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***Leratiomyces percevalii*, A New Record for Turkish Mycobiota**

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Abstract: This study was conducted on macrofungus samples collected in Hakkari-Şemdinli and Yüksekova districts in 2014. According to field and laboratory data *Leratiomyces percevalii* (Berk. & Broome) Bridge & Spooner species which was identified for the first time in Turkey and added to the macromycota database of our country as new record. Thus, the number of species belonging to the genus in our country has increased to two. A short description of the species is given along with macroscopic and microscopic pictures.

Key words: *Basidiomycota*, Agaricales, *Leratiomyces percevalii*, Hakkari

***Leratiomyces percevalii*, Türkiye Mikobiyotası için Yeni Bir Kayıt**

Öz: Bu çalışma 2014 yılında Hakkari-Şemdinli ve Yüksekova ilçelerinde toplanan makrofungus örnekleri üzerinde yapılmıştır. Arazi ve laboratuvar verilerine göre teşhisi yapılan *Leratiomyces percevalii* (Berk. & Broome) Bridge & Spooner türü Türkiye'den ilk kez belirlenmiş ve ülke Makromikota veritabanına yeni kayıt olarak ilave edilmiştir. Böylece ülkemizdeki cinse ait tür sayısı ikiye çıkmıştır. Türün makroskobik ve mikroskobik resimleri ile birlikte kısa deskripsiyonu verilmiştir.

Anahtar kelimeler: *Basidiomycota*, Agaricales, *Leratiomyces percevalii*, Hakkari

Introduction

The agaric family *Strophariaceae* Singer & A.H. Sm. includes dark-spored mushrooms inhabiting a wide diversity of substrates, including litter, decaying wood, mosses, dung, fields, pastures, gardens and swamps (Singer 1986).

Until 2008, the species belonging to *Leratiomyces* were *Stropharia*, *Hypholoma*, *Psilocybe* and *Weraroa*.

The name *Leratiomyces* Bresinsky & Manfr. Binder was first proposed by Bresinsky and Binder (1998), and it was thought that this name would replace the generic name "Le Ratia" for the secondary mushrooms Patouillard (1907) to present small mushrooms from New Caledonia.

Later, Bridge et al. (2008) adopted the name *Leratiomyces* by making changes in the identification of the genus to describe the secotiaceous mushroom species. However, it was not published under the name *Leratiomyces* proposed by Bresinsky and Binder (1998).

As a result, the name issue was published as a valid name by Redhead and McNeill (2008) by studying all the features of the genus in detail.

Species of *Leratiomyces* are saprotrophic fungi and found in soil, wood debris and decayed trees, as well as plant debris, sandy soil and dry grassland habitats (Noordeloos.2011; Ryman 2012).

Leratiomyces genera is represented by 13 species worldwide and only one species *L. squamosus* (Pers.)



Bridge & Spooner is determined in Turkey until now (Sesli et al., 2020).

The number of *Leratiomyces* taxa present in Turkey was recorded as single species according to checklist of Turkish mycota (Sesli et al., 2020) and research studies conducted in Turkey (Güngör et al. 2015; Acar et al 2017; Akata, 2017; Allı et al., 2017; Altuntaş et al., 2017; Uzun et al., 2017; Akata et al., 2018; Acar and Kalmer 2018; Acar et al., 2018; Doğan 2018; Işık and Türkekul, 2018; Sadullahoğlu and Demirel 2018; Uzun and Kaya, 2018; Acar et al., 2019; Akata et al., 2019; Dizkırıncı et al., 2019; Kalmer et al. 2019; Acar et al. 2021), and it was aimed to increase this number to 2 through findings obtained within the present study.

Material and Method

During research in 2014, the samples which were collected from Hakkâri province were identified by their microscopic and macroscopic characters. Samples were collected from the surface of the remnants of the woods in the field. Basidiocarps were photographed in their natural habitats then they were dug and carried to the laboratory. Measurements for microscopic characters (spores, basidia, pileipellis, hyphae and cheilocystidia) were made by using a Leica DM500 research microscope. Microscopic studies was conducted properly by using surface matrix of the samples collected. All measurements were done with a Leica EZ4 stereo microscope with the Leica Application Suite (version 3.4.0) program. Forty spores, 25 basidia and 25 cheilocystidia measurements were made from *L. percevalii* for microscopic measurements. The identification of the samples was performed with the help of the relevant literature (Noordeloos, 1999; Bridge et al., 2008; Noordeloos, 2011). The identified samples are kept in the Fungarium of Yüzüncü Yıl University, Science Faculty, and Department of Biology.

