical apparatus; large, fusiform to broadly ellipsoidal ascospores; slender, simple or branched paraphyses (Petrini, 1982; Butin, 1984). The genus *Rutstroemia* P. Karst. (*Rutstroemiaceae*) is characterized by brown to dark olivaceous, discoid to cup-shaped, stipitate apothecia with smooth to distinctly toothed margin; ectal excipulum usually with prismatic cells; cylindrical and 8-spored asci generally with broadly rounded Sclerotinia-type apex bluing in iodine; cylindrical to filiform paraphyses usually thickening toward to apex; ellipsoid to cylindrical, straight or allantoid, hyaline, uni to biseriate ascospores with lipid content (Hansen and Knudsen, 2000; Perić and Baral, 2019).

During routine field studies in İstanbul Province, two small stipitate ascomycete specimens were collected, one from fallen *Cupressus* L. sp. leaves and the other from a dead *Carpinus* L. sp. twig. Following detailed mycological examination, the specimens were determined as *Chloroscypha alutipes* (W. Phillips) Dennis and *Rutstroemia bolaris* (Batsch) Rehm, both belonging to the order *Helotiales* Nannf.

A review of the recent checklists and additional taxonomic studies on list of Turkish *Helotiales* (Akata and Erdoğdu, 2020; Sesli et al., 2020; Akçay et al., 2023; Kaya and Uzun, 2023; Uzun et al., 2023; Acar and Karabıyık, 2024a,b; Acar and Uzun, 2024; Uzun and Kaya, 2024; Acar and Karabıyık 2025) revealed that neither of these species has been previously recorded in Türkiye. Therefore, we report *Chloroscypha alutipes* and *Rutstroemia bolaris* as new records for the mycobiota of Türkiye.

2. Materials and Method

Fresh ascomata of *Chloroscypha alutipes* and *Rutstroemia bolaris* were collected from the Beykoz district of İstanbul Province during field surveys conducted in 2024 and 2025. The fresh ascocarps were photographed in situ, and relevant ecological notes were recorded at the time of collection. The specimens were carefully placed into specially prepared paper bags. Then the samples were transferred to the fungarium, and dried in an air conditioned room. Micromorphological examinations were perpormed on dried materials. A Leica DM 2500 trinocular light microscope was used for these investigations. For each microscopic structure, at least 15-20 measurements were performed after mounting in water, 10% KOH, Congo Red, Lugol's solution, and/or lacto phenol cotton blue (LPCB).

A Risingcam Sony imx 1'' 20 mp digital camera was used for the photography of the microscopic components. Macromorphological and micromorphological features were compared with relevant literature sources (Seaver, 1951; Petrini, 1982; Breitenbach and Kränzlin, 1984; Ellis and Ellis, 1997; Van Vooren, 2012; Desjardin, 2014; Martinez-Gil and Caballero, 2015; Krisai-Greilhuber et al., 2017), and the specimens were identified accordingly.

Voucher specimens are kept at Karamanoğlu Mehmetbey University, Science Faculty, Department of Biology.

3. Results and Discussion

Ascomycota Caval.-Sm.

Leotiomycetes O.E. Erikss. & Winka

Helotiales Nannf.

Gelatinodiscaceae S.E. Carp.

Chloroscypha alutipes (W. Phillips) Dennis, Persoonia 3(1): 34 (1964)(Fig. 1)

Syn: [*Hymenoscyphus alutipes* (W. Phillips) Kuntze, *Kriegeria alutipes* (W. Phillips) Seaver, *Peziza alutipes* W. Phillips, *Phialea alutipes* (W. Phillips) Sacc.]

Macroscopic and microscopic features: Apothecia stipitate, disc up to 2 mm in diameter, cup- to goblet-shaped when young, becoming disc- or saucer-shaped at maturity; hymenium smooth, initially bright yellow to orange-yellow, becoming somewhat paler to light brownish-yellow with age; external surface concolorous with the hymenium; stipe 3 - 6(7) × 0.4 - 0.6 mm, cylindrical, straight to curved, tapering sligtly towards the base, concolorous with the cup, sometimes finely pulverulent, flesh thin, yellow. Ascomata turn black when dried. Asci 110-130 × 11-14 µm, cylindrical, somewhat narrowing toward the base, containing 8 spores arranged biseriately or irregularly (Fig. 2 a,b). Paraphyses filiform, septate, some bifurcated, thickened toward the apex usually surrounded by a yellowish gelatinous sheat. Ascospores (19.3-) 21.5 - 23.8 (-24.1) × (5.2-) 5.8 - 7.1 (-8.1) µm, fusiform, hyaline, foamy with 1-2 (3) large droplets and many small droplets (Fig. 2c).

