

Additional macrofungi records from Trabzon province for the mycobiota of Turkey

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Abstract: Four macrofungi taxa (*Conocybe filaris* (Fr.) Kühner, *Hygrocybe glutinipes* (J.E.Lange) R.Haller Aar. var. *glutinipes*, *Inocybe calospora* Quél., and *I. margaritispota* (Berk.) Sacc.) collected from Trabzon province are reported from Turkey for the first time. Comments on their habitats and substrata and a short diagnosis are provided for each new taxon new to Turkey.

Key words: Basidiomycota, new records, biodiversity

Trabzon yöresinden Türkiye mikobiyotası için ilave yeni kayıtlar

Özet: Trabzon yöresinden toplanan 4 makrofungus taksonu (*Conocybe filaris* (Fr.) Kühner, *Hygrocybe glutinipes* (J.E.Lange) R.Haller Aar. var. *glutinipes*, *Inocybe calospora* Quél. ve *I. margaritispota* (Berk.) Sacc.) Türkiye'den ilk kez rapor edilmektedir. Türkiye için yeni taksonların her biri için habitat ve substratları ile ilgili yorumlar ve kısa bir betimleme verilmiştir.

Anahtar sözcükler: Basidiomycota, yeni kayıtlar, biyoçeşitlilik

Introduction

The Kingdom Fungi is a large group of organisms that includes more than 70,000 species but the global biodiversity of the fungi has been estimated at about 1.5 million species (Hawksworth, 1991; Hawksworth et al., 1995).

Attention to determine the macrofungal diversity of Turkey has particularly increased in the last decade

as many investigations have been conducted on this subject and some of them are still in progress (Solak et al., 2007; Sesli & Denchev, 2008; Baş Sermenli & Işiloğlu, 2009; Kaya, 2009). According to Sesli and Denchev (2008), totally 1929 macrofungi taxa have been reported from Turkey.

Trabzon is located in the east Black Sea region of Turkey and has borders with the provinces of

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Rize, Giresun, Bayburt, and Gümüşhane (Figure 1). Beşikdüzü and Arsin districts in Trabzon province, where the samples of macrofungi were collected, are situated on the coast of east Black Sea region. Trabzon has a typical oceanic climate with a heavy uniform rainfall and relatively warm temperatures all year round. Precipitation is heaviest in autumn and spring. It is a mild climate where the difference between day and night temperatures is not very high. During the winter, the lowest average minimum temperature is around 5 °C, in January. Summers are warm and humid with the average maximum temperature around 28 °C in July and August.

The vegetation of the region is dominated by mixed stands of *Fagus orientalis* Lipsky, *Picea orientalis* (L.) Link, *Abies nordmanniana* (Stev.) Spach, *Pinus sylvestris* L. *Corylus avellana* L. and pseudomacchie.

The region is one of the richest areas in terms of macrofungal diversity because the vegetation and climate are very suitable for macrofungal growth. The aim of this article is to make contribution to the Turkish mycobiota.

Materials and methods

Basidiocarps of the specimens were collected from Beşikdüzü and Arsin districts (Trabzon) during routine field trips. Relevant morphological and ecological characteristics of the samples were recorded and they were photographed in their natural habitats. Then the samples were taken to the laboratory for further investigations. Necessary macroscopic and microscopic measurement data were obtained using a ruler, light microscope, and micrometers. Microphotographs were taken using a Leica DM 1000. Some reagents (distillate water, Melzer's reagent, 5% KOH, Congo red etc.) were used for identification. Identification was performed with the aid of literature (Bas et al., 1990; Hansen & Knudsen, 1992; Boertmann, 1995; Breitenbach & Kränzlin, 1995, 2000; Jordan, 2004; Noordelos et al., 2005). All specimens were deposited at the herbarium of Ankara University (ANK).

Results and discussion

In this study, *Conocybe filaris* (Fr.) Kühner, *Hygrocybe glutinipes* (J.E.Lange) R.Haller Aar.