Results

Brief description of *L. percevalii*, basidiomata photos and microscopic photos of basidia, cheilocystidia and pileipellis are provided as follows.

Leratiomyces percevalii (Berk. & Broome) Bridge & Spooner

Syn:

Agaricus percevalii Berk. & Broome, *Fungus percevalii* (Berk. & Broome) Kuntze,

Psilocybe percevalii (Berk. & Broome) P.D. Orton

Stropharia percevalii (Berk. & Broome) Sacc.,

Stropholoma percevalii (Berk. & Broome) Ryman

Macroscopic and microscopic features

Pileus 35-75 mm, hemispherical or conical then broadly convex or broadly bell-shaped, occasionally with a wide umbo, at first with violently confused then on deflexed or almost flatwise margin, viscid when young, but this property is short-lived, honey yellow when young, quickly turns yellowish, whitish, dirty olive color, lightly pallid on drying to ochraceous brown at center, glabrous or finely hairy in places, the edges carry white to pale yellow velum remnants especially when young. Lamellae adnate to subdecurrent, white, pale cream when young, then with yellow-green, pinkish grey, dark purple from ripening spores, grey-black, eventually deep violaceous grey or violaceous brown, with white, fimbriate margin. Stipe 50-120 × 3-9 mm, usually thinner towards the base or cylindrical, infrequently with subbulbous at base, an annular zone, darkened with falling spores, whitish, reddish brown stains towards to base, usually hairy at base, with distinct mycelial threads. Spores 11-17(19.5) × 6.7-9.5 µm, smooth, brown, more or less ellipsoid, broadly oblong to elongate in side-view, has an eccentric germ pore. Basidia 22-36 × 7-12 µm, hyaline, cylindrical to subclavate, 4-spored, with clamp. Cheilocystidia 40-70 × 4-6(7) µm, narrowly clavate to subcylindrical, flexuous. Pileipellis two layered, suprapellis a 50-140 µm thick ixocutis of radially arranged, cylindrical or slightly swollen 4-9 µm, pigment pale yellowish brown (Figure 1).

Hakkâri, district exit of Şemdinli, on remnant of woods, creek edge, 37° 18'419"N - 44° 33'522"E 1372 m, 24.10.2014, Acar. 418; - Yüksekova, Köşkönu village 37° 25'524"N - 44° 09'431"E 1670 m, 26.10.2014, Acar. 545.

