



Four New Records of Basidiomycota for the Turkish Mycota From Trabzon and Istanbul Provinces

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Abstract: Fungal samples were collected from Trabzon and İstanbul provinces between 2013 and 2015. After field and laboratory studies, *Hebeloma sacchariolens*, *Chroogomphus mediterraneus*, *Podoscypha multizonata* and *Sarcodontia pachyodon* were identified as new records for the Turkish mycota. The newly reported species are given with field photographs descriptions and a short discussion.

Key words: *Chroogomphus*, *Hebeloma*, *Podoscypha*, *Sarcodontia*, new records, Turkey.

Türkiye Mikotası İçin Trabzon ve İstanbul İllerinden Dört Yeni Bazidiyomikota Kaydı

Öz: Mantar örnekleri 2013 ve 2015 yılları arasında Trabzon ve İstanbul illerinden toplanmıştır. Arazi ve laboratuvar çalışmaları sonucunda, *Hebeloma sacchariolens*, *Chroogomphus mediterraneus*, *Podoscypha multizonata* ve *Sarcodontia pachyodon* Türkiye mikotası için yeni kayıt olarak belirlenmiştir. Yeni kayıtlar arazi fotoğrafları, tanımları ve kısa bir tartışma ile birlikte verilmiştir.

Anahtar kelimeler: *Chroogomphus*, *Hebeloma*, *Podoscypha*, *Sarcodontia*, yeni kayıtlar, Türkiye.

Introduction

Hebeloma members are characterized by small to very large, viscid to dry, rarely hygrophanous, more or less smooth, white, grey, brown, clay, cinnamon or tan, hemispherical, convex or plane pileus; cylindrical to clavate stipe; adnate, adnexed or notched, whitish, grayish to brown lamellae; brown spore prints, usually four spored, subcylindric to subclavate basidia; ellipsoid, amygdaloid, citriform or fusiform basidiospores and cylindrical, clavate, lageniform or fusiform cheilocystidia (Hansen and Knudsen, 1992; Vesterholt, 2005). *Chroogomphus* has viscid to dry, smooth to woolly, yellowish, reddish, brownish or vinaceous, convex to conical or

plane pileus; cylindrical and sometimes tapered or thickened stipe; usually decurrent, greyish, dull orange, ochraceous or blackening lamellae; smoky gray, light brown, olive brown to black spore prints; four spored and clavate basidia; ellipsoid to fusiform basidiospores and cylindrical, clavate or fusiform chelio-pleurocystidia. *Pileipellis* consists of hyaline, yellowish or brownish and amyloid hyphae (Miller, 1964; Arora, 1986; Hansen and Knudsen, 1992). *Sarcodontia* is characterized by resupinate or vertically attached fruitbodies; hydroid or ipricoid hymenium; clavate and four spored basidia; ellipsoid to subglobose basidiospores; clamped hyphae and monomitic hyphal system (Eriksson et al., 1981).



Podoscypha is distinguished from the other genera by stipitate and flabellate basidiome, dimitic hyphal system, presence of gloeocystidia and inamyloid basidiospores (Dahlberg and Croneborg, 2006; Jahn and Müller, 1976). The aim of the present study is to contribute to the Turkish mycota.

Materials and Methods

Basidiomata were collected from Trabzon and İstanbul provinces between 2013 and 2015. Macroscopic and ecological characteristics of the species were noted and the field photos were taken in situ. Laboratory examinations were carried out using the reagents such as melzer's reagent, 5% KOH, H₂O, H₂SO₄, congo red and cotton blue etc. Identification of the samples was carried out according to the current literature (Jahn and Müller, 1976; Eriksson et al, 1981; Breitenbach & Kränzlin, 1986; 2000; Vesterholt, 2005; Dahlberg and Croneborg, 2006; Martin et al., 2016). Fungal materials are kept at Ankara University (ANK) and Karadeniz Technical University herbariums.

Results

Hymenogastraceae Vittad.

Hebeloma sacchariolens Quéél.

(Figure 1-2).

Syn.: *Hylophila sacchariolens* (Quéél.)

