

DEATH CAP

THIS MUSHROOM CAN BE LETHAL!



Photo: © David Catcheside

Scientific name: *Amanita phalloides* (Vaill.: Fr.) Link.

General description: This fungus grows in association with broadleaved trees, usually oaks. It is deadly poisonous and, if early treatment is not given, will result in almost certain death in 6–16 days. It has a yellow-green, olive brown or brownish, rounded cap which may have remnants of cobwebby white veil adhering to it. The gills are white and crowded. The stalk is white, cylindrical with a white skirt-like ring, usually just beneath the cap. There is an open bag-like sac at the base of the stalk.

Division: Basidiomycota. **Order:** Agaricales. **Family:** Amanitaceae.

Common name: Death Cap.



Description: Cap 30–55 (–150) mm diameter, 9–22 mm high, initially convex, hemispherical, becoming almost flat, sometimes with a slight central depression. The colour varies from greenish-yellow, olive green, pale olive buff, yellow-green olive-brown and may dry to almost white. The surface is dry but may feel slightly greasy if moist. It is smooth, with a slight sheen and there may be fine fibres radiating from the centre giving a streaked appearance. Sometimes there are patches of white membranous patches of universal veil closely attached to the cap. The margin is smooth, not striate (stripy).

Flesh is thick, white, yellowish under cap. It stains yellow.

Stalk: 50–200 mm high, 7–20 mm diameter; cylindrical or widening towards the somewhat swollen base; white to cream sometimes with greenish or brownish tints, smooth to finely fibrillose; solid to slightly hollow.

Partial veil (ring on stalk): White, skirt-like but may stick to the stalk in older specimens. The upper surface is marked with striations (fine stripes) from the gills.

Gills are free from the stalk, white to slightly cream, close to crowded and of various lengths.

Volva (sac at base of stalk): Like an open bag with a flaring margin, 15–35 mm diameter.

Universal veil: Young specimens (which resemble eggs) are totally enclosed by this membranous case. As the fruit body develops, the veil casing is split, the lower part remains as a volva, a sac, at the base of the stalk, the upper part is carried up on the cap where it may remain as the whitish cobwebby veil remnant.

Spore print: When a cap is placed gills downwards on to white paper and left for a few hours, a white spore print is left.

Habitat: In soil, amongst moss and leaf litter, usually under oaks (species of *Quercus*), occasionally under sweet Chestnut (*Castanea sativa*). Fruit bodies may be single or in groups, and scattered, often in arcs or circles around a tree.

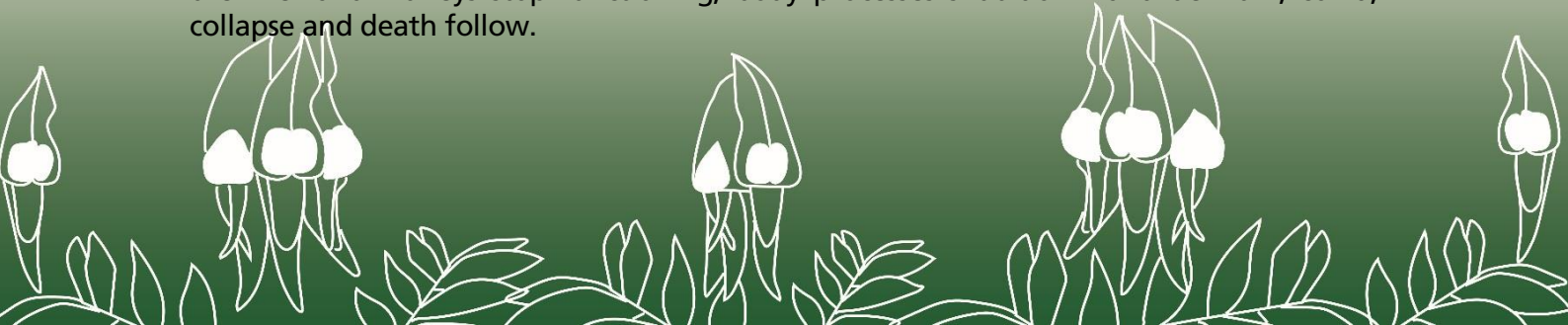
Like all *Amanitas*, *A. phalloides* is mycorrhizal: it forms a symbiotic partnership with its 'host' tree. The fungus collects nutrients and water from the soil, essential for the growth and health of the tree. In return, the plant provides energy in the form of sugars and other photosynthetic compounds.

Distribution: ACT, NSW, SA, Vic., Tas.

Smell: Sweetish, of raw potato, becoming fetid when old.

Toxicity: This mushroom is deadly poisonous. One third of a cap will kill a child. If it is suspected that the Death Cap has been eaten, seek immediate medical attention and go to hospital.

During the initial incubation period there may be no symptoms, but it is during this time that severe, sometimes irreparable, damage is being done to the internal body organs. Within 6–24 hours after ingestion the symptoms exhibited include: severe and prolonged abdominal pains, vomiting, nausea, diarrhoea and extreme thirst. Then there may be a seeming recovery period of 2–3 days during which few symptoms, if any, may show. Finally the liver and kidneys stop functioning, body processes shut down and delirium, coma, collapse and death follow.



