

## New fungal records for the Turkish Mycota from Trabzon

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**Abstract:** Fungal specimens were collected in Trabzon Province in 2010 and 2012. Taxonomical studies were performed in our laboratory and in the Royal Botanic Garden Edinburgh. According to the results, *Entoloma noordeloosi* Hauskn., *Inocybe lutescens* Velen., and *Tricholoma saponaceum* var. *squamosum* (Cooke) Rea are recorded for the first time for the Turkish Mycota. The new records are illustrated, briefly described, and discussed.

**Key words:** New records, Trabzon, Turkish Mycota

### 1. Introduction

*Entoloma* (Fr.) P.Kumm. is a large genus with about 1000 species. Their basidiomata are crepidotoid, omphalinoid, collybioid, mycenoid, or tricholomatoid. Most of them are saprobic and some are mycorrhizal. They have pink lamellae, angular spores, and pink spore prints (Knudsen & Vesterholt, 2008). According to Sesli and Denchev (2008), the most common *Entoloma* in Turkey is *E. sinuatum* (Bull.) P.Kumm. and 38 species have been recorded to date. *Inocybe* (Fr.) Fr. is also a large, complex genus of ectomycorrhizal fungi seen on soil from early spring to autumn. The fruiting bodies of this group are mycenoid, collybioid, or tricholomatoid (Knudsen & Vesterholt, 2008). According to Sesli and Denchev (2008), it is common in Turkey and about 70 species were recorded before this study. This genus was originally placed in the family *Cortinariaceae*; however, phylogenetic analyses suggest a new family, *Inocybaceae* (Matheny, 2005). *Inocybe* species are not considered suitable for consumption, because many of them contain muscarine, while the majority of them are toxic. All the fungi in *Tricholoma* (Fr.) Staude are tricholomatoid and it is a common genus in our area (Sesli & Denchev, 2008). At the end of this study, the total number of species of larger ascomycetes and larger basidiomycetes recognised as occurring in Turkey to date is 2049, including 165 species of ascomycetes and 1884 species of basidiomycetes (Sesli & Denchev, 2008). The aim of the present study was to make a contribution to the Turkish Mycota.

### 2. Materials and methods

Fungal specimens for the study were collected during excursions in Trabzon Province in 2010 and 2012. Photos were taken and ecological characteristics were noted in the field. Diverse fruiting bodies were collected belonging to different developmental stages of the fungi. Some basidiomata were used to make spore prints and the remaining parts were dried for microscopic examinations. Microscopic studies and preparation of the fungi for light microscopy were performed according to Cléménçon (2009), Kasom and Karadelev (2012), and Ordynets (2012). At least 10 spores were measured to calculate dimensions. After that, dried specimens were taken to the Royal Botanic Garden Edinburgh and were compared with the British collections. Descriptions of the taxa were made in the light of the microscopic and morphological findings. Identifications were conducted according to Bas et al. (1999), Breitenbach and Kränzlin (1991–1995), Dähncke (1993), Knudsen and Vesterholt (2008), Noordeloos (2004), Riva (1988), and Sterry and Hughes (2009). Author names are given according to Kirk et al. (2008) and fungal names according to Index Fungorum and Mycobank.

### 3. Results

After the laboratory studies, *Entoloma noordeloosi* Hauskn., *Inocybe lutescens* Velen., and *Tricholoma saponaceum* var. *squamosum* (Cooke) Rea were identified and recorded for the first time for the Turkish Mycota (Sesli, 2007; Sesli & Denchev, 2008). The new records are given below with

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descriptions, photos, and microscope drawings within the orders and families.