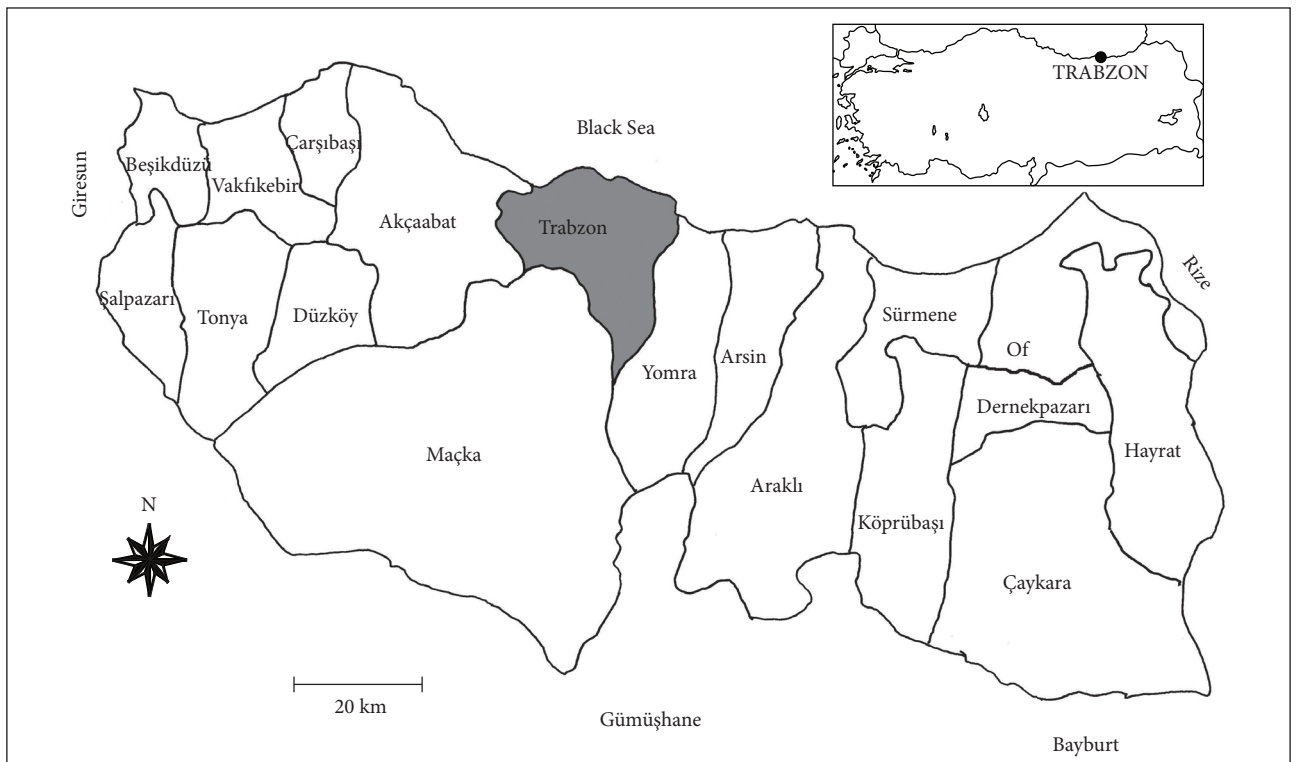


Figure 1. Map of Trabzon province.

var. *glutinipes*, *Inocybe calospora* Quél., and *I. margaritispora* (Berk.) Sacc. are reported from Turkey for the first time. Short descriptions, remarks on the species, photographs of the fruit bodies, and microphotographs are provided. The systematics of the taxa is in accordance with Cannon and Kirk (2007) and Kirk et al. (2008) and they are listed in alphabetical order.

Fungi

Basidiomycota Whittaker ex Moore

Agaricales Underw.

Bolbitiaceae Singer

Conocybe filaris (Fr.) Kühner 1935 (Figure 2).

Syn: *Agaricus togularis* var. *filaris* Fr. 1884, *Pholiota filaris* (Fr.) Peck 1908, *Pholiota togularis* var. *filaris* (Fr.) J.E.Lange 1921, *Pholiotina filaris* (Fr.) Singer 1936.

