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# New records of lichenicolous and lichenized fungi from Turkey

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**Abstract** — In the course of studying the lichenicolous and lichenized fungi deposited in the lichen herbarium of Erciyes University, three lichenicolous fungi (*Arthonia epicladonia*, *Lichenostigma dimelaenae, Sphinctrina leucopoda*) and one lichenized fungus (*Rhizocarpon sublavatum*) are reported from Turkey for the first time. Comments on their habitats, substrata, and key anatomical features are provided for each taxon.

**Key words** — *Ascomycota*, lichens, biodiversity, Trabzon, Yozgat

## Introduction

In the last 20 years, there have been intensive lichenological studies to determine the lichen mycota of Turkey (e.g. John 1996, Aslan 2000, John & Breuss 2004, Halıcı et al. 2005, Tufan et al. 2005, Candan & Özdemir Türk 2008). At the moment, approximately 1200 lichenized fungal species are known from Turkey but at least 2000 lichenized fungal species are expected in the country (Halıcı et al. 2007a). The checklist of lichenized and lichenicolous fungi of Turkey is being prepared by Volker John and should be published in a few years (V. John, pers. comm.).

The lichenicolous fungi of Turkey have started to receive more attention during the last five years, and a key to the 117 known taxa of lichenicolous *Ascomycota* (including mitosporic fungi) of Turkey was published by Halıcı (2008a). After this publication, there were some more additions (e.g. Candan &

Halıcı 2008, Halıcı 2008b,c, Halıcı & Candan 2009, Halıcı et al. 2009, Candan et al. 2010) and the number of lichenicolous fungal taxa known from Turkey has reached 157. With the 3 species reported in this paper, 160 lichenicolous fungal species are known from Turkey.

## Material and methods

The specimens are deposited in the lichen herbarium of Erciyes University, Biology Department (Kayseri, Turkey). They were examined by standard microscopic techniques. Hand sections were studied in water, potassium hydroxide (KOH) and Lugol's solution (I). Measurements were made in water and the extreme values outside the main range are given in parentheses.

## The species

***Arthonia epicladonia*** (Nyl.) Alstrup & Zhurb.

A detailed description is provided by Zhurbenko & Alstrup (2004) and figures were provided by Alstrup & Hawksworth (1990) under the name *Scutula epicladonia* (Nyl.) Zopf.

TRABZON: **Of,** Uzungöl-Soğanlı geçidi, 40°36.117'N, 40°16.682'E, alt. 2110 m, on squamules of *Cladonia pyxidata* on mosses, 30 Sep. 2008, M.G. Halıcı & I. Akata (MGH 0.6320).

*Arthonia epicladonia* was collected on the squamules of *Cladonia pyxidata* from northeast of Turkey. The Turkish specimen seems to be pathogenic as the infected squamules eventually become brownish. Zhurbenko & Alstrup (2004) did not observe any pathogenic effect in the American specimen; they also cited a wider ascospore size range [(10–)14–17.5(–20) × 5–5.5(–6) µm] than we observed in our Turkish specimen (14–15 × (3.5–)4–5 µm). All other Turkish characters agree well with the description given in Zhurbenko & Alstrup (2004).

New to Turkey.

***Lichenostigma dimelaenae*** Calat. & Hafellner

A detailed description is provided by Calatayud et al. (2004).

YOZGAT: **Şefaatli,** Şekerci Dağı, 39°32.511'N, 34°43.242'E, alt. 880 m, on areoles of *Dimelaena oreina* on siliceous rocks, 12 Jul. 2009, M. Kocakaya (MGH 0.4018).

Ascomata not connected to superficial hyphal strands and forming dense groups, centrum I + pale red. Asci 8–spored, subglobose to globose, 25–28 × 25–28 µm. Ascospores brown, 1–septate, broadly obovate and constricted at the septum, not halonate, 13–16 × 6.5–11 µm.

Previously this species was recorded only from the USA. The Turkish specimen is identical with the original species description. New to Turkey.

***Rhizocarpon sublavatum*** Fryday

A detailed description is provided by Fryday (2000).

**TRABZON: Of,** UZUNGÖL-SOĞANLI GEÇIDI, 40°36.117'N, 40°16.682'E, alt. 2110 m, on exposed siliceous rocks, 30 Sep. 2008, M.G. Halıcı & I. Akata (MGH 0.2920).

The Turkish specimen has a cracked-areolate and brownish-grey thallus, which is clearly limited by a black prothallus. Ascospores are hyaline to very pale brownish, muriform with 19–20 cells, and (24–)29–30(–34) × (11–)13–14 µm.

Fryday (2000) noted that *R. sublavatum* has ascospore characters intermediate between *R. reductum* and *R. lavatum* and suggests that it is a northern montane species, probably with some oceanic affinities. The Turkish specimen, which was collected at 2110 m altitude in a very humid locality, supports confirms this observation.

Previously reported only from UK (Fryday 2000) and Norway (Ihlen 2004). New to Turkey.

***Sphinctrina leucopoda*** Nyl.

Detailed descriptions are provided by Löfgren & Tibell (1999) and Tibell (2004).

**YOZGAT: Akdağmaden,** BÜYÜK NALBANT MOUNTAIN, 39°32'N, 36°00'E, alt. 2150 m, on *Lecanora swartzii* on exposed siliceous rocks, 14 Aug. 2004, M.G. Halıcı & M. Kocakaya (MGH 0.4016).

The Turkish specimen is parasymbiotic, has distinctly stalked apothecia, 8-spored asci measuring 45–53 × 6–7 µm, and non-septate brown ascospores that are minutely ornamented in maturity. Ascospores of the Turkish specimen are slightly larger [(5–)5.5–6(–7) µm vs. (4–)4.3–6.3 × 4–5.7(–5.8) µm] than the reports previously given for the species (Löfgren & Tibell 1999).

This variable species is sometimes hard to distinguish from *Sphinctrina turbinata* morphologically, but the latter species shows a characteristic K + intensified red pigment in the exciple as stated by Löfgren & Tibell (1999) and Tibell (2004). The Turkish specimen was collected on the areoles of *Lecanora swartzii*, although *S. leucopoda* is also reported frequently on *Pertusaria pertusa* and rarely on *Diploschistes* or *Lecanora* on rocks (Löfgren & Tibell 1999, Tibell 2004). *Sphinctrina leucopoda* is rarely reported on *Lecanora swartzii* from Sweden (Ihlen & Wedin 2008).

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