

## New records for Turkey and contributions to the macrofungal diversity of Isparta Province

Halil GÜNGÖR<sup>1\*</sup>, Mehmet Halil SOLAK<sup>2</sup>, Hakan ALLI<sup>1</sup>, Mustafa İŞILOĞLU<sup>1</sup>, Erbil KALMIŞ<sup>3</sup>

<sup>1</sup>Department of Biology, Faculty of Science, Muğla Sıtkı Koçman University, Kötekli, Muğla, Turkey

<sup>2</sup>Program of Elementary Science Education, Faculty of Education, Muğla Sıtkı Koçman University, Kötekli, Muğla, Turkey

<sup>3</sup>Ministry of Science, Industry, and Technology Provincial Directorate, Manisa, Turkey

Received: 09.06.2014

Accepted/Published Online: 29.12.2014

Printed: 30.09.2015

**Abstract:** This study was conducted on specimens of macrofungi collected from Isparta Province between 2005 and 2008; in addition, *Trichophaea woolhopeia* (Cooke & W. Phillips) Boud. is given as a new record from Muğla Province. After fieldwork and laboratory studies, 129 taxa belonging to 36 families and 2 divisions were identified from Isparta Province. Five of them, *Cortinarius olidus* J.E. Lange, *Cystoderma jasonis* (Cooke & Masee) Harmaja, *Echinoderma echinaceum* (J.E. Lange) Bon, *Hebeloma gigaspermum* Gröger & Zschiesch., and *Psathyrella canoceph* (Kauffman) A.H. Sm., are new records for Turkey.

**Key words:** Biodiversity, macrofungi, new records, Isparta, Muğla, Turkey

### 1. Introduction

Although many studies have been carried out on the Mycota of Turkey, there are numerous regions that have not been investigated yet. There are only a small number of records in the literature on the Mycota of Isparta Province (Afyon, 1996). In these studies, 52 macrofungi taxa have been identified from Isparta.

Isparta Province is located in the southern part of Turkey, bordered by Antalya to the south, Burdur and Afyonkarahisar to the west, Afyonkarahisar to the north, and Konya to the east (Figure 1). The province has a transitional climate between Mediterranean and continental. The annual average temperature is 12 °C, and the annual rainfall is about 581 mm. *Pinus nigra* Arnold subsp. *pallasiana* (Lamb.) Holmboe, *Abies cilicica* (Antoine & Kotschy) Carrière subsp. *isaurica* Coode & Cullen, *Cedrus libani* A.Rich., *Juniperus excelsa* M.Bieb., *J. foetidissima* Willd., *J. oxycedrus* L., *Quercus cerris* L., *Q. coccifera* L., and *Q. vulcanica* Boiss. & Heldr. ex Kotschy are very common plants in the region.

Muğla Province is located in southwestern Turkey and possesses a Mediterranean climate. *Pinus brutia* Ten., *P. pinea* L., and *Quercus* spp. in particular are very common in the region. Because of the suitable climate and the type of vegetation, Isparta and Muğla provinces have a rich fungal biodiversity.

The aims of this study are to identify the macrofungal taxa of Isparta; to classify edible, inedible, and poisonous species of the region; and to make a contribution to the Mycota of Turkey with new macrofungal records.

### 2. Materials and methods

The specimens analyzed in this study were collected from different localities within Isparta and Muğla provinces between 2005 and 2008. The field studies were conducted mostly in autumn and spring, because of the suitable climatic conditions for growth of fungi. Morphological and ecological characteristics of the macrofungi were recorded and photographed in the field. After the field studies, specimens were taken to the laboratory for further investigation. Macroscopic and microscopic measurement data were obtained using a ruler, light microscope, and micrometers. Microphotographs were taken using a Leica EC3. Some reagents (NH<sub>4</sub>OH 10%, FeSO<sub>4</sub> 10%, KOH 10%, distilled water, Melzer's reagent, KOH 5%, Congo red, etc.) were used for identification. All microscopic studies were done according to Breitenbach and Kränzlin (1991). Specimens were identified with the help of Marchand (1971–1986), Watling (1982), Moser (1983), Breitenbach and Kränzlin (1984–2000), Cappelli (1984), Pacioni (1985), Watling and Gregory (1987, 1989), Riva (1988), Bresinsky and Besl (1990), Candusso and Lanzoni (1990), Ellis and Ellis (1990), Hansen and Knudsen (2000),

\* Correspondence: hgngnr1@gmail.com

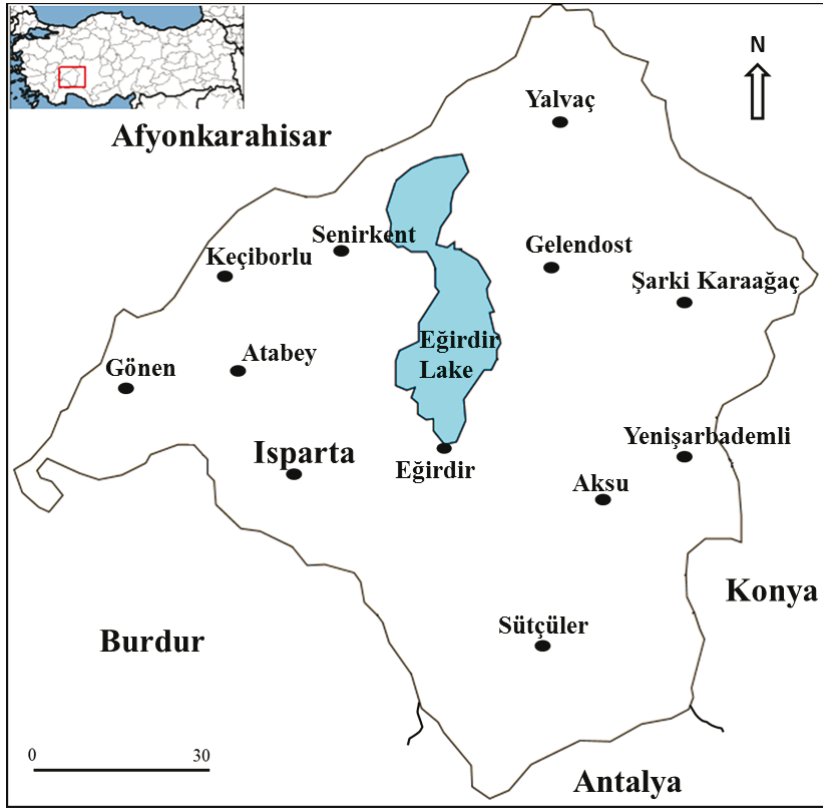


Figure 1. Map of Isparta.

Ladurner and Simonini (2003), Kränzlin (2005), Muñoz (2005), Roux (2006), Knudsen and Vesterholt (2008), Kibby (2012), Medardi (2012), and Beug et al. (2014). The new records for Turkey were checked using the relevant literature (Doğan et al., 2005; Solak et al., 2007; Allı, 2011; Kaya et al., 2012; Sesli and Denchev, 2013; Akata et al., 2014; Solak et al., 2014).

The identified specimens are kept at the fungarium of Muğla Sıtkı Koçman University.

### 3. Results

In this study, 129 taxa belonging to 36 families were identified from Isparta Province. Seven taxa belong to Ascomycota and 122 to Basidiomycota. *Trichophaea woolhopeia*, *Cortinarius olidus*, *Cystoderma jasonis*, *Echinoderma echinaceum*, *Hebeloma gigaspermum*, and *Psathyrella canoceph* are reported here as new records for Turkey. All these taxa are presented with their localities, habitats, collection dates, and accession numbers. Nomenclature and distributions of the taxa of the families are given according to Kirk (2011) and Sesli and Denchev (2013). Edible taxa are indicated with E, inedible taxa with IE, and poisonous with P, while taxa with unknown edibility are indicated with U.

