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***Buelliella*, *Codonmyces*, and *Polycoccum* species new to Turkey**

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ABSTRACT — Three species of lichenicolous fungi are reported as new to Turkey: *Buelliella poetschii* and *Codonmyces lecanorae* (both also new to Asia) and *Polycoccum pulvinatum*. Short descriptions are presented, including geographic distribution, host, and a comparison with similar taxa.

KEY WORDS — *Ascomycetes*, biodiversity, coelomycetes, Burdur, *Dothideales*

Introduction

Although studies on the lichenicolous fungi of Turkey are insufficient and not intensive, there have been an increasing number of publications on the subject during 2009–11 (Candan & Halici 2009, 2011, Etayo & Yazici 2009, Halici et al. 2010a,b, Yazici et al. 2010, 2011). Recently, during our study of the lichens and bryophytes of Burdur Province, we identified some lichenicolous fungi. Although 139 taxa of lichenicolous fungi are known from other regions of Turkey (Yazici et al. 2011), no lichenicolous fungi have been reported from Burdur.

This number is small when compared with other European countries (Fałtynowicz 2003, Hawksworth 2003, Kocourková 2000, Santesson 1993, Scholz 2000). Thus exploration of more regions of Turkey is urgently needed.

Materials & methods

The present report is based on collections from the Burdur region made on 25 and 29 June 2012. Burdur has a continental Mediterranean climate with cold, snowy winters and very hot, long and dry summers. The temperature ranges from –16 to 39°C with a mean of 15°C; the annual rainfall averages 468 mm, and the average humidity is 51.2% (Akman 1999).

The visited areas (Bucak and Altınyayla districts) are mountainous with vast forested areas dominated by *Abies*, *Cedrus*, *Ficus*, *Fraxinus*, *Juniperus*, *Olea*, *Pinus*, *Pistacia*, *Prunus*, *Quercus* (especially in Altınyayla district), and *Rhus*, and alternating streams,

lakes, and dams (e.g., Yapraklı Dam in Altınyayla district, and Karacaören dam in Bucak district) (Baytop & Denizci 1963). Within the forests, other flora is very abundant, and marble rock is common.

Hand-cut sections were examined microscopically in water (including all measurements), 10% KOH, and lactophenol cotton blue. Air-dried samples were observed using a Nikon SMZ1500 stereomicroscope and a Nikon Eclipse 80i light microscope. Nomenclature and species concepts follow Hawksworth & Diederich 1988, Pegler et al. 1980, Hafellner et al. 2008, Calatayud & Etayo 1999, and Etayo 2010a. Vouchers are stored in the herbarium of the Biology Department, Faculty of Science, Karadeniz Technical University, Trabzon, Turkey (KTUB). The descriptions are based on Turkish specimens.

The species



FIG. 1. *Buelliella poetschii*, habitus with apothecioid ascomata. Scale = 1mm

Buelliella poetschii Hafellner, Mitt. Naturw. Ver. Steierm. 137: 187. 2008 FIG. 1
Detailed descriptions: Hafellner et al. (2008); Etayo (2010a).

Ascomata apothecioid, dispersed over the host thallus in black spots with 1–4 tiny composite groups of apothecia, rarely single, rounded, globular when young, pressed at the edges, later oval, up to 120–1200 μm in diam., often bleaching the host thallus, occasionally sunken. Vegetative hyphae intercellular. Hymenium hyaline to brownish, on the outside olive-brown, c. 60–70 μm high, I–, KI–. Excipulum dark brown, K+ greenish-brown. Paraphyses branched, anastomosing, capitate at apical and intercalary cells with pigment, cells at tips 4–5 μm thick with dark-brown pigment. Asci cylindrical, fissitunicate,

4–6-spored. Ascospores, long, hyaline, later \pm brown, thin walled, 1-septate, clearly constricted at the septa, cells rounded, the upper one sometimes tapered, (15–)16–16.3–18.5(–20) \times 6.5–7.2–8.5 μm (n = 15).