Chloroscypha alutipes has been reported to grow in the litter layer on fallen dead needles or twigs of *Calocedrus decurrens* (Torr.) Florin, *Cupressus macrocarpa* Hartw. ex Gordon, *Juniperus occidentalis* Hook, and *J. sabina* L. (Petrini, 1982; Krisai-Greilhuber et al., 2017; Desjardin, 2014; Van Vooren, 2012).

Specimen examined: Istanbul, Beykoz, Burunbahçe place, mixed forest, on decaying leaves of *Cupressus* sp., 41.112651N, 29.086249E, 75 m, 25.01.2025, YKaraduman 041.

Suggested Turkish name for this genus and the species is "çivimantarı".

Comments: *Chloroscypha alutipes* is well characterized by its bright colour, long stipe, gelatinous context, and large fusiform spores. It is most likely distributed predominantly within the Mediterranean-Atlantic climate zone Due to its specific substrate preference and the color change from orange-yellow to black upon drying, it is unlikely to be confused with other tiny orange cup fungi. *Chloroscypha sabinae* (Fuckel) Dennis may also occur on Juniperus, but the ascospores of this species are very different from *C. alutipes*. Similarly, *Pithya cupressina* (Batsch) Fuckel resembles *Chloroscypha alutipes* in general size, coloration, and substrate preference; however, it can be readily distinguished by its globose, hyaline ascospores, which are clearly different in shape from the fusiform spores of *C. alutipes* (Petrini, 1982; Van Vooren, 2012; Desjardin, 2014; Martinez-Gil and Caballero, 2015; Krisai-Greilhuber et al., 2017).

Figure 1. Ascocarps of *Chloroscypha alutipes* (bar 2 mm)