Quéél.

Pileus 20-50 mm, hemispherical, convex, plane, sometimes slightly depressed, generally eaten or injured by beetles; surface lubricous or viscid, soft, yellow-ocher to light yellowish brown, sometimes reddish or reddish-brown especially when injured; margin acute. Content whitish, thin. Odor very beautiful like perfume. Taste raphanoid. Lamellae notched, broad, edges crenate, whitish to pinkish brown. Stipe 35-60 × 5-10 mm, cylindrical, surface whitish-fibrillose on a brownish or reddish brown background especially towards the base and whitish-pruinose near the pileus, generally curved and sometimes twisted according to growth conditions. Basidia clavate, 30-40 × 8-11 μm,

with 4 sterigmata and basal clamp. Basidiospores fusiform to amygdaliform, slightly verrucose, dextrinoid, olive yellow or light brownish, 11-13.5 × 6-9 μm. Cheilocystidia slenderly cylindrical or clavate, abundant, 30-100 × 4-10.5 μm.

Material examined: TURKEY—Trabzon, Karadeniz Technical University, gregarious in campus. 40°59'38.13" N, 39°46'17.82" E, 109 m, 05.11.2015, E. Sesli 3655.

Gomphidiaceae Maire ex Jülich

Chroogomphus mediterraneus (Finschow) Vila, Pérez-De-Greg. & G. Mir (Figure 3-4).

Syn.: *Gomphidius mediterraneus* Finschow

Pileus 50-80 mm, hemispherical when young, later convex, slightly irregular depending on growth conditions; margin strongly incurved, fibrillose to squamose, surface sticky and soft, copper brown or reddish brown, more darker from place to place, pinkish purple to blood color when injured. Lamellae decurrent, spaced, thick, broad, entire edge, dull yellowish first pinkish red later. Content compact, thick in the center, thin towards the margin, melon color, yellowish white to dark yellow when cut, and pinkish red with time. Stipe 60-100 × 10-20 mm, cylindrical, tapered towards the base, surface smooth, viscous, slightly fibrillose, dark ocher to cinnamon color in the field, pinkish red after a while when injured. Basidia clavate, 50-60 × 10-15 μm, with 2-4 sterigmata, without basal clamp. Basidiospores fusiform, smooth, with big drops, olive brownish, 17-20 × 6.5-8.5 μm. Cheilo- and pleurocystidia abundant, cylindrical, 100-175 × 17-21 μm.

Material examined: TURKEY—Trabzon, Çukurçayır, solitary in mixed forest, 40°59'01.98" N, 39°44'18.21" E, 210 m, 31.10.2015, E. Sesli 3630.



Figure 1. *Hebeloma sacchariolens*: a,b,c- basidiomata (scale bars: 50 mm). Photos by E. Sesli

