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New Locality Records in Türkiye for Two Rare Members of Ascomycota

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Abstract

Apothecia of two previously reported rare members of Ascomycota, *Dumontinia tuberosa* and *Sarcopeziza sicula*, were collected from different localities and identified. *Dumontinia tuberosa* was collected from the Eastern Black Sea Region while *S. sicula* was collected from Central Anatolian and Southeastern Anatolian Regions of Türkiye. Brief descriptions and new distribution localities of the species were provided together with the photographs of their macro and micromorphologies.

Keywords: Biodiversity, rare fungi, Pezizaceae, Sclerotiniaceae

Nadir İki Ascomycota Üyesi İçin Türkiye'de Yeni Lokalite Kayıtları

Özet

Daha önceden rapor edilmiş olan iki nadir Ascomycota üyesi, *Dumontinia tuberosa* ve *Sarcopeziza sicula*, yeni lokalitelerden toplanarak teşhis edilmiştir. *Dumontinia tuberosa* Türkiye'nin Doğu Karadeniz Bölgesinden, *S. sicula* ise İç Anadolu ve Güneydoğu Anadolu Bölgelerinden toplanmıştır. Türlerin kısa betimlemeleri ve yeni yayılış lokaliteleri, makro ve mikromorfolojilerine ait fotoğrafları ile birlikte verilmiştir.

Anahtar kelimeler: Biyoçeşitlilik, nadir mantarlar, Pezizaceae, Sclerotiniaceae

INTRODUCTION

Fungi are important components of the ecosystem. Besides their vital roles in biogeochemical cycling, nutrient recycling, and decomposing the dead organic matter in soil, they play indispensable roles in many areas such as industry, agriculture, textile, bioremediation, etc. The most visible group, the macrofungi, are the most prominent members of the fungal kingdom, some of which have long been used primarily for nutritional and medicinal purposes. Utilization of naturally growing macrofungi can only be possible after their collection from nature. Though many of them are cosmopolitan, occurring in all aerobic ecosystems, and colonize a wide range of substrates, some are specialists and found only in restricted substrates or habitats. Since most species can be detected only when they produce reproductive structures, some macrofungi are often difficult to detect, especially the rare, sparsely-distributed, and seldom-fruiting species. Depending on species-specific relationships to nutrient availability and environmental conditions, different species may produce detectible fruit bodies at different times and seasons (Marcot 2017). In general, fungal fruiting records are used to understand the fungal distribution. The majority of fungal studies have taken place at localized scales, and to provide any assurance of detection, at

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least a five-year surveying at various times of the year, especially in spring and autumn, was recommended (O'dell et al. 1996).

Almost 2.700 species of macrofungi have been reported from Türkiye, more than 30% of which were recorded once and 18% twice. The overall list was created from the accumulated data, presented either as local lists or new records. A quick overview of the publications on macrofungal diversity of Türkiye also indicates that the majority of the local surveys were finished in two to three years. Therefore, additional data (regional lists, new distribution localities, etc.) need to be constantly presented in order to holistically reveal the diversity and regional distribution of Turkish macrofungi.

Here we present new localities for two rare (Mircea et al. 2016; Agnello et al. 2018; Fokshei 2022) and previously presented ascomycete species, *Dumontinia tuberosa* (Bull.) L.M. Kohn and *Sarcopeziza sicula* (Inzenga) Agnello, Loizides & P.Alvarado (Doğan & Kurt 2016; Sesli et al. 2020; Altuntaş et al. 2021; Akçay et al. 2023; Uzun 2023). The study aims to contribute to the knowledge of macrofungi of Türkiye.

MATERIAL AND METHOD

Apothecia of *Dumontinia tuberosa* was collected from Gümüşhane province in 2023, and *Sarcopeziza sicula* was collected from Gerger district of Adıyaman in 2009 and central district of Karaman province in 2021. During field surveys, the apothecia were photographed in their natural habitats, and ecological and some morphological characteristics were noted. Then the samples were transferred to the fungarium in paper boxes and dried in an air-conditioned room. A Nikon eclipse Ci-S trinocular light microscope, equipped with a DS-Fi2 digital camera was used for microscopic investigations. SEM images were obtained by a Hitachi SU5000 scanning electron microscope. By comparing the accumulated data with the relevant literature (Inzenga 1869; Doğan & Kurt 2016; Kim et al. 2009; Uzuhashi et al. 2010; Medardi 2012; Agnello et al. 2013; 2018; Thompson 2013; Beug et al. 2014; Mircea et al. 2016; Altuntaş et al. 2021) the samples were identified. The specimens are kept at the Biology Department, Kamil Özdağ Science Faculty, Karamanoğlu Mehmetbey University.

