

A close-up photograph of a large group of mushrooms growing on a forest floor. The mushrooms have brown, patterned caps and light-colored stems. They are growing on a bed of dark soil and green moss. The background is slightly blurred, showing more mushrooms and forest vegetation.

Some common fungi
at Mount Holdsworth

Di Batchelor



Cover photo:

Hypholoma brunneum is a saprophytic fungus that normally appears in large groups on rotting logs. Their caps, which usually have distinctive white scales around the margin, are often covered with brown spores falling from the gills of the fruit bodies above them. The caps can be large and go black or very dark brown after rain.

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Introduction

Hundreds of different species of fungi can be found in the Mount Holdsworth area and they come in all shapes and sizes. Such a variety reflects the range of habitats from lowland river grassland up through dense bush to open areas above the snow line.

The different species are mostly identified from their fruiting bodies, the visible spore-producing parts, but the main body of the fungus lives unseen either in the soil or in fallen wood and is made up of microscopic threadlike ‘hyphae’ which altogether make up the ‘mycelium’, the feeding stage of the fungus.

This guide highlights some of the more common or distinctive species. As with plants and animals, fungi are arranged as related species within a genus, related genera in a family, families into orders and so on, culminating in the Kingdom Fungi to which all “true fungi” belong. (Incidentally, fungi are more closely related to animals than to plants.) The different genera and families of fungi are often quite distinctive but identifying a particular species within a genus can be difficult and often requires examination of microscopic features such as spore shape and structure.

Fungal lifestyles

There are three major fungal lifestyles—mycorrhizal, saprophytic and parasitic—and all three are found among the fungi at Mount Holdsworth.

1. Mycorrhizal fungi have a complex, mutually beneficial relationship with particular tree species. The mushroom fruiting bodies of these fungi can be readily seen on soil at Mount Holdsworth in autumn and early winter. Below ground, the fungus forms a net of thread-like hyphae around the tree rootlets and sometimes into the root cells. The fungus is efficient at extracting water and nutrients from the soil which are then available to the plant; in return the plant provides the fungus with sugars produced in the leaves that the fungus cannot produce itself. Such relationships are called ‘symbiotic’. These fungi will

generally be found growing up out of the soil. Common genera found at Mount Holdsworth include:

Cortinarius—a large genus with gilled mushrooms having a cobwebby veil and ring on stalk, and brown spores

Russula—a group of often colourful mushrooms with white to yellow gills and whitish spores

Entoloma—with gills and pink spores (it is thought that not all *Entoloma* species are mycorrhizal)

Boletes—several genera that have sponge-like tubes and pores rather than gills on the underside of the stalked cap.

Toothed fungi—genera that have a toothed structure on the underside of the cap instead of pores or gills

2. Saprophytic fungi feed on dead organic material such as wood and leaves leading to their decomposition and the recycling of nutrients for plants, animals and other fungi to use. Without these leaf- and wood-rotting fungi we could not walk in the forest because of the depth of accumulated and non-decomposed plant material. This group will generally be seen growing out of dead or dying wood and on leaf litter and mulch. Some of the saprophytic genera found at Mount Holdsworth include the following mushroom genera:

Hygrocybe, *Humidicutis* and *Gliophorus*—the white-spored ‘waxcaps’

Mycena—with small bonnet-shaped caps and white spores.

Hypholoma—a small but common group of brown-spored fungi

Marasmius—with tough, horse-hair like stems, parachute-shaped caps and white spores.

3. Parasitic fungi attack and may eventually kill living trees, other plants and animals. Examples include:

Ganoderma—a typical bracket-shaped fungus or polypore.

Armillaria—a white-spored fungus which has “fruits” that often grow in large clumps.

1. Mycorrhizal fungi—symbiotic with trees and shrubs

Cortinarius species—brown-spored curtain fungi

Cortinarius are so-named because of the cobweb-like curtain (Latin *cortina*) that protects the gills of the developing mushroom. After the mushroom has opened out the remains of the ‘cortina’ can often be seen on the edges of the cap and on the stem as a fine ring. These fungi are found in beech forests because *Cortinarius* forms mycorrhizal relationships with the roots of beech trees.



Cortinarius rozites

Has a patchy shaggy cap and a ring on the stipe. Grows with beech.

Amanita species

Amanitas have white spores. These mushrooms form inside a universal veil which protects the gills of the developing fruit bodies. The remains of the universal veil often leaves wart-like dots on the cap and a volva at the base of the stipe. There are about ten native species. A well known exotic species, the fly agaric, *A. muscaria* (the red one with white dots), associates with conifers and other introduced species, and is also becoming established in native forests.



Amanita karea

Found under beech. Many *Amanita* species are poisonous, although the edibility of *Amanita karea* is unknown.

***Russula* species—the crumble caps**

Russulas are recognised by their characteristic chalky stem that readily breaks across when bent. Their caps can be red, pink, green, purple, brown, or multicoloured. They all have whitish spores.



Russula kermisina

This *Russula* is found often alongside tracks at Mount Holdsworth and has the almost closed cap characteristic of pouch fungi.



Russula roseopileata

Many *Russula* species appear at Mount Holdsworth, including this delicate pink *Russula roseopileata*.



Russula miniata

This rare species was first discovered in Karamea in 1968 and has been found only a couple of times since then. It grows under beech forest and is always small with a pastel pink cap.

Lactarius species are closely related to the *Russulas*.



Lactarius umerensis

This small *Lactarius* is common on tracks and in leaf litter under beech. It is recognised by its brown cap and the white milky substance that exudes from the gills when cut.