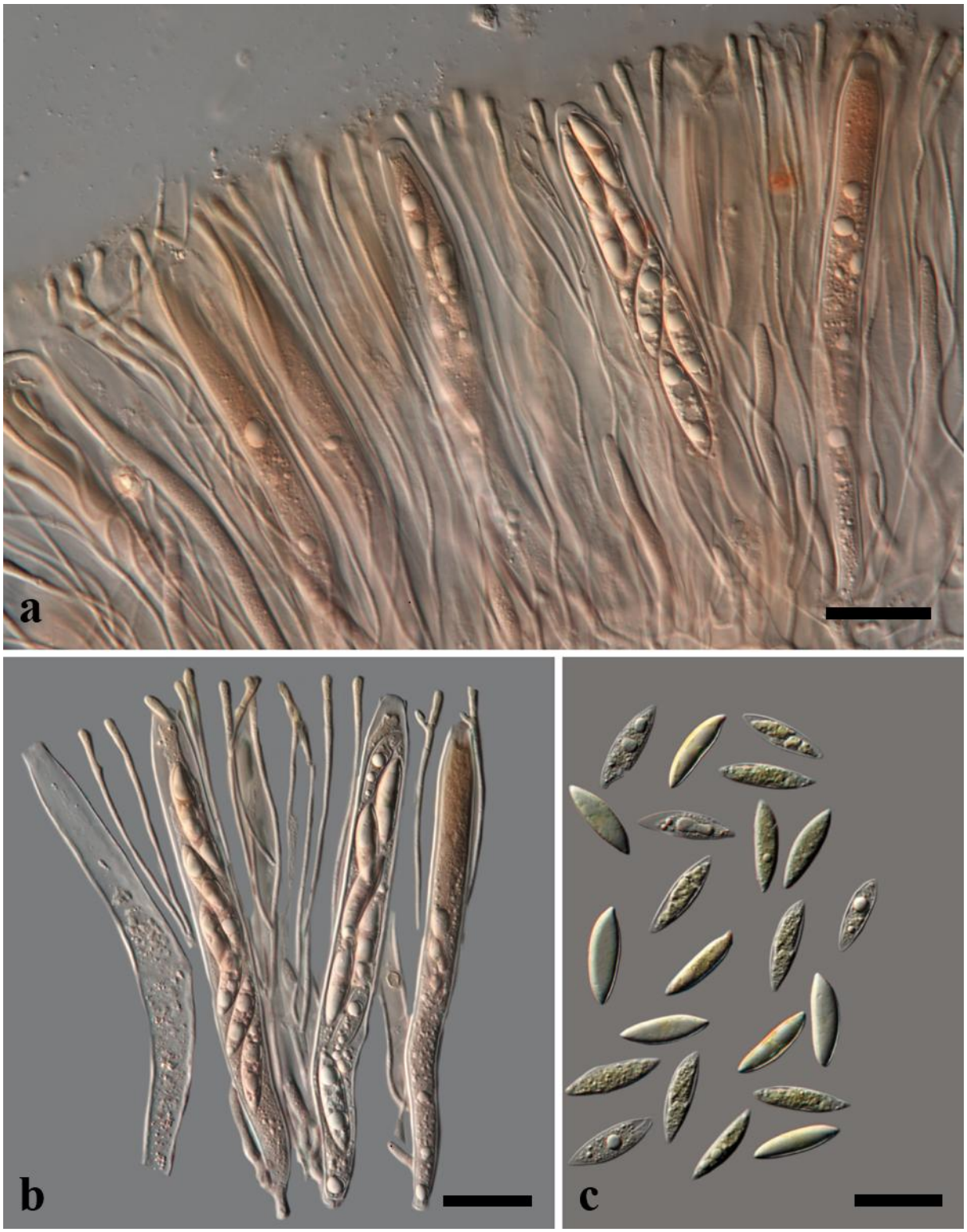

Figure 2. Asci, paraphyses (a,b) and ascospores (c) of *Chloroscypha alutipes* (bars 20 µm) (a,b in Congo Red, c in LPCB)

According to IndexFungorum (2025), there are currently present 16 conformed species within the *Chloroscypha*, none of which have previously been reported from Türkiye. *Chloroscypha alutipes* thus represents the first member of the genus in the country.

Rutstroemiaceae Holst-Jensen, L.M. Kohn & T. Schumach.

Rutstroemia bolaris (Batsch) Rehm, Rabenh. Krypt.-Fl., Edn 2 (Leipzig) 1.3(lief. 39): 765 (1893) [1896](Fig. 3)

Synonymy: *Calycina bolaris* (Batsch) Seaver, *Ciboria bolaris* (Batsch) Fuckel, *C. bolaris* var. *explanata* (Holmsk.) Fuckel, *Helotium bolare* (Batsch) Massee, *Hymenoscyphus bolaris* (Batsch) W. Phillips, *Lachnea bolaris* (Batsch) Gillet, *Peziza bolaris* Batsch, *P. bolaris* var. *explanata* (Holmsk.) Fr., *P. explanata* Holmsk., *Phialea bolaris* (Batsch) Quél., *Phialea bolaris* var. *explanata* (Holmsk.) Boud.

Macroscopic and microscopic features: Apothecia stipitate, disc 5-7 mm in diameter, goblet- to cup-shaped

Figure 3. Ascocarps of *Rutstroemia bolaris* (bar 5 mm)

when young, later expanding to a saucer-shaped form with a slightly raised margin; hymenium smooth to slightly wrinkled at the center, yellowish-brown, reddish, reddish-orange to somewhat brick-colored; outer surface and margin concolorous to somewhat paler than the hymenium, often slightly downy; attached to the substrate by a central stipe of 3-4 x 0.6- 1 mm, almost concolorous with the outer surface of the disc or somewhat darker toward the base. Ectal excipulum is composed of subspherical or globose cells. Asci cylindrical, 130-195 × 12-14 µm, uniseriate eight-spored, with an apical pore (Fig. 4a,b,c). Paraphyses filiform, cylindrical, septate, some slightly with clavate and thickened toward the apex. Ascospores (18.1) 18.6 - 22 (23.9) × (7.8) 8.3 - 9.5 (9.8) µm, cylindrical to elongate-elliptical, some slightly curved, smooth, hyaline, often with few drops, some with 1-2 septa, some with a short hyaline appendage at one or each end. Excipulum of textura globulosa.

