

Notes on *Amanita phalloides* (The 'Death Cap')

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Amanita phalloides is a poisonous fungus and was probably introduced into Australia on imported tree roots. It is found only occasionally in Australia, in association with exotic trees, usually under oaks, liquidamber, and birch, in some of the cooler areas of Australia where these types of tree are grown, predominantly as ornamentals.

The cap colour is variable, yellow-green, pale olive-green and yellow-brown, although a white variety is also known. While there is a variation of colour, the predominant colour is greenish, which may account for the 'long and chequered career' of its various names and may have been one reason that Christiaan Hendrick Persoon (1755-1837) in his work of 1797, *Tentamen Dispositionis Methodicae Fungorum In Classes, Ordines, Genera Et Familias. Cum Supplemento Adjecto*. Lipsiae, P.P. Wolf, classified it as an *Amanita*, giving it the name *Amanita viridis*.

However, notwithstanding the publication of Persoon's *Synopsis Methodica Fungorum* in 1801, his epic work on fungal systematics, by 1821 when Elias Magnus Fries's (1794-1878) work *Systema Mycologicum : Sistens Fungorum Ordines, Genera Et Species, Huc Usque Cognitas, Quas Ad Normam Methodi Naturalis Determinavit, Disposuit Atque*. Lundæ : ex officina Berlingiana, (1821-32) was published, the name was *Agaricus phalloides* Vaill. Ex Fr.

In 1833, Heinrich Friedrich Link (1767-1851) in his work *Handbuch Zur Erkennung Der Nutzbarsten Und Am Häufigsten Vorkommenden Gewächse*. Berlin (1829-1833) established the name *Amanita phalloides* (Vaill. ex Fr) Link, noting in his description that it had been given many synonyms; *Agaricus phalloides* Fries., *Agaricus vernalis* Bolt., *Agaricus bulbosus* Shaeff., *Agaricus virens*, *Agaricus sinuatus*, *Amanita verna*, *bulbosa*, *citrina* and *viridis*, to name some. Today we know it as *Amanita phalloides* (Vaill. : Fr.).

Amanita phalloides, the ingestion of which has, over the years, accounted for many fatal cases of mushroom poisoning, earning it the common names "Death Cap" and "Destroying Angel".

The 'Phalloides syndrome', which involves the toxins amatoxin and phalloidin, has a latent period of from 6 to 24 hours. The symptoms are, vomiting, diarrhoea, abdominal pain, liver and kidney collapse, followed by coma and death. The duration of the illness is from 10 to 20 days. If lethal, death usually occurs from 4 to 7 days after first symptoms. While the toxic cyclopeptides responsible are known, no effective antidote has been developed. The amatoxins block the production of DNA, which causes cell necrosis especially in those areas that first interact with the toxins and have a high rate of degeneration, like the liver and kidneys.

With proper fluid replacement the early symptoms will subside, wherein lies a primary danger of *A. phalloides* poisoning. In many cases, the doctors will assume the danger has passed (especially when misdiagnoses has occurred, as it is difficult to diagnose symptomatically), and the patient will be

discharged. However, in this case, the toxins continue to attack the kidney tubules and instead of entering the urine are reabsorbed into the bloodstream and recirculated, continuing to cause liver and kidney damage, leading to jaundice and renal shutdown, which can lead to coma, organ failure, and death.

With no known antidote or therapy for *A. phalloides* poisoning, statistically, death occurs in 20-30% of cases (with rates of over 50% for children under 10 years old). If there is time and a suitable donor is available a liver transplant may reverse the toxin's progress when hepatic failure threatens. In most cases, however, hospitalisation and close monitoring is the only treatment.

Nevertheless, even some grim humour may be had as illustrated below, in the macabre poem by the well-known science fiction author, Isaac Asimov in *Ellery Queen's Mystery Magazine* (Detectiverse), May 1984.

Amanita Phalloides

A salad with diced amanita
Will kill with the speed of a cheetah.
Though it's mushrooms you've bought,
Added toadstools are thought
By a killer to make things much sweeter.

Isaac Asimov
Ellery Queen's Mystery Magazine
(Detectiverse), May 1984