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Research Note

Cystoderma cinnabarinum (Alb. & Schwein.) Fayod, a New Turkish Mycota Record

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Abstract: *Cystoderma cinnabarinum* (Alb. & Schwein.) Fayod is recorded for the first time from Turkey. A key to the known Turkish species of *Cystoderma* Fayod is given.

Key Words: Taxonomy, fungal diversity, Turkey

Cystoderma cinnabarinum (Alb. & Schwein.) Fayod, Türkiye Fungusları İçin Yeni Bir Kayıt

Özet: *Cystoderma cinnabarinum* (Alb. & Schwein.) Fayod, Türkiye'de ilk kez kaydedildi. Aynı zamanda bilinen Türkiye *Cystoderma* Fayod türleri için bir anahtar verildi.

Anahtar Sözcükler: Taksonomi, Fungal çeşitlilik, Türkiye

Introduction

The known taxa of *Cystoderma* Fayod were recorded from Turkey between 1992 and 2003. *C. amianthinum* was recorded by Işıloğlu & Watling in Mediterranean Turkey in 1992. Afyon (1996) collected the same species in Beyşehir district (Konya). Solak et al. (1999) recorded the fungus in İzmir province. Gezer (2000) observed the same species in Antalya province. *C. carcharias* (Pers.) Fayod and *C. granulosum* (Batsch) Fayod were collected by Solak et al. (1999) in İzmir province. Aktaş et al. (2003) recorded *C. granulosum* in Bozkır district (Konya). Kaşık et al. (2003) collected the same fungus in Yahyalı (Kayseri) province. During our field trips within the framework of this study, we collected specimens of *C. cinnabarinum* (Alb. & Schwein.) Fayod in the Maçka and Akçaabat districts of Trabzon province in the Black Sea region of Turkey. The purpose of this study is to add a new record of *Cystoderma* to the Turkish Mycota. After the addition of *C. cinnabarinum*, the total number of *Cystoderma* species recorded in Turkey is 6. The distribution of the known species of *Cystoderma* is shown on the map (Figure 1).

Materials and Methods

We collected the specimens under *Picea orientalis* L. and *Pinus pinea* L. during our field trips in the Maçka and Akçaabat districts in August 2002. Macroscopic description and data about the ecology of the fungus were noted and photographs were taken in the field. The specimens were examined in the laboratory and identified using the keys in Breitenbach & Kränzlin (1995), Smith & Singer (1945), and Wasser (1993). All the spore measurements were calculated from at least 20 individual measurements using Nikon microscopes with magnification of 1000. The pileus of the fungus was moistened by the addition of a few drops of Clemençon's solution (20 of ml concentrated ammonia + 1 g of glycerine + 80 ml of 96% ethanol) and then sectioned under a binocular loupe. A key to the species of *Cystoderma* reported from Turkey is also given. The key was prepared using character states derived from the literature. The specimens were deposited at the fungarium of the Fatih Faculty of Education at Karadeniz Technical University in Trabzon, Turkey.

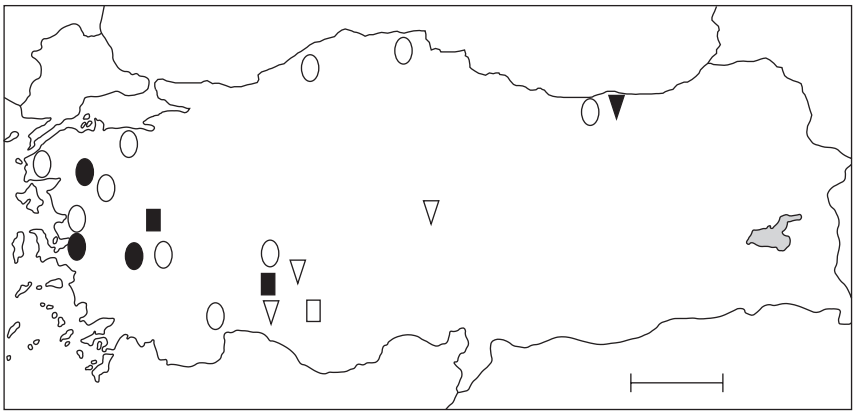

Figure 1. The distribution of the species of *Cystoderma* in Turkey: O = *C. amianthinum*, ❑ = *C. ambrosii*, ● = *C. carcharias*, ■ = *C. fallax*, ∇ = *C. granulosum*, ▼ = *C. cinnabarinum* (bar: 200 km).

Results

The specimens were identified according to Breitenbach & Kränzlin (1995), Smith & Singer (1945), and Wasser (1993). The authors of fungal names are cited according to Kirk & Ansell (1992).

Cystoderma cinnabarinum (Alb. & Schwein.) Fayod. Ann. Sci. Nat. Bot:351 (1889).

[Syn. *Agaricus cinnabarinus* (Alb. & Schwein.) Fr. Syst. mycol. Lundae 3: (1832), *Agaricus granulosus* var. *cinnabarinus* Alb. & Schwein. Consp. Fung: 147 (1805), *Agaricus terrei* Berk. & Broome. Ann. Mag. Nat. Hist. 462: (1870), *Cystoderma terrei* (Berk. & Broome) Harmaja, Karstenia 30: (1978), *Armillaria cinnabarina* (Alb. & Schwein.) Kauffman. (1923), *Cantharellus cinnabarinus* (Alb. & Schwein.) Schwein. (1832), *Chanterel cinnabarinus* (Alb. & Schwein.) Murrill. (1913), *Lepiota cinnabarina* (Alb. & Schwein.) P. Karst. Die Blätterpilze 327: (1914)].