### 3.1. New records for Turkey

#### 3.1.1. Descriptions of taxa

##### 3.1.1.1. Pyrenomycetaceae Corda

##### *Trichophaea woolhopeia* (Cooke & W. Phillips)

Ascomata 5–12 mm, hemispherical to flattened disc shape. Hymenium gray to white, outside brownish and covered with brown hairs. Asci 8-spored, 200–260 × 20–22 μm, spores ellipsoid-subglobose, smooth, hyaline, 18–22 × 14–15 μm, generally with 1 large guttule, sometimes with 2 guttules. Paraphyses elongated, forked at the base, septate, slightly enlarged towards tips. Hairs 180–400 × 19–23 μm, brown, thick-walled, with blunt ends, enlarged towards base, with few septa. In parks, forests, and shady places, in groups on sandy soil, among mosses and grasses. An autumnal species. This species is very similar to *T. gregaria* (Rehm) Boud., but differs from it with wider spores (≥13 μm) (Figure 2).

Muğla, Fethiye, Yaylakoru village, in pine forest, 9.11.2006, Solak 2713. IE.

##### 3.1.1.2. Agaricaceae Chevall.

##### *Cystoderma jasonis* (Cooke & Masee) Harmaja

Pileus 15–25 mm across, hemispherical, bell-shaped to flattened, cinnamon buff to yellowish. When young, margins dentate with veil remnants. Flesh in cap ochre,

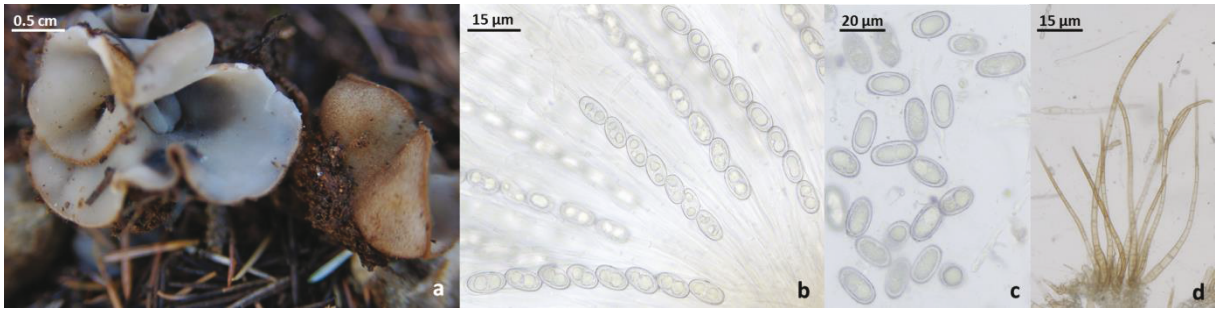


Figure 2. *Trichophaea woolhopeia*: a- ascomata, b- asci, c- ascospores, d- hairs.

but light brown in stem. Arthroconidia present under pileipellis and numerous. Odor faint, taste mild and not distinctive. Lamellae whitish to yellowish-buff, adnexed. Stipe 40–60 × 3–5 mm, cylindrical, first solid, then hollow, brownish. Annulus floccose. Basidia rather small and clavate, 22–23 × 6–7 µm. Spores oblong to fusiform, smooth, hyaline, amyloid, 6–7 × 2.5–3 µm. Cystidia absent. It grows in coniferous forest on soil. This species is described as a variety of *C. amianthinum* (Scop.) Fayod by some authors, but this species is distinguished from *C. amianthinum* by abundant arthrospores on pileal surface and a small depression on the spores under apiculus (Figure 3).

Isparta, Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2387. IE.

***Echinoderma echinaceum* (J.E. Lange) Bon**

Pileus 30–50 mm across, convex to applanate with a low umbo, surface with brown conical scales on a red-brown background, towards the margin radially fibrillose, margin incurved for a considerable length. Flesh white, odor and taste unpleasant. Lamellae whitish to cream-colored, free. Stipe 40–50 × 5–7 mm, cylindrical, slightly enlarged towards the base, solid when young, later

hollow, cream-colored, slightly fibrillose at the upper part of annular zone. Basidia cylindrical, with basal clamp, 20–22 × 5.5–6 µm. Spores oblong to ellipsoid, smooth, hyaline, dextrinoid, 4.5–5.5 × 2.5–3 µm. Pileipellis made up of chains of subglobose to cylindrical cells. Grows in conifer or mixed forests. This species is closely related to *E. pseudoasperulum* (Knudsen) Bon, *E. jacobi* (Vellinga & Knudsen) Gminder, and *E. carinii* (Bres.) Bon, but none of them have cheilocystidia. Another similar species is *E. calcicola* (Knudsen) Bon, which differs in having conical warts 2–3 mm in length (Figure 4).

Isparta, Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2377. IE.

**3.1.1.3. Bolbitiaceae Singer**

***Hebeloma gigaspermum* Gröger & Zschiesch.**

Pileus 30–45 mm across, hemispherical to convex, later expanded, smooth when young, later slightly tomentose, dull or light brown when young, later pale clay buff to cinnamon, almost reddish-brown, and paler towards the margin. Flesh white to gray-brown, odor strong and sweetish, flavor not distinctive. Lamellae light brown to coffee-brown, broadly attached, edges slightly crenate. Stipe 45–75 × 6–8 mm, cylindrical, fragile, first solid, later

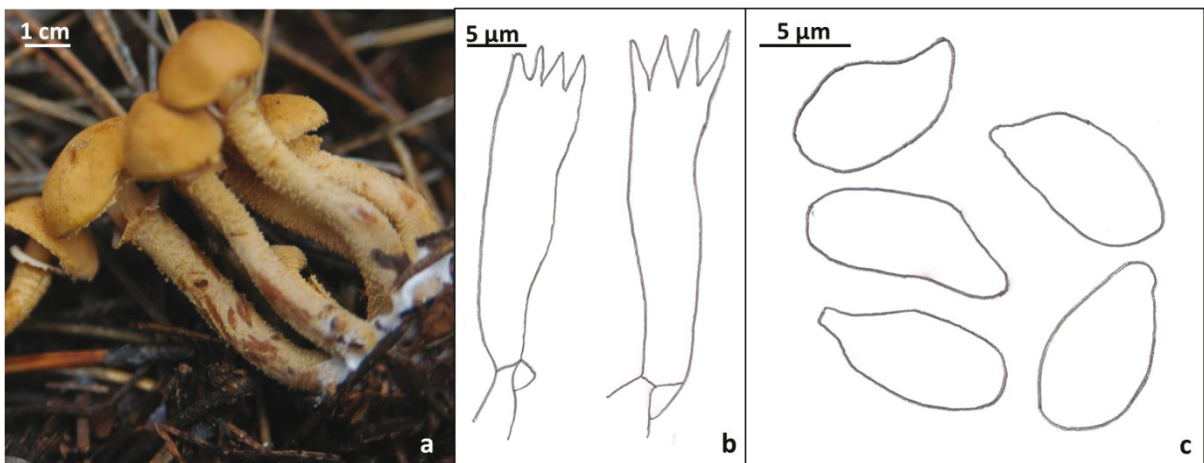


Figure 3. *Cystoderma jasonis*: a- basidiomata, b- basidia, c- basidiospores.

