= Amanita australis =

Amanita australis is a species of fungus in the Amanitaceae family . It is found only in New Zealand , where it occurs in Leptospermum and Nothofagus forest . The species was first described by New Zealand mycologist Greta Stevenson in 1962 ; in the same publication Stevenson also described what she thought was a unique species , Limacella macrospora , but over 30 years later this was reduced to synonymy with A. australis .

Amanita australis produces small- to medium @-@ sized fruit bodies , with brown caps up to 9 cm (3 @.@ 5 in) in diameter covered with pyramidal warts . The gills on the underside of the cap are white , closely crowded together , and free from attachment to the stem . The stem , which is up to 9 cm (3 @.@ 5 in) long and 26 mm (1 @.@ 0 in) thick , has a ring and a bulbous base . The mushroom may be confused with another endemic New Zealand species , A. nothofagi , but can be distinguished by differences in microscopic characteristics .

= = Taxonomy and classification = =

Amanita australis was first described by Greta Stevenson in 1962 , based on specimens she collected in April 1954 around Lake Rotoiti in Nelson Lakes National Park , in New Zealand . In the same publication , Stevenson described Limacella macrospora , collected in 1952 at Day 's Bay near Wellington . Stevenson thought this was a new species different from any previously described Limacella because of its larger size and amyloid spores . Austrian mycologist Egon Horak later transferred it to the genus Oudemansiella , but did not provide a reason for making the new combination . In 1986 , Pegler and Young proposed a classification for Oudemansiella based largely on spore structure , but they excluded O. macrospora , considering it a species of Amanita . Geoff Ridley examined Stevenson 's holotype material and reduced L. macrosporus to synonymy with A. australis in 1993 , explaining :

The size , shape and amyloid reaction of the spores , the dimensions of the basidia , the presence of clamp connections and lamella margin cells indicate that this is Amanita australis Stevenson and easily fits into the concept of this taxon . ... Macroscopically the specimen lacks the typical pronounced basal bulb to the stipe and volva remnants on the pileus ; however , it is not an unknown condition in this taxon .

Although Stevenson originally placed the species in Amanita section Phalloideae because of a perceived similarity to A. citrina , it is now classified in section Validae ; many species in this section have bulbous stem bases . Ridley suggests an appropriate common name would be the " straw flycap " , while Rodham Tulloss calls it the " far south Amanita " . The specific epithet australis means " southern " .

= = Description = =

The shape of the A. australis cap is initially convex , later flattening out or even developing a central depression , and reaching diameters of 20 ? 90 mm (0 @.@ 8 ? 4 in) wide . The cap margin sometimes splits and rolls back to give a ragged appearance . The centre of the cap is dark buff , honey or isabelline , becoming paler to buff at the margin . The surface is sticky when young or wet , but dries out with age . The remnants of the volva form conical to pyramidal warts that are most densely aggregated in the center , but become sparse and low towards the margin . They are initially white then greyish @-@ sepia or isabelline with white to buff tips .

The gills are crowded closely together , free from attachment to the stem , 6 ? 10 mm (0 @.@ 24 ? 0 @.@ 39 in) wide , and white . The lamellulae (short gills that do not extend fully from the cap edge to the stem) have truncated ends . The stem is 37 ? 90 mm (1 @.@ 5 ? 3 @.@ 5 in) tall , 6 ? 26 mm (0 @.@ 24 ? 1 @.@ 02 in) in diameter , and narrowest at center . It is hollow , and has an abruptly bulbous base that is between 14 and 38 mm (0 @.@ 55 and 1 @.@ 50 in) in diameter . The surface of the stem above the level of the ring is white and covered in woolly tufts of mycelia ; below the ring it is white with buff to greyish transverse , grooved bands . The base may or may not

have a rim of volval remnants that are powdery , and a greyish @-@ buff to greyish @-@ sepia colour . The ring is membranous , white to buff , first hanging freely then later adhering to the stem . The flesh of the cap is white , occasionally pale isabelline under the center of the cap ; the flesh of the stem is white .

The spore print is white . The spores are typically 9 ? 12 by 8 ? 10 @.@ 5 µm , spherical to ellipsoid , and thin @-@ walled . They are hyaline (translucent) , and amyloid ? meaning they will stain bluish @-@ black to black in Melzer 's reagent . The basidia are 43 @.@ 5 ? 76 @.@ 5 by 10 @.@ 5 ? 17 µm , mostly four @-@ spored , and clamped at their bases . There are abundant spherical , elliptic or club @-@ shaped hyaline cells on the gill edges , measuring 16 ? 39 @.@ 5 by 10 @.@ 5 ? 27 @.@ 5 µm . The cap cuticle is 220 ? 270 µm wide , consisting of a gelatinised suprapellis (upper layer) and non @-@ gelatinised subpellis (lower layer) . The volval remnants on the cap consist of abundant spherical , club @-@ shaped , or turnip @-@ shaped cells , measuring 10 ? 86 by 9 ? 85 µm . These cells are umber in colour , and arranged in chains perpendicular to the cap surface , becoming smaller and paler at tip of the wart , subtended by moderately abundant hyphae that are 4 ? 10 µm wide . Clamp connections are abundant in the hyphae .

= = = Similar species = = =

Amanita australis mushrooms that have lost their warts and have had the colours faded may resemble another New Zealand species , A. nothofagi . The two species may be distinguished reliably using microscopy ? A. nothofagi does not have clamp connections at the base of the basidia , unlike A. australis.A. australis also bears some resemblance to the eastern North American and east Asian species A. abrupta , which also has an abruptly bulbous stem base .

= = Habitat and distribution = =

Amanita australis is found only on the north and south islands of New Zealand , where it grows in a mycorrhizal association with Southern Beech (genus Nothofagus) (including New Zealand Red Beech , Silver beech , New Zealand Black Beech , Hard Beech) , Manuka , and K?nuka . The mushroom usually grows solitarily , but has on rare occasions been found growing in groups .