RESULTS AND DISCUSSION

Ascomycota Caval.-Sm.
Leotiomycetes O.E.Erikss. & Winka
Helotiales Nannf.
Sclerotiniaceae Whetzel
Dumontinia tuberosa (Bull.) L.M.Kohn (Figures 1 and 2)

Synonyms. [*Aleuria rapulum* (Bull.) Gillet var. *tuberosa* (P.Karst.) Gillet, *Helotium tuberosum* (Hedw.) P.Karst., *Hymenoscyphus tuberosus* (Bull.) W.Phillips, *Macroscyphus tuberosus* (Hedw.) Gray, *Octospora tuberosa* Hedw., *Peziza tuberosa* Bull., *Peziza tuberosa* (Hedw.) Dicks., *Peziza tuberosa* Bull. f. *strobilina* Fr., *Peziza tuberosa* Bull. subsp. *radicata* (Reichard) N.Lund, *Peziza tuberosa* Bull. var. *communis* Alb. & Schwein., *Rutstroemia tuberosa* (Bull.) P.Karst., *Sclerotinia tuberosa* (Hedw.) Fuckel, *Sclerotinia tuberosa* (Hedw.) Fuckel f. *pallida* Henn., *Whetzelinia tuberosa* (Hedw.) Korf & Dumont].

Macroscopic and microscopic features. Apothecia 12–27 mm in diameter, stipitate, goblet-shaped with a small apical aperture at the beginning, later cup to funnel-shaped, some become plane at

maturity, hymenial surface smooth, some slightly wrinkled at the center, light brown to yellowish brown, outer surface smooth, concolorous with hymenial surface, flesh thin and brittle. Stipe 22–80 × 2–4 mm, arises from a globose to irregularly shaped black sclerotium, dark-brown to blackish-brown. Asci 150–170 × 9–12 µm, cylindrical, hyaline, 8-spored. Paraphyses cylindrical to filiform, aseptate, some slightly enlarged towards the apex. Ascospores 11.5–16.3 × 6.5–7.5 µm, ellipsoid to elongated-elliptical, hyaline, smooth, some with two drops at the poles.

Dumontinia tuberosa was reported to arise from the sclerotia, which develop on the rhizomes of an *Anemone* L. species, in deciduous and mixed forests (Uzuhashi et al. 2010; Medardi 2012; Thompson 2013; Beug et al. 2014; Fokshei 2022).

Figure 1. Ascocarps of *Dumontinia tuberosa*.

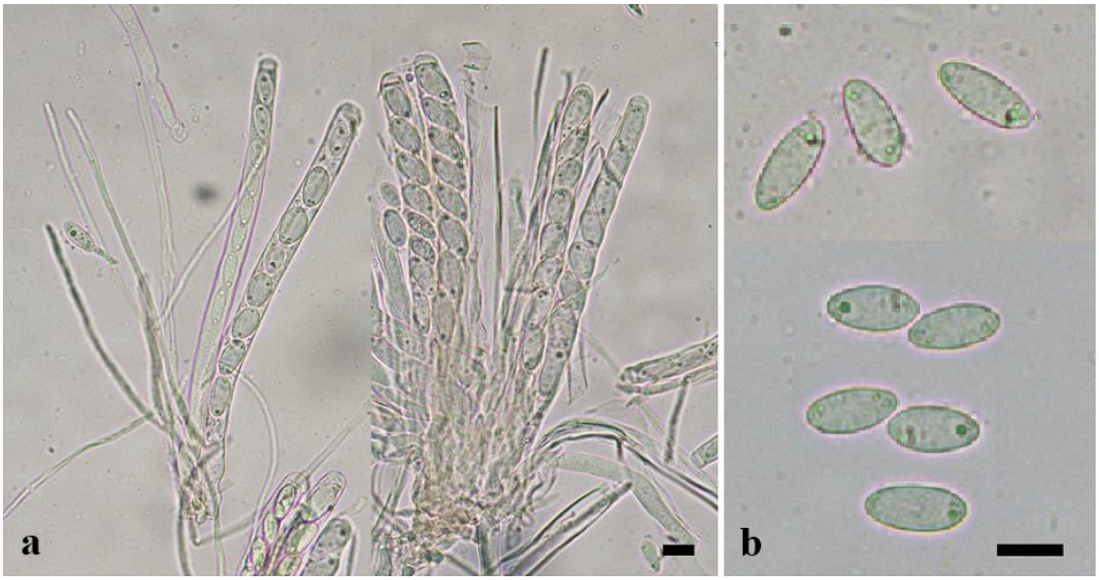

Figure 2. Asci and paraphyses (a) and ascospores (b) of *Dumontinia tuberosa* (Bars:10 µm).