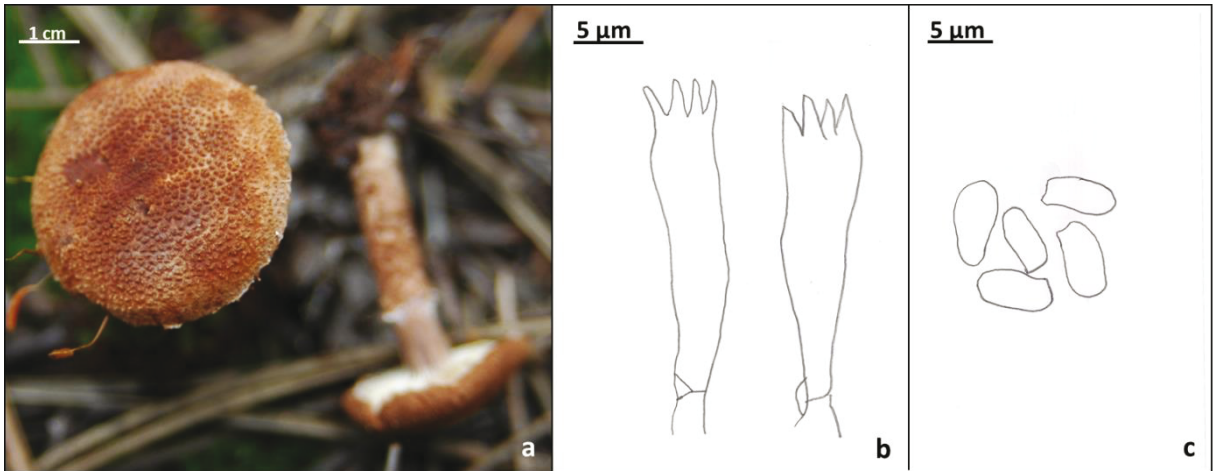


Figure 4. *Echinoderma echinaceum*: a- basidiomata, b- basidia, c- basidiospores.

hollow, pruinose, whitish to pale brownish, turning darker brown from the base. Basidia cylindrical to clavate, with basal clamp,  $35\text{--}36 \times 9\text{--}10 \mu\text{m}$ . Spores broadly elliptical to citriform, verrucose, strongly dextrinoid, ochre-brown,  $14\text{--}16 \times 6.5\text{--}8 \mu\text{m}$ . Cheilocystidia cylindrical to clavate,  $50\text{--}80 \times 8\text{--}10 \mu\text{m}$ . It grows under willows. *H. sacchariolum* Qué. is similar to this species but differs in having a perfume-like sweetish odor, ochre to red-brown pileus, and larger spores (Figure 5).

Isparta, Sütçüler, Çandır village, in willow-poplar mixed grove, 3.11.2007, Solak 3244. IE. 3.1.1.4. **Cortinariaceae**  
R. Heim ex Pouzar

***Cortinarius olidus*** J.E. Lange

Pileus 50–80 mm, first hemispherical to convex, later expanded, yellow, ochre yellow to brown, with an olivaceous tinge, granulate-diffracted into small olivaceous brown scales, margin paler. Lamellae gray to white. Flesh white, odor like cut grass. Stem 40–60 × 13–18 mm, cylindrical, whitish, with yellowish to ochraceous yellow scattered veil

remnants. Basidia  $25\text{--}30 \times 9\text{--}10 \mu\text{m}$ , cylindrical to clavate. Spores  $9.5\text{--}10.5 \times 5.5\text{--}6.3 \mu\text{m}$ , amygdaloidal to ellipsoid, verrucose. It grows in deciduous and mixed forests. This species is very closely related to the species *C. cephalixus* Secr. ex Fr., but *C. cephalixus* differs in having a fruity odor, somewhat shorter spores, and different habitat (Figure 6).

Isparta, Eğirdir, Ağilköy village, in *Cedrus-Quercus* mixed forest, 26.10.2008, Solak 3848. IE.

3.1.1.5. **Psathyrellaceae** Vilgalys, Moncalvo & Redhead

***Psathyrella canoiceps*** (Kauffman) A.H. Sm.

Pileus 7–12 mm, conical to campanulate, surface hygrophanous, dark brown to ochre brown, completely covered with white veil remnants, veil is in form of erect tuft of hairs, margin striate and covered with veil remnants. Flesh ochre-brown, odor spicy, taste mild. Lamellae light brown to dark brown with a reddish tinge, broadly adnate, edges whitish-ciliate. Stipe 25–40 × 1–2 mm, cylindrical, somewhat enlarged to bulbous towards the base, hollow, fragile, surface densely whitish-tomentose

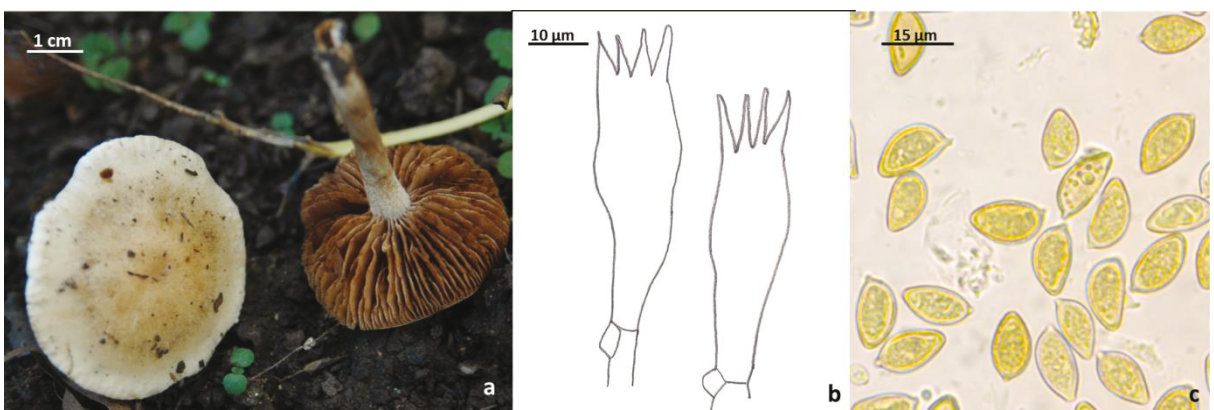


Figure 5. *Hebeloma gigaspermum*: a- basidiomata, b- basidia, c- basidiospores.

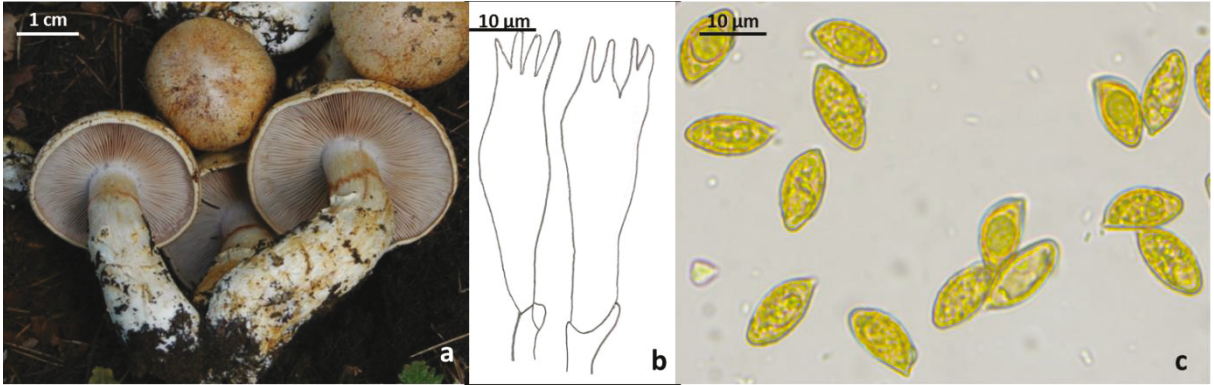


Figure 6. *Cortinarius olidus*: a- basidiomata, b- basidia, c- basidiospores.

when young, later whitish-fibrillose on a whitish to light brown background, apex white-floccose. Spores elliptical, smooth, dark brown, with a germ pore,  $9-11 \times 5.5-6 \mu\text{m}$ . Basidia clavate,  $20-25 \times 8-10 \mu\text{m}$ , without a basal clamp. Cheilocystidia lageniform-ventricose,  $25-40 \times 10-18 \mu\text{m}$ . Gregarious, usually grows on wood remains. This species is easily recognized by veil remnants on pileus and stipe. *P. sacchariolens* Enderle is similar to this species, but smells perfume-like and has pleurocystidia (Figure 7).

