

Close connections

Many fungi form connections with a great variety of plants, helping them to access water and nutrients as well as protecting tree roots from soil pathogens. In return, plants provide fungi with sugars produced through photosynthesis. These mutually beneficial relationships, known as mycorrhizal symbioses, also help the forager to identify fungi, as particular fungi associate with particular trees.

THE POPULAR SAFFRON MILK CAP GROWS IN ASSOCIATION WITH CONIFERS AND CAN BE FOUND IN GREAT ABUNDANCE IN PINUS RADIATA PLANTATIONS.

PHOTOS: ALISON POUILLIOT

Slow mushrooming

FUNGUS EXPERT ALISON POUILLIOT EXPLORES THE RISE OF FORAGING FOR EDIBLE WILD FUNGI IN AUSTRALIA, WITH A GUIDE TO HOW TO DO IT WITH MINIMUM IMPACT, AND WHAT TO WATCH FOR.

While Australia's rural regions are renowned for their gourmet food, thriving wineries and weekend getaways, a new contender is fast gaining popularity – wild mushroom foraging. As the seasons change and the earth slowly cools, fungi of every imaginable colour, shape and form reveal themselves. With their earthy fragrances of wet forest, mushrooms capture the essence of autumn. Foraging presents minimal risk for those who adopt the attentive and cautious approach of 'slow mushrooming' and have a keen awareness of the dangerously poisonous species that lurk among the edibles.

Edible fungi have been foraged for thousands of years across the world, with Aboriginal Australians probably being among the first. Fungi are gathered not just for eating but for medicinal and spiritual uses.

Australia happens to have a megadiverse mycota (fungi) but in contrast to many European countries, where there are centuries of knowledge on what is edible, there are currently no Australian field guides that consistently and reliably indicate the edibility of different native fungus species and very little research to determine which are edible and which are toxic.

Over recent decades waves of different migrant groups from mycophilic (fungus-loving) nations have brought new knowledge about edible fungi to Australia. However, this does not always translate to a country where foragers encounter different fungus species and environments, meaning migrants here are especially prone to poisoning.

In reality, there are far fewer poisonings from mushrooms in Australia than from other sources such as regular household products. Media sensationalism around fungus poisonings has not helped the status of fungi as vitally significant organisms that underpin the functioning of terrestrial ecosystems.

It is also in the interest of every forager to first and foremost be a fungal conservationist, to not just ensure the ongoing survival of their species of interest, but their ecosystems and interactions with other species more broadly.

Slow mushrooming

Fungi are many, varied and complex and take time to get to know. Foragers must be able to accurately identify not just their desired edible species, but similar looking toxic species as well. Once identified, consult an expert to confirm edibility or toxicity.

Alas, there is no such thing as a ten-point checklist of characteristics that differentiate edible from toxic species. Nor is it possible to identify fungus species from images alone. Rather, each species needs to be comprehensively known through close observation over time. This means being familiar with specific characteristics at different developmental stages, as well as in different habitats and in response to different environmental conditions.

This is the notion of 'slow mushrooming'. Just like people, fungi can be elusive and unpredictable and the same species can appear in many different guises. It takes time to become



THE CHEMICAL ODOUR OF THE TOXIC YELLOW STAINER IS A CLUE THAT IT'S NOT TO BE ADDED TO YOUR BASKET.

familiar with the associations between species and the particular substrate types a species inhabits. Doing foraging workshops involving experienced mushroomers is a good way to start.

Your accumulative knowledge will gradually allow you to anticipate where and when, and with what, a certain species is likely to be found. It is better to know fewer species comprehensively, than many species superficially. Moreover, identifying fungi involves more than visual observations and other senses also play a role.

The smell factor

While the odour of many fungi is often described as 'indistinct' or simply as 'earthy' or 'mushroomy', others are very distinct. For example, the toxic yellow stainer (*Agaricus xanthodermus*), which is often confused with field mushrooms such as *Agaricus campestris*, has a distinctive smell of phenol that is often described as being like iodine or antiseptic or as having a 'chemical edge'. It's definitely not mushroomy or earthy. Yet many people seem unable to detect this odour, partly because of unfamiliarity and not knowing what to expect.

