

ORBILIACEAE FOR TURKISH ASCOMYCOTA: THREE NEW RECORDS

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Abstract

Orbilia curvatispora Bond., *O. sarraziniana* Bond. and *O. xanthostigma* (Fr) Fr. belonging to the family Orbiliaceae were recorded. Since, these three taxa we have been considered on new report to the Turkish mycobiota at family level. These species can be characterized by the presence of thin ascospores along with the small ascocarps. An identification key were also given in the text for the species.

Introduction

Orbiliaceae contains more than 200 species in 12 genera (Kirk *et al.* 2008). Generally, they are cosmopolitan, but most of them are more prevalent in temperate regions. Most members of the family are saprobe on rotten stumps and woods, sometimes on herbaceous stems and develop bright-coloured, discoid, translucent apothecia on substratum. Some of them are also carnivorous fungi, and they have evolved a number of specialized mechanisms to trap nematodes (Liu *et al.* 2005, Zhang *et al.* 2007).

The genus *Orbilia* Fr. is characterized by light-colored, translucent to semitranslucent, small, bright colored, waxy, sessile to sub-sessile, apothecia, cylindrical to clavate asci arising from a long-stalked furcate base without crosiers, a thin-walled ectal excipulum on the flanks consisting of globose to angular cells, hyaline ascospores, filiform, often swollen paraphyses at the apex (Thind and Sharma 1980, Liu *et al.* 2005, Zhang *et al.* 2007).

According to the present checklists on Turkish mycobiota (Sesli 2007, Sesli and Denchev 2008) and the recent contributions (Akata 2012a,b; Akata and Kaya 2012a,b, 2013a;b; Akata *et al.* 2012, Güngör *et al.* 2013), there is no record of *Orbiliaceae* and the present study reports for the first time from Turkey.

Materials and Methods

Fungal specimens were collected from East Black Sea Region (Gümüşhane, Giresun and Trabzon) of Turkey in 2011 and 2012. Relevant morphological and ecological characteristics of the specimens were recorded and they were photographed in their natural habitats before transferred to the laboratory for further investigations. Photomicrographs were taken under a light microscope (Leica DM 1000). Some reagents (distilled water, Melzer's reagent, 5% KOH) were used for microscopic investigation. The identification of the taxa was carried out after Thind and Sharma (1980), Breitenbach and Kränzlin (1984), Hansen and Knudsen (2000) and Medardi (2006). The identified samples were deposited at the Herbarium of Ankara University (ANK).

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Results and Discussion

Systematic enumeration of the recorded taxa belonging to the family Orbiliaceae is provided below.

Ascomycota Caval.-Sm.

Orbiliaceae Nannf.

Orbilina Fr.

Key to the species of Turkish *Orbilina*

- | | |
|---|------------------------|
| 1. Ascospores 3 - 4 μm long, ellipsoid to reniform | <i>O. xanthostigma</i> |
| *1. Ascospores 6 - 12 μm long, allantoid or fusiform | 2 |
| 2 Ascospores 6 - 7 μm long, fusiform | <i>O. sarraziniana</i> |
| *2. Ascospores 9 - 12 μm long, allantoid | <i>O. curvatispora</i> |

1. *Orbilina curvatispora* Boud.

(Fig. 1)

Apothecia 0.5 - 0.1 mm, in diameter, subsessile, urceolate to flat or plate shaped, stalkless on substrate, hymenophore smooth, ochre or orange, translucent when fresh, becoming opaque on drying, outer surface the same colour (Fig. 1a). Flesh thin, fragile, deeply yellow to orange. Asci 35 - 40 \times 2.5 - 3.5 μm , eight spored, cylindrical to clavate, biseriata spores (Fig. 1b,c). Paraphyses cylindrical with widened tips (Fig. 1b,c). Ascospores 9 - 12 \times 1 μm , allantoid, smooth and hyaline (Fig. 1d).

Ecology: Autumn, growing gregariously, on damp rotten wood and herbaceous angiospermic stems, not common (Thind and Sharma 1980, Breitenbach and Kränzlin 1984).

Specimen examined: Akata 4867, Giresun, Eynesil, 41° 01' N- 39° 07' E, 360 m, 30.10.2012, on damp rotten wood of common alder (*Alnus glutinosa* L.), October 30, 2012.

