1. Introduction

Paralepistopsis Vizzini (2012) is a new genus introduced as a consequence of molecular studies: it belongs to the family Tricholomataceae. Lotsy and encompasses a couple of taxa previously inserted in the genus Clitocybe (Fr.). Members of the aforementioned genus have generally a clitocyboid habit and are characterized by umbrella-shaped pilei with pruinose surface, decurrent lamellae, cylindrical stipe with no trace of veil, whitish to cream spore print, inamylid, smooth spores and cylindrical, clamped hyphae (Vizzini and Ercole 2012). In the past Paralepistopsis acromelalga (Ichimura) Vizzini (formerly known as Clitocybe acromelalga) in Japan and P. amoenolens (Malaençon) Vizzini (formerly known as Clitocybe amoenolens) in France and Italy, caused significant mushroom poisoning syndromes known as erythromelalgia, erythermalgia or acromelalgia. These syndromes, unlike better known kinds of mushroom poisoning, do not show symptoms such as stomach upsets, vomiting and diarrhoea, so that their identification can be very problematic. The commonest and best known symptoms of this syndrome are edema especially of the feet with a pain like electric shocks, and a skin rash (Nakamura et al. 1987; Bresinsky and Besl 1990; Saviuc et al. 2001; Saviuc and Danel 2006; Nakajima et al. 2013). In recent years some surveys have added many new records and taxa new to science have been described for the Turkish territory (İntini et al. 2003; İşıloğlu et al. 2009; İşıloğlu et al. 2010; Watling et al. 2010; Çolak et al. 2015; Sesli et al. 2015; Vizzini et al. 2015; Akata et al. 2016; Doğan and Kurt 2016; Kaygusuz et al. 2016; Topcu-Sesli and Sesli 2016; Sesli et al. 2016; Şen et al. 2016; Çolak et. al. 2017; İşik and Türkekul 2017; Kaygusuz and Çolak 2017a; Kaygusuz and Çolak 2017b; Türkekul 2017; Uzun et al. 2017). Likewise, the aim of this study is to contribute to increase the knowledge of fungal diversity in Turkey and make it easier for toxicologists to obtain important information from the literature.

2. Materials and Methods

In the autumn of 2017, some fungal samples were collected from Gölcük Lake Nature Park in Isparta Province. The specimens were photographed in the field, and the morphological and ecological characteristics were noted in the field notebook. Afterwards, each specimen was packaged by wrapping in aluminium foil and brought to the laboratory, where the specimens were dried after spore prints were taken. Microscopical structures were observed with a light microscope using KOH and Congo Red. The following abbreviations are used in the descriptions: L for the average length of all the measured basidiospores, W for the average width of all the measured basidiospores, Q for the quotient of length and width of all the measured basidiospores, and Q for the average of all calculated Q values for all basidiospores measured. Identification of the samples was conducted according to Contu et al. (1999), Moreau et al. (2001), Martinez et al. (2010) and Vizzini and Ercole (2012). The
dried samples are conserved in the personal fungarium of the first author at Süleyman Demirel University. The names of taxa and authors are quoted according to MycoBank (www.mycobank.org) and Index Fungorum (www.indexfungorum.org).

3. Results

**Tricholomataceae** Lotsy

**Paralepistopsis** Vizzini / Felceden

**Paralepistopsis amoenolens** (Malençon) Vizzini, Mycotaxon 120: 257 (2012) / **Kokulu felceden**

Figs: 1–4


**Turkish etymology:** As stated above, fungi of the genus *Paralepistopsis* cause the syndrome erythromelalgia, and because this syndrome causes physiological disorders to the feet which are similar to stroke, they have been called *felceden* in Turkish (Turkish *felç*: paralysis or stroke; *felceden*: paralyser). The Latin name *amoenolens* means aromatic, and so the species *Paralepistopsis amoenolens* has been given the Turkish name of *Kokulu felceden* (Turkish *kokulu*: aromatic) (Menemen et al. 2016). Also, this species has been called the “paralysis funnel” in English (Evans and Kibby 2004).

**Pileus** 2.8 – 6 cm in diameter, at first hemispherical, then applanate, fleshy and elastic, margin partially wavy, inflexed. Surface viscid when wet, generally whitish-cream, pinkish to faded orange especially in the center, partially wrinkled-areolate. **Lamellae** decurrent, sometimes furcate, paler than the pileus, whitish to yellowish ochre or pinkish. **Stipe** 2.5 – 6 × 0.6 – 1.6 cm, central to slightly eccentric, more or less cylindrical, curved, hollow, slightly paler than the pileus. **Taste** mild to slightly bitter after prolonged chewing. **Odour** distinctly aromatic. **Spore print** whitish to pale cream.

