

A NEW PSILOPEZIOID FUNGI RECORD ON RELICT ENDEMIC *LIQUIDAMBAR ORIENTALIS* IN TURKEY

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Abstract

In the current study, *Psilopezia nummularia*, which known as psilopezioid fungi, is a new record at genus level in Turkey. In addition, this is the first report that relict endemic *Liquidambar orientalis* is a host of this species. Macro- and microphotographs of the taxon are given together with a description.

Key words: Ascomycota, new record, new host, oriental sweetgum, taxonomy.

Introduction

The majority of Turkey has a unique biodiversity consisting of rare and endemic species. Among them *Liquidambar orientalis* Mill., generally known as oriental sweetgum, is very important by being used economically by local people. In addition, oriental sweetgum forests act as hosts for other animals, plants and mushrooms. Especially, it encourages interesting macro- and microfungi species by moisture structures of its forests (Öztürk et al. 2008, Işıloğlu et al. 2011, Çolak et al. 2015, Güngör and Allı 2016, Kaygusuz et al. 2016).

Psilopezioid fungi are recognized with several genera of operculate discomycetes. As mentioned above these interesting fungi are generally growing on wet, submerged wood or other decayed plant debris. The most of psilopezioid members are belonging to *Pachyella* Boud. and *Psilopezia* Berk. (Pfister 1973a,b,c; Ho-

soya and Maruyama 2004; Hansen and Pfister 2006).

The genus *Psilopezia* is a member of cup fungi in the family Pyronemataceae Corda (Pezizales, Ascomycota) (Anonymous 2017a). It was circumscribed by Miles Berkeley in 1847 (Pfister 1973b). It includes approximately 14 taxa throughout the world (Kirk et al. 2008, Anonymous 2017b, Wijayawardene et al. 2017). However, there is not any report of the members related to genus *Psilopezia* in Turkey (Sesli and Denchev 2008, Solak et al. 2015).

Members of the genus are mainly characterized by sessile and ascomata broadly attached to the substrate. They are 0.3–3 cm in diameter, flat and disc-shaped, sometimes it becomes convoluted, with dark colours of blackish, brown or greenish. Asci are operculate, cylindrical, with prominent croziers and generally 8-spored. Ascospores are generally more than 25 µm long, ellipsoidal, hyaline, with

two guttules at maturity, smooth, with a perispore which loosens in cotton-blue, lactic acid or in Melzer's reagent (Seaver 1942; Pfister 1973a,b).

The purpose of this study was to contribute knowledge to the mycobiota of Turkey.

Materials and Methods

In the autumn of 2017, some fungal samples were collected from sweetgum forest protected area in Burdur Province. In the field, the specimens were photographed on the substrates. The morphological and ecological characteristics were recorded. Microstructural data were observed with a light microscope magnification, trade using Congo Red and Melzer's reagent. 20 asci, ascospores and paraphyses from each ascoma were measured, length and width ranges were recorded. Identification of the samples was conducted according to Pfister (1973b) and Breitenbach and Kränzlin (1984). The dried samples were

conserved in the personal fungarium of the first author at Süleyman Demirel University.

Results

A new psilopezioid fungi record for Turkey

Pyronemataceae Corda

Psilopezia nummularia Berk. [as 'nummularis'], London J. Bot. 6: 325 (1847) SYN.: *Peziza nummularia* (Berk.) Morgan [as 'numularia'], J. Mycol. 8(4): 190 (1902) (Figs 1 and 2).

Ascomata 1–2 cm in diameter, sessile, disc shaped, initially flat but with undulating surface or somewhat convoluted as it get age, **hymenium** smooth and shiny when wet, from chestnut to greenish-light brown, becomes blackish with time, **outer surface** lighter, almost whitish beige and often invisible. **Asci** 340–425 × 19–22 μm, cylindrical, operculate, non-amyloid, with



Fig. 1. *P. nummularia*: a and b – fresh ascomata developed on wood of *L. orientalis*.