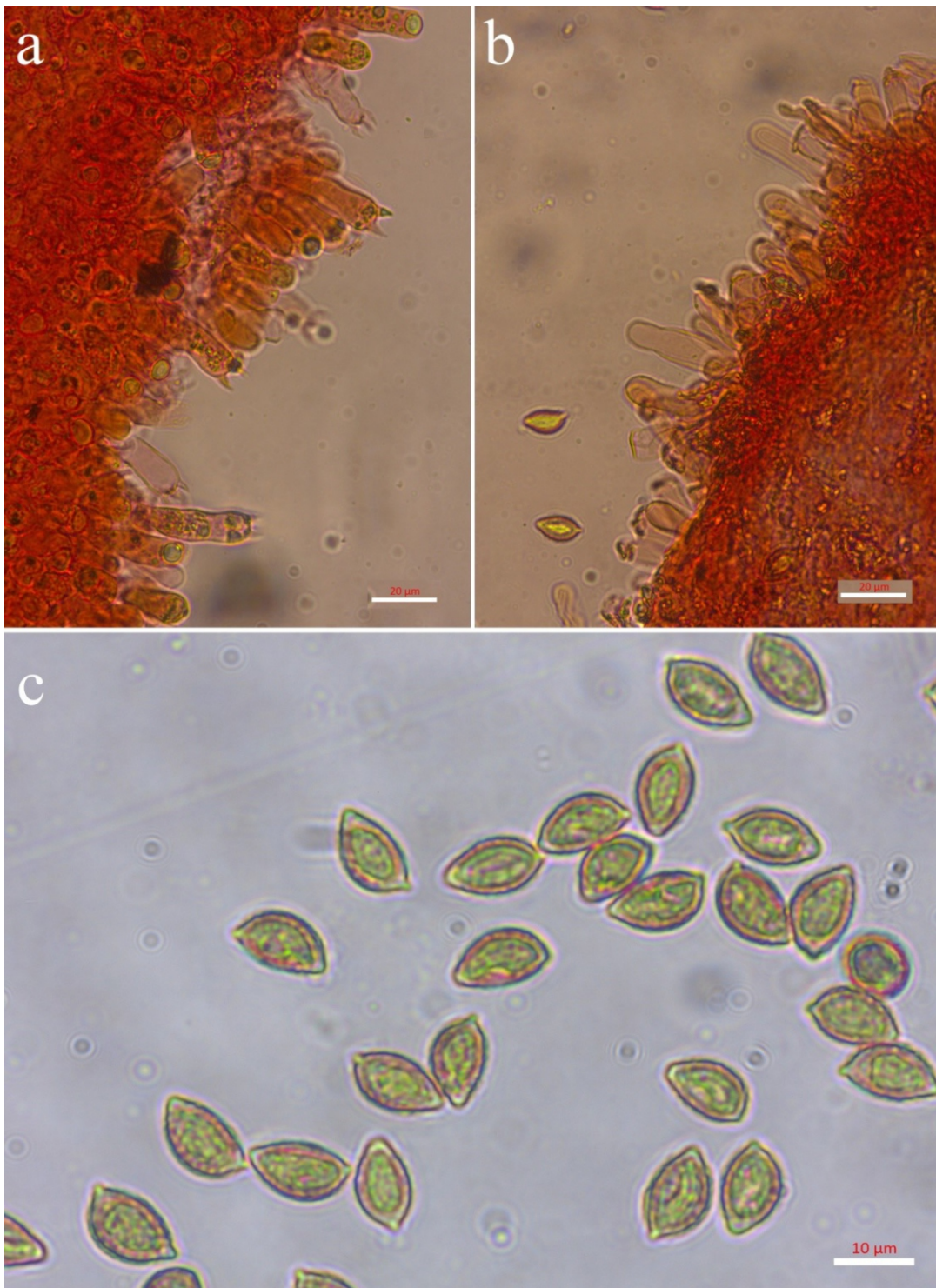


Figure 2. *Hebeloma sacchariolens*: a,b- cross sections through the lamella (scale bars: 20 µm). c- basidiospores (scale bars: 10 µm). Photos by E. Sesli.

