



Research Article

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First Record of *Imperator torosus* for the Mycobiota of Türkiye

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Abstract

Imperator torosus (Fr.) Assyov, Bellanger, Bertéa, Courtec., Koller, Loizides, G. Marques, J.A. Muñoz, Oppicelli, D. Puddu, F. Rich. & P.-A. Moreau (Boletaceae) was reported as new record for the mycobiota of Türkiye, based on the identification of the samples collected from Gerede and Mudurnu districts of Bolu province. This species is the second member of the genus *Imperator* Koller, Assyov, Bellanger, Bertéa, Loizides, G. Marques, P.-A. Moreau, J.A. Muñoz, Oppicelli, D. Puddu & F. Rich. in Türkiye. A brief description of the Turkish collections is provided together with the photographs, related to its macro and micromorphologies.

Keywords: Biodiversity, Boletales, new record, Türkiye

Imperator torosus'un Türkiye Mikobiyotası İçin İlk Kaydı

Özet

Imperator torosus (Fr.) Assyov, Bellanger, Bertéa, Courtec., Koller, Loizides, G. Marques, J.A. Muñoz, Oppicelli, D. Puddu, F. Rich. & P.-A. Moreau (Boletaceae) Bolu'un Gerede ve Mudurnu ilçelerinden toplanan örneklerin teşhisine bağlı olarak, Türkiye mikobiyotası için yeni kayıt olarak rapor edilmiştir. Bu tür *Imperator* Koller, Assyov, Bellanger, Bertéa, Loizides, G. Marques, P.-A. Moreau, J.A. Muñoz, Oppicelli, D. Puddu & F. Rich. cinsinin Türkiye'deki ikinci üyesidir. Türün kısa bir betimlemesi, makro ve mikromorfolojisine ilişkin fotoğraflarıyla birlikte verilmiştir.

Anahtar kelimeler: Biyoçeşitlilik, Boletales, yeni kayıt, Türkiye

INTRODUCTION

Imperator Koller, Assyov, Bellanger, Bertéa, Loizides, G. Marques, P.-A. Moreau, J.A. Muñoz, Oppicelli, D. Puddu & F. Rich. is a boleteoid genus situated within the order Boletales. It was initially delimitated by Assyov et al. (2015) based on recent molecular studies related to Boletaceae (Nuhn et al. 2013; Wu et al. 2014). Members of this genus are predominantly characterized by a reticulate stipe ranging in color from yellow to reddish-orange, exhibiting a dark purplish-red staining from the base as they mature. Additionally, a distinctive blue to blackish discoloration occurs on the pileus surface upon tactile contact, accompanied by an intense blueing reaction in the context when incised (Breitenbach & Kränzlin 1991; Hills 1997; Assyov 2013).

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Gürzoğlu, A., Yeşilyurt, F., Karaduman, Y., Uzun, Y. & Kaya, A. (2024). First Record of *Imperator torosus* for the Mycobiota of Türkiye. *Türler ve Habitatlar* 5(1): 21–25.

Index Fungorum (2024) lists four members of this genus, *Imperator luteocupreus* (Bertéa & Estadès) Assyov, Bellanger, Bertéa, Courtec., Koller, Loizides, G. Marques, J.A. Muñoz, Oppicelli, D. Puddu, F. Rich. & P.-A. Moreau, *I. rhodopurpureus* (Smotl.) Assyov, Bellanger, Bertéa, Courtec., Koller, Loizides, G. Marques, J.A. Muñoz, Oppicelli, D. Puddu, F. Rich. & P.-A. Moreau, *I. torosus* (Fr.) Assyov, Bellanger, Bertéa, Courtec., Koller, Loizides, G. Marques, J.A. Muñoz, Oppicelli, D. Puddu, F. Rich. & P.-A. Moreau and *I. xanthocyaneus* (Romain) Klofac, among which *I. torosus* is the type species of the genus.