Meanwhile, some fungi are slightly fragrant or perfumed, others smell fishy or like rotten meat, and yet others like cucumber, radish, garlic, even curry powder. Also, be aware that humans are often susceptible to persuasion. When identifying fungi, be sure to trust your fungus-trained nose more than someone who desperately wants their freshly picked mushrooms to be edible.

WATCH OUT!

DEATH CAP

The first species every forager should know and never confuse is the aptly named death cap (*Amanita phalloides*). This poisonous fungus is responsible for most deaths globally from eating fungi. In Australia it grows in association with various oak (*Quercus*) species and is commonly found in parks and gardens and nature strips.

Study this species very carefully and take every opportunity to observe it in situ to get a really good idea of its morphological variability. Among the key diagnostic features to watch out for are:

- The pileus (cap) is often pale green but can be yellowish, pale brown, cream or white.
- Lamellae [gills] are white, crowded and free from the stipe (stem).
- The base of the stipe is bulbous with a saccate volva (membranous cup).
- Membranous annulus (ring) on stipe.
- White spores.
- Grows in soil.



THE DEADLY POISONOUS DEATH CAP (AMANITA PHALLOIDES)



Where to start

For those new to foraging, focus on easily identifiable species such as saffron milk caps (*Lactarius deliciosus*), slippery jacks (*Suillus luteus* and *S. granulatus*), lawyer's wigs (*Coprinus comatus*) and blewits (*Lepista nuda*), keeping in mind that you must also be able to recognise their toxic lookalike species. Here are details on two easy edibles to start with, saffron milk cap and lawyer's wig. Oh, and a few pointers on terminology: pileus (cap); lamellae (gills); stipe (stem).

Saffron milk cap

One of the more popular and easily identifiable edible species in Australia is the saffron milk cap (*Lactarius deliciosus*). It grows in association with conifers and can be found in great abundance in *Pinus radiata* plantations. While its orange colour makes it very conspicuous, it is very variable, hence an unreliable feature. Colour must always be considered in association with the morphology (or form) of a fungus.

Although the saffron milk cap seems like an easy species to identify, some people still confuse it with toxic or potentially toxic species such as *Gymnopilus junonius*, *Paxillus involutus* Group, *Austropaxillus infundibuliformis*, *Lactarius pubescens-torminosus* Group and various orange-brown coloured

ABOVE: THE SAFFRON MILK CAP (*LACTARIUS DELICIOSUS*) HAS HOLLOW STIPES AND SAFFRON-COLOURED LATEX.
TOP RIGHT: ANOTHER FEATURE OF THE SAFFRON MILK CAP IS PROMINENT GREEN OXIDISATION.
RIGHT: NOTE THE DISTINCTIVE PITS OR PATCHES ON THE STIPE OF THE *LACTARIUS DELICIOSUS*.

Cortinarius. While all these fungi share some features with the saffron milk cap and can appear superficially similar, none share them all. Make sure you can recognise the following key features of the saffron milk cap:

- Grows in soil in association with conifers.
- Pileus starts out convex, then flattens and becomes funnel-shaped with age.
- Colour typically orange to pinkish-orange but generally paler with age and drying.
- Exudes bright orange latex when lamellae or flesh are broken.
- Green oxidation of bruised or broken flesh.
- Concentric rings on upper side of pileus.
- Pits or darker coloured patches on the stipe.
- Decurrent lamellae (that run down the stipe).
- Chalky textured and hollow stipe.
- White spores.
- Often fruits several times between late summer and late autumn.
- Often fruits in great abundance in overlapping clusters.

PHOTOS: ALISON POULIOT

SLOW MUSHROOMING MANIFESTO

Keep in mind that while the careful removal of a mushroom might not damage its mycelium (the underground growing and feeding part of the fungus), disturbance caused by trampling can crush mycelium, alter water filtration patterns, introduce pathogens and damage fungus habitats.

Also, remember that other creatures forage for fungi. In Australia, over 40 species of mammals are known to eat edible fungi. There are also uncountable invertebrates that rely on fungi as food and habitat.

