

fungimap

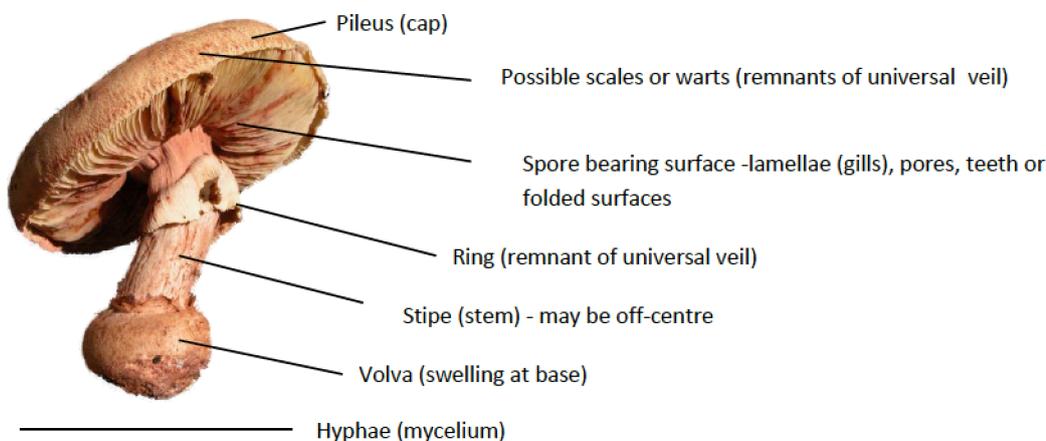
An introduction to *Fabulous Fungi*

Fungal Basics

Fungi are in their own Kingdom. They are found everywhere around the world, from rainforest to desert, stream to ocean, and poles to the equator.

Fungi are not plants, they have no chlorophyll and cannot photosynthesise to make sugars. There are an estimated 10,000 species of Australian macrofungi, of which only 50% are described.

Fungi are diverse forms. Mushroom-shaped fungi have some or all of these features:



Life Cycle of fungi

Macrofungi (fungi that are visible) are made up of tangled masses of tiny threads that look like cotton wool called **hyphae**. The network of hyphae is called the **mycelium** and can be white, yellow, red, blue, orange, brown or black.

Chemical structure of fungi is different from plants. Plant cells have protective walls of (hard) cellulose.

Hyphae are proteins in the chitons group.

Hyphae produce **enzymes** that soften and break apart chemicals in the substrate.

Hyphae absorb these simpler chemicals to fuel further growth.

Mycelia spore once they have enough in store and weather is right.

The sporing body ('mushroom') is >90% water and can grow quickly. It **produces spores** that are disbursed by air, water and animals.

If spores land in suitable conditions, they **germinate** and the cycle recurs.

Eat and be eaten – what fungi 'eat'

Dead things (saprophytes). Saprotrophic fungi are nature's rotters. They break down and feed on dead organic matter.

Living things (parasites). Parasitic fungi feed on live plants, animals (especially insects) or even other fungi

Shared meals Mycorrhizal fungi have **sybiotic** relationships with ~90% of Australian plants, helping them to take up water, nutrients and trace elements. In return, fungi take sugars. Their hyphae can wrap around and penetrate roots and other parts of plants and even exist inside cells. They are essential in Australia's low nutrient soils.

What 'eats' fungi: Fungi provide habitat and food for many animals and insects, eg., truffles make up 85-90% of a potoroo's diet and potoroos help to spread the spores.

Ecology

Fungi provide **communications networks** to link plants. If plants are attacked by animals they emit **chemical signals** to warn other plants. They also send **warning signals** via mycorrhizal fungi.

If there were no fungi:

Dead trees and leaf litter would not decay.
Carbon and nitrogen would not be recycled.
90% of Australian **plants** would be stunted.
Many small **mammals** would starve.
Terrestrial **orchids** would die.

Main groups of fungi

Agarics are most common, have gills and are usually fleshy.

Boletes have tubes or pores.

Tooth fungi have spines.

Corals usually grow upwards.

Jellies have gelatinous textures.

Puffballs have powdery spores.

Clubs and pins have spores on the outside surface.

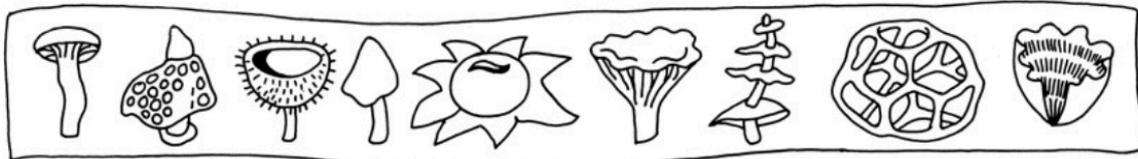
Cups and discs may have stems.

Brackets are fleshy or leathery.

Birds-nest fungi rely on rain to splash out spores.

Cannonball fungi fire out their spores.

Stinkhorns have a slimy, smelly spore mass.



Friends of fungi

Lichens are symbiotic partnerships between a fungus and an alga or cyanobacteria. **Slime moulds** are in a kingdom of their own.

Fungi as weeds

Some fungi are introduced like *Amanita muscaria* – the red and white agaric of children’s stories – and may be displacing native fungi

Fungi identification tips for beginners

Start by learning a few species common in your area and build on these. **Fungi Down Under** – a Guide to 100 easily identifiable species is a good place to start. Field guides and knowledgeable people can help.

Take detailed **notes and photographs** of fungi you see and build records for your area. Know that not all fungi can be easily identified by sight - some require microscopy.

Fungimap: Citizen Science in action

Fungimap is a national non-profit community organisation dedicated to improving **knowledge and conservation** of Australian fungi. Our focus is on fungi in the natural environment.

The National Fungimap Database contains >100,000 records and 6500 images of fungi - available at the **Atlas of Living Australia**: www.ala.org.au

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