

= Bothia =

Bothia is a fungal genus in the family Boletaceae . A monotypic genus , it contains the single species *Bothia castanella* , a bolete mushroom first described scientifically in 1900 from collections made in New Jersey . Found in the eastern United States , Costa Rica , China , and Taiwan , it grows in a mycorrhizal association with oak trees . Its fruit body is chestnut brown , the cap is smooth and dry , and the underside of the cap has radially elongated tubes . The spore deposit is yellow @-@ brown . The edibility of the mushroom is unknown . Historically , its unique combination of morphological features resulted in the transfer of *B. castanella* to six different Boletaceae genera . Molecular phylogenetic analysis , published in 2007 , demonstrated that the species was genetically unique enough to warrant placement in its own genus .

= = Taxonomy = =

The bolete was first named *Boletinus castanellus* by American mycologist Charles Horton Peck in 1900 . The type was collected in New Jersey by botanist Edward Sterling . William Alphonso Murrill transferred it to *Boletinellus* in 1909 ; his generic concept of *Boletinus* included a ring on the stipe . Rolf Singer placed it in *Gyrodon* in 1938 , while Wally Snell and Esther Dick thought the species to be more appropriately placed in *Xerocomus* , and transferred it to that genus in 1958 . Alexander H. Smith and Harry D. Thiers moved it to *Suillus* in their 1964 treatment of North American species . In more recent history (1996) , it has been moved to *Chalciporus* . Snell and Dick 's *Boletinus squarrosoides* (later moved by different authors to *Phylloporus* , *Xerocomus* , and *Chalciporus*) is a facultative synonym (based on a different type) of *B. castanella* . In their original 1936 publication , they compared the two species , and noted that *Boletinus squarrosoides* differed from *B. castanellus* by " reddish brown color , terete scaliness , and yellow colors of the flesh , tubes and stipe . " By 1958 , after having examined additional collections , they realized that the two species were conspecific and represented morphological variations of each other .

In 2007 , Roy Halling and colleagues published molecular analysis showing that the species was genetically and morphologically distinct enough to deserve placement in a new Boletaceae genus , which they named *Bothia* . Since the original type has been lost , they designated a neotype from a collection made in Reading , Pennsylvania . *Bothia* is named in honor of mycologist Ernst E. Both , formerly curator emeritus of the Buffalo Museum of Science , and " promoter , facilitator and consummate student of boletology " . The specific epithet *castanella* , which means " small chestnut " , refers to the color of the cap .

= = Description = =

The cap of *Bothia castanella* is convex at first before flattening out in age , reaching a diameter of 3 ? 8 cm (1 @. @ 2 ? 3 @. @ 1 in) . The center of the cap sometimes acquires a shallow depression , while the margin ranges from even to wavy and irregular . The cap surface is dry and initially hairy , but becomes smooth in maturity . Its color ranges from reddish @-@ brown to burgundy @-@ brown to dark yellowish @-@ brown . The flesh is white , and , unlike several other bolete species , does not change color when bruised or injured . It is about 8 mm (0 @. @ 3 in) thick .

On the cap undersurface are the pores , which are angular to elongated and measure about 2 mm wide . The color of the pore surface is pinkish brown to tan or buff , but it becomes yellowish brown in maturity ; bruised areas turn ochre @-@ tawny . The tubes are somewhat decurrent attached to the stipe (i.e. , running slightly down its length) , and extend about 6 mm (0 @. @ 24 in) deep . The mushroom lacks any appreciable odor or taste . The dry , solid stipe measures 2 ? 7 cm (0 @. @ 8 ? 2 @. @ 8 in) long by 0 @. @ 6 ? 2 cm (0 @. @ 2 ? 0 @. @ 8 in) thick , and is nearly equal in thickness throughout , or slightly tapered on either end . Its surface is more or less smooth except for a reticulate (meshed) area at the apex . The edibility of the mushroom is unknown .

Fruit bodies produce a yellow @-@ brown spore print . Spores are egg @-@ shaped to ellipsoid , smooth , thin @-@ walled , and measure 8 @. @ 4 ? 10 @. @ 5 by 4 @. @ 2 ? 4 @. @ 9 µm . The

basidia (spore @-@ bearing cells) are club @-@ shaped , four @-@ spored , and measure 25 ? 35 by 7 ? 9 μm . Cystidia are present on both the tube walls (as pleurocystidia) and abundantly on the edges (as cheilocystidia) . They are somewhat spindle @-@ shaped , sometimes with a central swelling , and measure 45 ? 70 by 7 ? 12 μm . Clamp connections are absent from the hyphae , and all of the hyphae are inamyloid .

Several chemical tests can be used to help confirm identification of the mushroom . The cap cuticle turns grayish with the application of a drop of ferrous sulfate (FeSO_4) , and dark brown to amber with a dilute solution of potassium hydroxide (KOH) . The flesh turns pale brown with KOH , and pale yellow with ammonia (NH_4OH) .

= = Habitat and distribution = =

The fruit bodies of *Bothia castanella* grow singly , scattered , or in groups under oak , although other trees such as birch , beech , hickory , eastern white pine , and hemlock are sometimes present in the area . Typical habitats include woods and parklands . In Asia it has been recorded growing in bamboo forests .

In the United States , where the fruiting season occurs from July to October , its range extends from the Carolinas north to New York and New England , and west to Minnesota . It has also been collected from Costa Rica , China , and Taiwan .