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## Notes on Some Lichenicolous Fungi Species from Turkey

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**Abstract:** Comments on habitat, substrata and spore structures for 9 lichenicolous fungi species from Turkey are given. *Endococcus verrucosus* Hafellner and *Rosellinula haplospora* (Th.Fr. & Almqu. ex Th.Fr.) R.Sant. are new records for Turkey.

**Key Words:** *Ascomycota*, pyrenocarpous lichenicolous fungi, *Coelomycetes*

### Türkiye'den Bazı Likenikol Fungus Türleri Üzerine Notlar

**Özet:** Türkiye'den dokuz likenikol fungus türünün habitat, substrat ve spor yapıları hakkında yorumlar verilmiştir. Bu türlerden ikisi, *Endococcus verrucosus* Hafellner ve *Rosellinula haplospora* (Th.Fr. & Almqu. ex Th.Fr.) R.Sant Türkiye için yeni kayıttır.

**Anahtar Sözcükler:** *Ascomycota*, pyrenokarp likenikol funguslar, *Coelomycetes*

### Introduction

Knowledge about the distribution of lichenicolous fungi in Turkey is limited when compared with that in European countries (Scholz, 2000; Hawksworth, 2003; Faltynowicz, 2003; Sujja, 2005a, 2005b). Recently, Hafellner & John (2006) compiled the lichenicolous fungi occurring in Turkey. In addition, Halıcı et al. (2005) described one lichenicolous fungus new to science from Turkey, and Halıcı et al. (2006) reported 6 lichenicolous fungi species from different regions of Turkey. To date, 68 lichenicolous fungi taxa have been reported from Turkey. Here, we make additional contributions to the knowledge of the lichenicolous fungi in Turkey.

### Materials and Methods

The specimens are stored in ANES (Herbarium of Anadolu University, Science Faculty, Eskişehir, Turkey) and their herbarium numbers are provided in parentheses

after the locality details. The specimens were examined with a Leica MZ6 model stereomicroscope and an Olympus BX51 microscope. Specimens were examined in water, 10% KOH, Lugol's solution, or lactofuchsin. Spore measurements were generally carried out in KOH, but in the case of thin-walled spores these were also checked in water.

### Species Recorded

*Arthonia molendoi* (Heufl. ex Frauenf.) R.Sant.

Host lichen: *Caloplaca decipiens*

The specimen was examined on the apothecia of *Caloplaca decipiens*. It seems to be mildly pathogenic as the ascospore production in the host is suppressed in the infected apothecia. Ascospores arthonioid, black when dry, exciple absent; paraphyses branched and anastomosed. Asci broadly clavate, 8-spored. Hymenium I + wine-red without pre-treatment with K. Epithecium black, ascospores colourless, sometimes light green, 11-13 × 4-5 µm.

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Previously reported from Adiyaman, Kayseri, Konya, and Kütahya provinces on *Caloplaca lobulata*, *C. biatorina*, *C. trachyphylla*, and *Xanthoria elegans* in Turkey (Hafellner & John, 2006).

Specimen studied: Malatya, south of Venk village, north skirts of Bey (Şilan) Mountain (38°19'N 38°22'E), alt. 1450-1550 m, on apothecia of *Caloplaca decipiens* on calcareous rocks, 21 Jul. 2004, M. Candan (ANES 10161).

***Clypeococcum hypocenomycis* D.Hawksw.**

Host lichen: *Hypocenomyce scalaris*

The specimen was collected on the thallus of *Hypocenomyce scalaris*. It seems to be parasitic as the infected squamules became brown, bleached, and finally died. Ascomata perithecia, ~ 80 µm. Hamathecium of branched and anastomosing paraphyses. Asci 8-spored; 45-50 × 13-14 µm. Ascospores colourless first, then pale brown, 13-14 × 6 µm.

Previously reported from İzmir on *Hypocenomyce scalaris* (Hafellner & John, 2006).

Specimen studied: Eskişehir, Mihaliççık, Çatacık (39°58'N 30°57'E), alt. 1200 m, on thallus of *Hypocenomyce scalaris* on *Pinus nigra*, 25 May 2005, T. Tay (ANES 10157).