- Practise slow mushrooming by learning the characteristics of one fungus, at different developmental stages, across several seasons.
- For each of the edible species, learn all the toxic lookalike species.
- Tread lightly and cause no environmental damage – that is, practise ecological foraging.
- Do not eat wild-picked fungi raw.
- Collect only what you can eat that day, as fungi lose their flavour and also become bacterial very quickly. Leave plenty for native animals.

- If trying a species for the first time, only eat a small amount. Keep a whole specimen aside in case a professional mycologist needs to identify it in the event of an allergic reaction or poisoning.
- Use a mirror to examine features on the underside of fungi rather than picking them unnecessarily.
- Identify fungi in the field rather than bringing everything you find home and then separating edible from toxic species.
- Be aware of your potential to spread potentially problematic organisms such as *Phytophthora* or *Favolaschia calocera*. Disinfect your boots before entering and departing from areas at risk of infection.
- Never pick fungi that are rare or endangered.
- Do not collect fungi on public land without a permit and always seek permission to collect on private land.
- Think of others who enjoy seeing fungi and do not leave fungi over turned. Be sure to discretely dispose of 'offcuts'.
- Submit records of your finds to data repositories such as Fungimap or the Atlas of Living Australia. This information contributes to the greater understanding of the distribution and ecology of Australia's fungi.



CAN YOU PICK WHICH OF THE ABOVE FUNGI IS THE SAFFRON MILK CAP?

THE EDIBLE SAFFRON MILK CAP (*LACTARIUS DELICIOSUS*) IS PICTURED AT THE FAR LEFT ON THE BOTTOM ROW. ALL THE OTHERS ARE TOXIC SPECIES (CLOCKWISE FROM THE TOP LEFT): FUNNEL PAX (*AUSTROPAXILLUS INFUNDIBULIFORMIS*); CORTINAR (*CORTINARIUS* SP.); SPECTACULAR RUSTGILL (*GYMNOPIIUS JUNONIUS*); WOOLLY MILKCAP (*LACTARIUS PUBESCENS-TORMINOSUS* GROUP); POISON PAX (*PAXILLUS INVOLUTUS* GROUP).

PHOTOS: ALISON POULIOT



Lawyer's wig

Another popular and easily identifiable edible species in Australia is the lawyer's wig (*Coprinus comatus*). Make sure you can differentiate it from *Coprinopsis atramentaria* and other lookalike species such as young *Chlorophyllum brunneum* and *C. molybdites*. Here are some of the key diagnostic features:

- Distinctively oval, cylindrical to rounded-conical pileus; becomes bell-shaped as it expands, often with a flaring margin.
- Pileus margins deliquesce (liquefy) at maturity.
- Has white tufted 'scales' (universal veil remnants) that run down the pileus.
- Pileus margin often becomes striate and tattered with age.
- Lamellae are free and very closely crowded; turning pinkish with age, then black.
- Stipe white, hollow, up to 30cm long; centrally attached to pileus; often tapering toward apex.
- Stipe has a membranous partial veil that forms a small, fragile, white, movable annulus.
- Can be found singly although often in scattered or dense groups.
- Odour earthy or mushroomy.
- Spore print black.

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LEFT: THE LAWYER'S WIG (*COPRINUS COMATUS*) IS EASILY IDENTIFIABLE WITH ITS SHAGGY CAP. ABOVE: SHOWS DIFFERENT DEVELOPMENTAL STAGES AND DELIQUESCING PILEUS OF LAWYER'S WIG.

RESOURCES

Websites

- Atlas of Living Australia: ala.org.au
- Australian fungi: anbg.gov.au/fungi
- Downloadable Australian fungus field guide: fncv.org.au/fungi-in-australia
- Foragers code: britmycolsoc.org.uk/mycology/conservation/code-conduct
- Fungimap: fungimap.org.au

Australian field guides

- *Field Guide to Tasmanian Fungi*, Genevieve Gates and David Ratkowsky, The Tasmanian Field Naturalists Club Inc, 2014.
- *Fungi Down Under: The Fungimap guide to Australian Fungi*, Pat Grey and Ed Grey, Fungimap, 2005.
- *A Field Guide to the Fungi of Australia*, Tony Young, UNSW Press, 2005.