Isparta, Eğirdir, Çamköy village, in meadows, 4.11.2007, Solak 3262. IE.

### 3.2. List of the macrofungi of Isparta Province

#### 3.2.1. Ascomycota

##### Discinaceae Benedix

###### 1. *Discina ancilis* (Pers. : Fr.) Sacc.

Isparta Gölcük national park, in pine forest, 21.4.2006, Solak 2119; Eğirdir, Aşağı Gökdere village, in pine forest, 22.4.2006, Solak 2151. IE.

###### 2. *Gyromitra esculenta* (Pers. : Fr.) Fr.

Eğirdir-Aksu way 10 km, in pine forest, 23.4.2006, Solak 2148; Eğirdir, Ağlıköy village, in pine forest, 15.4.2007, Solak 3158. P.

##### Helvellaceae Fr.

###### 3. *Helvella leucomelaena* (Pers.) Nannf.

Eğirdir, Yazılı kanyon way, in pine forest, 22.4.2006, Solak 2123; Isparta-Antalya-Burdur city border, Yumrutaş turnout, in pine forest, 14.4.2007, Solak 3142. P.

###### 4. *Helvella leucopus* Pers.

Isparta-Antalya-Burdur city border, Yumrutaş turnout, in pine forest, 14.4.2007, Solak 3144; Eğirdir, Yazılı kanyon way, near stream, on sandy soil, 14.4.2007, Solak 3147. E.

##### Morchellaceae Rchb.

###### 5. *Morchella elata* Fr.

Sütçüler, Yeşilyurt, Selimler village, in pine forest, 22.4.2006, Solak 2136. E.

###### 6. *Morchella esculenta* (L. : Fr.) Pers.

Isparta-Gölcük way 2 km, under willow, in meadows, on sandy soil, 21.4.2006, Solak 2110; Eğirdir-Aksu way 10 km, in pine forest, 23.4.2006, Solak 2147. E.

##### Pyronemataceae Corda

###### 7. *Tarzetta catinus* (Holmsk.) Korf & J.K. Rogers

Eğirdir, Yazılı kanyon way, in pine forest, 22.4.2006, Solak 2127. IE.

#### 3.2.2. Basidiomycota

##### Agaricaceae Chevall.

###### 8. *Agaricus bitorquis* (Quél.) Sacc.

Isparta-Antalya way Burdur city border, Yumrutaş turnout, in meadows, 29.10.2006, Solak 2537. E.

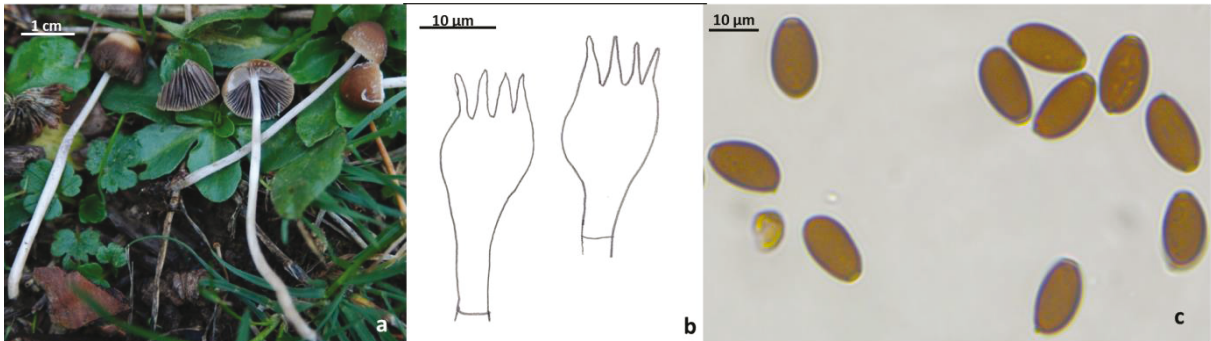


Figure 7. *Psathyrella canocephs*: a- basidiomata, b- basidia, c- basidiospores.

9. *Agaricus campestris* L. : Fr.  
Eğirdir, Yukarı Gökdere village, in apple orchard, 8.10.2005, Solak 1471; Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2397; Eğirdir, Yukarı Gökdere village, in meadows, 3.11.2007, Solak 3234; Eğirdir, Çamköy village, in meadows, 4.11.2007, Solak 3265. E.
10. *Agaricus langei* (F.H. Møller) F.H. Møller  
Eğirdir, Yenişarbademli saddle, in *Pinus nigra* forest, 9.10.2005, Solak 1521. E.
11. *Agaricus luteomaculatus* (F.H. Møller) F.H. Møller  
Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2303. IE.
12. *Agaricus macrocarpus* (F.H. Møller) F.H. Møller  
Eğirdir, Yukarı Gökdere village, in meadows, 3.11.2007, Solak 3235. E.
13. *Agaricus xanthodermus* Genev.  
Eğirdir, Ağilköy village, in *Cedrus-Quercus* mixed forest, 26.10.2008, Solak 3846. P.
14. *Bovista nigrescens* Pers. : Pers.  
Eğirdir, Yukarı Gökdere village, in meadows, 8.10.2005, Solak 1473; Eğirdir, Ağilköy village, in *Cedrus-Quercus* mixed forest, 26.10.2008, Solak 3837. E.
15. *Bovista plumbea* Pers. : Pers.  
Eğirdir, Çayköy village, in meadows, 28.10.2006, Solak 2395; Aksu, Yılanlı village, in meadows, 26.10.2008, Solak 3885. E.
16. *Coprinus comatus* (O.F. Müll.) Pers.  
Şarkikaraağaç, Konya way exit, 23.4.2006, Solak 2164. E.
17. *Cystoderma carcharias* (Pers.) Fayod  
Eğirdir, Ağilköy village, in *Cedrus-Quercus* mixed forest, 26.10.2008, Solak 3845. IE.
18. *Cystodermella granulosa* (Batsch) Harmaja  
Eğirdir, Yenişarbademli saddle, in pine forest, 9.10.2005, Solak 1509; Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2386. IE.
19. *Lepiota clypeolaria* (Bull. : Fr.) P. Kumm.  
Aksu, Yılanlı village, in pine forest, 26.10.2008, Solak 3889. IE.
20. *Lepiota cristata* (Bolton : Fr.) P. Kumm.  
Eğirdir, Kırıntı village, in pine forest, 8.10.2005, Solak 1486; Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2315. IE.
21. *Lepiota griseovirens* Maire  
Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2322. IE.
22. *Lepiota ignivolvata* Bousset & Joss. ex Bousset & Joss.  
Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2314. IE.
23. *Lycoperdon nigrescens* Wahlenb. : Pers.  
Eğirdir, Çamköy village, in pine forest, 4.11.2007, Solak 3267. IE.
24. *Lycoperdon perlatum* Pers. : Pers.  
Eğirdir, Yenişarbademli saddle, in pine forest, 9.10.2005, Solak 1524; Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2348. E.
25. *Macrolepiota excoriata* (Schaeff. : Fr.) Wasser  
Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2342; Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2346; Eğirdir, Çamköy village, in pine forest, 4.11.2007, Solak 3269. E.
26. *Macrolepiota mastoidea* (Fr. : Fr.) Singer  
Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2355; Eğirdir, Çamköy village, in pine forest, 4.11.2007, Solak 3280. E.
27. *Macrolepiota procera* (Scop. : Fr.) Singer  
Eğirdir, Yenişarbademli saddle, in pine forest, 9.10.2005, Solak 1510; Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2351; Eğirdir, Çamköy village, in pine forest, 4.11.2007, Solak 3259. E.
- Amanitaceae** R. Heim ex Pouzar
28. *Amanita ovoidea* (Bull. : Fr.) Link  
Gelendost, North hillside, 17.11.2006, I. 8063; Gönen, opposite of Gönen vocational high school, 18.11.2006, I. 8068; Eğirdir, Aşağı Gökdere village, under *Quercus*, 29.10.2006, Solak 2541. E.
29. *Amanita pantherina* (DC. : Fr.) Krombh.  
Aksu, Yılanlı village, in pine forest, 26.10.2008, Solak 3906. P.
- Auriculariaceae** Fr.
30. *Auricularia mesenterica* (Dicks. : Fr.) Pers.  
Eğirdir, Yazılı kanyon, on plane tree, 22.4.2006, Solak 2132; Eğirdir, Kovada national park, on plane tree root, 14.4.2007, Solak 3149. IE.
- Boletaceae** Chevall.
31. *Xerocomellus chrysenteron* (Bull.) Quél.  
Eğirdir, Kırıntı village, in pine forest, 8.10.2005, Solak 1483; Eğirdir, Yenişarbademli saddle, in *Pinus nigra* forest, 9.10.2005, Solak 1516. E.
- Bolbitiaceae** Singer
32. *Bolbitius titubans* (Bull. : Fr.) Fr.  
Eğirdir, Yukarı Gökdere village, in meadows, 8.10.2005, Solak 1475; Isparta, Kadılar village, under *Quercus*, 29.10.2006, Solak 2423; Eğirdir, Çayköy village, in pine forest, 26.10.2008, Solak 3380. IE.
33. *Conocybe tenera* (Schaeff. : Fr.) Fayod  
Eğirdir, Çamköy village, in meadows, 4.11.2007, Solak 3261. IE.
34. *Panaeolus olivaceus* F.H. Møller  
Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2400. P.
35. *Panaeolus semiovatus* (Sowerby : Fr.) S. Lundell & Nannf.  
Eğirdir, Çamköy village, in pine forest, 4.11.2007, Solak 3273. IE.
- Cantharellaceae** J. Schröt.