Agaricales

Entolomataceae

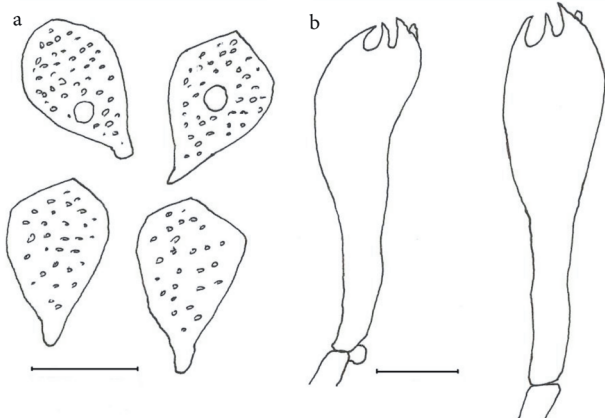
*Entoloma noordeloosi* Hauskn.

Pileus up to 10 cm across (Figure 1), pinkish brown to greyish-orange, darker at the centre and paler towards the margin, convex, brittle, irregularly appanate when old, usually with a broad umbo, hygrophanous, striate at the margin and glabrous. Lamellae adnate and emarginate, up to 1.5 cm broad, generally crowded, white to pink with irregular edge. Stipe cylindrical to irregularly compressed, broadened towards the base, up to 15 × 2 cm, striate, white, usually yellowish at the base, flexuous and curved. Spores heterodiametrical, 8–11 × 6.5–8 μm (Figure 2). Basidia 25–40 × 9–11 μm with 4 sterigmata (Figure 2), clamp-connections present (Hausknecht, 1999; Noordeloos, 2004).

**Specimens examined:** Turkey, Trabzon: Akçaabat, Hıdırnebi, 01.10.2010, under *Fagus orientalis*, Sesli 2964.



**Figure 1.** The basidiomata of *Entoloma noordeloosi*. Scale bar: 3 cm.



**Figure 2.** *Entoloma noordeloosi*. a- spores, b- basidia. Scale bars: 10 μm.

Inocybaceae

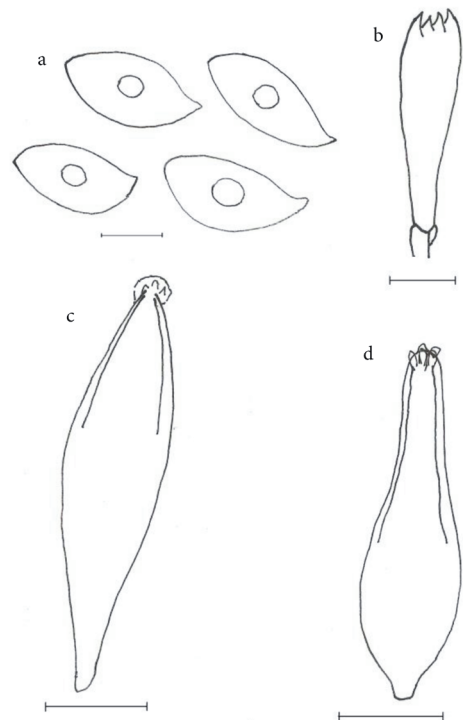
*Inocybe lutescens* Velen.

Syn.: *Inocybe hypotheja* Kühner

Pileus ochre to yellowish brown, 0.5–2.5 cm across, fibrillose, conical to campanulate or convex, rimose, weakly umbonate. Lamellae yellowish at first, later greyish (Figure 3). Stipe yellowish white, hollow near pileus, 0.5 × 4 cm. Spores almond shaped 9.5–11.5 × 5–7 μm (Figure 4). Basidia 20–30 × 7–10 μm with 2–4 sterigmata (Figure 4).



**Figure 3.** The basidiomata of *Inocybe lutescens*. Scale bar: 1 cm.



**Figure 4.** *Inocybe lutescens*. a- spores, b- basidia, c- hymenial cystidium type 1, d- hymenial cystidium type 2. Scale bars: a = 5 μm, b = 10 μm, c = 15 μm, d = 20 μm.

Hymenial cystidia abundant and various (Figure 4), thick walled and  $55\text{--}70 \times 14\text{--}24 \mu\text{m}$  (Knudsen & Vesterholt, 2008).