SPECIMEN EXAMINED: TURKEY. BURDUR: BUCAK, surroundings of Karacaören Dam, 37°21'35.14"N 30°50'05.80"E, 300 m, on the thallus of *Endocarpon* sp., 25.06.2012, leg. K.Yazici (KTUB–2353).

Our specimen was found on an *Endocarpon* thallus, which appeared damaged by this fungus. *Buelliella poetschii* has previously been found growing on the thalli of *Endocarpon* and *Catapyrenium* species (*E. adscendens*, *E. adsurgens*, *E. loscosii*, *E. pusillum* agg., *Catapyrenium* sp.) on exposed calcareous rocks.

The species was previously known from Europe, North America, and South America (Hafellner et al. 2008, Diederich et al. 2009, Etayo 2010a,b, Urbanavichus & Urbanavichene 2011, Flakus & Kukwa 2012). New to Turkey and Asia.

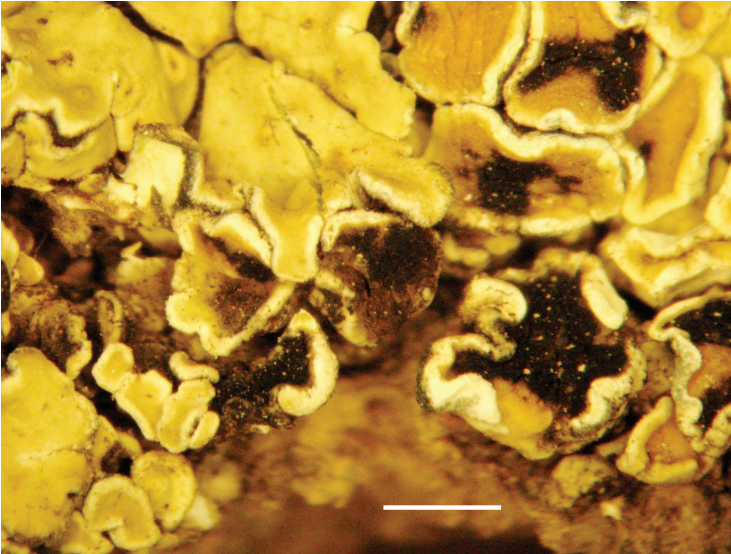


FIG. 2. *Codonmyces lecanorae*, habitus with apothecia. Scale = 1mm

Codonmyces lecanorae Calat. & Etayo, Lichenologist 31(6): 594. 1999

FIG. 2

Detailed description: Calatayud & Etayo (1999).

Vegetative hyphae spanning fully or partly the apothecia and thallus of the host lichen. Conidiophores \pm cylindrical, hyaline, and immersed in the host tissue, up to 3–4 μm wide. Cells near the surface of the host tissue \pm globular and 6–7 μm wide, colourless or \pm pale brown. Conidiogenous cells formed by a globose cell with annellations, globose cells with \pm smooth and \pm dark brown surfaces, annellations \pm dark brown, (8–)9–11(–12) \times (4–)5–8(–9) μm

(including the annellations). Conidia 1-septate, brown, oblong with rounded apices, constricted at the septum, (6–)7–11(–12) × (4–)5–6 μm (n = 20).

SPECIMEN EXAMINED: TURKEY. BURDUR: ALTINYAYLA, between İbecik-Altinyayla road, 36°56'59.32"N 29°27'40.68"E, 1373 m, on the thallus and apothecia of *Protoparmeliopsis muralis*, 29.06.2012, leg. K.Yazıcı (KTUB-2345).

Our specimen growing on the apothecia and thallus of *Protoparmeliopsis muralis* was not deformed in the affected parts, although the host was moderately damaged. *Codonmyces lecanorae*, previously known from Europe, is new to Turkey and Asia.