**Basidiospores** (4.8-) 5.1 – 6.4 (-6.8) × (3.0-) 3.2 – 4.0 (-4.5) μm, \( L^m \times W^m = 5.6 \times 3.6 \) μm, \( Q = (1.3-) 1.4 – 1.8 \) (-1.9), \( Q^m = 1.6 \) μm, widely ellipsoid, hyaline, thin-walled, smooth and inamyloid, and containing a single droplet.

**Basidia** (30.0-) 39.3 – 44.00 × 4.3 – 5.6 μm, cylindrical to clavate, 4-spored, rarely 2-spored. **Basidioles** scattered, similar to basidia, (25.5-) 38.5 – 42 × 4.2 – 5.1 μm, cylindrical to sub fusiform, mostly arcuated and twisted, occasionally forked at apex, hyaline and thin-walled. **Cheilocystidia** absent. **Pleurocystidia** absent. **Pileipellis** composed of cylindrical, hyaline, thin-walled hyphae 3 – 7 μm broad, embedded in a 140 – 300 μm thick gelatinous matrix. **Stipitipellis** a cutis made up of cylindrical to sub fusiform, flexuous, hyaline, thin-walled, 3 – 6 μm wide hyphae. **Clamp connections** present in all tissues.

**Fig. 1. Paralepistopsis amoenolens** (OFÇ 1371): basidiomata
**Paralepistopsis amoenolens** (OFÇ 1372): basidiomata

**Fig. 2.**

**Paralepistopsis amoenolens** (OFÇ 1373): basidiomata

**Fig. 3.**

**Habitat:** Forests of *Cedrus libani* A. Rich.

**Specimen examined:** TURKEY. Isparta Province, Gölcük Lake Nature Park, approximately 1400 m above sea level, 15 November 2017 (OFÇ 1371, 1372, 1373).

### 4. Discussion

*Paralepistopsis amoenolens* was first reported from Morocco and later from France, Spain and Italy, while *P. acromelalga* has been reported only from Japan and South Korea. To our knowledge Turkey is the fifth country where *P. amoenolens* has been found (Ichimura 1918; Moreau et al. 2001; Saviuc et al. 2001; Leonardi et al. 2002; Martínez et al. 2010; Vizzini and Ercole 2012).

*P. amoenolens* can be distinguished from *P. acromelalga* on account of its paler pileus and stipe, more distant lamellae, larger spores and a peculiar odour (Ichimura 1918; Moreau et al. 2001; Leonardi et al. 2002; Vizzini and Ercole 2012). Misidentifications are possible with morphologically similar entities like *Clitocybe gibba* (Pers.) P. Kumm., *Lepista lentiginosa* Maire, *Lepista irina* (Fr.) H.E. Bigelow, *Paralepista flaccida* (Sowerby) Vizzini and *Paralepista gilva* (Pers.) Raithelh. Cases of poisoning have been reported from various European countries as a result of wrong identifications of fungi (Moreau et al. 2001; Saviuc et al. 2001; Leonardi et al. 2002; Vizzini and Ercole 2012).

Detailed descriptions of *P. amoenolens* have been provided in previous studies (Contu et al. 1999; Moreau et al. 2001; Leonardi et al. 2002; Martínez et al. 2010; Vizzini and Ercole 2012). A comparative analysis of the Turkish specimens and data provided by other authors are presented in Table 1: it shows that the size of macroscopic and microscopic structures of our samples are compatible with previous findings.

*P. amoenolens* has previously been reported growing in woods of *Cedrus atlantica* (Endl.) Manetti ex Carrière, *C. deodara* (Roxb. ex D. Don) G. Don, *Picea abies* (L.) Karst, *Pinus nigra* Arnold, *P. pinaster* Ait., *P. sylvestris* L., *Quercus ilex* L., *Q. petraea* (Matt.) Liebl., *Cupressus arizonica* Greene, *Ilex aquifolium* L., *Larix decidua* Mill., *Cistus ladanifer* L. and *Daphne gnidium* L. (Leonardi et al. 2002; Martínez et al. 2010; Vizzini and Ercole 2012). In this study *P. amoenolens* was picked up under *Cedrus libani* and that is an ecological news for this fungus.

