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A NEW RECORD FOR TURKEY'S MYCOBIOTA FROM AN INTERESTING HABITAT IN THE MUGLA PROVINCE: *Hortiboletus bubalinus* (OOLBEKK. & DUIN) L. ALBERT & DIMA

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Abstract

In this study, fungal samples collected in Mugla province were identified as *Hortiboletus bubalinus* (Oolbekk.&Duin)L. Albert & Dima and recorded for the first time for the Turkish mycobiota. Short description, photographs, locality, collection date and ecological features of this newly reported species was also provided.

Keywords: *Hortiboletus bubalinus* (Oolbekk.&Duin)L. Albert & Dima, biodiversity, macrofungi, new record, Mugla, Turkey

MUĞLA İLİNDEKİ İLGİNÇ BİR HABİTATTAN TÜRKİYE MİKOBİYOTASI İÇİN YENİ BİR KAYIT: *Hortiboletus bubalinus* (OOLBEKK. & DUIN) L. ALBERT & DIMA

Özet

Bu çalışmada, Muğla yöresinden toplanan mantar örnekleri *Hortiboletus bubalinus* (Oolbekk.&Duin) L. Albert & Dima olarak teşhis edildi ve Türkiye mikobiyotası için ilk kez kaydedildi. Yeni rapor edilen türün kısa tanımı, fotoğrafları, lokalitesi, toplanma tarihi ve ekolojik özellikleri verildi.

Anahtar Kelimeler: *Hortiboletus bubalinus* (Oolbekk.&Duin) L. Albert & Dima, biyoçeşitlilik, makrofungus, yeni kayıt, Muğla, Turkey

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1. Introduction

Hortiboletus is a genus belonging to family Boletaceae with approximately 7 species worldwide [1]. This genus is characterized by boletoid fruiting body with yellow tubes. Stem varies from cylindrical to clavate, sometimes tapering below and rooting, smooth to scurfy granular, some species developing ridges or with a raised irregular and incomplete network. Tube and pores is concolorous or pores rarely slightly differently colored, yellow to greenish, unchanging or blueing when bruised. Flesh soft, whitish to yellow, sometimes vinaceous to purplish in stem base, in some species blueing when bruised. Smell weak and not distinctive. Taste mild. Spore print is olive brown.

apparently common in the other Central, Northern and Western European countries [3], because its' presence was reported from Norway [4], Sweden [4, 5], England [1, 6], Scotland [5], Spain [7], France [8], Czech Republic [9], Hungary [10], Austria [11] and Bulgaria [12] afterwards. This species probably occurs all over the Europe. In fact, this and the other studies [7, 8] demonstrate that *H. bubalinus* has a more widespread distribution, which is not limited to Northern Europe.

According to Sesli and Denchev [13], 2158 macrofungi species were recorded for Turkish mycobiota. With recent studies [14 - 19], this number has increased even more. Present study also provided a new contribution to this reach diversity.

H. bubalinus was originally described in the Netherlands [2] where it seems to be quite widespread. It is

2. Material-Methods

The specimen was collected from the Geyik canyon of Muğla during routine field trips in 2018. In the field, morphological characters such as shape, size and color of basidiocarp, and habitat features of sample was noted and it was photographed in the habitat. Microscopic characters were observed by mounting the samples in 3% KOH and 1% Congo red solutions and analyzing with a light microscope (Leica DM750). The morphological approaches suggested by Kibby [20], Knudsen & Vesterholt [4] and Hills [6], were followed in order to identify the specimens. Dried samples were deposited in the Fungarium of Department of Biology, Muğla Sıtkı Koçman University.

3. Results

3.1. Taxonomy

Fungi

Basidiomycota R.T. Moore

Boletaceae Chevall.

Hortiboletus bubalinus (Oolbeek. & Duin) L. Albert & Dima

Bas.: *Boletus bubalinus* Oolbeek. & Duin, in Oolbekkink, Persoonia 14 (3): 267, 1991.