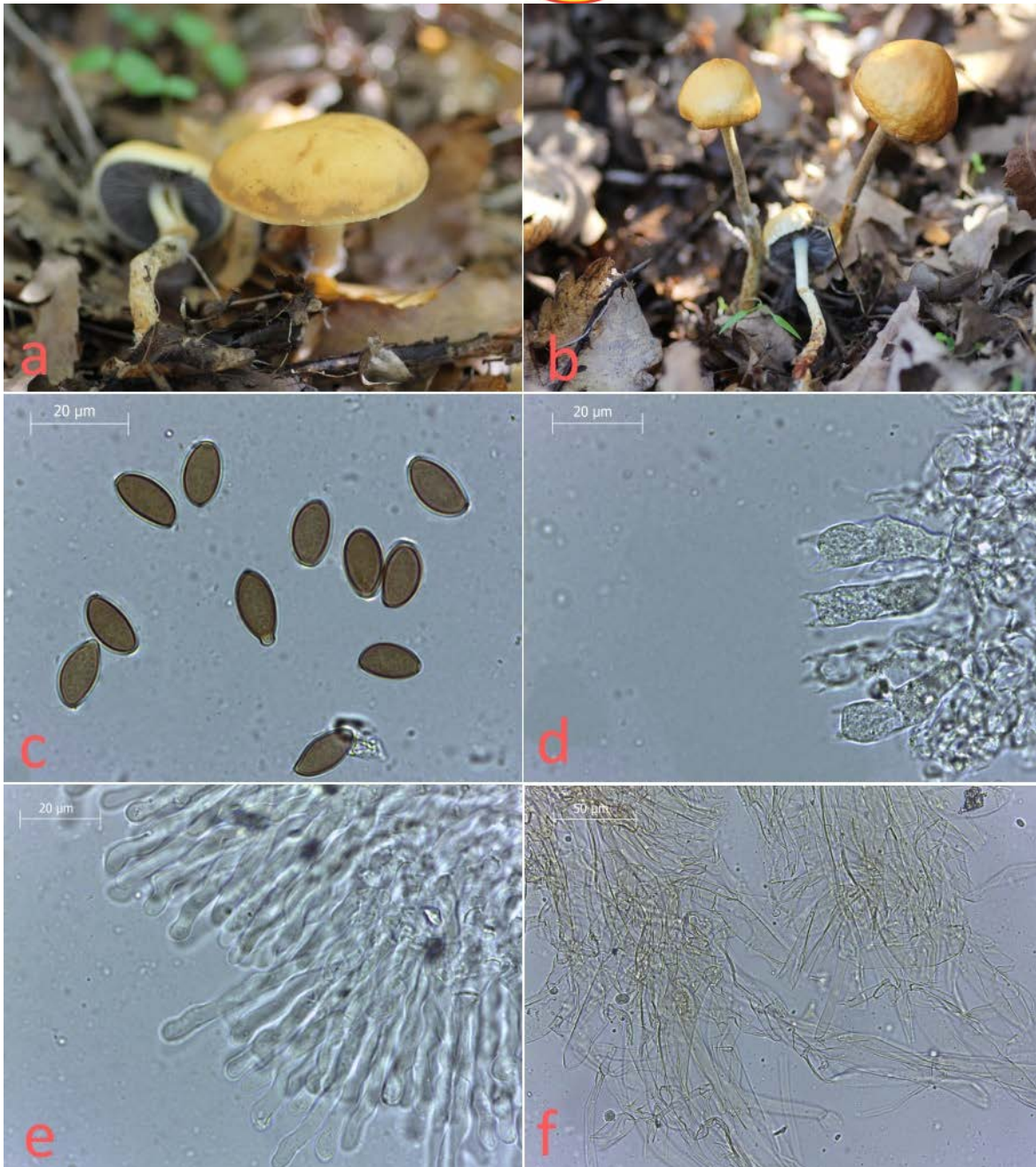


Figure1. *Leratiomyces percevalii* a-b. Basidiomata c. Basidiospores d. Basidia e. Cheilocystidia f. Pileipellis

Discussions

Leratiomyces is a genus represented by 13 species in the world (Redhead and McNeill, 2008). Species represented are *L. atrovirens* Bresinsky & Manfr. Binder, *L. ceres* (Cooke & Masee) Spooner & Bridge, *L. coccineus* (Masee & Wakef.) Bresinsky & Manfr. Binder, *L. cucullatus* (Shope & Seaver) Beever & D.C. Park, *L. erythrocephalus* (Tul. & C. Tul.) Beever & D.C. Park, *L. laetissimus* (Hauskn. & Singer) Borov., J. Stříbrný, Noordel., Gryndler & Oborník, *L. magnivelaris* (Peck) Bridge & Spooner, *L. percevalii* (Berk. & Broome) Bridge

& Spooner, *L. riparius* (A.H. Sm.) Redhead, *L. similis* (Pat. ex Sacc. & Trotter) Bresinsky & Manfr. Binder ex Redhead & McNeill, *L. smaragdinus* Pat. ex Bresinsky & Manfr. Binder, *L. squamosus* (Pers.) Bridge & Spooner and *L. tesquorum* Adamčík & Vizzini. *Leratiomyces squamosus*, the first species of *Leratiomyces* in our country, was published by Akata et al., 2010 and Uzun et al., 2017.

Leratiomyces percevalii is morphologically similar to *L. riparius* but *L. riparius* is recognized by a cream-buff cap, decorated with veil fragments when young and a



slender, typically twisted stipe and it grows under aspens, cottonwoods and alders. The dimension of *L. riparius* spores is 12-15 × 6-7.5 µm (Kuo, 2009; Desjardin et al., 2015).