Imperator rhodopurpureus is the only member of the genus that has been reported from Türkiye (Sesli et al. 2020). The current checklist (Sesli et al. 2020) and the most recent contributing studies (Akçay et al. 2022; Allı 2022; Polat & Keleş 2022; Acar & Dizkırıcı 2023; Yeşilyurt et al. 2023) on Turkish mycobiota indicate that any other member of the genus *Imperator* haven't been reported from Türkiye before. Here, we introduce *I. torosus* as a new record for the mycobiota of Türkiye.

MATERIAL AND METHOD

Basidiocarps of *Imperator torosus* were collected from Gerede and Mudurnu districts of Bolu province in 2023 during routine field surveys. Fruit bodies at different development stages were photographed in their natural habitat, and necessary notes were taken related to their ecological and other descriptive characteristics. Subsequently, the samples were transferred to the fungarium in paper boxes and dried in a climate-controlled room. Microscopic investigations were carried out on the sections obtained from dried material, and conducted under a Leica DM 2500 trinocular light microscope, and photographs related to micromorphology were taken by a Relab Sony imx 8.3 mp usb 3.0 camera. The samples were identified by comparing the accumulated descriptive data with the existing literature (Breitenbach & Kränzlin 1991; Hills 1997; Assyov 2013; Bertolini & Simonini 2013). The specimens are kept at Biology Department, Kamil Özdağ Science Faculty, Karamanoğlu Mehmetbey University.

RESULTS AND DISCUSSION

Basidiomycota R.T.Moore

Boletaceae Chevall.

Imperator torosus (Fr.) Assyov, Bellanger, Bertéa, Courtec., Koller, Loizides, G. Marques, J.A. Muñoz, Oppicelli, D. Puddu, F. Rich. & P.-A. Moreau (Figures 1-2).

Synonyms. [*Boletus appendiculatus* subsp. *torosus* (Fr.) Konrad, *Boletus torosus* Fr., *Boletus torosus* var. *gallicus* Romagn., *Boletus torosus* var. *xanthus* Cetto, *Boletus torosus* var. *xanthus* Cetto, *Dictyopus torosus* (Fr.) Quél., *Suillellus torosus* (Fr.) Blanco-Dios, *Suillus torosus* (Fr.) Kuntze, *Tubiporus torosus* (Fr.) Imler].

Macroscopic and microscopic features

Pileus 70-160 mm in diameter, globose to almost spherical when young, then hemispherical, convex to flattish at maturity. Surface smooth to somewhat velvety at first, later slightly tuberculate and with some slight linear depressions, finely appressed tomentose suedelike to somewhat glabrous at maturity, reddish brown with yellowish tint when young, later wineceous to dark olive-brown, immediately bluing strongly when touched or bruised (Fig. 1). Margin slightly incurved for a long time. Flesh thick, firm, yellowish to pale yellow, immediately turning to blue. Taste mild, odor

fruity. Pores round and small, bright to sulphur-yellow when young, orange-yellow to pale orange, especially towards the stipe, at maturity, immediately bluing when touched. Tubes up to 20 mm, yellow, bluing when cut, tube mouths pale orange. Stipe 60-120 × 40-70 mm, bulbous when young, bulbous-ventricose to clavate at maturity, brownish yellow to sulphur yellow when young, pale yellow to pale brownish yellow at maturity, covered with a reddish-brown reticulation, immediately bluing strongly when touched or bruised. Basidia 39-47 × 9-14 µm, clavate, generally four-spored, without a basal clamp. Cheilocystidia 35-50 × 6-8 µm, narrowly fusiform, pleurocystidia slightly shorter but similar to cheilocystidia. Basidiospores 12-15.5 × 5-6.7 µm, ellipsoid to somewhat fusiform, thick walled, some with small drops (Figure 2).



Figure 1. Basidiocarps of *Imperator torosus*.

Imperator torosus was reported to grow either solitarily or gregariously in calcareous soils within hardwood forests, often in association with deciduous trees such as *Carpinus* L., *Fagus* L., and particularly various species of *Quercus* L. The fruiting period occurs from spring through late summer (Alessio 1985; Breitenbach & Kränzlin 1991; Hills 1997; Assyov 2013).