Pileus 10-22 mm, conical to conic-campanulate when young, then conic-convex to plano-convex, usually with obtuse umbo, uplifted when old, hygrophanous, surface smooth, silky, when moist orange-brown, yellow brown to reddish brown, translucently striate up to 3/4 the distance to the centre, when dry ochre yellow, beige to cream colour with often darker centre, margin acute. Lamellae adnate or adnexed, at first light ochre, later ochre to orange-brown with whitish flocculose edge. Stipe 20-38 × 1.5-2.5 mm, cylindrical, fragile, rigid, apex cream to pale yellow, downwards pale orange to light brown, annulus movable, membranous, thin and easily detached from stipe. Flesh thin, brown. Smell not distinctive, taste mild. Spore print rusty-brown. Basidia 20-25 × 7-9 µm, clavate, 4-spored. Basidiospores 7.5-9.5 × 4.5-5.5 µm, elliptic to slightly amygdaliform, smooth, thick walled, honey brown with an apical germ pore. Cheilocystidia 35-45 × 9-12 µm, fusiform to lageniform.

Ecology: Widespread, spring to autumn, solitary to gregarious, on damp, nutrient-rich, subneutral, basic, clayey, or sandy soils, on pathsides, in gardens, parks, and deciduous forests (Breitenbach & Kränzlin, 1995; Noordelos et al., 2005).

Specimen examined: Trabzon: Beşikdüzü, Aksaklı village, outside nut garden, on soil,

41°03'17"N, 39°11'42"E, 190 m, 06.07.2010, *Akata-Halıcı* 024.

Remarks: *Conocybe filaris* is macroscopically very close to several *Conocybe* species due to their membranous annulus on the stem but it is separated from others by its cheilocystidia features. Although *C. filaris* and *C. blatteria* (Fr.) Kühner are very similar in their microscopic elements, they have different sizes of spores (Breitenbach & Kränzlin, 1995).

Hygrophoraceae Lotsy

Hygrocybe glutinipes (J.E.Lange) R.Haller Aar. var. *glutinipes* 1956 (Figure 2)

Syn: *Gliophorus glutinipes* (J.E.Lange) Kovalenko 1988, *Hygrocybe aurantioviscida* Arnolds 1982, *H. citrina* var. *glutinipes* J.E.Lange 1940, *H. glutinipes* (J.E.Lange) R.Haller Aar. 1956, *H. glutinipes* (J.E.Lange) P.D.Orton 1960.

Pileus 8-17 mm, conical at first, later expanded conical to appanate, slightly depressed centre and upturned margin, viscid, when moist lemon yellow or chrome yellow, sometimes yellow orange in places, when dry discolouring greyish white, often with translucent striate up to centre. Lamellae broadly adnate to decurrent with tooth, whitish, yellowish white, pale yellow or pale orange yellow, often with paler margin. Stipe 20-35 × 1.5-2.5 mm, cylindrical, pale orange yellow, lemon yellow, or chrome yellow, strongly viscid when moist. Smell and taste insignificant. Spore print white. Basidia 30-40 × 6-8 µm, narrowly clavate, often 4-spored, few 2-spored. Basidiospores 6-8 × 4-5 µm, hyaline, smooth, oblong, cylindrical or ellipsoid. Cystidia absent.

Ecology: Widespread, summer to autumn, solitary to subgregarious on poor, acid to neutral, sandy or loamy soils in grasslands, mossy places, old unfertilised lawns (Bas et al., 1990; Boertmann, 1995).

Specimen examined: Trabzon: Arsin, İşhan village, roadside, on naked soil, near road, 40°33'31"N, 39°51'01"E, 1440 m, 27.09.2009, *Akata-Uzun* 472.