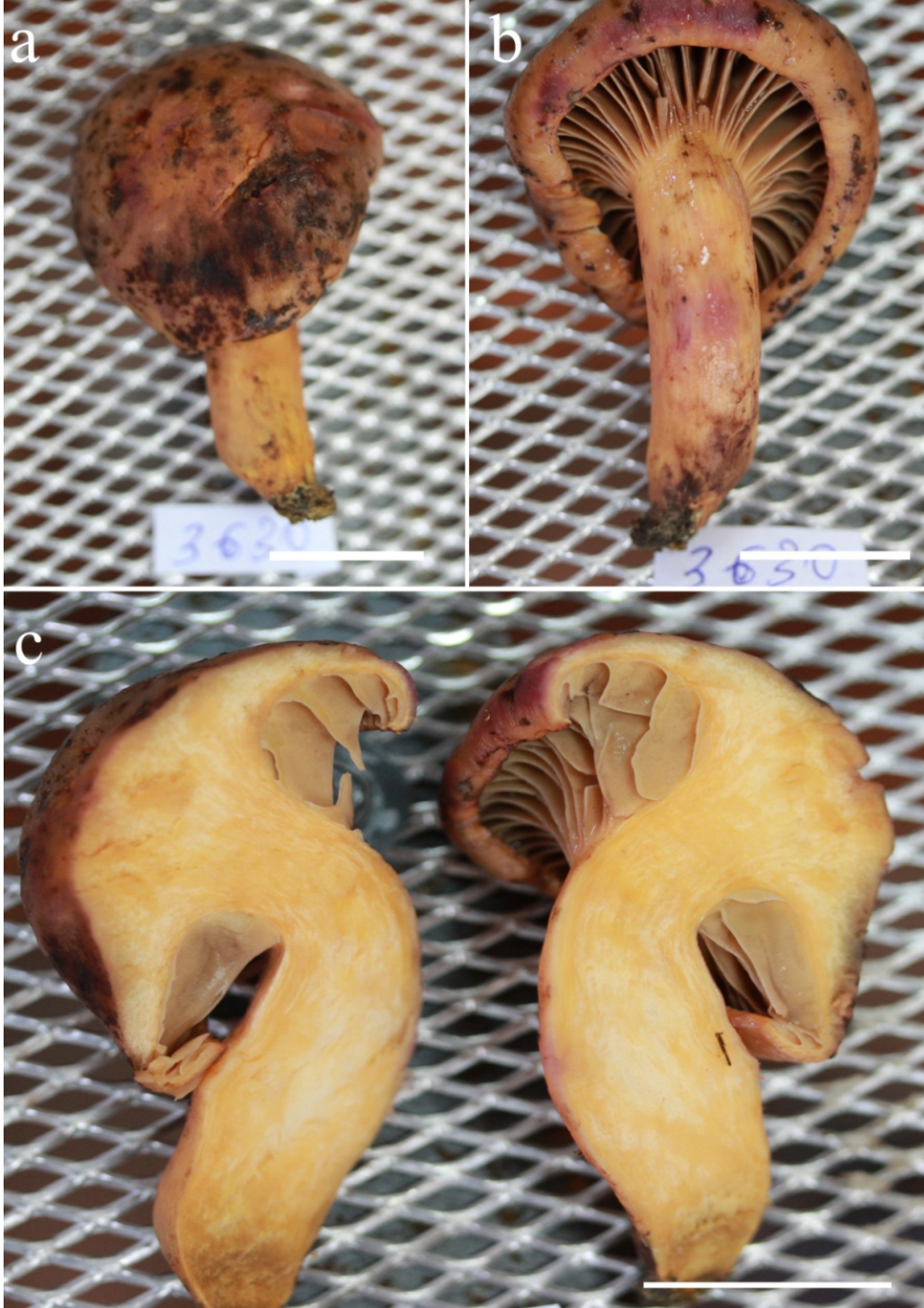


Figure 3. *Chroogomphus mediterraneus*: a-c- basidiomata (scale bars: 30 mm). Photos by E. Sesli.

