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A New Locality Record from the Order of Helotiales; *Cistella grevillei*

İsmail ACAR*

**Sorumlu yazar: iacar2011@gmail.com*

Van Yüzüncü Yıl University, Başkale Vocational High School, Department of Organic Agriculture, Van, Türkiye / iacar2011@gmail.com,

Abstract: In this article, new findings regarding the presence of a saprophytic fungus, *Cistella grevillei* (Berk.) Raitv., in Bingöl province are presented. The fungus has been identified using morphological data and represents one of the two species of this genus in Türkiye. The article provides a comprehensive description of the macroscopic and microscopic characteristics of the fungus, along with information on where and when it was collected, accompanied by photographs.

Keywords: Ascomycota, Morphology, New record, Türkiye

Helotiales Takımından Yeni Bir Lokalite Kaydı; *Cistella grevillei*

Öz: Bu makalede, Bingöl ilinde saprofit bir mantar olan *Cistella grevillei* (Berk.) Raitv.'nin varlığına dair yeni bulgular sunulmaktadır. Mantar morfolojik veriler kullanılarak tanımlanmış olup, bu cinsin Türkiye'deki iki türünden birini temsil etmektedir. Makalede, mantarın makroskobik ve mikroskobik özelliklerini içeren kapsamlı bir tanım sunmakta, ayrıca fotoğrafları ile birlikte nerede ve ne zaman toplandığına dair bilgileri içermektedir.

Anahtar Kelimeler: Ascomycota, Morfoloji, Yeni kayıt, Türkiye

Introduction

Helotiales is a diverse group of apothecial ascomycetes that possess inoperculate asci. With approximately 3000-4000 known taxa, it is one of the largest groups in this category (Kirk et al., 2008; Baral, 2016). These fungi typically have small apothecia, typically less than 2 mm in diameter, that can be sessile or stipitate, brightly colored or dark, and either superficial or erumpent on the plant host. The shape of the apothecia can be cup-shaped, discoid, turbinate funnel-shaped, or clavate (Korf, 1973). Most members of this group are saprophytic and live on decaying wood and fallen leaves, but some are symbiotic, parasitic, or pathogenic to other organisms. While many members are relatively easy to isolate, inducing the formation of apothecia in vitro is challenging (Müller and Loeffler, 1976). Although some members produce an asexual state, many do not. Despite the diversity of these fungi, taxonomic and ecological studies are still lacking (Hosoya, 2021). Quijada et al., in their study in 2015 the generic type species of *Cistella* and *Hyphodiscus*, have not been included in any phylogenetic analyses.

In recent years, there has been a significant increase in the number of studies conducted on Ascomycetes in Türkiye (Acar et al. 2020; Uzun and Kaya 2020; Sadullahoğlu and Uzun 2020; Acar 2021; Çetinkaya and Uzun 2021; Kaplan and al. 2021; Kesici and Uzun 2021; Acar and Quijada 2022; Akçay et al. 2022; Tekpınar Dizkırıcı and Acar 2022; Uzun and Kaya 2022, Kaşık et al. 2022; Acar and Dizkırıcı, 2023; Akçay et al., 2023). Despite the increasing activity in studies on Ascomycetes in the country, the current checklist of Turkish fungi only reports one species belonging to the Cistella genus (Sesli et al., 2020) and Solak and Türkoğlu (2022). Previously, Uzun et al. (2017) provided a genus record as Discocistella grevillei (Berk.) Svrček. Our report on Cistella grevillei represents both the second record of the genus in Türkiye and the second locality record for this species. Considering that the current checklist of Turkish fungi does not yet include a significant number of

species from this genus, our report makes a significant contribution to the mycological knowledge of the country.