Remarks: *H. glutinipes* var. *glutinipes* resembles other yellow-orange taxa (*H. inspida*, *H. laeta* var. *laeta*, and *H. vitellina*). Although they have yellow to orange basidiocarps with viscid or moist stipe, they can easily be distinguished from *H. glutinipes*

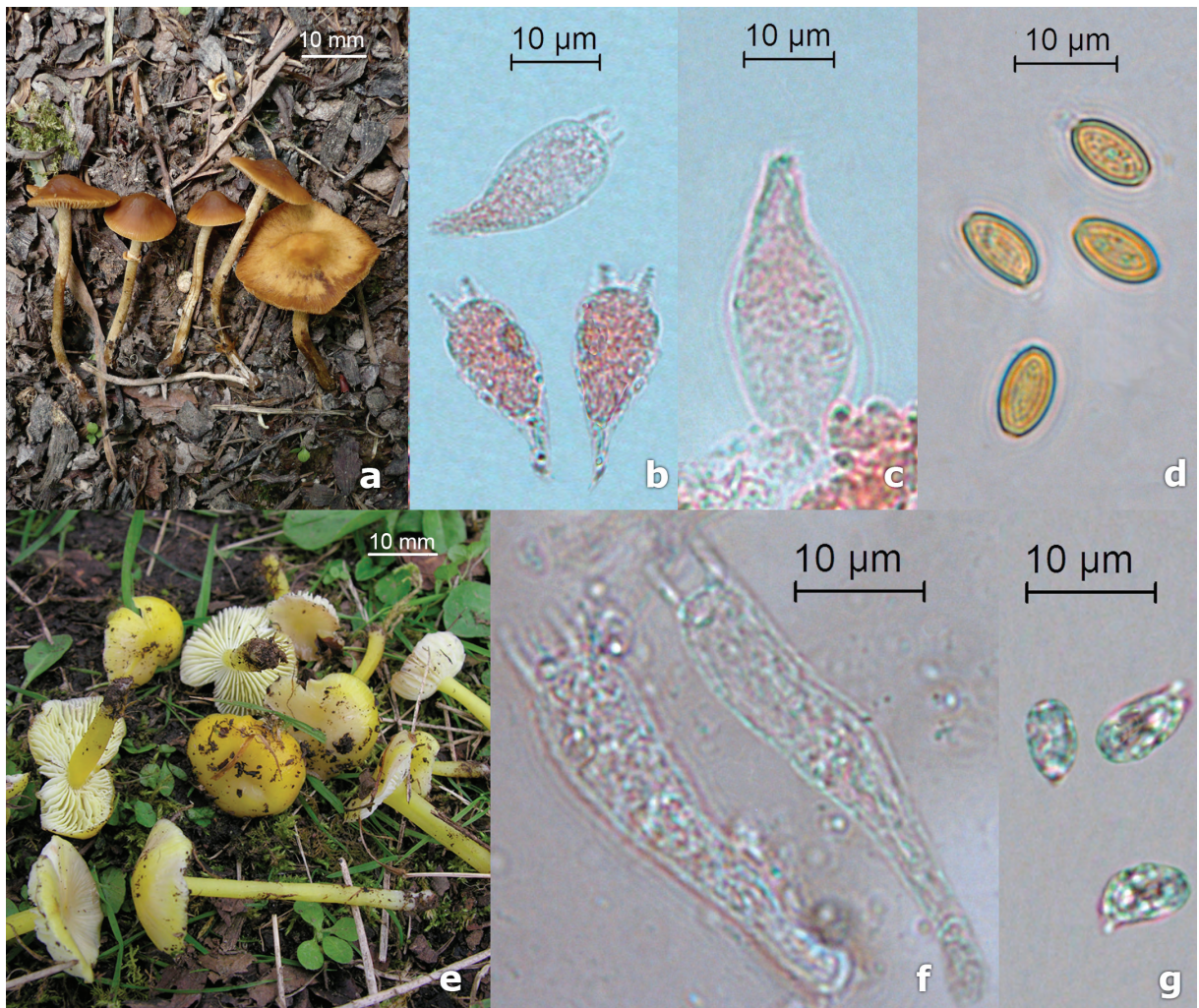


Figure 2. *Conocybe filaris*; a- basidiocarps, b- basidia, c- cheilocystidia, d- basidiospores. *Hygrocybe glutinipes* var. *glutinipes*, e- basidiocarps, f- basidia, g- basidiospores.

var. *glutinipes* by subregular hymenophoral trama and more strongly decurrent lamellae (Boertmann, 1995).