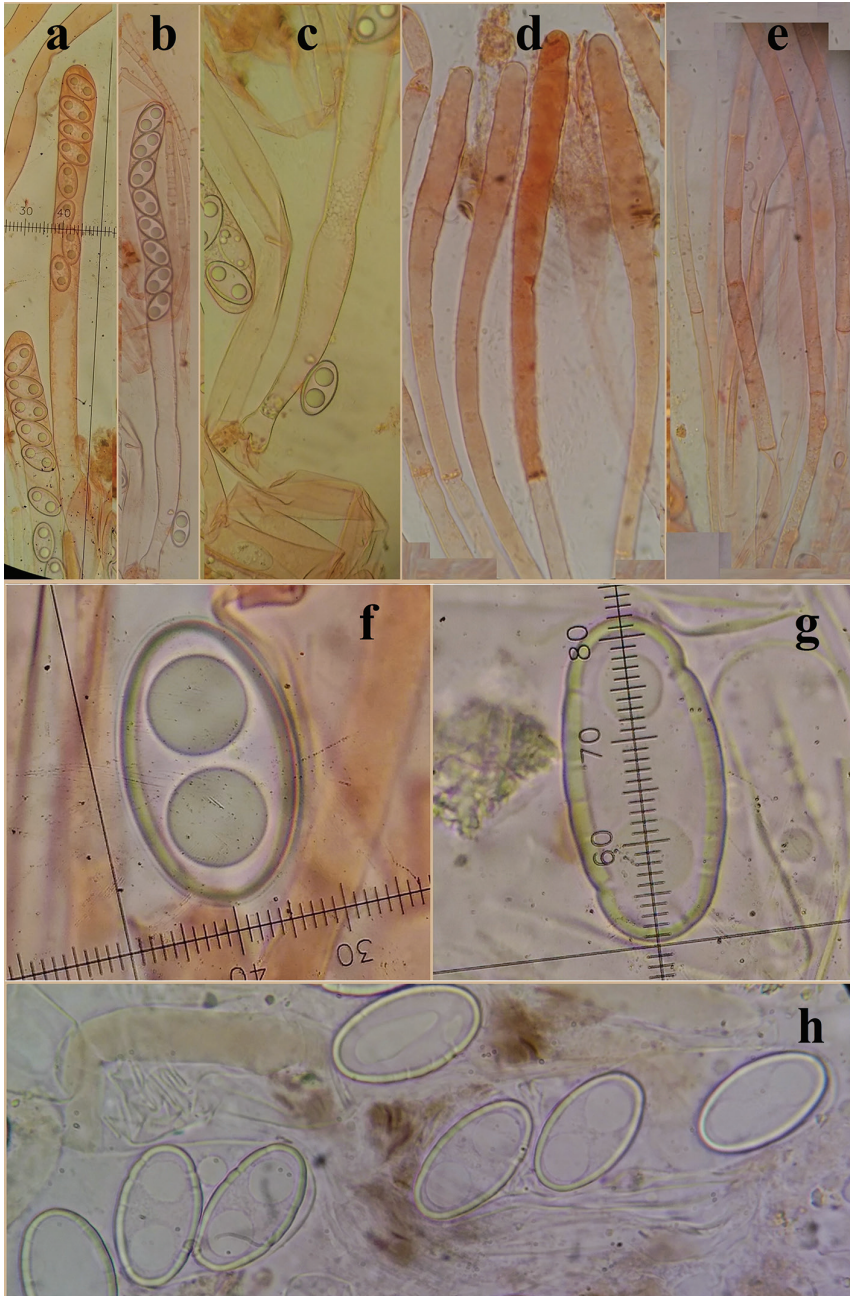


Fig. 2. *P. nummularia*: a – asci in Congo red; b – asci in Congo red, with croziers and eight uniseriate spores; c – asci in Congo red, with croziers; d – paraphyses upper part in Congo red, with brownish amorphous material; e – paraphyses down part in Congo red, with septate; f – ascospores in Congo red; g and h – ascospores, with an outer spore wall which loosens in Melzer's reagent (magnification: a–e: 40 \times , f–h: 100 \times).

evident croziers and eight uniseriate spores. **Ascospores** (23-)24–30(-31.5) × (13-)14–17(-19) µm, ellipsoidal, hyaline and smooth surface, 2-guttulate, with an outer spore wall which loosens in Melzer's reagent. **Paraphyses** 10 µm wide in the upper part, septate and cylindrical, with brownish amorphous material.