Imperator torosus is added as a new record for Turkish Mycobiota. This species is the second member of the genus *Imperator* in Türkiye. In general, the characteristics of the sample are in agreement with Breitenbach and Kränzlin (1991), Hills (1997) and Assyov (2013).

Imperator torosus somewhat resembles *Cyanoboletus poikilochromus* (Pöder, Cetto & Zuccher.) M. Carbone, D. Puddu & P. Alvarado, but smaller fruit body, somewhat cylindrical stipe, and the lighter colours of younger fruit bodies of *C. poikilochromus* differs it from *I. torosus*. *Imperator torosus* is sometimes confused with *I. luteocupreus*, but the latter species is well separated by uniformly vivid red color of the pores even in young basidiocarps, while in *I. torosus* pores are mainly yellow (Assyov 2005).

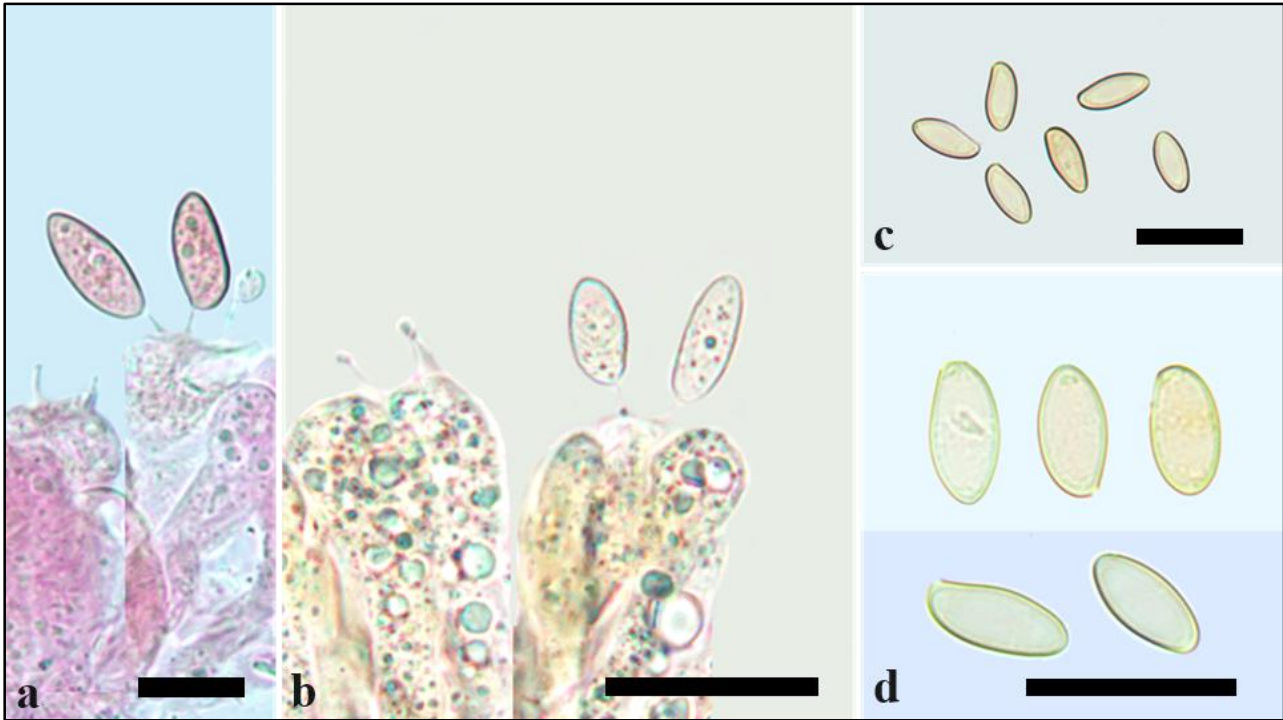


Figure 2. Basidia and basidiospores (a,b) and basidiospores (c,d) of *Imperator torosus* (bars: a- 10 μ m, b-d- 20 μ m) (a- in Congo Red, b-d- in water).

