

= Boletus auripes =

Boletus auripes , commonly known as the butter @-@ foot bolete , is a species of bolete fungus in the family Boletaceae . First described from New York in 1898 , the fungus is found in eastern Asia , Central America , and eastern North America from Canada to Florida . It is a mycorrhizal species and typically grows in association with oak and beech trees .

The fruit bodies (mushrooms) formed by the fungus have convex to nearly flat caps that are up to 13 cm (5 @.@ 1 in) wide . The stems are up to 10 cm (3 @.@ 9 in) long by 3 cm (1 @.@ 2 in) thick , and feature reticulations (net @-@ like ridges) on the upper portion . Other than the brownish upper cap , the entire surface of the mushroom is yellow . *B. auripes* is edible . It can be distinguished from other similar yellow boletes by differences in color , degree of stem reticulation , and distribution .

= = Taxonomy = =

The species was originally described by American mycologist Charles Horton Peck in 1898 . Peck collected the type specimen in Port Jefferson , New York . In 1945 , Rolf Singer proposed the variety *Boletus auripes* var. *aureissimus* as a new combination of the name *Ceromyces aureissimus* described by William Alphonso Murrill in 1938 ; this taxon is now regarded as a distinct species under the name *Boletus aureissimus* . In 1936 , Wally Snell reported finding a specimen of *Boletus crassipes* , another species described by Peck from Mount Gretna , Pennsylvania . Snell suggested that although *B. crassipes* might be a valid species distinguished from *B. auripes* by a deeper brown cap color , yellow flesh that does not fade to white , and a stem with a more orange @-@ yellow color and more extensive reticulation , he conceded that it was not clear that the morphological characteristics between the two did not overlap , and that further collections would be needed to clarify any differences between them . A couple of years later , he was more convinced of his stance and considered the two conspecific . The taxonomic authorities Index Fungorum and MycoBank , however , do not recognize this putative synonymy .

In the genus *Boletus* , *B. auripes* is classified in section *Appendiculati* . Species in this section are characterized by having a dry cap with a surface texture ranging from smooth to somewhat tomentose , yellow flesh , a reticulate stem , and a mild taste . Other North American boletes in this section include *Boletus speciosus* and *Boletus regius* .

The specific epithet *auripes* means " golden yellow foot " . It is commonly known as the " butter @-@ foot bolete " .

= = Description = =

The cap of *B. auripes* has a convex shape before flattening somewhat in maturity , and attains a diameter of 4 ? 13 cm (1 @.@ 6 ? 5 @.@ 1 in) . The cap surface is dry , with a texture ranging from finely tomentose (hairy) to nearly smooth , and colored yellowish @-@ brown to chestnut brown or grayish @-@ brown . The cap color fades with age . Similarly , the flesh ? initially yellow ? fades to whitish in maturity . Unlike some other *Boletus* species , in *B. auripes* neither the surfaces nor the internal tissue turns blue when injured or exposed to air . The odor and taste of the mushroom are not distinctive .

Initially pale yellow to yellow , the pore surface develops olive tinges as it matures , and often becomes depressed near the stem attachment . Pores are circular to angular , and minute ? typically less than 1 mm wide ; the tubes are 1 ? 2 @.@ 5 cm (0 @.@ 4 ? 1 @.@ 0 in) deep . The golden @-@ yellow stem is 7 ? 10 cm (2 @.@ 8 ? 3 @.@ 9 in) long by 2 ? 3 cm (0 @.@ 8 ? 1 @.@ 2 in) thick . Young stems are typically bulbous to club @-@ shaped , but this evens out somewhat as the mushroom grows , and mature stems are club @-@ shaped to nearly equal in width throughout . The stem is dry , solid (i.e. , not hollow) , and features yellow reticulation , at least on the upper portion . Mycelia at the base of the stem have a buff color . The fruit body does not have a partial veil or a ring on the stem . *Boletus auripes* is edible .

Mushrooms produce a spore prints that is yellow brown (especially in fresh prints) to olive brown . The smooth , yellowish spores measure $10 \text{ ? } 14$ by $3 \text{ ? } 5 \text{ ?m}$, and range in shape from roughly elliptic to cylindric to subfusoid (somewhat spindle @-@ shaped) . The basidia (spore @-@ bearing cells) are club @-@ shaped , four @-@ spored , and measure $27 \text{ @.@ } 2 \text{ ? } 35 \text{ @.@ } 2$ by $9 \text{ @.@ } 6 \text{ ? } 10 \text{ @.@ } 4 \text{ ?m}$. The cellular arrangement of the cap cuticle is a trichodermium (whereby the outermost hyphae emerge roughly parallel , like hairs , perpendicular to the surface of the cap) consisting of erect hyphae with a diameter of $3 \text{ @.@ } 2 \text{ ? } 6 \text{ @.@ } 4 \text{ ?m}$.

= = = Similar species = = =

Field characteristics used to distinguish *Boletus auripes* from potential lookalike species include the yellowish brown to chestnut @-@ brown cap surface that becomes paler with age , yellow flesh that does not stain blue , and a reticulate stem . *B. aureissimus* has a similar appearance , but has a honey @-@ yellow to bright yellow or yellow @-@ ochre cap , less conspicuous stem reticulation , and a more limited range covering Florida west to Texas . *B. aureissimus* var. *castaneus* has a purplish @-@ brown cap with a texture like velvet .

Boletus auripes somewhat resembles *B. aurantiosplendens* , but the latter species has a more variably colored cap that can be orange , brownish @-@ orange , or yellowish , and variable degrees of stem reticulation . *B. hortonii* has a similar color scheme but lacks reticulation on the stem . *B. auripes* bears a superficial resemblance in coloration to the Costa Rican species *B. lychnipes* , known only from a limited area in the northern Cordillera de Talamanca . The latter species may be distinguished by the lack of reticulations on the upper half of the stem , a brown or salmon @-@ pink staining reaction on the stem in response to handling , and microscopically by a conspicuously sterile margin and prominent pseudocystidia . *Retiboletus retipes* is set apart from *B. auripes* by a darker cap , tubes that lack an olive tinge , and a stem that has more prominent reticulation extending down to the base . In contrast to *B. auripes* , *B. impolitus* has a floccose (wooly) or tomentose cap surface , and lacks an olive tinge on the tubes .

= = Distribution and habitat = =

Boletus auripes is mycorrhizal , and fruits singly , scattered , or in groups on the ground under broadleaf trees , especially oak and beech , but it has also been recorded associating with mountain laurel (*Kalmia latifolia*) . *Boletus auripes* typically forms fruit bodies between June and November .

Boletus auripes has a disjunct distribution , and is one of several fungi found in both eastern Asia and eastern North America . In North America , where it is relatively common , the range of the fungus extends from Alaska south to Mexico , and east to New York . In Central America , it has been recorded in Belize . The mushroom has also been recorded from Taiwan , China (including Yunnan , Sichuan , Guangdong , Kwangsi , and Hunan) , and Japan . It was reported for the first time from the Russian Far East in 2008 .