In this study, *L. percevalii* was identified as a new record and so, the number of species in Turkey had risen to 2.

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References

- Acar, İ., Dizkırıcı-Tekpınar, A., Kalmer, A., Uzun, Y. (2017). Phylogenetic relationships and taxonomical positions of two new records *Melanoleuca* species from Hakkâri province, Turkey, *Biological Diversity and Conservation* 10(3): 85-93.
- Acar, İ., Kalmer, A. (2018). Two New Records for Turkish Macromycota from Diyarbakır (Hani) Province. *Journal of the Institute of Natural & Applied Sciences* 23 (3): 212-215.
- Acar, İ., Kalmer A, Uzun Y, Dizkırıcı Tekpınar A (2018). Morphology and Phylogeny Reveal a New Record *Gyromitra* for Turkish Mycobiota, *The Journal of Fungus* 9(2)176-181.
- Acar, İ., Uzun Y, Keleş A, Dizkırıcı Tekpınar A (2019). *Suilellus amygdalinus*, a new species record for Turkey from Hakkâri Province, *Anatolian Journal of Botany* 3(1): 25-27.
- Acar, İ., Uzun Y, Kalmer A, Dizkırıcı Tekpınar A, Öğün Y (2021). A New Record for Turkish Mycobiota from Selim (Kars) District, *The Journal of Fungus*, 12(1)65-70
- Akata, I., Çetin, B. Işıloğlu, M. (2010). Macrofungal diversity of Ilgaz Mountain National Park and its environs (Turkey). – *Mycotaxon* 113: 287–290.
- Akata, I. (2017). Macrofungal Diversity of Belgrad Forest (İstanbul). *Kastamonu Üniversitesi Orman Fakültesi Dergisi*, 17(1): 150-164.
- Akata, I. & Uzun, Y. (2017). Macrofungi determined in Uzungöl Nature Park (Trabzon). *Trakya University Journal of Natural Sciences*, 18(1): 15-24.
- Akata, I., Doğan HH, Öztürk Ö, Bozok F. (2018). *Suillus lakei*, An Interesting Record For Turkish Mycobiota, *The Journal of Fungus*, 9(2)110-116.
- Akata, I., Altuntaş, D. & Kabaktepe Ş. (2019). Fungi Determined in Ankara University Tandoğan Campus Area (Ankara-Turkey). *Trakya University Journal of Natural Sciences*, 20(1): 47-55.
- Akçay, ME (2019). A New Edible Macrofungus Record for Turkey, *Journal of Natural & Applied Sciences of East* 2(1): 10-15.
- Allı, H., Candar, S.S. & Akata, I. (2017). Macrofungal Diversity of Yalova Province. *Mantar Dergisi*, 8(2): 76-84.
- Altuntaş, D., Allı, H. & Akata, I. (2017). Macrofungi of Kazdağı National Park (Turkey) and its close environs. *Biological Diversity and Conservation*, 10(2): 17-25.
- Binder, M, Besl H, Bresinsky A. (1997). Agaricales oder Boletales? Molekularbiologische Befunde zur Zuordnung einiger umstrittener Taxa. *Z. Mykol.* 63: 189–196.
- Bresinsky, A., Binder M. (1998). *Leratiomyces* nom. nov. für eine bislang nicht gültig beschriebene Gattung der *Strophariaceae* (Agaricales) aus Neukaledonien. *Z. Mykol.* 64: 79–82.
- Bridge, P.D. Spooner, B.M. Beever, R.E. Park, D.C. (2008). Taxonomy of the fungus commonly known as *Stropharia aurantiaca*, with new combinations in *Leratiomyces*. *Mycotaxon.* 103:109-121.
- Desjardin, DE., Wood, M.G. & Stevens, FA. (2015). *California Mushrooms: The Comprehensive Identification Guide*. Timber Press: Portland, OR. 560 p.
- Dizkırıcı, A., Acar İ., Kalmer A, Uzun, Y. (2019). Morphological and Molecular Characterization of *Hebeloma subtortum* (*Hymenogastraceae*), a New Record Macrofungus from Bingöl Province, Turkey, *Kastamonu Uni., Orman Fakültesi Dergisi*, 19(1): 1-10.
- Doğan, HH. (2018). A new Genus, *Schenella*, Addition to Turkish Mycota from *Geastraceae*, *The Journal of Fungus*, 9(2)92-94.
- Güngör H, Solak MS, Allı H, Işıloğlu M, Kalmış E. (2015). New records for Turkey and contributions to the macrofungal diversity of Isparta Province. *Turk J Bot*, 39: 867-877.
- Işık, H. & Türkeul, İ. (2018). New additions to Turkish macrofungi from Tokat and Yozgat Provinces. *Mycotaxon*, 133(4):697-709.
- Kalmer, A., Acar İ., Dizkırıcı Tekpınar, A. (2019). Phylogenetic and Taxonomic Studies on *Cortinarius caerulescens* (Schaeff.) Fr. a New Record for Turkish Mycota. *The Journal of Fungus*, 10(1)8-16.