The period between eating and death may be three to sixteen days, depending on the overall health of the victim and the amount of fungus eaten. Mortality rates have been very high but, if early treatment is given, they may be reduced to around 10–15%.

Some of the poisonous compounds in the Death Cap, amatoxins, are not destroyed on cooking. These toxins inhibit enzymes involved in the synthesis of messenger RNA, essential for protein synthesis. With protein synthesis and hence cell metabolic processes ceasing, liver and also kidney damage and failure follow. The amatoxins do not affect the *Amanita phalloides* itself.

Look-alikes: The Death Cap has been mistaken for *Volvopluteus gloiocephalus* (Stubble Rosegill), and with fatal results, since the latter species is very similar to the Paddy Straw Mushroom, *Volvariella volvacea*, a delicacy in Asian cuisine. *Volvariella* species have a sac at the base of the stalk but they do not have a ring on the stalk, the gills turn pink and produce a pink spore print.

The Smooth White Parasol, *Leucoagaricus leucothites*, has no basal sac and there are no green tinges on the cap.

Etymology: the derivation of the generic name, *Amantia*, is unknown, but it might refer to Mt Amanon in Turkey; *phallos* [Greek]: penis, the epithet refers to the shape of the young fruiting body.

Other Descriptions, Illustrations and References

D = Description; I = Illustration; P = Photo; CP = Colour Photo.

Arora, D. (1986). *Mushrooms demystified*. (Ten Speed Press: Berkeley). — pp. 264, 269, 892, 893, plate 50 [D P CP].

Atlas of Living Australia [ALA]. <http://bie.ala.org.au/species/http://id.biodiversity.org.au/name/apni/133337> [accessed: 10 June 2017] [D CP].

Encyclopaedia of Life [EOL]. http://www.eol.org/pages/1009706?text_id=6684938 [accessed: 7 June 2017].

Fuhrer, B.A. (2005). *A field guide to Australian fungi*. (Blooming Books: Melbourne). — pp. 26, 27 [D CP].

Fungimap. <http://www.rbg.vic.gov.au/fungimap/fsp/sp053.html> [accessed: 7 June 2017].

Grey, P. & Grey, E. (2005). *Fungi down under*. (Fungimap: Melbourne). — p. 20 [D CP].

Hall, I., Buchanan, P.K., Yun, W. & Cole, A.L.J. (1998). *Edible and poisonous mushrooms: An introduction*. (Caxton Press: Christchurch, N.Z.). — pp. 70–72 [D CP].

Hall, I., Stephenson, S.L., Buchanan, P.K., Yun, W. & Cole, A.L.J. (2003). *Edible and poisonous mushrooms of the world*. (Crop & Food Research: Christchurch, N.Z.). — pp. 107, 130–133 [D CP].

Razak, I. (2017). *World's deadliest mushroom outnumbering edible varieties in Victoria*. ABC News. <http://www.abc.net.au/news/2017-05-04/victoria-worlds-deadliest-mushroom-outnumbering-edible-variety/8497638> [accessed: 8 June 2017].



Laessle T., Del Conte, A. & Lincoff, G. (1996). *The mushroom book*. (DK Publishing: New York). — p. 131 [D CP].

Lepp, H. (2014). Deathcap Mushroom *Amantia phalloides*. In: *Australian fungi*. <https://www.anbg.gov.au/fungi/deathcap.html> [accessed: 1 June 2017].

Phillips, R. (2006). *Mushrooms*. (Macmillan: London). — pp. 144–145 [D CP].

Ramsbottom, J. (1954). *Mushrooms and toadstools*. (Collins: London). [*The New Naturalist series*]. — pp. 39–43 [D CP].

Royal Botanic Gardens Melbourne. <https://www.rbg.vic.gov.au/science/herbarium-and-resources/identification-and-information-services/amanita-phalloides> [accessed: 7 June 2017].

Shepherd, C.J. & Totterdell C.J. (1988). *Mushrooms and toadstools of Australia*. (Inkata Press: Port Melbourne). — pp. 35, 36 [D CP].

Southcott, R.V. (1996). *Mechanisms of macrofungal poisonings in humans*. In: Orchard, A.E. [Exec. Ed.], Mallett, K. & Grgurinovic C. [Vol. Eds.], *Fungi of Australia 1B*: 297–313. (CSIRO Publishing: Collingwood).

Wikipedia. https://en.wikipedia.org/wiki/Amanita_phalloides [accessed: 8 June 2017].

Willis, J.H. (1963). *Victorian toadstools and mushrooms*. (The Field Naturalists Club of Victoria: Melbourne). — pp. 27, 28 [D].

Young, A.M. (2005). *A field guide to the fungi of Australia*. (University of New South Wales Press: Sydney). — pp. 108–109, plate 33 [D | CP].

IN A POISONING EMERGENCY PHONE

13 11 26

24 hours a day, 7 days a week

Australia-wide

State Herbarium Factsheet — Death Cap

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