***Endococcus verrucosus* Hafellner**

Host: *Aspicilia* sp.

The specimen was collected on the thallus of *Aspicilia* sp. on calcareous rocks, showing K reaction. It seems to be pathogenic as the ascomata production is suppressed in the host. Ascomata perithecia, black, ~ 220 µm, immersed in the areoles of the host lichen. Paraphyses present. Asci 8-spored. Ascospores brown, 1-septate; 11-15(-16) × 7 µm, surface verruculose. Hymenial gel I + blue, with higher concentrations I + red-brown. This species differs from *E. rugulosus* and *E. propinquus* in the structure of spore walls (Hafellner, 1994). It is known on various *Aspicilia* species (Hafellner, 1994).

New record for Turkey.

Specimen studied: Malatya, Yeniköy, south-west of Yeniköy (38°19'N 38°30'E), alt. 1065 m, on *Aspicilia* sp. on calcareous rocks, 26 Aug. 2003, M. Candan (ANES 10153).

***Intralichen christiansenii* (D.Hawksw.) D.Hawksw. & M.S.Cole**

Host lichens: *Aspicilia caesiocinerea*, *Parmelina quercina* and *Protoparmeliopsis muralis*

Conidiophores immersed in the hymenium or thallus of the host, pale brown, conidia forming in chains, 1-septate, ellipsoid, pale brown, smooth walled, 5-8 × 4-7 µm. In the infected apothecia of the host lichens ascospore production is suppressed. This species has proved to be widespread and able to grow on a wide range of hosts (Hawksworth & Cole, 2002).

Previously reported from İzmir on the apothecia of *Protoblastenia incrustans* (Hafellner & John, 2006).

Specimens studied: Adiyaman, Kahta, north of İslam village (37° 42' N 38° 32' E), alt. 590 m, on thallus and apothecia of *Protoparmeliopsis muralis* on calcareous rocks, 28 Jul. 2004, M. Candan (ANES 10162), Balıkesir, Bigadiç, Yağcılar (37°42'N 38°32'E), alt. 590 m, on thallus and apothecia of *Protoparmeliopsis muralis* on calcareous rocks, 28 Jul. 2004, M. Candan (ANES 10163), Çanakkale, Lapseki, Şap Dağı, alt. 550 m, on thallus of *Parmelina quercina* on *Quercus* sp., 7 Aug. 2000, Ş. N. Karabulut (ANES 9119).

***Lichenostigma maureri* Hafellner**

Host lichen: *Pseudevernia furfuracea*

The specimen was collected on thallus of *Pseudevernia furfuracea*. This species seems to be commensalistic as no damage was observed in the host thallus. Ascomata perithecia, black, non-aggregated, ~ 80-100 µm. Ascomata internal structure paraplectenchymatic stromatic. Asci 8-spored. Ascospores brown, 1-septate, somewhat echinulate, 9-11 × 4-5 µm.

Previously reported from Bolu, İzmir and Manisa on *Pseudevernia furfuracea* and *Hypogymnia tubulosa* by Hafellner & John (2006), and from Muğla and Yozgat on *Pseudevernia furfuracea* and *Usnea subfloridana* by Halıcı et al. (2006).

Specimens studied: Çanakkale, Gökçeada, Bademli on *Pseudevernia furfuracea* on *Pinus brutia* alt. 20 m, 14 Aug. 1986, A. Türk (ANES 5522), Eskişehir, Seyitgazi, Kırka, Büyük Yayla, alt. 1140 m, on *Pseudevernia furfuracea* on *Pinus nigra*, 21. Jun. 2001, A. Türk (ANES 5626).

***Muellerella pygmaea* (Körb.) D.Hawksw.**

Host lichens: A brown *Acarospora* sp., *Aspicilia calcarea*, *A. contorta* subsp. *hoffmaniana*, *Lecanora garovaglii*.

This common lichenicolous fungus species was collected on various crustose lichens on rocks. It seems to be commensalistic since no damage was observed in the host thalli. Ascomata perithecia, black, ~ 170 µm, superficial or immersed only at the base. Ascomata internal structure gelatinised. Asci 16-64 spored, ascospores dark brown, 1-septate, 8-12 × 4.5-6 µm.