Inocybaceae Jülich

Inocybe calospora Quéél. 1881 (Figure 3).

Syn: *Astrosporina calospora* (Quéél.) E.Horak 1981, *Astrosporina gaillardii* (Gillet) Rea 1922, *Inocybe calospora* var. *gaillardii* (Gillet) R.Heim 1931, *Inocybe gaillardii* Gillet 1883, *Inocybella calospora* (Quéél.) Zerova, 1979.

Pileus 15-20 mm, conical at first, becoming campanulate to convex with a distinct umbo, grey-brown, reddish brown to dark brown, surface radially fibrillose, darker scales from the centre to

outward, margin incurved for a long time. Lamellae narrowly attached to stem, whitish, cream coloured or pale greyish when young, later light brown to brownish. Stipe 25-35 × 1-3 mm, cylindrical, often with a small basal bulb, surface pale cinnamon, gray to reddish-brown, whitish fibrillose. Flesh thin, whitish to yellowish. Smell spermatic, taste mild. Spore print red brown. Basidia 30-40 × 10-12 µm, cylindrical to ventricose, 2-4 spored with a basal clamp. Basidiospores 8.5-13 × 7.5-11 µm (including ornamentation), broadly ellipsoid to subglobose, with 2-3 µm long spines, yellow brown. Cheilocystidia 40-55 × 11-15 µm, thick walled, fusiform to langeniform, some with apical encrustations. Pleurocystidia similar to cheilocystidia.

Ecology: Not common, spring to summer, often gregarious, on soil in moist places, roadsides deciduous and mixed forest (Hansen & Knudsen, 1992; Breitenbach & Kränzlin, 2000).

Specimen examined: Trabzon: Beşikdüzü, Aksaklı village, in nut garden, on soil, 41°03'22"N, 39°11'53"E, 170 m, 08.07.2010, Akata-Halıcı 067.

Remarks: *Inocybe* members can easily be recognised in the field due to macroscopic characters but it is not possible to identify the full range of known *Inocybe* species without microscopic features. *I. calospora* is characterised by elliptical to subglobose long-spinose spores. This species microscopically resembles *I. asterospora*, but *I. asterospora* has

strongly tuberculate spores (Breitenbach & Kränzlin, 1995; Jordan 2004).

Inocybe margaritispota (Berk.) Sacc. 1887 (Figure 3).

Syn: *Agaricus margaritispota* Berk. 1883, *Astrosporina margaritispota* (Berk.) Rea 1922, *Inocybe phaeosticta* Furrer-Ziogas 1952.

Pileus 30-50 mm, conical to hemispherical at first, later plane and umbonate, ochre, yellow-ochre or ochre-brown, darker in the centre, surface radially fibrillose with small squamules, margin incurved when young, sometimes splitting when old. Lamellae narrowly attached to stipe, greyish at first, becoming greyish-brown, margin slightly crenate.