Specimen examined

Türkiye. **Gümüşhane**: Torul, Zigana Village, *Pinus* L. and *Populus* L. containing mixed forest, on rhizomes of *Anemone* sp. under *Populus* sp., 17.05.2020, *Yuzun 7321*.

Chorological notes

The first Turkish record of *Dumontinia tuberosa* was reported by Doğan and Kurt (2016) from Pozantı district of Adana province on *Anemone* sp., in a mixed forest containing *Abies cilicica* (Antoine & Kotschy) Carrière subsp. *cilicica*, *Cedrus libani* G.Don, and *Quercus* L. sp. We found it on rhizomes of *Anemone* sp. in *Pinus* and *Populus* containing mixed forest, under *Populus* sp.

Pezizomycetes O.E.Erikss. & Winka
Pezizales J.Schröt.
Pezizaceae Dumort
Sarcopeziza sicula (Inzenga) Agnello, Loizides & P.Alvarado (Figures 3 and 4).
Synonyms. [*Peziza sicula* Inzenga, *Sarcosphaera sicula* (Inzenga) Pat.]
Macroscopic and microscopic features. Apothecia up to 50–75 in diam., 45–74 in height, hypogeous or semihypogeous when young, subglobose, globose to pear-shaped, some longitudinally ellipsoid, hollow, with a small apical opening, partially or fully emerging from the soil at maturity, and superiorly turn into several large, 4–5 irregular lobes, substipitate to indistinctly stipitate. Hymenium smooth, vinaceous-red to brownish-red. Outer surface smooth to covered with tiny warts, almost concolorous with the hymenial surface, somewhat paler. Flesh up to 5 mm thick, fragile, concolorous with the hymenial surface or somewhat brighter. Asci 340–370(–390) × 12.5–13.5(–15) µm, cylindrical, 8-spored, amyloid especially at the apex. Paraphyses cylindrical, the same length as the asci, some longer, often slightly enlarged towards the apex, rarely distinctly enlarged. Ascospores 13–15(–17) × 7.8–9.2(–9.7) µm, ellipsoid, uniseriate, hyaline to subhyaline, 1–2 to multiguttulate, visible as smooth under light microscope but clearly warty to irregularly ribbed under scanning electron microscope.

Figure 3. Ascocarps of *Sarcopeziza sicula*.

Sarcopeziza sicula was reported to grow on bare ground, among grasses and herbs, sometimes under Aleppo pine (*Pinus halepensis* Mill.), olive tree (*Olea europaea* L.) and other sclerophyllous vegetation of the Mediterranean basin (Agnello et al. 2013; 2018).

Specimen examined

Türkiye. **Adıyaman**: Gerger, Budaklı village, both sides of highway, in meadow, and among grass under *Pinus brutia* Ten., 07.03.2009, *K. 5964*; Karaman: KMU Yunus Emre Campus, on soil among grass, 21.04.2021, *Yuzun 7325*.

Chorological notes

Sarcopeziza sicula (Inzenga) Agnello, Loizides & P.Alvarado, also reported as *Peziza sicula* Inzenga and *Sarcosphaera sicula* (Inzenga) Pat., is the only member of the genus and has a Mediterranean distribution. It has so far been reported from Cyprus, Greece, Israel, Italy (Inzenga 1869; Agnello et al. 2018) and Tunisia (Patouillard 1904).