36. *Cantharellus ferruginascens* P.D. Orton  
Isparta, Kadılar village, under *Quercus*, 29.10.2006, Solak 2424. E.
- Diplocystidiaceae** Kreisel
37. *Astraeus hygrometricus* (Pers. : Pers.) Morgan  
Eğirdir, Yazılı kanyon way, in pine forest, 22.4.2006, Solak 2126; Sütçüler, Yeşilyurt, Selimler village, in pine forest, 22.4.2006, Solak 2137. IE.
- Fomitopsidaceae** Jülich
38. *Laetiporus sulphureus* (Bull. : Fr.) Murrill  
Isparta-Gölcük way 2 km, under willow tree, 21.4.2006, Solak 2109. E.
39. *Phaeolus schweinitzii* (Fr. : Fr.) Pat.  
Eğirdir, Yenişarbademli saddle, on pine tree, 9.10.2005, Solak 1532. IE.
- Ganodermataceae** Donk
40. *Ganoderma applanatum* (Pers.) Pat.  
Eğirdir, Yukarı Gökdere village, on willow, 8.10.2005, Solak 1478; Eğirdir, Kırıntı village, on willow, 8.10.2005, Solak 1481; Eğirdir, Kovada national park, on *Quercus*, 8.10.2005, Solak 1494. IE.
41. *Ganoderma lucidum* (Curtis : Fr.) P. Karst.  
Eğirdir, Çandır, Yazılı kanyon national park, on plane tree, 8.10.2005, Solak 1498. IE.
- Gloeophyllaceae** Jülich
42. *Gloeophyllum sepiarium* (Wulfen : Fr.) P. Karst.  
Eğirdir, Yazılı kanyon way, on pine tree, 22.4.2006, Solak 2124. IE.
- Gomphidiaceae** Maire ex Jülich
43. *Chroogomphus rutilus* (Schaeff. : Fr.) O.K. Mill.  
Eğirdir, Yenişarbademli saddle, in *Pinus nigra* forest, 9.10.2005, Solak 1513; Eğirdir, Yenişarbademli saddle, Pınar gözü region, in pine forest, 9.10.2005, Solak 1530; Sütçüler, Yeşilyurt, Selimler village, in pine forest, 22.4.2006, Solak 2136; Sütçüler-Yeşilyurt way 5 km, in pine forest, 22.4.2006, Solak 2138; Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2360; Aksu, Yılanlı village, in pine forest, 26.10.2008, Solak 3900. E.
- Hydnangiaceae** Gäum. & C.W. Dodge
44. *Laccaria laccata* (Scop. : Fr.) Cooke  
Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2374. E.
- Hymenochaetaceae** Donk
45. *Inonotus hispidus* (Bull. : Fr.) P. Karst.  
Eğirdir, Yuvalı village, on walnut tree, 9.10.2005, Solak 1506. IE.
- Inocybaceae** Jülich
46. *Inocybe maculata* Boud.  
Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2365; Eğirdir, Yazılı kanyon, on sandy soil, near stream, 14.4.2007, 3158. P.
47. *Inocybe rimosa* (Bull. : Fr.) P. Kumm.  
Gelendost, North hillside, in *Quercus* forest, 17.11.2006, I. 8064; Isparta, Kadılar village, under *Quercus*, 29.10.2006, Solak 2440. P.
48. *Inocybe substellata* Kühner  
Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2383. P.
- Marasmiaceae** Roze ex Kühner
49. *Baeospora myosura* (Fr. : Fr.) Singer  
Eğirdir, Çamköy, on pine cones, 4.11.2007, Solak 3263. IE.
50. *Gymnopus dryophilus* (Bull. : Fr.) Murrill  
Eğirdir, Aşağı Gökdere village, under plane tree, 22.4.2006, Solak 2142; Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2312; Eğirdir, Ağilköy village, in *Quercus-Cedrus* mixed forest, 26.10.2008, Solak 3841. E.
51. *Gymnopus exsculptus* (Fr.) Murrill  
Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2326. E.
52. *Marasmius oreades* (Bolton : Fr.) Fr.  
Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2398. E.
53. *Marasmius wynneae* Berk. & Broome  
Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2328. IE.
54. *Omphalotus olearius* (DC. : Fr.) Singer  
Eğirdir, Ağilköy village, under *Quercus*, 26.10.2008, Solak 3844. P.
- Meripilaceae** Jülich
55. *Meripilus giganteus* (Pers. : Fr.) P. Karst.  
Eğirdir, Kovada national park, on *Quercus*, 8.10.2005, Solak 1493. IE.
56. *Rigidoporus ulmarius* (Sowerby : Fr.) Imazeki  
Eğirdir, Aşağı Gökdere village, on tree, 22.4.2006, Solak 2143. IE.
- Meruliaceae** Rea
57. *Bjerkandera adusta* (Willd. : Fr.) P. Karst.  
Eğirdir, Kırıntı village, on peach tree, 8.10.2005, Solak 1487; Isparta, Sav village, on willow, 29.10.2006, Solak 2417; Eğirdir, Cirbey district, on plane tree, 3.11.2007, Solak 3237. IE.
- Mycenaceae** Overeem
58. *Hemimycena pseudocrispula* (Kühner) Singer  
Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2337. IE.
59. *Mycena aetites* (Fr.) Quél.  
Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2366. IE.
60. *Mycena epipterygia* (Scop. : Fr.) Gray  
Eğirdir, Ağilköy village, in *Cedrus* forest, 26.10.2008, Solak 2339. U.
61. *Mycena pelianthina* (Fr. : Fr.) Quél.  
Eğirdir, Ağilköy village, in *Cedrus* forest, 26.10.2008, Solak 2311. P.
62. *Mycena seynesii* Quél.