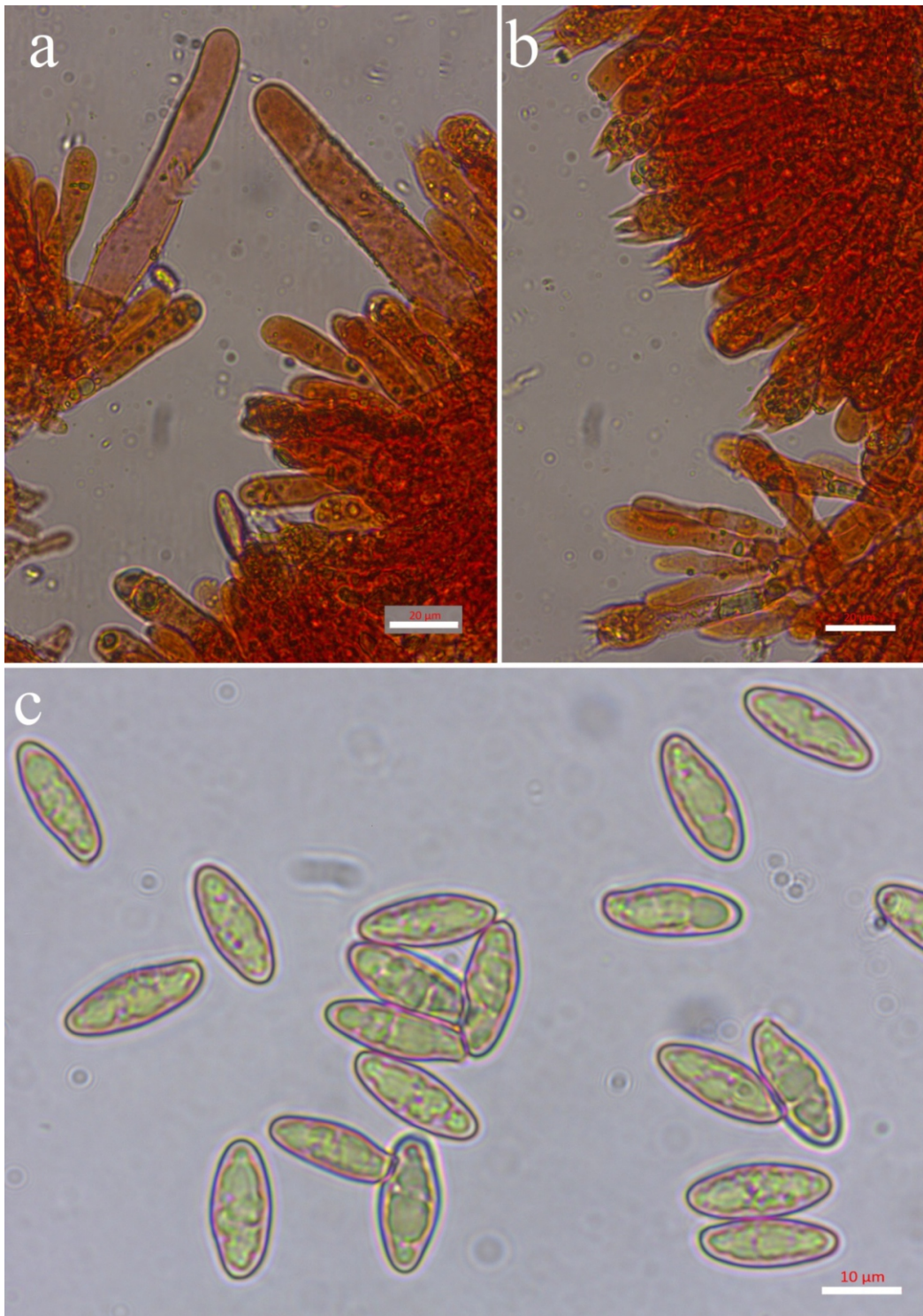


Figure 4. *Chroogomphus mediterraneus*: a,b- cross sections through the lamella (scale bars: 20 μ m). c- basidiospores (scale bars: 10 μ m). Photos by E. Sesli.



Meruliaceae P. Karst.

Sarcodontia pachyodon (Pers.) Spirin (Figure 5).

Syn.: *Hydnum pachyodon* Pers., *Irpex crassitatus* Lloyd, *I. crassus* Berk. & M.A. Curtis, *I. mollis* Berk. & M.A. Curtis, *I. pachyodon* (Pers.) Quél., *I. pachyodon* var. *trametea* Bourdot & Galzin, *Irpiciporus mollis* (Berk. & M.A. Curtis) Murrill, *I. pachyodon* (Pers.) Kotl. & Pouzar, *Lenzites pachyodon* (Pers.) Pat., *Radulomyces pachyodon* (Pers.) M.P.Christ. *Sistotrema pachyodon* (Pers.) Fr., *Spongipellis pachyodon* (Pers.) Kotl. & Pouzar, *Xylodon crassus* (Berk. & M.A. Curtis) Kuntze, *X. mollis* (Berk. & M.A. Curtis) Kuntze.