Syn.: *Boletus populinus* Oolbeek. & Duin nom. prov., Coolia 31: 11, 1988;

Xerocomus bubalinus (Oolbeek. & Duin) Redeuilh, Doc. mycol. 23(89): 62, 1993.

Xerocomellus bubalinus (Oolbeek. & Duin) Mikšík, Index Fungorum 182: 1 (2014)

Pileus, 4-7 cm, first hemispherical and rounded then convex-flattened, velvety to smooth, ochraceous-buff, reddish-brown, dull apricot to yellowish-brown, often cracking, margin at first involute then slightly flattened (Figure 1 a, b). **Pores** at first very small, labyrinthine, then wider and angular (1,5 mm in a diameter), and bright yellow to olive-yellow when young, greenish yellow when old, bruising blue (Figure 1c). **Stipe**, 4-5 x 1-1,5 cm, cylindrical, slightly rooting, surface smooth, yellowish at apex, flushed red over most of its length with slightly darker striations (Figure 1c). **Smell** strong, fruit-like. **Taste** mild. **Spores** 9.5 - 13 × 4 - 5.5 µm, elliptic to subfusiform, thick-walled and smooth, hyaline to slightly yellowish, often with bright yellow oil guttules (Figure 2a). **Basidia** 29 - 35 × 9 - 11 µm, clavate, 4 spored (Figure 2b). **Pleurocystidia** 50 - 60 × 7 - 20 µm, abundant to numerous and subclavate, some slightly bent, hyaline to very slightly yellowish (Figure 2c, d). **Cheilocystidia** similar to pleurocystidia. **Pileipellis** interwoven, floccose, homogenous (Figure 2e).

Habitat: open, parkland habitats with *Populus* and *Tilia*.

Specimen examined: Geyik Canyon, Köyceğiz, Muğla, 37° 08' N, 28° 36' E, 360 m., stream bed, *Populus nigra*, 24.10.2018, Allı 6873.

4. Conclusion

In this study, *H. bubalinus* is reported as a new record for Turkish mycobiota. Until today, *H. rubellus* (Krombh.) Simonini, Vizzini & Gelardi is reported from Turkey [13] and *H. bubalinus* is second species belonging to *Hortiboletus* genus.

H. bubalinus characterized by its dull-apricot to yellowish brown pileus, yellowish pores and cylindrical stipes. This species turns blue when cut or bruised [20]. *H. bubalinus* is confused with *H. engelii* (Hlaváček) Biketova & Wasser and *H. rubellus*. *H. bubalinus* differs from these two species by pinkish color in the pileus and presence of flame-orange spots in the stipe base [3, 20]. Also, *Xerocomellus chrysenteron* (Bull.) Šutara (Syn. *Xerocomus communis* (Bull.) Bon) can be distinguished with *H. bubalinus*, but it differs from it by lack of orange spot in the stipe base, pinkish colors of pileus and narrower spores [6]. Also, the other closer species to *H. bubalinus* is *X. erubescens* Cadiñanos & J.A. Muñoz and some authors consider the possibilities of their being synonym [3, 21]. However, these two species could be distinguished by different habitat features. *H. bubalinus* grows in *Tilia* and *Populus* forest, while *X. erubescens* associated with *Quercus* [22]. Additionally, the flesh beneath the pileipellis of *X. erubescens* turns quickly raspberry red when cut, and turns blue in the middle of stipe. However, *H. bubalinus* doesn't show pinkish zone beneath the pileipellis and turns blue especially above the tubes [22]. These color differences provide clear morphological discrimination of the two species. Nevertheless, further morphological and molecular comparisons are still needed for the confirmation.

H. bubalinus grows in open habitats with *Populus* and *Tilia* [20, 21]. In this study, we collected the specimens on the rock surface in stream bed (Figure 1) and there was few *Populus* trees in the area. This interesting habitat features have not been reported before. Probably, there was a connection to soil by a crack.

In this study, we reported another new record for the diverse mycobiota of Turkey. Taxonomical studies should be conducted in future to evaluate the real magnitude of macrofungi diversity in Turkey.