Material and Metod

Macrofungi specimens were collected from Bingöl province on branches of on leaf petiole Populus sp. in 2021. Bingöl is situated in the Eastern Anatolian region of Türkiye and is bordered by Erzurum and Erzincan to the north, Tunceli and Elâzığ to the west, Diyarbakır to the south, and Muş to the east. In the course of conducting field studies, we documented the geographical coordinates and characteristics of samples based on their morphology and ecology. We captured images of fresh specimens using a Canon (EOS 60D) camera fitted with a Tokina 100 mm macro lens, while images of dried specimens were taken with a Leica EZ4 stereo microscope.

We undertook microscopic examinations at Yüzüncü Yıl University, as per the Clémençon (2009) method. Using a Leica DM500 research microscope with oil immersion, we observed the microscopic characteristics in water. The Leica Application Suite (version 3.4.0) program was used to measure at least 30 asci, ascospores, paraphyses and hairs.

To identify and compare our collection with other species in the genus, we referred to several sources, including Hansen and Knudsen (2000); Raitviir (2004); Quijada et al., (2015). The studied specimen has been deposited at the Fungarium of the Van Flora Application and Research Center, Van Yüzüncü Yıl University (VANF).

Results

The identified species is described below, along with details of its location, collection date, fungarium number, and accompanying figures.

Cistella grevillei (Berk.) Raitv.

Apothecia 0.2–0.7 mm, broadly sessile, dispersed to gregarious, whitish, white to pink-white, margin shortly hairy (Figure 1). **Asci** 32–50 × 3.5–6.1 µm, spores 2-seriate, cylindrical, 8-spored, arising from croziers. **Ascospores** 6–9.5 × 1.5–2 µm, hyaline, multiguttulate at poles, straight to slightly curved, cylindric to clavate. **Paraphyses** terminal cell 9–16 × 1.8–2.5 µm, cell below 10–17 × 1.6–2.8 µm, lanceolate, cylindric to sublanceolate, 3–4 septate, not branched, without guttules. **Hairs** 14–45 × 3–5 µm, 1–4 septate cylindric, clavate to subclavate, densely spiny, straight to sinuous (Figure 2).

Specimen Examined: **TÜRKİYE, Bingöl,** Sarıçiçek village, 38° 54′01"N, 40° 36′55"E, 1063 m, on petiole of *Populus* sp., 10.04.2021, VANF Acar. 1201.