Eğirdir, Aşağı Gökdere village, in pine forest, 29.10.2006, Solak 2540. IE.

#### Paxillaceae Lotsy

63. *Paxillus involutus* (Batsch : Fr.) Fr

Eğirdir, Yukarı Gökdere village, under willow, 8.10.2005, Solak 1476; Eğirdir, Yazılı kanyon, near stream, on sandy soil, 22.4.2006, Solak 2129; Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2402. P.

#### Physalacriaceae Corner

64. *Armillaria mellea* (Vahl : Fr.) P. Kumm.

Isparta, Kadılar village, on blackberry root, 29.10.2006, Solak 2534a; Gönen, opposite of Gönen vocational high school, 18.11.2006, I. 8073. E.

65. *Strobilurus tenacellus* (Pers. : Fr.) Singer

Gönen entrance, in rose orchard, 18.11.2006, I 8067; Isparta, Gölcük national park, in pine forest, 21.4.2006, Solak 2118; Eğirdir-Aksu way 10 km, in pine cones, 23.4.2006, Solak 2146; Eğirdir-Yenişarbademli way, in *Pinus nigra* forest, 23.04.2006, Solak 2153b; Eğirdir, Ağılköy village, in pine forest, 15.4.2007, Solak 3157. IE.

#### Pleurotaceae Kühner

66. *Pleurotus eryngii* (DC. : Fr.) Quéf.

Aksu, Yılanlı village, in meadows, 26.10.2008, Solak 3883. E.

67. *Pleurotus ostreatus* (Jacq. : Fr.) P. Kumm.

Isparta, Kadılar village, on poplar, 29.10.2006, Solak 2533. E.

#### Pluteaceae Kotl. & Pouzar

68. *Pluteus cinereofuscus* J.E. Lange

Eğirdir, Aşağı Gökdere-Sütçüler turnout, in pine forest, 29.10.2006, Solak 2565. IE.

69. *Volvariella pusilla* (Pers. :Fr.) Singer

Eğirdir, Yazılı kanyon, in pine forest, 22.4.2006, Solak 2135. IE.

#### Polyporaceae Fr. ex Corda

70. *Fomes fomentarius* (L. : Fr.) Fr.

Eğirdir, Kırıntı village, on poplar, 8.10.2005, Solak 1490; Eğirdir, Sipahiler, on *Quercus*, 9.10.2005, Solak 1507; Eğirdir, Yazılı kanyon, on plane root, 22.4.2006, Solak 2130; Isparta-Şarkikaraağaç and Konya exit, on poplar, 23.4.2006, Solak 2163; Sav, on willow, 29.10.2006, Solak 2148. IE.

71. *Lentinus tigrinus* (Bull. : Fr.) Fr.

Eğirdir, Yukarı Gökdere village, on willow, 8.10.2005, Solak 1477; Eğirdir, Kırıntı village, on willow, 8.10.2005, Solak 1479; Eğirdir, Kovada national park, on *Quercus*, 8.10.2005, Solak 1491; Eğirdir, Çandır, Yazılı kanyon national park, on plane tree, 8.10.2005, Solak 1500. E.

72. *Polyporus squamosus* (Huds. : Fr.) Fr.

Sav, near stream, on willow root, 14.4.2007, Solak 3139; Aksu, Zindan cave exit, on poplar, 4.11.2007, Solak 3288. E.

73. *Trametes pubescens* (Schumach. : Fr.) Pilát

Eğirdir, Aşağı Gökdere-Sütçüler turnout, on plane, 29.10.2006, Solak 2558. IE.

74. *Trametes trogii* Berk.

Eğirdir, Kırıntı village, on poplar, 8.10.2005, Solak 1482; Isparta-Gölcük way, on poplar, 15.4.2007, Solak 3151. IE.

75. *Trametes versicolor* (L. : Fr.) Lloyd

Eğirdir, Aşağı Gökdere Sütçüler turnout, on plane tree, 29.10.2006, Solak 2558; Eğirdir, Ağılköy village, on *Quercus*, 26.10.2008, Solak 3838; Aksu, Yılanlı village, on *Quercus*, 26.10.2008, Solak 3895. IE.

#### Psathyrellaceae Vilgalys, Moncalvo & Redhead

76. *Coprinellus disseminatus* (Pers. : Fr.) J.E. Lange

Eğirdir, Aşağı Gökdere village, on plane tree root, 22.4.2006, Solak 2144; Eğirdir-Yenişarbademli way, in *Pinus nigra* forest, 23.4.2006, Solak 2154; Eğirdir, Aşağı Gökdere village, in pine forest, 29.10.2006, Solak 2545. IE.

Eğirdir, Çamköy village, in pine forest, on rotting herbs, 4.11.2007, Solak 3270. IE.

77. *Coprinopsis marcescibilis* (Britzelm.) Örstadius & E. Larss.

Isparta-Gölcük way 2 km, in meadows, 21.4.2006, Solak 2111. IE.

78. *Parasola hemerobia* (Fr.) Redhead, Vilgalys & Hopple

Eğirdir, Çamköy village, in pine forest, 4.11.2007, Solak 3272. IE.

79. *Parasola plicatilis* (Curtis : Fr.) Redhead, Vilgalys & Hopple

Eğirdir, Akbelenli village, in pine forest, 29.10.2006, Solak 2569. IE.

80. *Psathyrella candolleana* (Fr. : Fr.) Maire

Şarkikaraağaç, Sarıkayalı village, in meadows, 23.4.2006, Solak 2158; Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2405. IE.

81. *Psathyrella pennata* (Fr.) Konrad & Maubl.

Eğirdir, Yukarı Gökdere village, in meadows, 8.10.2005, Solak 1474. IE.

82. *Psathyrella potteri* A.H. Sm.

Isparta-Gölcük way 2 km, under willow, on sandy soil, in meadows, 21.4.2006, Solak 2116. IE.

83. *Psathyrella tephrophylla* (Romagn.) M.M. Moser

Aksu, Yılanlı village, in pine forest, 4.11.2007, Solak 3286. IE.

#### Rhizopogonaceae Gäum. & C.W. Dodge

84. *Rhizopogon luteolus* Fr. & Nordholm : Fr.

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2356; Eğirdir, Aşağı Gökdere village, in pine forest, 29.10.2006, Solak 2551; Eğirdir, Çamköy village, in pine forest, 4.11.2007, Solak 3258; Eğirdir, Çayköy village, in meadows, 26.10.2008, Solak 3866. E.

85. *Rhizopogon roseolus* (Corda) Th. Fr.

Isparta-Antalya-Burdur city border, Yumrutaş turnout, in pine forest, 14.4.2007, Solak 3141. E.



**Russulaceae** Lotsy86. *Lactarius controversus* (Pers. : Fr.) Fr.

Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2403. IE.

87. *Lactarius deliciosus* (L. : Fr.) Gray

Aksu, Yılanlı village, in pine forest, 26.10.2008, Solak 3904. E.

88. *Lactarius deterrimus* Gröger

Eğirdir, Yenişarbademli saddle, in pine forest, 9.10.2005, Solak 1531. E.

89. *Lactarius sanguifluus* (Paulet) Fr.

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2345; Eğirdir, Çayköy village, under rosehip, 26.10.2008, Solak 3870; Eğirdir, Çayköy village, in pine forest, 26.10.2008, Solak 3905. E.