Basidiomata resupinate to effuse-reflexed, broadly attached to the substrate. Pileus 30-50 × 10-20 mm, upper surface white to cream, somewhat slightly ochraceous, unzoned, finely tomentose when young, smooth in age, margin sharp and sometimes incurved. Hymenial surface whitish when fresh, ochraceous when dry, hydroid in the most part of the hymenium, usually irpicoid near the margin. Teeth (up to 10 mm) cylindrical, somewhat flattened. Basidia 30-35 × 4-5 µm, cylindrical to narrowly clavate, 4-spored and basal clamped. Basidiospores 5.5-6.5 × 4.5-5.5 µm, broadly ellipsoid to subglobose, smooth, hyaline, with drops and thick walled. Hyphal system monomitic, 2-5 µm across, septa with clamps, hyphae, thin to thick walled, some with oil drops

Material examined: TURKEY—İstanbul: Belgrad Forest, Neşet Suyu, on beech stump, N 41° 11' - E 28° 58', 85 m, 15.11.2014, Akata 6257.

Podoscypha multizonata (Berk. & Broome) Pat. (Figure 6).

Syn.: *Phylacteria intybacea* var. *multizonata* (Berk. & Broome) Bigeard & H. Guill., *Stereum multizonatum* (Berk. & Broome) Masee, *Thelephora multizonata* Berk. & Broome.

Basidiomata 100-150 × 80-100 mm, stipitate, rosette-like, spatulate to fan-shaped, consisting of numerous thin, erected, brownish,

concentrically zoned, dark banded lobes arising from a common base. Hymenophore smooth or rugose, pale brown to grey brown, smooth. Flesh leathery, pinkish-brown to brownish-wine. Basidia 30-35 × 5-6 µm, clavate, 2-4 spored and clamped. Basidiospores 4-6 × 4-5 µm, broadly ellipsoid to subglobose, thin-walled, hyaline and smooth. Gloeocystidia 50-70 × 6-8 µm, thin walled, cylindrical with an obtuse apex. Hyphal system dimitic. Generative hyphae 3-5 µm wide, thin-walled and clamped. Skeletal hyphae 4-8 µm and thick walled.

Material examined: TURKEY—İstanbul: Belgrad Forest, Kömürcü Bent, on beech root, N 41° 12' - E 28° 57', 100 m, 22.10.2013, Akata 5864.

Discussion

Considering the checklists (Doğan et al., 2005; Sesli and Denchev, 2008) and the recent data on Turkish mycobiota (Acar et al., 2015; Akata, 2017; Akata and Uzun, 2017; Alkan et al., 2016; Allı et al., 2017; Altuntaş et al., 2017; Demirel and Koçak, 2016; Demirel et al., 2017; Doğan and Kurt, 2016; Öztürk et al., 2017; Sesli et al., 2016), *Chroogomphus mediterraneus* (Finschow) Vila, Pérez-De-Greg. & G. Mir, *Hebeloma sacchariolens* Quél., *Podoscypha multizonata* (Berk. & Broome) Pat. and *Sarcodontia pachyodon* (Pers.) Spirin are recorded for the first time from Turkey. Among them, *Podoscypha multizonata* is the first member of the genus *Podoscypha* in Turkey.

Hebeloma sacchariolens and *H. pallidoluctuosum* Gröger & Zschiesch. resemble each other in terms of similar morphology and ecology, but the latter has shorter cystidia and smaller basidiospores (Vesterholt, 2005). *Chroogomphus mediterraneus* can be confused with *C. rutilus* (Schaeff.) O.K. Mill. because of similar morphology, but the cystidia of the latter has thicker wall (up to 2.5 µm) than the former (up to 1 µm) (Li et al., 2009; Martin et al., 2016).