Figure 1. Ascomata of *Cistella grevillei*

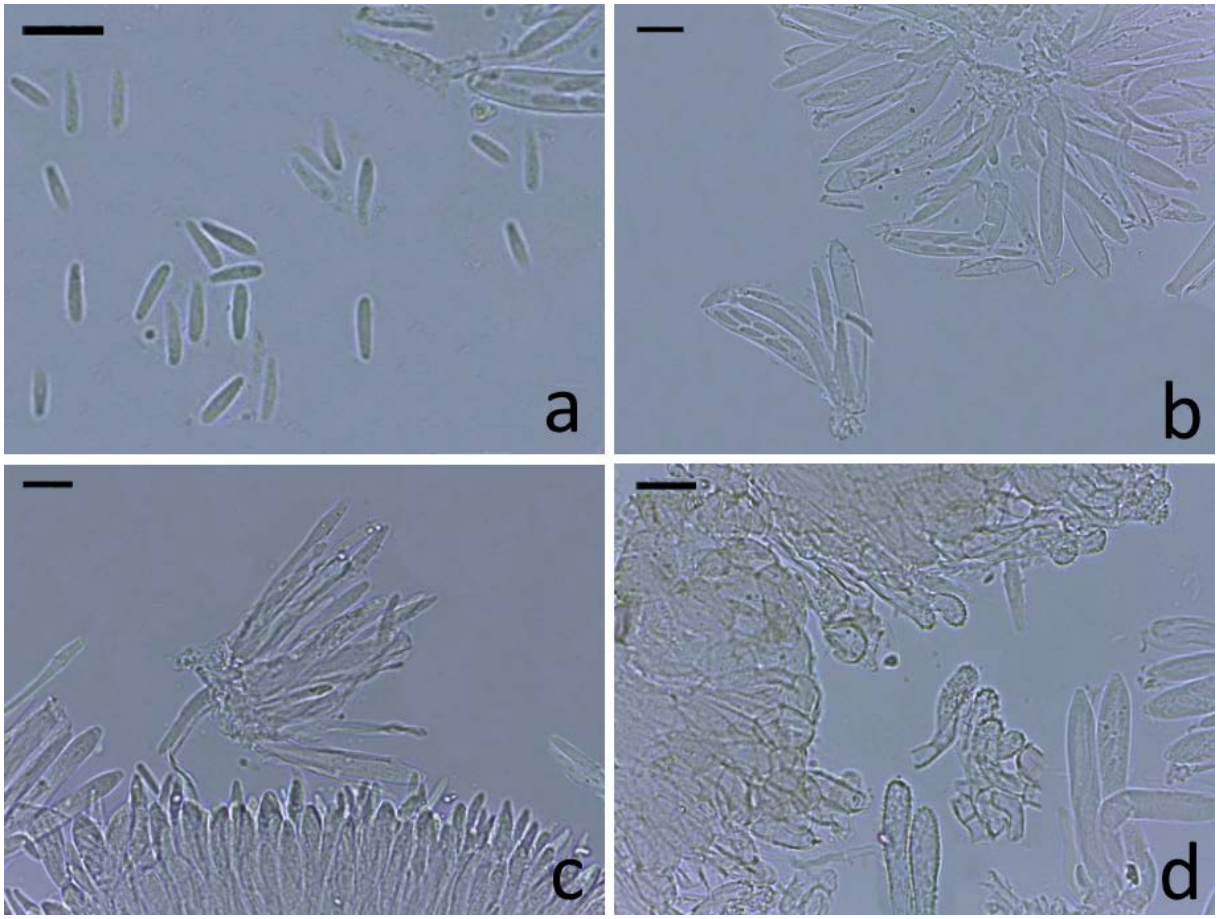

Figure 1. Microscopic characters of *Cistella grevillei* **a**. ascospores, **b**. asci, **c**. paraphyses and asci, **d**. hairs
Scale bar: 10 µm

Discussions

The example presented in the manuscript aligns quite well with the existing definitions (Hansen and Knudsen 2000; Raitviir 2004; Quijada et al., 2015). Raschle (1978) documented significantly longer spores for his samples (6–15 µm). The most similar species is *Cistella hungarica* (Rehm ex Kuntze) Raitv., but there are notable differences compared to the Canarian specimen: (1) ascospores in *C. grevillei* are longer (8–9.8 µm vs *6.3–7.5 µm); (2) the terminal cell in paraphyses in *C. grevillei* is shorter (*8.7–15.2 µm vs *12.5–21.3 µm); and (3) the color of apothecia is white in *C. grevillei* and yellowish in *C. hungarica*. Raitviir (2004) utilized ascus and ascospore size to differentiate between the two taxa, which is also adopted here, although Raschle (1978) reported exceptionally large variability in ascus length (Quijada et al., 2015).

Dicocistella grevillei (Berk.) Svrček was recorded at the genus level by Uzun et al. (2017). In addition, Acar (2021) also provided the first genus-level record for *Cistella dentata* (Pers.) Quél. in Türkiye. When considering Mycobank and Index Fungorum, it can be observed that *Dicocistella grevillei* is synonymous with *Cistella grevillei*. One of the most characteristic features of the *Cistella* genus is the presence of a hair structure within the microscopic characters, which is of significance for genus identification. However, Uzun et al. (2017) did not provide any information about the hair structure in their study. With this research, the species description of *Cistella grevillei* has been supported, and a new locality has been added.

Author Contributions

All authors have equal contribution.

Conflict of Interest

There is no conflict of interest with any institution or person

Ethical Statement: It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited (İsmail ACAR).

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