REMARKS — *Codonmyces* is similar to *Xanthoriicola* (Hawksworth & Punithalingam 1973, Hawksworth, 1979) in producing effuse powdery colonies lacking stromatic structures and sporodochia. The morphologically similar *Xanthoriicola physciae* is distinguished by simple conidia that are not 1-septate. Additionally warts in *Xanthoriicola* are typically spinulose (Hawksworth 1979, Ellis 1976), and not flattened as in *Codonmyces* (Calatayud & Etayo 1999).

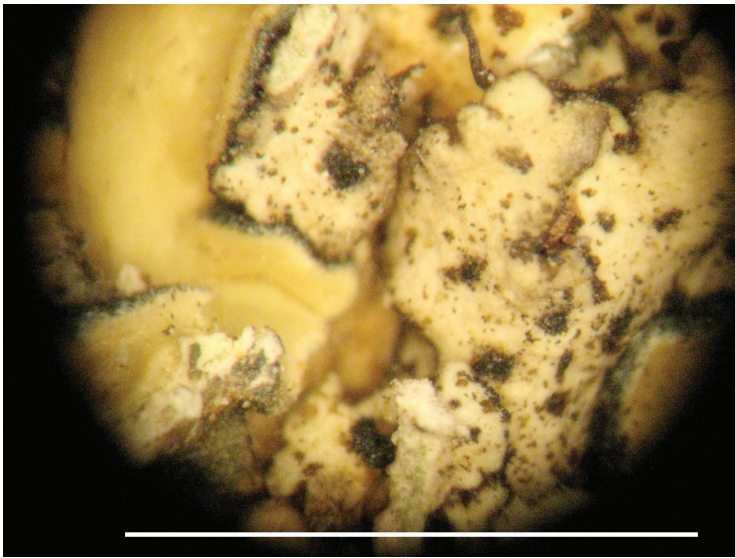


FIG. 3. *Polycoccum pulvinatum*, habitus with galls, including perithecioid ascomata. Scale = 1mm

Polycoccum pulvinatum (Eitner) R. Sant., Lich. Lichenic. Fungi Sweden Norway: 175. 1993

FIG. 3

Detailed description: Hawksworth (1975).

Galls wart-like, on *Physcia* sp., convex or hemispherical, 1–2.5 mm in diam., ascomata perithecioid (pseudothecium), 150–290 × 140–200 μm, subglobose, arising singly, walls of angular pseudoparenchymatous cells, hymenium

not exposed at maturity; hamathecium of branched and anastomosing pseudoparaphyses. Asci 60–80 × 14–18 µm, cylindrical-clavate, (4–)8-spored; ascospores 1-septate, 14–20 × 6–8(–9) µm (n = 18), ellipsoid to oblong-ellipsoid, brown at maturity, perispore present.

SPECIMEN EXAMINED: TURKEY. **BURDUR:** ALTINYAYLA, between İbecik-Altinyayla road, 36°56'59.32"N 29°27'40.68"E, 1373 m, on the thallus of *Physcia* sp., 29.06.2012, leg. K. Yazıcı (KTUB–2352).

Widespread in Mediterranean to boreal and arctic-alpine areas, *P. pulvinatum* induces the gall formation and grows on *Physcia* spp. (e.g., *P. adscendens*, *P. caesia*, *P. dubia*, *P. tenella*). The species is known from all continents except Africa and is widely distributed in Europe (Alstrup et al. 2009, Hawksworth 1983, Pegler et al. 1980). New to Turkey.

REMARKS—*Polycoccum pulvinatum* resembles *P. clauzadei*, which differs in its smaller galls and ascomata. Additionally, its ellipsoid or oblong-ellipsoid ascospores and usually 8-spored asci distinguish *P. pulvinatum* from *P. clauzadei* with obovoid or soleiform ascospores and 4–6-spored asci (Navarro-Rosinés & Roux 1998).

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