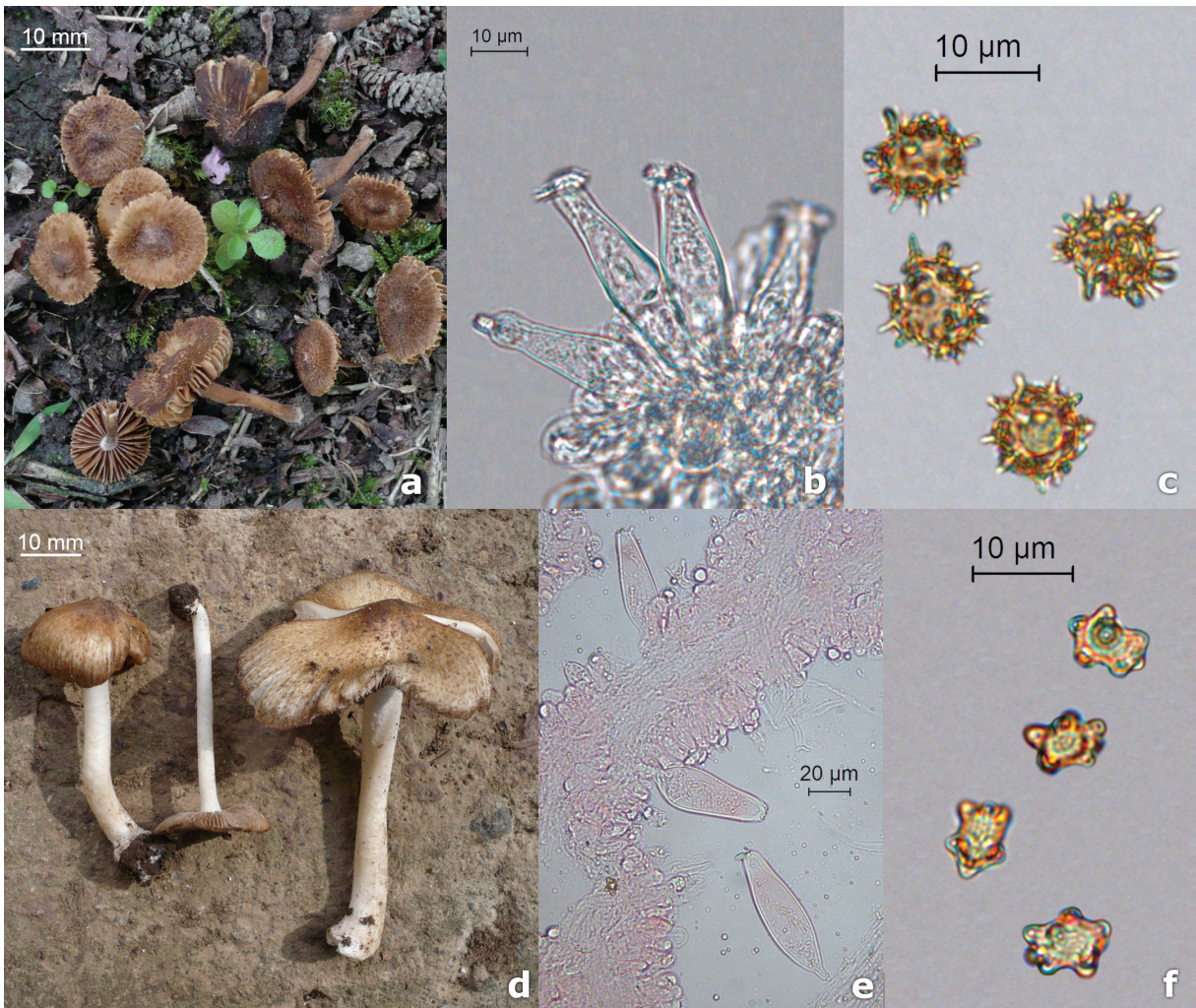


Figure 3. *Inocybe calospora*: a- basidiocarps, b- cheilocystidia, c- basidiospores; *Inocybe margaritispota*: d- basidiocarps, e- cheilocystidia, f- basidiospores.

Stipe 50-70 × 5-8 mm, cylindrical with slightly marginate bulb, surface whitish to cream coloured with whitish pruinose. Flesh thin, whitish. Smell spermatic, taste mild. Spore print red brown. Basidia 30-35 × 10-11 µm, clavate 4-spored with basal clamp. Basidiospores 8.5-11.5 × 7-8.5 µm, subglobose to elongate, yellow brown. Cheilocystidia 50-80 × 15-25 µm, thick walled, fusiform to langeniform, usually with apical encrustations. Pleurocystidia similar to cheilocystidia.

Ecology: Rare, summer to autumn, gregarious, on calcareous soil in deciduous and mixed forest, also near *Picea* (Breitenbach & Kränzlin 2000).

Specimen examined: Trabzon: Beşikdüzü, Akkese village, under alder, on soil, 41°02'37''N, 39°10'59''E, 220 m, 07.07.2010, *Akata-Halıcı* 051.

Remarks: *I. margaritispora* can be confused with *I. mixtilis* but the latter has smaller lamellar cystidia and spores (Breitenbach & Kränzlin, 1995).

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