Podoscypha multizonata differs from other *Podoscypha* members by its distinctive rosette-like, reddish to pinkish brown

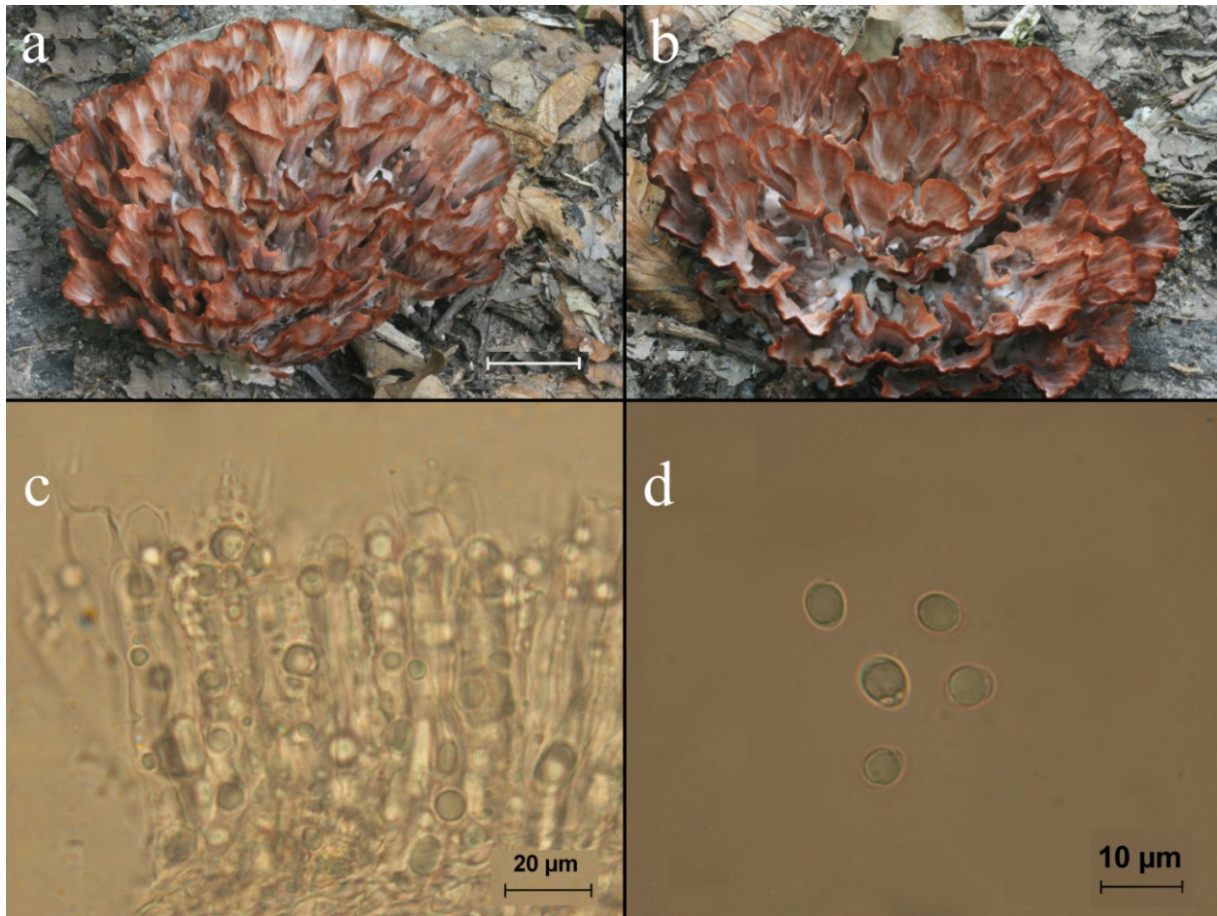


Figure 6. *Podoscypha multizonata*: a,b- basidiomata (scale bar: 50 mm)-c- basidia, d- basidiospores. Photos by I. Akata.

basidiomata consisting of numerous thin, tough and erect individual lobes. It is also macroscopically close to *Cotylidia pannosa* (Sowerby) D.A. Reid, except the diversity of their hyphal systems (Kout and Zibarova, 2013). *Sarcodontia pachyodon* macroscopically resembles some irpicoid species such as *Schizopora paradoxa* (Schrad.) Donk. and *Irpex lacteus* (Fr.) Fr. . However they differ because of the thinner fruit bodies and lacking clamp connections respectively (Breitenbach & Kränzlin, 1986).