Macroscopic features: Pileus 20-80 mm, hemispherical when young, undulating when mature, surface densely covered with fine granules and conical warts, orange-brown to brick-red, reddening when rubbed, margin involute, with veil. Context whitish-cream, grey-yellow under the cuticle and above the lamellae, taste mild, fungoid. Lamellae whitish to cream, narrow, emarginate, edges undulating. Stipe 20-60 x 5-10 mm, cylindrical, fleshy, solid, stuffed, elastic, surface light orange, white-fibrillose above the faint ring zone, below faintly white flocculose-scaly and covered with dark orange squamules, slightly bulbous, surrounded with whitish mycelium (Figure 2a).

Microscopic features: Spores broadly ellipsoid, smooth and hyaline, 3.5-5 x 2.2-3.3 µm Figure 2b).

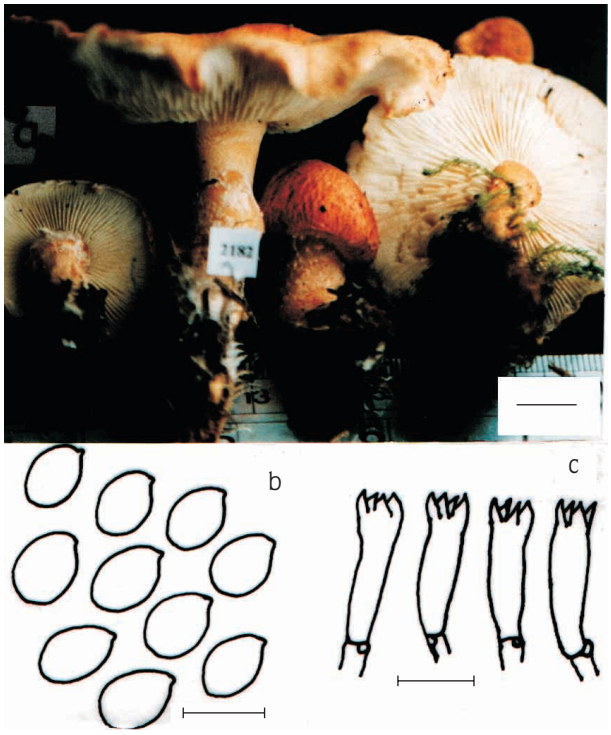

Figure 2. a. Fruit bodies (bar: 10 mm), b. Spores (bar: 5 µm), c. Basidia (bar: 10 µm).

Basidia clavate, 17-22 x 4.5-6.5 µm, with 4 sterigmata and basal clamp (Figure 2c).

Specimens examined: under *Pinus pinea* L. and *Picea orientalis* L. among mosses and grasses, Akçaabat and Maçka districts of Trabzon province of Turkey, October 2002, leg.et det. E. Sesli (Ses 2182).

Distribution: Asia, Europe, Africa and America (Breitenbach & Kränzlin, 1995)

Discussion

According to Breitenbach & Kränzlin (1995), the pileus of *Cystoderma cinnabarinum* is 30-60 (100) mm across and the fungus grows gregariously in hardwood and coniferous forests. We calculated the diameter of the specimens as 20-80 mm and collected the specimens under *Pinus pinea* L. and *Picea orientalis* L. among mosses and grasses. According to the same reference the spores are broadly elliptic-oval, smooth, hyaline and 3.6-5 x 2.4-3.2 µm and basidia clavate, 18-21 x 5-6 µm. We measured the spores as 3.5-5 x 2.2-3.3 µm and basidia as 17-22 x 4.5-6.5 µm.

C. cinnabarinum is recorded here for the first time from Turkey. Contemporary knowledge of the diversity of Turkish fungi is based on 160 years of investigations (Baytop, 1994). Sesli & Baydar (1996) presented the first checklist of *Agaricales* including species of *Cystoderma*. The known taxa of *Cystoderma* were recorded from Turkey between 1992 and 2003. They are as follows: *C. ambrosii*. *C. amianthinum*, *C. carcharias*, *C. fallax* and *C. granulosum* (Sesli & Denchev, 2005). The distribution of the 6 species of *Cystoderma*. in Turkey is shown on the map (Figure 1). We hope that this paper will be helpful for creating a database of Turkish fungi.

Key to Species of *Cystoderma* Recorded in Turkey

Characters for the key have been adapted from Moser (1983). Only the species known to occur in Turkey are included in the key.

1a. Pileus without cystidia 2

1 b. Pileus with spear-shaped cystidia, orange to brick brown, stipe with an annular zone or a very fugacious annulus, spores nonamyloid, 3.5-5 x 2.2-3.3 µm . .*C. cinnabarinum* (Alb. & Schwein.) Fayod

2a. Spores amyloid 3

2b. Spores nonamyloid 5

3a. Stipe with membranous, ascending annulus . . .4

3b. Stipe with only floccose annular zone, pileus ochre yellow, ochre brown, spores 4-6 x 3- 4 µm . . . . . .*C. amianthinum* (Scop.) Fayod

4a. Pileus dingy white to vinaceous, spores 4-5.5 x 3-4 µm . . . . . .*C. carcharias* (Pers.) Fayod

4b. Pileus yellow rust coloured, spores 3.5-5 x 3-4 µm . . . . . .*C. fallax* A.H. Sm. & Singer

5a. Pileus whitish to cream coloured, spores 4-5.5 x 2.2-3 µm . . . . . .*C. ambrosii* (Bres.) A.II. Sm. & Singer

5b. Pileus fox to orange brown, spores 3.5-5 x 2.5-3 µm . . . . . .*C. granulosum* (Batsch) Fayod

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