Habitat: On water-soaked rotten branches of *L. orientalis*.

Specimen examined: Turkey. Burdur Province, Bucak district, Kargı village, Sweetgum forest protected area, 200–250 m above sea level, 15 October 2017, leg. & det. Ö.F. Çolak (ÖFÇ 1311).

Discussion

P. nummularia has been reported so far from North America (USA), South America (Trinidad), the Caribbean, Europe (Germany, Italy, France, Great Britain, Switzerland) and Asia countries (Seaver 1942, Beller 1972, Pfister 1973b, Breitenbach and Kränzlin 1984, Moynes et al. 2014).

P. nummularia is barely distinguishable macroscopically from *Pachyella babingtonii* (Berk. & Broome) Boud. (Breitenbach and Kränzlin 1984). Unlike *Psilopezia*, *Pachyella*, a member of the family Pezizaceae Dumort. (Pezizales, Ascomycota), is characterized by asci without prominent croziers; usually less than 25 µm ascospores, lacking a loosening outer spore wall in Melzer's reagent, cotton-blue or lactic acid (Pfister 1973a,b,c; Hosoya and Maruyama 2004; Hansen and Pfister 2006).

Although the ascomata of *P. nummularia* is dark coloured, *P. aquatica* (Lam. & DC.) Rehm is yellow or orange. Also the ascomata of *P. nummularia* and *P. juruensis* Henn. is larger than 1 cm diameter while *P. deligata* (Peck) Seaver is smaller

than 1 cm diameter. *P. nummularia* and *P. juruensis* are distinguished by spores' lengths (length is greater than 30 µm or smaller) and apothecia shapes. Ascospores of all these species are smooth while ascospores of *P. trachyspora* Ellis & Everh are rough (Seaver 1942, Pfister 1973b).

P. nummularia has previously been reported growing on various wet dead wood (Seaver 1942, Beller 1972, Pfister 1973b, Breitenbach and Kränzlin 1984, Moynes et al. 2014). In this study *L. orientalis* is found as a new host substrate for this species found here.

Detailed descriptions of *P. nummularia* have been provided in previous studies (Seaver 1942, Beller 1972, Pfister 1973b, Breitenbach and Kränzlin 1984, Van Vooren 2006, Moynes et al. 2014). A comparative analysis of Turkish specimens and data provided by other authors is presented in Table 1: it shows that the size of macroscopic and microscopic structures of our samples are compatible with previous findings.

Conclusions

According to current mycobiota checklists (Sesli and Denchev 2008, Solak et al. 2015) and the recent contributions regarding Ascomycetes in Turkey (Güngör et al. 2015, Acar and Uzun 2016, Akata et al. 2016, Akçay and Uzun 2016, Güngör et al. 2016, Şen et al. 2016, Çolak and Kaygusuz 2017, Kaygusuz and Çolak 2017, Uzun et al. 2017), it could be concluded that *Psilopezia nummularia* is a new record at genus level for the mycobiota of Turkey. According to recent studies, twenty four genera belonging to Pyrenomataceae family have so far been reported in Turkey (Sesli and Denchev 2008, Solak et

Table 1. Comparison of *P. nummularia* features.

Size of ascomata, cm	Size of asci, µm	Size of ascospores, µm	Width of paraphyses at the top, µm	References
1–5	200–250 × 15–18	20–25 × 12	10	Seaver (1942)
3–4	270–310 × 15–18	19–21 × 9–11	8	Beller (1972)
3	275–300 × 20–27	(25)29–40 × 14–20	12	Pfister (1973b)
0.5–2	300–350 × 18–26	25–37 × 15–18.5	10	Breitenbach and Kränzlin (1984)
0.8–1	370–390 × 17–23	24–28 × 14–16	8–10	Van Vooren (2006)
2	380–500 × 16–23	25–30 × 14–16	12	Moyne et al. (2014)
1–2	340–425 × 19–22	23–31.5 × 13–19	10	This study

al. 2015, Çolak and Kaygusuz 2017). In the present study, *Psilopezia* is reported as the 25th member of the family Pyrenomataceae in the country.

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