= Amanita abrupta =

Amanita abrupta , commonly known as the American abrupt @-@ bulbed Lepidella , is a species of fungus in the Amanitaceae family of mushrooms . Named for the characteristic shape of its fruit bodies , this white Amanita has a slender stem , a cap covered with conical white warts , and an " abruptly enlarged " swollen base . This terrestrial species grows in mixed woods in eastern North America and eastern Asia , where it is thought to exist in a mycorrhizal relationship with a variety of both coniferous and deciduous tree species .

= = Taxonomy = =

Amanita abrupta was first described by American mycologist Charles Horton Peck in 1897 , based on a specimen he found in Auburn , Alabama . Because the remains of the volva are not present on the bulb in dried , mature , specimens , Peck thought that the species should be grouped with Amanita rubescens and A. spissa . Synonyms include binomials resulting from generic transfers by Jean @-@ Edouard Gilbert to Lepidella in 1928 , and to Aspidella in 1940 . Both of these genera have since been subsumed into Amanita .

A. abrupta is the type species of the section Lepidella of the genus Amanita , in the subgenus Lepidella , a grouping of related Amanita mushrooms characterized by their amyloid spores . Other North American species in this subgenus include A. atkinsoniana , A. chlorinosma , A. cokeri , A. daucipes , A. mutabilis , A. onusta , A. pelioma , A. polypyramis , A. ravenelii , and A. rhopalopus . European and Asian species (also in section Lepidella) that are phylogenetically related ? close to it in the evolutionary family tree ? include A. solitaria , A. virgineoides , and A. japonica .

The specific epithet abrupta refers to the shape of the swollen base , which is abruptly enlarged rather than gradually tapering . The species ' common name is the " American abrupt @-@ bulbed Lepidella " .

= = Description = =

In Amanita abrupta , as with most mushrooms , the bulk of the organism lies unseen beneath the ground as an aggregation of fungal cells called hyphae ; under appropriate environmental conditions , the visible reproductive structure (fruit body) is formed . The cap has a diameter of 4 to 10 centimeters (1 @.@ 6 to 3 @.@ 9 in) , and has a broadly convex shape when young , but eventually flattens . The central portion of the cap becomes depressed in mature specimens . The cap surface is verrucose ? covered with small angular or pyramidal erect warts (1 ? 2 mm tall by 1 ? 2 mm wide at the base) ; the warts are smaller and more numerous near the margin of the cap , and small fragments of tissue may be hanging from the margin of the cap . The cap surface , the warts , and the flesh are white . The warts can be easily separated from the cap , and in mature specimens they have often completely or partly disappeared . The white gills are placed moderately close together , reaching the stem but not directly attached to it .

The stem is 6 @.@ 5 to 12 @.@ 5 cm (2 @.@ 6 to 4 @.@ 9 in) tall , and slender , with a diameter of 0 @.@ 5 to 1 @.@ 5 cm (0 @.@ 2 to 0 @.@ 6 in) . It is white , smooth (glabrous) , solid (that is , not hollow internally) , and has an abruptly bulbous base with the shape of a flattened sphere ; it may develop longitudinal splits on the sides . The base is often attached to a copious white mycelium ? a visual reminder that the bulk of the organism lies unseen below the surface . The ring is membranous , and persistent ? not weathering away with time ; the ring may be attached to the stem with white fibers . The mushroom has no distinct odor . The edibility of the mushroom is unknown ; however , it is generally not recommended to consume Amanita mushrooms of questionable edibility .

= = = Microscopic characteristics = = =

When collected in deposit , such as with a spore print , the spores appear white . Viewed with a

microscope , the spores are broadly elliptical or roughly spherical , smooth , thin @-@ walled , and have dimensions of 6 @.@ 5 ? 9 @.@ 5 by 5 @.@ 5 by 8 @.@ 5 µm . Spores are amyloid (meaning they take up iodine when stained with Melzer 's reagent) The basidia (spore @-@ bearing cells on the edges of gills) are four @-@ spored and measure 30 ? 50 by 4 ? 11 µm . The bases of the basidia have clamp connections ? short branches connecting one cell to the previous cell to allow passage of the products of nuclear division . The cap cuticle comprises a layer of densely interwoven , sightly gelatinized , filamentous hyphae that are 3 ? 8 µm in diameter . The stem tissue is made of sparse , thin , longitudinally oriented hyphae measuring 294 by 39 µm .

= = = Similar species = = =

The fruit bodies of Amanita kotohiraensis , a species known only from Japan , bears a superficial resemblance to A. abrupta , but A. kotohiraensis differs in having scattered floccose patches (tufts of soft woolly hairs that are the remains of the volva) on the cap surface , and pale yellow gills . A. polypyramis fruit bodies have also been noted to be similar to A. abrupta ; however , it tends to have larger caps , up to 21 cm (8 @.@ 3 in) in diameter , a fragile ring that soon withers away , and somewhat larger spores that typically measure 9 ? 14 by 5 ? 10 µm . The amyloidity and size of the spores are reliable characteristics to help distinguish A. abrupta specimens with less prominently bulbous bases from other lookalike species .

Mycologists Tsuguo Hongo and Rokuya Imazeki suggested in the 1980s that the Japanese mushroom A. sphaerobulbosa was synonymous with the North American A. abrupta . However , a 1999 study of Amanita specimens in Japanese herbaria concluded that they were closely related but distinct species , due to differences in spore shape and in the microstructure of the volval remnants . Another similar species , A. magniverrucata , is differentiated from A. abrupta by a number of characteristics : the universal veil is clearly separated from the flesh of the cap ; the volval warts disappear more quickly because the surface of the cap cuticle gelatinizes ; the partial veil is more persistent ; the spores are smaller and roughly spherical ; on the underside of the partial veil , the stem has surface fibrils that are drawn upward so as to somewhat resemble a cortina (a cobweb @-@ like protective covering over the immature spore bearing surfaces) ; A. magniverrucata has a known distribution limited to the south western coast of North America .

= = Habitat , distribution , and ecology = =

The fruit bodies of A. abrupta grow on the ground , typically solitary , in mixed conifer and deciduous forests , usually during autumn . The frequency with which fruit bodies appear depends on several factors , such as season , location , temperature , and rainfall . The mushroom has been described as common in the Southeastern United States ; in Texas , it has been called both infrequent , and common in the Big Thicket National Preserve . Like most other Amanita species , A. abrupta is thought to form mycorrhizal relationships with trees . This is a mutually beneficial relationship where the hyphae of the fungus grow around the roots of trees , enabling the fungus to receive moisture , protection and nutritive byproducts of the tree , and affording the tree greater access to soil nutrients . Amanita abrupta is widely distributed throughout eastern North America , where it has been found as far North as Quebec , Canada , and as far south as Mexico . Orson K. Miller claims to have found it in the Dominican Republic where it appeared to be growing in a mycorrizhal association with pine trees . Kuo also mentions a mycorrhizal relationship with both hardwoods and conifers , while Tulloss lists additional preferred tree hosts such as beech , birch , fir , tsuga , oak , and poplar . However , A. abrupta has been shown experimentally to not form mycorrhizae with Virginia Pine .

= = = Cited books = = =

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