Specimen examined

Imperator torosus. Türkiye. Bolu: Gerede, Hacı Veli High Plateau, on soil under *Abies* Mill. sp., 40.817990N, 32.184118E, 1400 m, 12.08.2023, Y.Karaduman 30; Mudurnu, Sinekli High Plateau, on soil under *Fagus* L. sp., 40.630760N, 31.287723E, 1450 m, 13.08.2023, A.Gürzoğlu 10.

AUTHOR CONTRIBUTION STATEMENT

In this study; the study idea and design, data collection, analysis and interpretation of the results, and drafting of the article were made by the authors.

REFERENCES

- Acar, İ. & Dizkırıcı, A. (2023). *Agaricus micromegethus*, a new record for Turkish Mycobiota. *Anatolian Journal of Botany* 7(2): 128–130.
- Akçay, M.E., Dengiz, Y. & Kesici, S. (2022). *Coprotus* Korf & Kimbr.: A new coprophilous genus record for the mycobiota of Türkiye. *Anatolian Journal of Botany* 6(2): 75–77.
- Alessio, C.L. (1985). *Boletus* Dill. ex. L. *Fungi Europaei* (in Italian). Vol. 2. Saronno, Italy: Biella Giovanna.

- Allı, H. (2022). Muğla Sıtkı Koçman Üniversitesi Kampüsünde Yetişen Makromantarlar. *Mantar Dergisi* 13(2): 96–104.
- Assyov, B. (2005). New and rare Bulgarian boletes. *Mycologia Balcanica* 2: 75–81.
- Assyov, B. (2013). "*Boletus torosus*". <https://boletales.com/genera/boletus/b-torosus/> [15.02.2024].
- Assyov, B., Bellanger, J.M., Bertéa, P., Courtecuisse, R., Koller, G., Loizides, M., Marques, G., Muñoz, J.A., Oppicelli, N., Puddu, D., Richard, F. & Moreau, P.A. (2015). Nomenclatural novelties. *Index Fungorum* (243).
- Bertolini, V. & Simonini, G. (2013). Problemi nomenclaturali inerenti alla Famiglia Boletaceae I. Tipificazioni: *Boletus torosus*, *Boletus rhodopurpureus* e *B. emilei*. *Rivista di Micologia* 2: 117–134.
- Breitenbach, J. & Kränzlin, F. (1991). *Fungi of Switzerland*, Vol. 3. Lucerne: Verlag Mykologia.
- Hills, A. (1997). Notes on British species of the *Boletus torosus* complex. *Mycologist* 11(4): 159–164.
- Index Fungorum (2024). <http://www.indexfungorum.org/Names/Names.asp>. [15.01.2024].
- Nuhn, M.E., Binder, M., Taylor, A.F., Halling, R.E. & Hibbett, D.S. (2013). Phylogenetic overview of the Boletineae. *Fungal Biology* 117(7–8): 479–511.
- Polat, T. & Keleş, A. (2022). Macrofungal biodiversity of Kop Mount (Bayburt-Erzurum). *Anatolian Journal of Botany* 6(2): 109–114.
- Sesli, E., Asan, A., 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., Erdoğdu, M., Ergül, C.C., Eroğlu, G., Giray, G., Halikî 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., Sevindik, M., Şen, B., Şen, İ., Türkekul, İ., Ulukapı, M., Uzun, Ya., Uzun, Yu. & Yoltaş, A. (2020). *Türkiye Mantarları Listesi*. Ali Nihat Gökyiğit Vakfı Yayını. İstanbul.
- Wu, G., Feng, B., Xu, J., Zhu, X.T., Li, Y.C., Zeng, N.K., Hosen, M.I. & Yang, Z.L. (2014). Molecular phylogenetic analyses redefine seven major clades and reveal 22 new generic clades in the fungal family Boletaceae. *Fungal Diversity* 69(1): 93–115.
- Yeşilyurt, F., Uzun, Y. & Kaya, A. (2023). *Pseudoboletus parasiticus* (Bull.) Şutara, a New Record for Turkish Mycobiota. *Biological Diversity and Conservation* 16(1): 70–74.