

# FIGHTING FOR FUNGI!

*Words and images by Alison Pouliot*

Foraging for mushrooms is becoming an ever more popular pastime. With their earthy fragrances of wet forest, mushrooms truly capture the essence of autumn and add interest to a forest stroll. While foraging for fungi is a well-known tradition of European countries, these days Australians are also likely to be found 'on the hunt' on a misty autumn afternoon.

However, those who fancy collecting a few mushies for dinner need to take heed. Among the tasty edible species, lurk dangerously poisonous species that could land you in hospital or even in the grave. Always remember that you should never eat a wild mushroom unless you are absolutely certain of its correct identification, and know that it's edible. Unfortunately, the appropriately named Death Cap (*Amanita phalloides*) has lived up to its sinister name on a dozen occasions in Australia, and appears to be increasing in distribution in Australia.

## ***Secret relationships***

Many of the functions that fungi perform are not always readily apparent. Further to the joy of some freshly picked edible mushrooms, fungi exist all year underground and are hard at work maintaining the health of ecosystems. We're usually only aware of fungi when we see their reproductive structures - mushrooms and other forms of fruiting bodies such as puffballs, brackets, cups and discs - push through the soil or appear on trees or other substrates.

However, most of the work is performed by the fungal 'body', a matrix of interconnected filamentous hyphae collectively known as mycelia. This part of the fungus forms an underground framework, stabilising soils, improving water retention and cycling nutrients.



*Right: The mushroom is the reproductive structure of the fungal mycelium, which is seen here as a matrix of interconnected hyphae that is decomposing the log*

Many fungi form mutually beneficial relationships, known as mycorrhizal associations, with plants. By forming a sheath around the tiny rootlets of plants, or directly penetrating them, the fungus effectively extends the plant's root system, increasing the plant's capacity to access greater volumes of soil in search of water and nutrients. The fungus also protects the plant from soil pathogens. In return, the plant provides the fungus with carbohydrates produced through photosynthesis.

All eucalypts form mycorrhizal relationships with fungi. Moreover, eucalypts often form these beneficial relationships with multiple fungal species. It is these relationships that enable the maximum growth and health of the great majority of trees and other plants.

The majority of fungi play another vital role in colonising and decomposing organic matter such as fallen trees and leaf litter. These fungi secrete enzymes that break down compounds, including cellulose and lignin, into simpler compounds, thereby making nutrients available for other organisms.



*Russula persanguinea* grows in eucalypt woodlands



*Fungi such as Pyronema omphalodes* are among the first colonisers of burnt soil

### ***Conserving fungi***

Little is known about the distribution and requirements of Australian native fungi. Although many fungi are widespread, they also have particular habitat requirements. During its lifetime, a large tree may host hundreds of different fungus species including those that colonise and decompose it once it falls to the ground. Like flora and fauna, fungi are susceptible to habitat fragmentation and the loss of age structure in forests and woodlands. A vital first step in improving fungal conservation is increasing public awareness of their significance.



The relationships between plants and fungi can be damaged or destroyed through certain land management practices. For example:

- Many fungus habitats have been much diminished due to clearing and fragmentation of woodlands and forests and, more recently, through firewood collection
- Heavy agricultural equipment can cause compaction and water logging in soils, both of which are detrimental to fungi
- Excess nutrients from the application of fertilisers and the use of pesticides and fungicides can alter soil chemistry
- Cattle grazing in woodlands also diminishes habitat by altering the composition and structure of plant communities.

Prolonged drought and high intensity fire also affect the biological, physical and chemical properties of soils. All of these can negatively affect the fungal mycelia that live in soils and leaf litter.

Retaining litter around trees could provide a very simple way to maximise soil moisture and maintain nutrient supply. Minimising impacts that potentially damage tree-fungal relationships will allow fungi to do their job in supporting tree health.



*These tiny Marasmius alveolaris play an important role decomposing leaf litter*



MURRUMBIDGEE  
**Landcare**  
INCORPORATED



Australian Government



### ***Making a difference for fungi***

We can begin by simply recognising that fungi are a vital part of biodiversity. Fungi are a unique kingdom - separate to plants and animals - but have been dubbed the ‘forgotten kingdom’, because of the sparseness of knowledge about them. They are also largely neglected in conservation efforts, despite their ecological significance.

Hundreds, possibly thousands of species of fungi exist in our woodlands and farmlands. As an indication of how little we know about Australian fungi, most species are yet to be formally described and named.

### ***Where are they?***

Our local native landscapes are undoubtedly repositories of undiscovered fungi, and Fungimap is keen to know what’s out there! Next time you spot some fungi, tell Fungimap about it and contribute to Australia’s knowledge of fungi. Information about how to submit records can be found at: [www.fungimap.org.au](http://www.fungimap.org.au).

### ***Fungimap***

The national non-profit citizen-science organisation, Fungimap, is dedicated to advancing fungal knowledge and conserving fungi.

For more information: [www.fungimap.org.au](http://www.fungimap.org.au).

### ***Further information***

Alison regularly runs of workshops on local fungi in our area. If you would like further information, please contact Alison at: [alison@alisonpouliot.com](mailto:alison@alisonpouliot.com).