### Table 1. Comparison of macroscopic and microscopic features of *P. amoenolens*.

<table>
<thead>
<tr>
<th>Country</th>
<th>Size of pileus (mm)</th>
<th>Size of stipe (mm)</th>
<th>Size of spores (µm)</th>
<th>Size of basidia (µm)</th>
<th>Width of pileipellis (µm)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>20–65</td>
<td>25–70 × 10–20</td>
<td>4.5–6.0 × 3.0–4.0</td>
<td>30–38 × 6.0–7.0</td>
<td>3.0–7.5</td>
<td>Contu et al. (1999)</td>
</tr>
<tr>
<td>France</td>
<td>40–70</td>
<td>20–50 × 4–12</td>
<td>4.3–5.6 × 3.0–4.0</td>
<td>23–30 × 5.0–7.5</td>
<td>3.0–6.0</td>
<td>Moreau et al. (2001)</td>
</tr>
<tr>
<td>* Morocco</td>
<td>—</td>
<td>—</td>
<td>3.8–5.3 × 3.0–3.9</td>
<td>18–30 × 3.5–4.5</td>
<td>2.0–3.5</td>
<td>—</td>
</tr>
<tr>
<td>Italy</td>
<td>—</td>
<td>—</td>
<td>4.0–6.0 × 3.0–4.0</td>
<td>21–32 × 4.0–6.0</td>
<td>—</td>
<td>Leonardi et al. (2002)</td>
</tr>
<tr>
<td>Spain</td>
<td>30–90</td>
<td>15–45 × 4–13</td>
<td>4.4–5.8 × 2.7–3.9</td>
<td>33–45 × 4.5–6.5</td>
<td>3.4–6.4</td>
<td>—</td>
</tr>
<tr>
<td>** Morocco</td>
<td>25–90</td>
<td>25–65 × 5–13</td>
<td>5.0–6.0 × 3.0–4.0</td>
<td>30–40 × 6.0–7.0</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>France and Italy</td>
<td>20–80</td>
<td>25–50 × 7–13</td>
<td>3.8–5.6 × 2.3–4.3</td>
<td>25–38 × 5.0–7.0</td>
<td>4.0–6.0</td>
<td>Vizzini and Ercole (2012)</td>
</tr>
<tr>
<td>Turkey</td>
<td>28–60</td>
<td>25–60 × 6–16</td>
<td>4.8–6.8 × 3.0–4.5</td>
<td>30–44 × 4.3–5.6</td>
<td>3.0–7.0</td>
<td>This study</td>
</tr>
</tbody>
</table>

* Examination of Malençon’s original fungarium material by P.A. Moreau ** Description of original material
Paralepistopsis amoenolens: First Record of A Rare and Poisonous Taxon in Turkey, Turk J Life Sci, 2/2:175-179

5. Conclusions

According to the literature (Sesli and Denchev 2008; Sesli et al. 2016; Sesli and Topcu-Sesli 2017; Solak et al. 2015) twenty genera of the family Tricholomataceae have been reported from Turkey so far (Arrhenia Fr., Clitocybe (Fr.) Staude, Clitolyophyllum E. Sesli, Vizzini & Contu, Collybia (Fr.) Staude, Delicatula Fayod, Fayodia Kühner, Gamundia Raithelh., Infundibulicybe Harmaja, Lepista (Fr.) W.G. Sm., Leucocortinarius (J.E. Lange) Singer, Leucopaxillus Boursier, Melanoleuca Pat., Myxomphalia Hora, Omphalina Quél., Phylotopsis E.-J. Gilbert & Donk ex Singer, Pseudoclitocybe (Singer) Singer, Pseuodomphalina (Singer) Singer, Resupinatus Nees ex Gray, Tricholoma (Fr.) Staude and Tricholomopsis Singer). In this study the poisonous and very rare species Paralepistopsis amoenolens is reported as a new record for the mycobiota of Turkey becoming the 21st genus of the Tricholomataceae occurring in this country.

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References


Vizzini A, Antonin V, Sesli E, Contu M. 2015. Gymnopus trabzonensis sp. nov. (Omphalotaceae) and Tricholoma virgatum var. fulvumbonatum var. nov. (Tricholomataceae), two new white-spored agarics from Turkey. Phytotaxa, 226/2: 119–130.