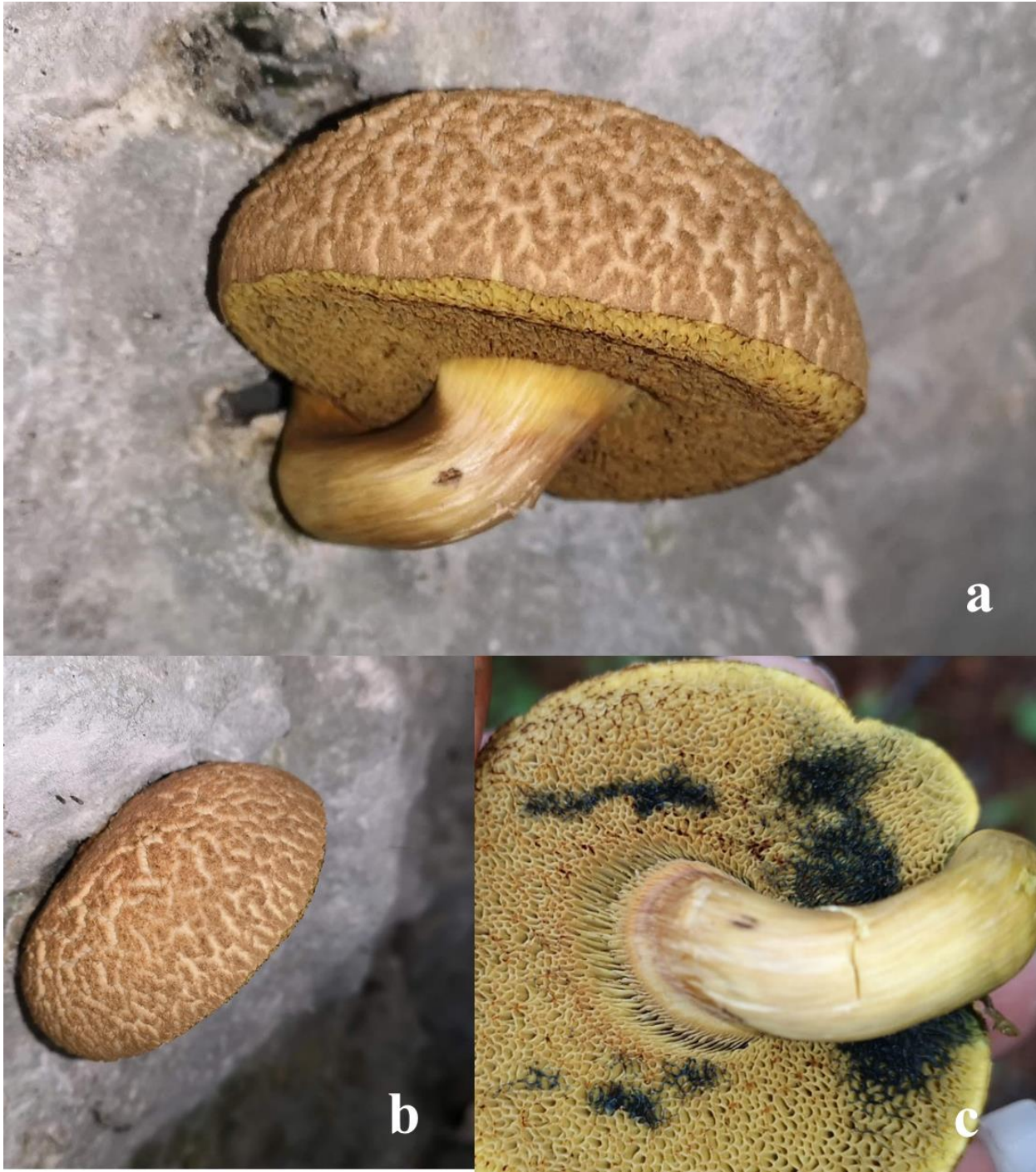


Figure 1. Basidiocarp of *Hortiboletus bubalinus*; a. Stipe, b. Pileus, c. Tubes

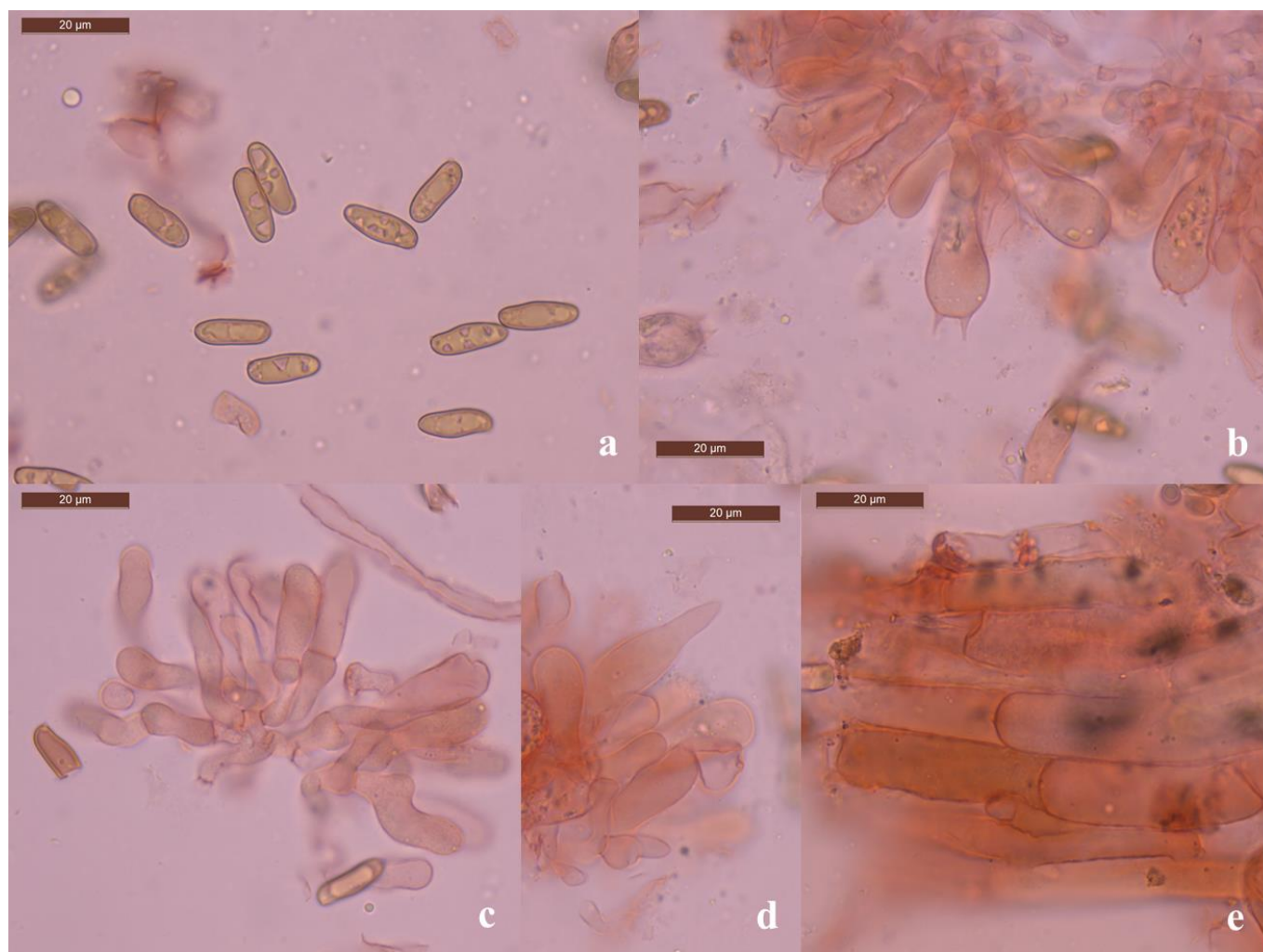


Figure 2. Microscopic structures of *Hortiboletus bubalinus*; a. Basidiospores, b. Basidia, c – d. Cystidia, e. Pileipellis.

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