Previously reported from Kayseri by Steiner (1905), and İzmir, Kayseri, and Trabzon by Hafellner & John (2006).

Specimens studied: Malatya, south of Venk village, north skirts of Bey (Şilan) Mountain (38°19'N 38°22'E), alt. 1450-1550 m, on thallus of *Aspicilia calcarea* on calcareous rocks, 21 Jul. 2004, M. Candan (ANES 10164), Malatya, north of Tokluca village (38°17'N 38°31'E) on a brown *Acarospora* sp. on siliceous rocks, 24 Aug. 2003, M. Candan (ANES 10165), Elazığ, Sivrice, Hazar Mountain, west of Karaçalı village (38°25'N 39°18'E), alt. 1470, on thallus of *Lecanora garovaglii* on calcareous rocks, 16 Aug. 2005, M. Candan (ANES 9789), Manisa, Kula, north-west of Kula town (38°34'N 28°38'E), on thallus of *Aspicilia contorta* subsp. *hoffmaniana*, 14 Aug. 2006, M. Candan (ANES 10166).

***Rosellinula haplospora* (Th.Fr. & Almqu. ex Th.Fr.) R.Sant.**

Host lichen: *Aspicilia intermutans*

The specimen was collected on the areoles of *Aspicilia intermutans* on siliceous rocks. Ascomata perithecia; black, immersed on thallus areoles of the host lichen. It seems to be commensalistic as no damage in the host thalli nor was any bleaching observed in the host. Hamathecial interascal filaments present, asci with a l + blue gelatinous cap. Asci to 50-spored. Ascospores brown, simple, 7-8 × 4-5 µm. This species is known on thallus areoles of *Aspicilia cinerea* in Madrid, Spain (Hafellner & Sancho, 1990).

New record for Turkey.

Specimen studied: Malatya, Doğanşehir, Malatya-Gaziantep-Eskiköy junction, (38°10'N 37°57'E), alt. 1100 m, on *Aspicilia intermutans*, on siliceous rocks, 27 Aug. 2003, M. Candan (ANES 10154).

***Toninia subfuscae* (Arnold) Timdal**

Host: *Protoparmeliopsis muralis*

The specimen was collected on the thallus of *Protoparmeliopsis muralis*. Ascomata apothecia, epithecium green to dark green, N + red, hypothecium brown-red, hymenium 50-60 µm. Asci 8-spored, ascospores colourless, 1-septate, slightly curved, 10-15 × 4-5 µm.

Previously reported from Trabzon on an unidentified host by John & Breuss (2004).

Specimen studied: Manisa, Kula, north of Sandal village (38°35'N 28°34'E), alt. 692 m, on thallus of *Protoparmeliopsis muralis* on volcanic rocks, 15 Aug. 2006, M. Candan (ANES 10167).

***Zwackhiomyces sphinctrinoides* (Zwackh) Grube & Hafellner**

Host: *Caloplaca variabilis*, *Caloplaca* sp.

The specimen was collected on the apothecia of *Caloplaca variabilis* and on an orange *Caloplaca* sp. on calcareous rocks. The second collection on thallus of *Caloplaca* sp. seems to be pathogenic as ascomata production is suppressed in the host. Ascomata perithecia, pyriform, 150-200 µm diam., peridial wall brown with basal cells paler than the upper ones. Asci 8-spored. Ascospores colourless, 1-septate, verruculose, 20-25 × 5-7 µm.

Previously reported from Kayseri on *Xanthoria elegans* by Halıcı et al. (2006).

Specimens studied: Elazığ, Baskil, Kömürhan, southern slopes of Karakaya Dam (38°26'N 38°50'E), alt. 750-800 m, on the apothecia of *Caloplaca* sp. on calcareous rocks, 26 Aug. 2003, M. Candan (ANES 10150), Adıyaman, Besni, south-east of Karagöl village (37°38'N 37°46'E), alt. 860 m, on the apothecia of *Caloplaca variabilis* on calcareous rocks, 27 Jul. 2004, M. Candan (ANES 10168).

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