EUROPEAN BOLETES

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Imperator rhodopurpureus
(Molnár Renátó)

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VOLUME 1

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Butyriboletus appendiculatus (Schaeff.) D. Arora & J. L. Frank

Mycologia 106(3): 466, 2014.

Synonyms

= *Boletus appendiculatus* Schaeff. in Fungorum qui in Bavaria et Palatinatu circa Ratisbonam nascuntur icones nativis coloribus expressae 4: 86, t. 130, 1774. (basionym)
= *Boletus radicans* var. *appendiculatus* (Schaeffer) Persoon, Synopsis Methodica Fungorum, p. 507, 1801.
= *Boletus edulis* f. *appendiculatus* Fr., Systema Mycologicum I:390, 1821.
= *Boletus aereus* Bull. s. Krombholz, Naturgetreue Abbildungen und Beschreibungen der essbaren, schädlichen und verdächtigen Schwämme 5, p. 10, tab. 36, fig. 1-7, 1836.
= *Dictyopus appendiculatus* (Schaeffer) Quélet (1886), Enchiridion fungorum in Europa media et praesertim in Gallia vigentium, p. 160, 1886.
= *Suillus appendiculatus* (Schaeffer) Kuntze, Revisio generum plantarum, 3, p. 535, 1898.
= *Tubiporus appendiculatus* (Schaeffer) Ricken, Vademecum für Pilzfreunde, Edn 1, p. 207, 1918.
= *Boletus radicans* Pers. s. Rostkovius, in Sturm, Deutschlands Flora, Abt. III, Die Pilze Deutschlands, 5(23), p. 84, tab. 26, 1844.
= *Boletus irideus* Rostkovius, in Sturm, Deutschlands Flora, Abt. III, Die Pilze Deutschlands, 5(22), p. 65, tab. 15, 1844.

Description

Pileus: 5-15 (–25) cm broad, firstly hemispherical, then more or less convex, finally pulvinate, rarely flat or slightly depressed with a straight or wavy margin, sometimes slightly bumpy, light brown, grey-brown or brown in early development, later deep brown, rarely chestnut brown to reddish-brown; slightly reddish-brown or darker brown when bruised. Pileus surface initially dry, dull, tomentose when young, later more or less glabrous; faintly cracked in dry conditions. **Tubes**: 15-30 mm long at maturity, adnate to depressed around the stipe apex, pale yellow to vivid yellow, yellow-olive in aged specimens, faintly bluing on exposure, sometimes unchangeable. **Pores**: small, up to 1 mm broad, concolorous with the tubes, turning bluish-green when handled. Spore print dark olive-brown. **Stipe**: 5-13(–15) × 3-6 cm, fibrous, fleshy, usually deeply rooting in the substrate, subspherical or ventricose-fusiform when young, subcylindrical to very slightly clavate at maturity; straight or curved, tapering towards the base, often with a short taproot; pale to vivid yellow, sometimes gradually discolouring in places or entirely to dingy white or dingy yellowish; not infrequently faintly brownish or with brown spots in the lower half, turning light blue when touched or damaged, covered with a whitish, yellowto brownish fine reticulum in the upper part of the stipe and usually extending to the lower half. Basal tomentum whitish-yellowish, sometimes rusty-brownish. **Context:** very firm and compact up to maturity, yellow, usually lighter yellow to almost whitish in the inner part, brownish at the base, sometimes erratically bluing on exposure, predominantly above the tubes or in the pileus and in the uppermost part of the stipe, not or only rarely bluing elsewhere. Insect larval tunnels inside tubes brown.

Odor: not distinctive or faintly, mushroomy. **Taste**: mild, pleasant

Spores: (9,0)11,0–14,0(15,5) × 3,5–5,5 µm, Q: 2–3,5; smooth, ellipsoid-fusiform, in side view with a distinct suprahilar depression; with 1-3 large oil droplets. **Basidia:** 30-42 × 7-12 µm, tetrasporic, clavate. **Cystidia:** 33-53 × 9-15 µm. **Pileipellis:** trichoderm of interwoven septate, filamentous-cylindrical hyphae, 4-10 µm wide, hyaline to pale ochraceous, some embedded in gelatinous matter. Terminal cells usually slightly swollen and rounded towards the apex (Assyov 2012). The surface of the stipe is covered with isolated tufts of caulohymenial elements with scattered fertile caulobasidia (Janda & Kříž 2016).