90. *Russula delica* Fr.Eğirdir, Yenişarbademli saddle, in *Pinus nigra* forest, 9.10.2005, Solak 1512; Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2349; Eğirdir, Çayköy village, in pine forest, 26.10.2008, Solak 3860. E.91. *Russula fellea* (Fr. : Fr.) Fr.

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2376. E.

92. *Russula foetens* (Pers. : Fr.) Fr.

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2389. IE.

93. *Russula pallidospora* J. Blum ex Romagn.Isparta, Kadılar village, under *Quercus*, 29.10.2006, Solak 2528. IE.94. *Russula puellaris* Fr.

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2392. E.

95. *Russula rhodopus* Zvára

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2344. IE.

96. *Russula roseipes* Secr. ex Bres.

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2375. IE.

97. *Russula torulosa* Bres.

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2352. IE.

98. *Russula viscida* Kudřna

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2353. E.

**Schizophyllaceae** Quéf.99. *Schizophyllum commune* Fr. : Fr.

Eğirdir, Kırıntı village, on poplar, 8.10.2005, Solak 1488; Eğirdir, Yazılı kanyon way, on pine, 22.4.2006, Solak 2128; Isparta-Antalya-Burdur city border, Yumrutaş turnout, on pine, 14.4.2007, Solak 3143; Eğirdir, Ağilköy village, on pine, 15.4.2007, Solak 3156; Sütçüler, Çandır village, on poplar, 3.11.2007, Solak 3242. IE.

**Streaceae** Pilát100. *Stereum hirsutum* (Willd. : Fr.) GrayEğirdir, Aşağı Gökdere village, on plane tree, 22.4.2006, Solak 2140; Eğirdir, Ağilköy village, on *Quercus*, 28.10.2006, Solak 2334; Eğirdir, Ağilköy village, on *Quercus*, 4.11.2007, Solak 3253; 3256; Eğirdir, Ağilköy village, on *Quercus*, 26.10.2008, Solak 3849; Aksu, Yılanlı village, on a cut tree, 26.10.2008, Solak 3881. IE.**Strophariaceae** Singer & A.H. Sm.101. *Agrocybe cylindracea* (DC. : Fr.) Maire

Çandır, Yazılı kanyon national park, on plane tree, 8.10.2005, Solak 1497; Center, Bahçelievler district, under a tree, 21.4.2006, Solak 2121; Isparta, Sav village, on willow, 29.10.2006, Solak 2416; Isparta, Sav village, on willow, 14.04.2007, Solak 3140. E.

102. *Hypholoma fasciculare* (Huds. : Fr.) P. Kumm.

Aksu, Yılanlı village, on rotten wood of pine, 28.10.2006, Solak 3907; Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2370. P.

103. *Hebeloma sarcophyllum* (Peck) Sacc.Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2343; Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2343; Gelendost, North hillside, in *Quercus* forest, 17.11.2006, I. 8057. IE.104. *Hebeloma sinapizans* (Paulet : Fr.) Gillet

Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2401. IE.

105. *Pholiota aurivella* (Batsch) P. Kumm

Aksu, Yılanlı village, on rotten wood, 28.10.2006, Solak 2413. E.

106. *Pholiota cerifera* P. Karst.

Eğirdir, Cırbey district, on plane tree, 3.11.2007, Solak 3241; Sütçüler, Çandır, on poplar, 3.11.2007, Solak 3243. IE.

107. *Pholiota gummosa* (Lasch : Fr.) Singer

Eğirdir, Aşağı Gökdere-Sütçüler turnout, on plane tree, 29.10.2006, Solak 2561; Eğirdir, Cırbey district, on plane tree, 3.11.2007, Solak 3240. IE.

108. *Pholiota lucifera* (Lasch) Quéf.

Eğirdir, Aşağı Gökdere, on plane tree wood, 29.10.2006, Solak 2542. IE.

109. *Pholiota tuberculosa* (Schaeff. : Fr.) P. Kumm.

Eğirdir, Aşağı Gökdere-Sütçüler turnout, on plane tree wood, 29.10.2006, Solak 2567. IE.

110. *Stropharia coronilla* (Bull. : Fr.) Fr.

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2393; Isparta-Antalya way, Burdur city border, in meadows, 29.10.2006, Solak 2535. IE.

**Suillaceae** Besl & Bresinsky111. *Suillus bellinii* (Inzenga) Watling

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2357. E.

112. *Suillus collinitus* (Fr.) Kuntze

Eğirdir, Aşağı Gökdere village, in pine forest, 29.10.2006, Solak 2538; Aksu, Zindan cave exit, in pine forest, 4.11.2007, Solak 3289a. E.

113. *Suillus luteus* (L. : Fr.) Roussel

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2380. E.

**Tricholomataceae** R. Heim ex Pouzar

114. *Clitocybe costata* Kühner & Romagn.

Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2310. IE.

115. *Clitocybe vermicularis* (Fr.) Quéf.

Eğirdir, Ağilköy village, in pine forest, 15.4.2007, Solak 3155. IE.

116. *Lepista nuda* (Bull. : Fr.) Cooke

Gelendost, North hillside, in *Quercus* forest, 17.11.2006, I. 8065; Gönen, opposite of Gönen vocational high school, 18.11.2006, I. 8070. E.

117. *Melanoleuca excissa* (Fr. : Fr.) Singer

Eğirdir, Aşağı Gökdere-Sütçüler villages turnout, in meadows, 29.10.2006, Solak 2566; Eğirdir, Aşağı Gökdere village, in pine forest, 22.4.2006, Solak 2152; Eğirdir, Ağilköy village, in *Cedrus* forest, 26.10.2008, Solak 3840; Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2415. E.

118. *Melanoleuca paedida* (Fr.) Kühner & Maire

Eğirdir, Çayköy village, in meadows, 28.10.2006, Solak 2396; Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2399; Eğirdir, Ağilköy village, in pine forest, 15.4.2007, Solak 3159. E.

119. *Melanoleuca stridula* (Fr.) Singer

Eğirdir, Aşağı Gökdere village, in pine forest, 22.4.2006, Solak 2149; Eğirdir, Ağilköy village, in *Cedrus* forest, 28.10.2006, Solak 2302. E.

120. *Pseudoclitocybe expallens* (Pers. : Fr.) M.M.Moser

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2364. U.

121. *Tricholoma caligatum* (Viv.) Ricken

Eğirdir, Yenişarbademli saddle, in pine forest, 9.10.2005, Solak 1517. E.

122. *Tricholoma equestre* (L. : Fr.) P. Kumm.

Eğirdir, Çayköy village, in pine forest, 28.10.2006, Solak 2373; Aksu, Yılanlı village, in pine forest, 26.10.2008, Solak 3902. E.

123. *Tricholoma fracticum* (Britzelm.) Kreisel

Eğirdir, Yenişarbademli saddle, in pine forest, 9.10.2005, Solak 1518; Aksu, Yılanlı village, in meadows, 28.10.2006, Solak 2406. IE.

124. *Tricholoma terreum* (Schaeff.) P. Kumm.

Eğirdir, Yenişarbademli saddle, in pine forest, 9.10.2005, Solak 1536; Eğirdir, Çayköy village, in pine forest, 26.10.2008, Solak 3864. E.