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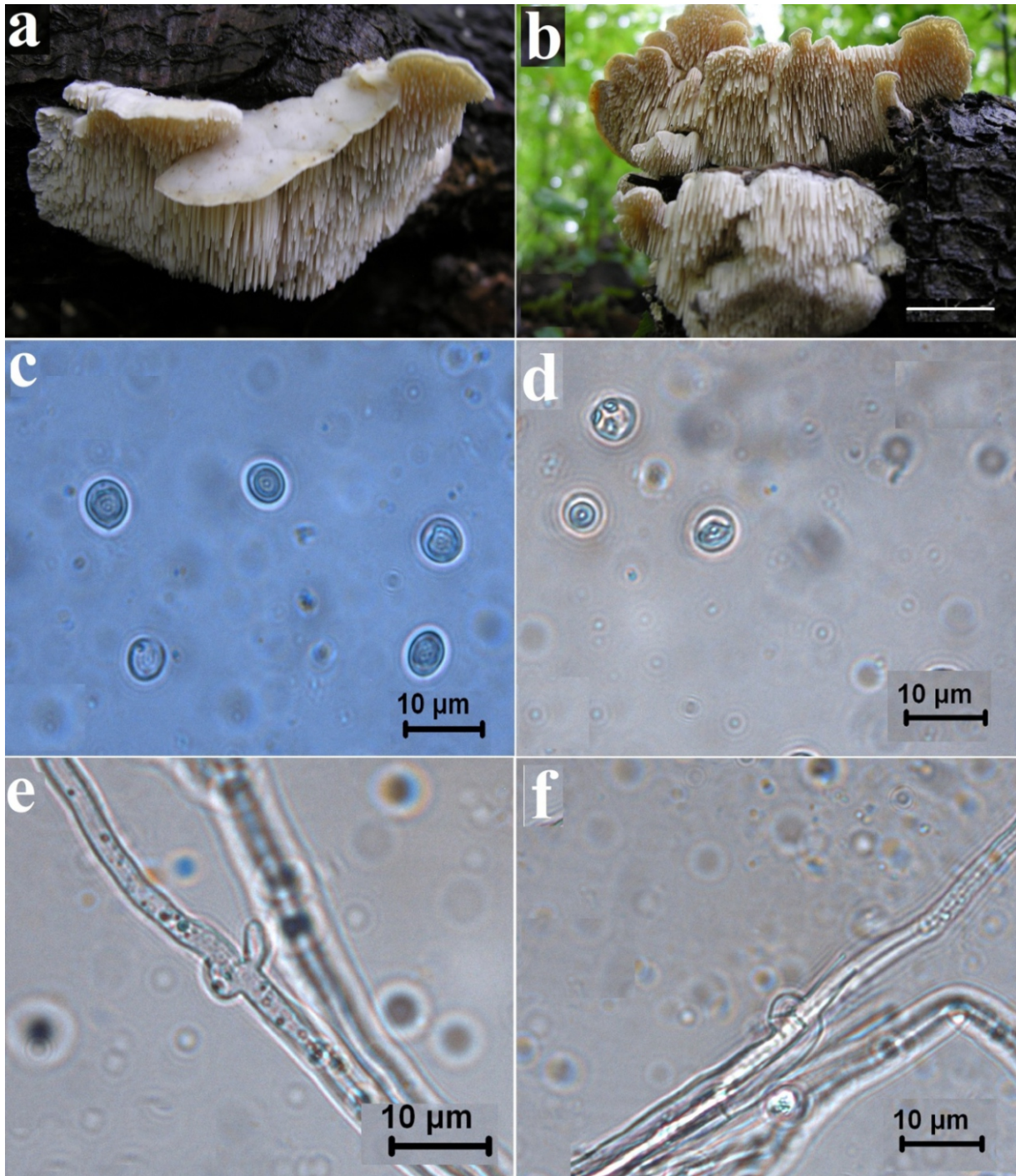


Figure 5. *Sarcodontia pachyodon*: a,b- basidiomata (scale bar: 20 mm) c,d- basidiospores, e,f- hyphae. Photos by I. Akata.



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