**Specimens examined:** Turkey, Trabzon: Akçaabat, Hıdırnebi, 01.06.2012, in forest under ferns among moss, Sesli 3060.

**Tricholomataceae**

*Tricholoma saponaceum* var. *squamosum* (Cooke)

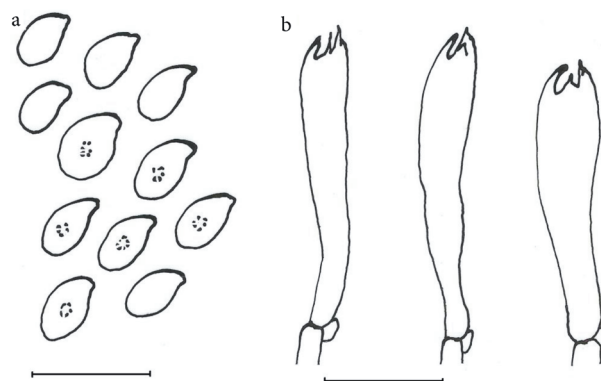
**Rea**

Pileus up to 8 cm (Figure 5), margin incurved and splitting, conical, then bell shaped or flatter, broadly umbonate, surface typically scaly, dry, lubricous when moist, colour dark brown to dark olive-grey fibrillose covering, darker towards to centre, flesh white, taste mild to slightly bitter. It has a distinct or odd smell, lamellae white to green-yellowish, notched, edges smooth to undulating. Stipe up to  $8 \times 2$  cm, typically fibrillose or squamose, cylindrical to clavate, stem tapered towards base. Spores elliptical with drops, hyaline,  $4.5\text{--}6 \times 3\text{--}4 \mu\text{m}$  (Figure 6). Basidia clavate (Figure 6),  $20\text{--}25 \times 4\text{--}6.5 \mu\text{m}$  (Riva, 1988; Knudsen & Vesterholt, 2008).

**Specimens examined:** Turkey, Trabzon: Akçaabat, Hıdırnebi, 17.09.2010, under *Picea orientalis*, Sesli 2913.



**Figure 5.** The basidiomata of *Tricholoma saponaceum* var. *squamosum*. Scale bar: 4 cm.



**Figure 6.** *Tricholoma saponaceum* var. *squamosum*. a- spores, b- basidia. Scale bars: 10  $\mu\text{m}$ .

**4. Discussion**

Noordeloos (2004) reported that the pileus of *Entoloma noordeloosii* may be up to 12.5 cm long. Our collections were smaller (10 cm) but may not have been fully grown. In addition, Hausknecht (1999) collected this fungus in mixed deciduous forest (*Corylus*, *Quercus*, *Carpinus*); however, we collected this fungus from *Picea-Fagus* mixed forest. The same author reported that the spores of this fungus are  $8.5\text{--}10 \times 6.0\text{--}7.5 \mu\text{m}$  and basidia  $20\text{--}35 \times 8.0\text{--}11.5 \mu\text{m}$ . We found the spores to be  $8\text{--}11 \times 6.5\text{--}8 \mu\text{m}$  and the basidia  $25\text{--}40 \times 9\text{--}11 \mu\text{m}$ . All the other data concerning this fungus are in agreement with the literature. According to Knudsen and Vesterholt (2008), *Inocybe lutescens* grows with dwarf *Salix* in late summer, whereas we collected it in mixed forest (*Picea orientalis* (L.) Link and *Fagus orientalis* Lipsky) under ferns among moss on 01 June 2012. All the other taxonomic characteristics concerning this fungus are in agreement with the present literature. Knudsen and Vesterholt (2008) reported that *Tricholoma saponaceum* var. *squamosum* has a dark brown to dark olive to grey fibrillose pileus. Our observations are in agreement with this and that the pileus is darker towards the centre.

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