- Kuo, M. (2009). *Leratiomyces perzevalii*. Retrieved from the MushroomExpert.Com Web site: http://www.mushroomexpert.com/leratiomyces_perzevalii.html.
- Moncalvo, J-M, Vilgalys R, Redhead, SA., Johnson JE, James TJ, Hofstetter V, Verduin S, Larsen E, Baroni TJ, Thorn RG, Jacobsson, S., Clémenton H., Miller, OK. (2002). One hundred and seventeen clades of euagarics. *Molec. Phylogen. Evol.* 23: 357–400.
- Noordeloos, M.E. (1999). *Strophariaceae*. In: Bas, C., Kuyper, T.W., Noordeloos, M.E. & Vellinga, E. (Eds.) *Flora Agaricina Neerlandica*. Vol. 4. A.A. Balkema, Rotterdam, pp. 27–107.
- Noordeloos, M.E. (2011). *Fungi Europaei - Strophariaceae* s.l. 13:1-648.
- Redhead, S.A. McNeill, J. (2008). The generic name *Leratiomyces* (*Agaricales*) once again. *Mycotaxon*. 105:481-488.
- Ryman, S. (2012). *Stropharia* (Fr.) Quéf. In: Knudsen H, Vesterholt J, editors. *Funga Nordica*. Agaricoid, boletoid, clavarioid, cyphelloid and gastroid genera. Copenhagen: Nordsvamp; p. 965–970.
- Sadullahoğlu C, Demirel K. (2018). *Flammulina fennae* Bas, A new record from Karz Mountain (Bitlis). *Anatolian Journal of Botany* 2(1): 19-21.
- Sesli, E., Asan, A., and Selçuk, F. (eds) Abacı Günyar, Ö., Akata, I., Akgül, H., Aktaş, S., Alkan, S., Allı, H., Aydoğdu, H., Berikten, D., Demirel, K., Demirel, R., Doğan, H.H., Erdoğan, M., Ergül, C.C., Eroğlu, G., Giray, G., Haliki Uztan, A., Kabaktepe, Ş., Kadaifçiler, D., Kalyoncu, F., Karaltı, İ., Kaşık, G., Kaya, A., Keleş, A., Kırbağ, S., Kıvanç, M., Ocak, İ., Ökten, S., Özkale, E., Öztürk, C., Sevindil, M., Şen, B., Şen, İ., Türkeul, İ., Ulukapı, M., Uzun, Ya., Uzun, Yu., Yoltaş, A. (2020). *Türkiye Mantarları Listesi (The Checklist of Fungi of Turkey)*. Ali Nihat Gökyiğit Vakfı Yayını. İstanbul. P. 1177.
- Uzun, Y., Acar, İ., Akçay, M.E. & Kaya A. (2017). Contributions to the macrofungi of Bingöl, Turkey. *Turkish Journal of Botany*, 41: 516-534.
- Uzun, Y., Kaya, A. (2018). *Leucocoprinus cepistipes*, A New Coprinoid Species Record for Turkish Macromycota, Süleyman Demirel University Journal of Natural and Applied Sciences Volume 22, Issue 1, 60-63.
- Walther, G., Garnica S., Weiß K. (2005). The systematic relevance of conidiogenesis modes in the gilled Agaricales. *Mycol. Res.* 109: 525–544.