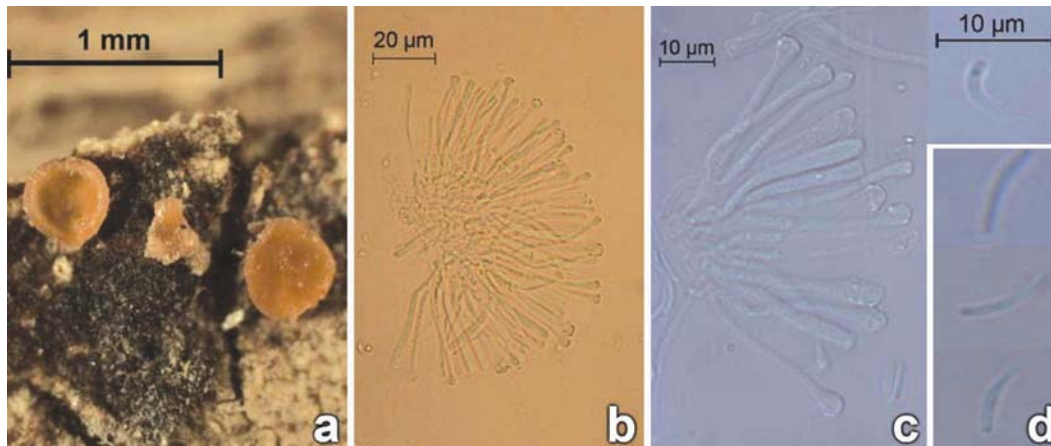


Fig. 1. *Orbilina curvatispora*. a. apothecia, b-c. asci and paraphyses, d. ascospores.

2. *Orbilina sarraziniana* Boud.

(Fig. 2)

Apothecia 0.4 - 0.6 mm, in diameter, sessile, concave when young, later flat, stalkless, superficial on rotten bark on substrate, hymenophore smooth, pinkish, sometimes translucent, outer surface smooth, darker in the middle where the carpophore attaches to wood (Fig. 2a). Flesh

thin fragile, pinkish. Asci $30 \times 4 - 4.5 \mu\text{m}$, eight spored, cylindrical to clavate, biseriata spores (Fig. 2b). Paraphyses cylindrical with widened tips (Figure 2b). Ascospores $6 - 7 \times 0.5 - 1.0 \mu\text{m}$, fusiform, smooth and hyaline (Fig. 2c).

Ecology: Summer, growing gregariously, on damp rotten hardwoods, in arctic environment even on coniferous wood, not common (Thind and Sharma, 1980, Breitenbach and Kränzlin, 1984).

Specimen examined: Gümüşhane: Akata 4088, Zigana mountain, Hamsi village, $40^{\circ} 42' \text{N} - 39^{\circ} 27' \text{E}$, 1400 m, on rotten wood of common hornbeam (*Carpinus betulus* L.), September 2, 2011.

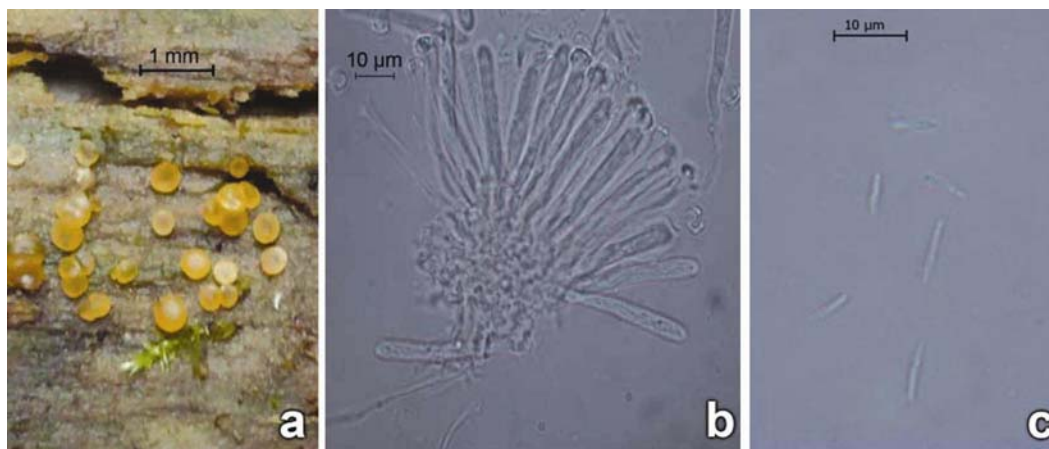


Fig. 2. *Orbilia sarraziniana* a. apothecia, b. asci and paraphyses, c. ascospores

3. *Orbilia xanthostigma* (Fr.) Fr. (Fig. 3).

Syn.: *Calloria xanthostigma* (Fr.) W. Phillips, *Peziza xanthostigma* Fr.