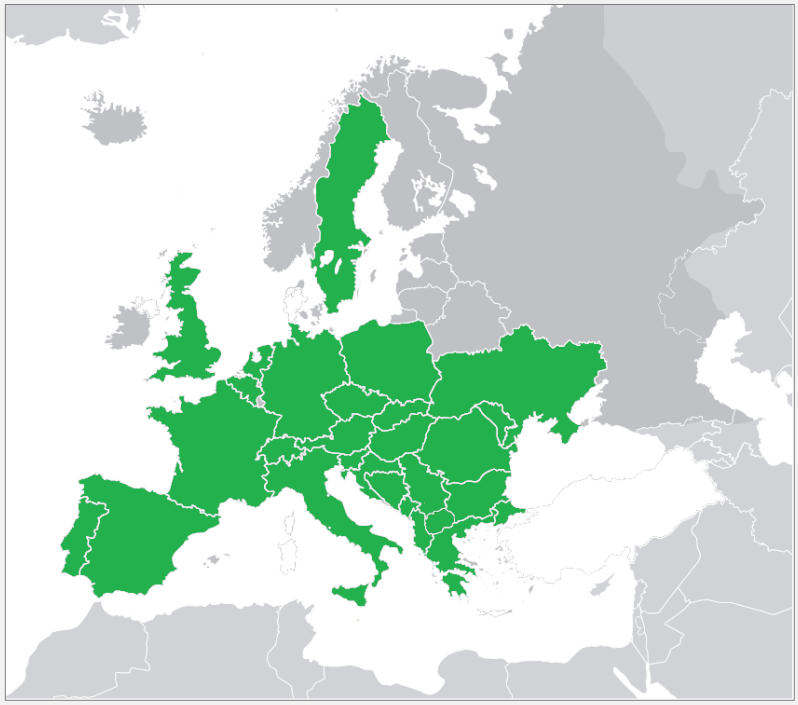
Chemical reactions: the hyphae of the context in the stipe base inamyloid with Melzer's solution.

Ecology

Butyriboletus appendiculatus grows from June to October in mixed deciduous forests or in some countries (e.g. Czech republic) on the dam of the pond (Janda & Kříž 2016). With a few exceptions, it grows mainly in warmer areas in lowlands and uplands, under oaks (*Quercus* spp.), beeches (*Fagus sylvatica*), hornbeams (*Carpinus betulus*) and sweet chestnut (*Castanea sativa*) in Mediterranean area, on alkaline (calcareous) limestone. In some countries (especially in the Czech Republic and Poland), an unusual occurrence of this species has been recorded in sub-mountane to mountane areas under coniferous trees (Janda & Kříž 2016) - *Abies alba* or *Picea abies*. In Southern Europe its growth is also reported under *Cistus* sp. (Alessio 1981). Typical for this species is the gregarious to subcaespitose growth and it can also be found in very dry weather conditions when other mushrooms species are generally absent. Of all the European species of the genus *Butyriboletus*, it is undoubtedly the most common and is a good indicator of the occurrence of other rarer bolete species.

Distribution

Distribution: widespread in most European countries except the Nordic regions (Scandinavia), where it occurs rarely only in the southernmost areas. Outside Europe, it is reliably documented from Israel (Biketova et al. 2015). According to photographic material, a finding from Algeria (Boukerker & Boumedjane 2018), probably represents *Hemileccinum impolitum*. One reliably documented find, which currently represents the easternmost confirmed locality, is from Georgia (Caucasus) near the town of Kojori on a calcareous bedrock in a beech-hornbeam forest (leg. and det. Archil Kvelashvili).



M.Mikšík

Butyriboletus appendiculatus, 6.8.2012, Czech Republic, Žehuňská game preserve, under the oaks on the limestone bedrock (MM 2012B36).