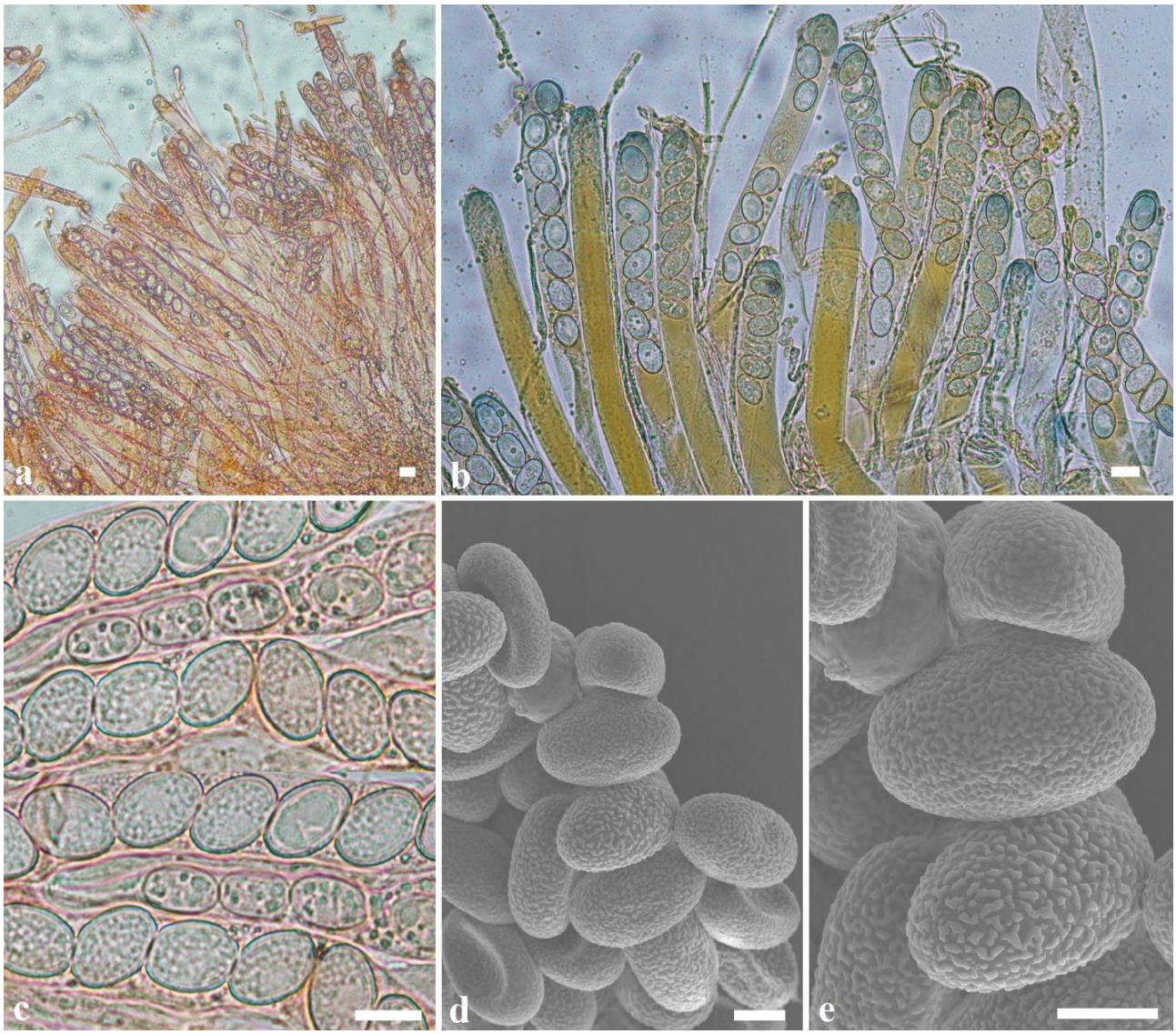

Figure 4. Asci and paraphyses (a,b) and ascospores (c-e) of *Sarcopeziza sicula* (Bars: a-c:10 µm, d-e: 5 µm) (a,c: Kongo Red, b: Melzer) (a-c: light microscope, d-e: SEM).

Sarcopeziza sicula was reported previously from Türkiye only once by Altuntaş et al. (2021) from Tavşanlı district of Kütahya province. The sample were collected on bare ground in April. We collected two samples of *S. sicula*. The first one was collected in meadow and grassy soil under *Pinus brutia,* while the second sample was collected on bare ground among dry herb remains.

Though the ascocarp and ascospore dimensions of the investigated samples are generally in agreement with all of the reported data, the length/diameter ratio for some of our collections is considerably greater, especially for those collected from tight soil in meadow, compared to those reported before. The length/diameter ratio of the samples, collected from loose soil under *Pinus* sp. and bare ground among grass well fit with Altuntaş et al. (2021) and Agnello et al. (2018). On the other hand, we did not clearly observe the purple color or the lilac tinge in fresh material.

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AUTHOR CONTRIBUTION STATEMENT

In this study; the study idea and design, data collection, analysis and interpretation of the results, and drafting of the article were done by the authors.

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