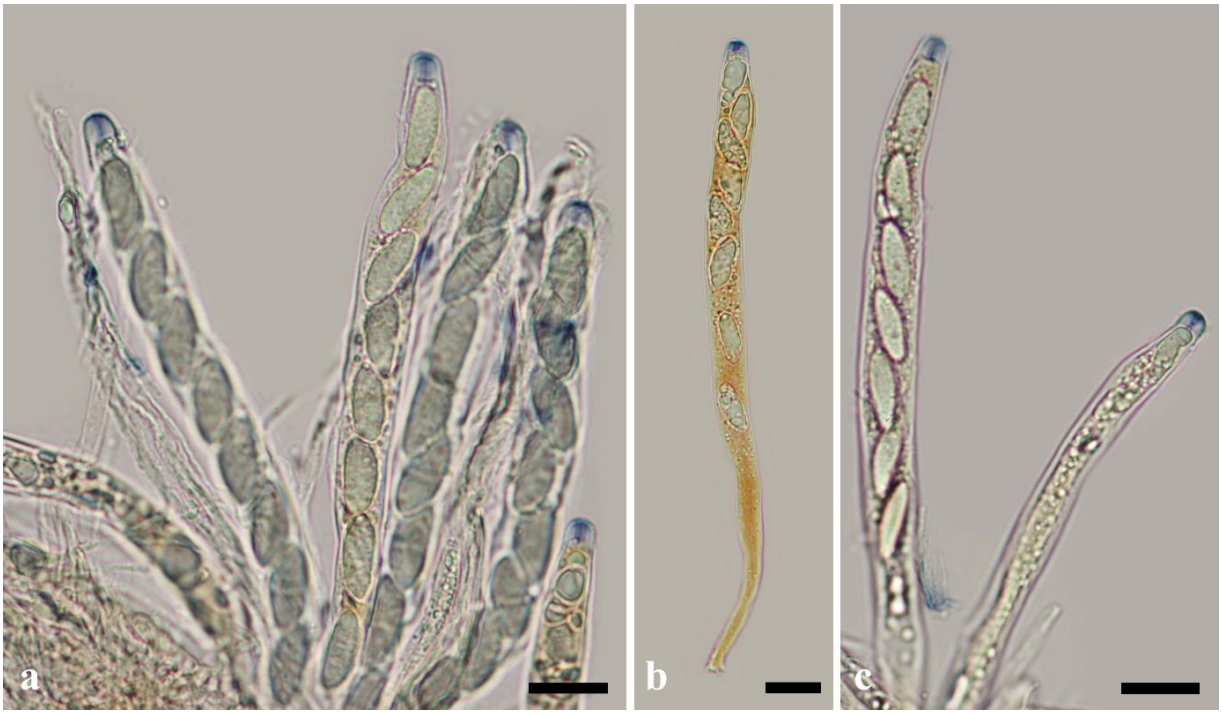

Figure 4. Asci, paraphyses and ascospores (a,b,c) of *Rutstroemia bolaris* (bars 20 µm) (a,c in Lugol, b in Melzer)

Rutstroemia bolaris was previously reported from deciduous forest, on dead branches or twigs of *Alnus viridis* (Chaix) DC., *Carpinus betulus* L., *Castanea sativa* Mill., and *Fagus* L. and *Quercus* L. spp. singly to gregariously or in cluster (Seaver, 1934; Breitenbach and Kränzlin, 1984; Ellis and Ellis, 1997).

Specimen examined: Istanbul, Beykoz, Polonezköy forest, in decidious forest composed of *Carpinus betulus* L., *Alnus glutinosa* (L.) Gaertn., and *Quercus* L. spp, on dead *C. betulus* twigs, 41.107541 N- 29.175008E, 150 m, 17.03. 2024, YKaraduman 033.

Suggested Turkish name for this species is "Gürgen kuşdüdüğü".

Comments: *Rutstroemia bolaris* may be confused with some other members of the genus, especially of *R. alni* L. Rémy, *R. firma* (Pers.) P. Karst. and *R. microsperma* (Speg.) Gamundí, but they may be distinguished from *R. bolaris* by some macro-and micromorphological and ecological properties. Ectal excipulum of *R. alni* and *R. firma* are composed of prismatic cells, while the ectal excipulum of *R. bolaris* is composed of globose cells (Martines-Gil et al., 2022). On the other hand, the smaller ascospores (4.5-5.8 × 2.5-2.8) of *R. microsperma* easily distinguishes it from *R. bolaris* (Medardi, 2007). Breitenbach and Kränzlin (1984) mentions about the development of secondary spores, but we did not observe a distinct secondary spore formation of ascospores, except some short hyaline appendages.

Four *Rutstroemia* species (*Rutstroemia conformata* (P. Karst.) Nannf., *Rutstroemia coracina* (Durieu & Lév.) Dennis, *Rutstroemia elatina* (Alb. & Schwein.) Rehm, *Rutstroemia firma* (Pers.) P. Karst.) have so far been reported from Türkiye (Öztürk et al., 2010; Işık and Türkekul, 2018; Akata and Erdoğdu, 2020; Uzun and Kaya, 2024). *Rutstroemia bolaris* is the fifth member of the genus from Türkiye.

Conflict of Interest

Authors have declared no conflict of interest.

Authors' Contribution

Authors contributed equally.

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