Edibility: An edible species of average quality. In addition, it is usually wormy and requires longer cooking due to its hard context.

Affinities*: Butyriboletus subappendiculatus* differs in the smaller size of the basidiomes (pileus up to 12 cm diam.), lighter colour of the pileus, shorter tubes (up to 10 mm long), a rather clavate base of the stipe, more pronounced reticulum and the usually non-bluing context, which turns pinkish to reddish at the stipe base about one hour after cutting. It typically grows at higher elevations and somewhat cooler conditions under fir (*Abies alba*), more rarely under beech. However, as already mentioned, *B. appendiculatus* is rare on sites that are preferred to *B. subappendiculatus*, although both species have been found together on a site. *Butyriboletus fuscoroseus* is distinguished by its matt, old pinkish to pinkish brown colored pileus, which becomes brownish ochre with age, context bluing more intensely and usually by the presence of a red band or shades in the lower part of the stipe. Like *B.appendiculatus*, it forms a mycorrhiza with oaks and in some areas both species have been shown to grow together, but *B.fuscoroseus* is undoubtedly rarer. *Hemileccinum impolitum* is distinguished by its lighter-colored, fawn-colored, cream or light ochre pileus (the pileus becomes distinctly brown only after handling or in rainy weather), it has a stipe devoid of reticulum which is covered with small and ephemeral, non-darkening scales, tissues not turning blue when touched or damaged, and a typical smells of iodoform at least at the stipe base (Janda…). Both species have similar ecological requirements and often grow together in the same woodlands. About extraeuropean species, the most similar is *B. persolidus* D.Arora & J.L. Frank which grows solitary to scattered with oaks (*Quercus* spp.) and tanbark oak (*Lithocarpus densiflora*) in western North America (California, central and northern Sierra Nevada foothills, Oregon to Canada - southern British Columbia). It was incorrectly identified as *B. appendiculatus* (Thiers 1975, Arora 1986), before being described as a distinct species (Arora & Frank 2014). The similarly colored, so far only provisionally described species *Butyriboletus pakistanicus* nom. prov., differs by its lighter pileus and, microscopically, by the shorter basidia (25-30 × 7-10 µm). It was found at an altitude of 1950 m under *Quercus incana*. It was also distinguished as a separate species by molecular analysis (Khan 2018).

B.Bušek

Butyriboletus appendiculatus, 8.9.2020, Czech Republic, Bechov-Svobodín, pod duby na vápnitém podloží (not preseved). The brown colouring of the insect burns and the slight bluing of the flesh in the pileus above the tubes are clearly visible on the section.

J.Malý

Butyriboletus appendiculatus, 15.8.2019, Czech Republic ……. Very rarely, the hat may be coloured in reddish-brown colours and may thus resemble the related species *Butyriboletus fuscoroseus* and *Butyriboletus regius*.

Butyriboletus appendiculatus, 16.7..2021, Czech Republic, Kozodírky, *Butyriboletus appendiculatus*, 15.8.2019, Czech Republic, Kozodírky village, dams of the pond "Stejskal" under the oaks on the limestone bedrock (not preserved). Under the right conditions, the fruit bodies can have a pileus size of over 20 cm at maturity.

M.Mikšík

M.Mikšík

Boletus aereus, 7.7.2018, Czech Republic, Jabkenice game preserve, under the beeches on the limestone bedrock (MM 2018B5). This species is characterized by the fact that it can grow even in very dry weather, when other mushroom species practically do not fructify. In this case, its pileus may even be cracked in older fruit bodies.

M.Miksik

Butyriboletus appendiculatus, 12.8.2012, Czech Republic, Žehuňská game preserve, under the oaks on the limestone bedrock (not preserved). This species often grows in clusters of more than 10 fruiting bodies.

J.Polčák

Butyriboletus appendiculatus, 2.7.2016 Czech Republic, Beskydy mountains, Under fir trees on calcareous subsoil (MM 2012B36). Rarely this species also grows under conifers, spruces (*Picea*) and firs (*Abies*).