Apothecia 0.3 - 1 mm in diameter, sessile, saucer shaped to flat, stalkless, superficial on rotten bark on substrate, hymenophore smooth, orange to gold yellow, outer surface smooth, margin darker (Fig. 3a). Flesh thin fragile, orange. Asci eight spored, $30 \times 4 - 4.5 \mu\text{m}$, eight spored, cylindrical to clavate, uniseriate spores (Fig. 3b,c). Paraphyses cylindrical, little longer than asci, with widened tips (Fig. 3b,c). Ascospores $3 - 4 \times 1 - 1.5 \mu\text{m}$, biguttulate, ellipsoid to reniform, smooth and hyaline (Fig. 3d).

Ecology: Summer, growing gregariously, on damp rotten woods, widespread (Thind and Sharma 1980, Breitenbach and Kränzlin 1984).

Specimen examined: Akata 4036, Trabzon, Çaykara, Taşkiran village, roadside, $40^{\circ} 39' \text{N} - 40^{\circ} 16' \text{E}$, 850 m, on rotten stump of common alder (*Alnus glutinosa* L.), August 24, 2011.

Members of the genus *Orbilia* can easily be recognised in the field with its waxy, translucent, usually very thin apothecia but it is not possible to identify the full range of known species without microscopic features (Thind and Sharma 1980, Zhang *et al.* 2007).

The main features of *O. curvatispora* are yellow to orange, sessile, urceolate to flat apothecia and curved, one-celled ascospores. It can be confused with *O. gaillardii* Sacc. and *O. fici* E.K. Cash & Corner due to their macroscopic characters but it is easily distinguished from

them by having larger and curved ascospores (Thind and Sharma 1980, Breitenbach and Kränzlin 1984).

Orbilina sarraziniana is readily identified by sessile, discoid, umbrinous or vinaceous apothecia and fusiform ascospores. This species is quite similar to *O. coccinella* Fr. which differs by having smaller asci, narrower and straight ascospores (Thind and Sharma 1980; Breitenbach and Kränzlin 1984, Hansen and Knudsen 2000).

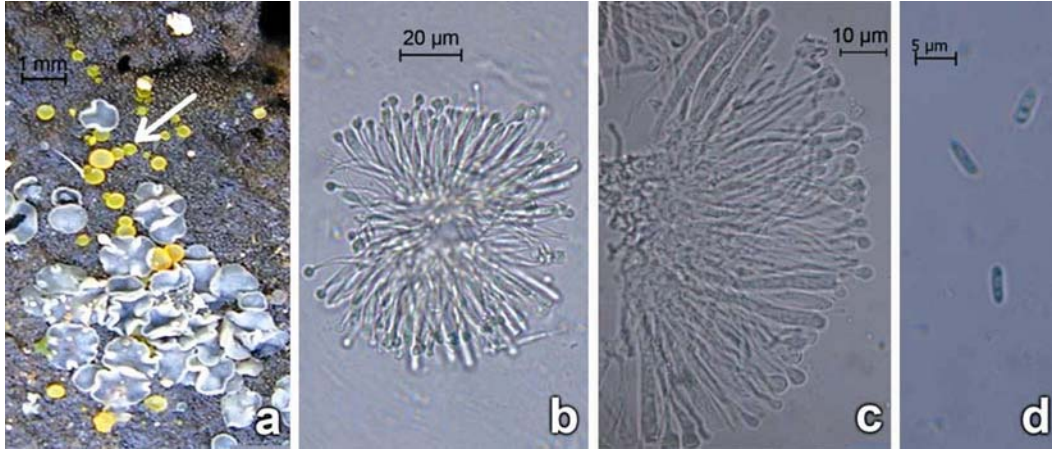


Fig. 3. *Orbilina xanthostigma*. a. apothecia, b-c. asci and paraphyses, d. ascospores.

Orbilina xanthostigma is characterised by sub-sessile, small, sauser-shaped, waxy, golden-yellow apothecia, ellipsoid to reniform and biguttulate ascospores. It is very close to *O. leucostigma* (Fr.) Fr. in terms of morphology and ecology. But it can easily be separated from the latter species in having golden yellow apotecia and slightly longer ascospores (Thind and Sharma 1980, Breitenbach and Kränzlin 1984, Hansen and Knudsen 2000).

According to the current literature (Sesli 2007, Sesli and Denchev 2008, Solak *et al.* 2007, Akata 2012a,b; Akata and Kaya 2012a,b; 2013a;b; Akata *et al.* 2012, Güngör *et al.* 2013, Kaya 2009, Uzun *et al.* 2010), 188 taxa within 90 genera, belonging 28 families of larger *Ascomycota* have previously been reported from Turkey.

It is concluding that *Orbilina curvatipora*, *O. sarraziniana* and *O. xanthostigma* are recorded for the first time from Turkey at family level and these taxa will be the first members of Turkish *Orbiliaceae*.

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