#### 4. Discussion

In the first study on the macrofungi of Isparta, 8 edible species were recorded. Another researcher later determined 13 edible macrofungal taxa in the studied area. According to those studies, *Helvella leucopus*, *H. lacunosa* Afzel., *Morchella conica* Krombh., *M. elata*, *M. esculenta*, *Terfezia arenaria* (Moris) Trappe, *Coprinus comatus*, *Pleurotus ostreatus*, *P. eryngii*, *Lentinus tigrinus*, *Amanita ovoidea*, *Agaricus bisporus* (J.E. Lange) Imbach, *A. campester*, *A. arvensis* Schaeff., *A. lanipes* (F.H. Møller & Jul. Schäff.) Hlaváček, *Russula delica*, and *Tricholoma populinum* J.E. Lange were consumed by local people. The first more detailed study on Isparta's Mycota was done by Afyon (1996). However, he identified only 45 taxa throughout Isparta in that study, 7 of them belonging to Ascomycota and the rest of them in Basidiomycota. Additionally, there was a fatal *Inocybe* poisoning reported in the study area. Following these studies, there have been no reports on the Mycota of Isparta Province.

As seen in the literature, there are little data on the macrofungi of Isparta, and the number of species reported in earlier studies is 52. The number of reported macrofungal taxa is too low; this study has added a further 103 species to the local Mycota. Thus, the number of total species recorded in Isparta so far is 155. Furthermore, *Cortinarius olidus*, *Cystoderma jasonis*, *Echinoderma echinaceum*, *Hebeloma gigaspermum*, *Psathyrella canocephs*, and *Trichophaea woolhopeia* are new records for Turkey.

*Cortinarius olidus* is very closely related to *C. cephalixus*, but *C. cephalixus* differs in having a fruity odor, somewhat shorter spores, and a different habitat. *Cystoderma jasonis* is described as a variety of *C. amianthinum* by some authors, but this species is distinguished from *C. amianthinum* by abundant arthrospores on the pileal surface and a small depression on the spores under the apiculus. *Echinoderma echinaceum* is closely related to *E. pseudoasperulum*, *E. jacobii*, and *E. carinii*, but none of them have cheilocystidia. Another similar species is *E. calcicola*, which differs from *E. echinaceum* with its 2–3 mm length conical warts. *Hebeloma sacchariolens* is similar to *H. gigaspermum*, but differs with a perfume-like sweetish odor, ochre to red-brown pileus, and larger spores. *Psathyrella canocephs* is easily recognized by veil remnants on the pileus and stipe. *P. sacchariolens* is similar to this species, but smells perfume-like and has pleurocystidia. *Trichophaea woolhopeia* is very similar to *T. gregaria*, but differs from it with wider spores ( $\geq 13 \mu\text{m}$ ).

Most of the determined species from Isparta Province belong to the families Agaricaceae (17.03%), Russulaceae (10.07%), Tricholomataceae (8.46%), and Strophariaceae (7.65%). Considered the edibility of macrofungi, 49 (37.9%) of the 129 taxa are edible, 66 (51.6%) are inedible, and 12 (9.3%) are poisonous, while edibility is unknown in 2 (1.5%) taxa. Although too few macrofungal taxa

were identified from Isparta Province in earlier studies, they show similarities with the species which we have identified. The reason for these similarities may be the common climate and vegetation. This study represents a contribution to the knowledge of Turkish Mycota.

## References

- Afyon A (1996). Isparta yöresinde belirlenen bazı makroskobik mantarlar. *Turk J Bot* 20: 161–164 (in Turkish).
- Akata I, Uzun Y, Kaya A (2014). *Macromycetes determined in Yomra (Trabzon) district*. *Turk J Bot* 38: 999–1012.
- Allı H (2011). *Macrofungi of Kemaliye district (Erzincan)*. *Turk J Bot* 35: 299–308.
- Beug MW, Bessette AE, Bessette AR (2014). *Ascomycete Fungi of North America*. Austin, TX, USA: University of Texas Press.
- Breitenbach J, Kränzlin F (1984–2000). *Fungi of Switzerland*, Vols. 1–5. Luzerne, Switzerland: Verlag Mykologia.
- Bresinsky A, Besl H (1990). *Colour Atlas of Poisonous Fungi*. Stuttgart, Germany: Wolfe Publishing Ltd.
- Candusso M, Lanzoni G (1990). *Fungi Europaei, Lepiota*. Saronno, Italy: Libreria Editrice Biella Giovanna.
- Cappelli A (1984). *Fungi Europaei, Agaricus*. Saronno, Italy: Libreria Editrice Biella Giovanna.
- Doğan HH, Öztürk C, Kaşık G, Aktaş S (2005). A checklist of Aphyllophorales of Turkey. *Pak J Bot* 37: 459–485.
- Ellis MB, Ellis JP (1990). *Fungi without Gills (Hymenomycetes and Gasteromycetes)*. London, UK: Chapman and Hall.
- Hansen L, Knudsen H (2000). *Nordic Macromycetes (Ascomycetes)*. Vol. 1. Copenhagen, Denmark: Nordsvamp.
- Kaya A, Demirel K, Uzun K (2012). Macrofungal diversity of Araban (Gaziantep/Turkey) district. *Biological Diversity and Conservation* 5: 162–166.
- Kibby G (2012). *The Genus Russula in Great Britain*. Geoffrey Kibby.
- Kirk P (2011 onward; continuously updated). *Index Fungorum*. URL: <http://www.indexfungorum.org> (accessed 8 October 2013).
- Knudsen H, Vesterholt J (2008). *Funga Nordica*. Copenhagen, Denmark: Nordsvamp.
- Kränzlin F (2005). *Fungi of Switzerland*. Vol. 6. Luzerne, Switzerland: Verlag Mykologia.
- Ladurner H, Simonini G (2003). *Xerocomus* s.l. *Fungi Europaei* Vol. 8. Alassio, Italy: Edizioni Candusso.
- Marchand A (1971–1986). *Champignons Du Nord Et Du Midi*. Vols. 1–9. Perpignan, France: Société mycologique des Pyrénées Méditerranéennes (in French).
- Medardi G (2012). *Ascomiceti d'Italia*. Vicenza, Italy: A.M.B. (in Italian).
- Moser M (1983). *Keys to Agarics and Boleti*. Stuttgart, Germany: Gustav Fischer.
- Muñoz JA (2005). *Boletus* s.l. *Fungi Europaei* 2. Alassio, Italy: Edizioni Candusso.
- Pacioni G (1985). *Mushrooms and Toadstools*. London, UK: MacDonald.
- Riva A (1988). *Fungi Europaei, Tricholoma* (Fr.) Staude. Alassio, Italy: Edizioni Candusso.
- Roux P (2006). *Mille et un Champignons*. Sainte Sigolène, France: Édition Roux (in French).
- Sesli E, Denchev CM (2013). Checklists of the Myxomycetes, Larger Ascomycetes, and Larger Basidiomycetes in Turkey [online]. URL: <http://www.mycotaxon.com> (accessed 8 October 2013).
- Solak MH, Allı H, Işıloğlu M, Güngör H, Kalmış E (2014). *Contributions to the macrofungal diversity of Antalya Province*. *Turk J Bot* 38: 386–397.
- Solak MH, Işıloğlu M, Kalmış E, Allı H (2007). *Macrofungi of Turkey Checklist*. İzmir, Turkey: Üniversiteliler Ofset.
- Watling R (1982). *British Fungus Flora: Bolbitaceae 3: Agrocybe, Bolbitius, Conocybe*. Edinburgh, UK: Royal Botanic Garden.
- Watling R, Gregory NM (1987). *British Fungus Flora: Agarics and Boleti 5: Strophariaceae and Coprinaceae*. Edinburgh, UK: Royal Botanic Garden.
- Watling R, Gregory NM (1989). *British Fungus Flora: Agarics and Boleti 6: Crepidotaceae, Pleurotaceae and other Pleurotoid Agarics*. Edinburgh, UK: Royal Botanic Garden.

## Acknowledgment

We would like to thank TÜBİTAK (the Scientific and Technological Research Council of Turkey) for supporting this project (TBAG-104T236) financially.