Boletes

The Boletes are fleshy mushroom-shaped fungi with their spores produced within soft tubes instead of gills. Some of the boletes introduced to NZ from Europe and North America are edible.



Tylopilus formosus

One of about 20 bolete species native to New Zealand. This is probably the most common large bolete in beech forests. It has a very dark violaceous brown cap and stem, making it difficult to spot, but the pores are a contrasting cream colour and turn pink with age.



Chalciporus aurantiacus

This very rare bolete appears regularly at Holdsworth. It is recognized by its coppery apricot and fairly large angular pores. It is related to the very common *C. piperatus* which grows with exotic trees.

Entoloma

The genus *Entoloma* includes the most iconic New Zealand fungal species the conical *Entoloma hochstetteri*, which appears on the fifty dollar note.



Entoloma hochstetteri

Common at Mount Holdsworth although the local variant (pictured) is a much lighter blue than is found elsewhere in NZ.

Toothed fungi

In place of gills or pores, these fungi have teeth on the underside of the cap on which the spores are produced.



Hydnium

Species in the genus *Hydnium* are commonly found at Mount Holdsworth.



Beenakia dacostae

The much rarer *Beenakia dacostae* also has teeth but has a dark grey or brownish cap. Only known from 20 collections at a handful of sites in North Island including Mount Holdsworth. These specimens were found near the Gentle Annie Track at about 500m.

Truffle-like fungi

These are fungi that form round or oval sac-like fruit bodies either at the soil surface or underground. The spores mature inside the unopened fruiting body and are dispersed when the outer case splits or an animal eats the fruiting body.



Chamonixia pachydermis

Commonly known as the potato fungus because of its shape, *Chamonixia pachydermis* gradually turns a metallic blue green where it is bruised or damaged by rain.



Cortinarius peruaraniancus

This (partially eaten) *Cortinarius peruaraniancus* is a truffle-like member of the genus *Cortinarius* that has a mycorrhizal relationship with silver beech (*Nothofagus menziesii*).

Pouch fungi



Cortinarius porphyroideus

The purple pouch fungus is easy to spot most of the year round at Mount Holdsworth. So-called because it is said to resemble an old-time tobacco pouch. Its spores are dispersed by animals and insects, unlike other fungi, which are mainly dispersed by wind.

2. Saprophytic fungi—the decayers and rotters

Waxcaps

The waxcaps include the genus *Gliophorus* and are so-called because of the waxy feel to their fruit bodies. Waxcaps are found at Munt Holdsworth from river level to the snowline.



Gliophorus viridis

This is one of two miniature green species at Mount Holdsworth often only spotted when you've got down to look more closely at a larger fungus.



Gliophorus lilacipes

Another waxgill, a bit slimier and more delicate than others and mostly pink in colour.



Gliophorus versicolor

This species is often found under beech trees and the white and rose coloured fruiting bodies have a delicate translucent quality.

***Mycena* species**

Little saprophytic fungi growing on dead wood and leaves with 2 to 10mm bell-shaped caps and, sometimes, a nipple on top.



Mycena interrupta

Easily recognised by its blue to green to cream colour gradation. Often found on the rotting logs.

Clavariaceae—the coral fungi

This family contains a number of genera that form club or coral-shaped fruiting bodies.



***Ramaria* sp.**

This *Ramaria* species branches like a coral but the various arms are all joined to a common base. Others can be club shaped.

Jelly fungi



Tremella fuciformis

The white, gelatinous and lobed *Tremella fuciformis* and the wood ear fungus, *Auricularia cornea*, are both edible.

Birdnest fungi



Nidula niveotomentosa

This small, woolly birdnest fungus appears in autumn and winter growing on decaying wood.

3. Parasitic fungi



Armillaria limonea

Armillaria limonea can be parasitic on *Nothofagus*. Although it eventually kills its host after many years, it is not as aggressively invasive as some other members of this genus overseas that cause problems for foresters. Some *Pinus radiata* seedlings are killed by *Armillaria*. A related species, *Armillaria novaezelandiae*, also occurring at Mount Holdsworth, is known to Māori as 'harore' and was eaten (see photo p. 11).



Ganoderma

Ganoderma is a common polypore bracket fungus and may be parasitic on trees. Vast numbers of spores are formed in narrow tubes that open on the lower surface of the cap. The brackets are very hard and woody, most often seen on old trees and on fallen wood.

Further information

This guide may well suffice as a first step but it is only an introduction. If you want to know more, there is a good paperback guide in the New Holland Publishers written by Geoff Ridley and Don Horne and you can still sometimes find an earlier excellent little guide in the Mobil New Zealand Nature series with watercolour illustrations by Marie Taylor in second-hand book shops. But even these only contain a very small proportion of all the mushrooms in New Zealand.

Good websites for fungi include:

www.hiddenforest.co.nz/fungi/

www.kaimaibush.co.nz/Fungi/

<http://nzfungi.landcareresearch.co.nz/html/mycology.asp>

It would also be useful to join FUNNZ, the Fungal Network of New Zealand. They hold an annual week-long 'fungal foray' where you will meet other mushroom enthusiasts and be able to gather and share heaps of information.



Armillaria novaezelandiae.

Collecting fungi

If you become seriously interested you will need to collect specimens as often the only way to identify them accurately is through dissection and microscopic analysis. Here in New Zealand the law requires a permit from the Department of Conservation to collect fungi on DOC land. They will want to know why you want to collect them and want to be reassured that it is not for food or commercial purposes and that there will be no damage to the environment. DOC will also consult the local iwi. All this takes time so allow for this when making an application.

Eating fungi

The best fungi to eat are the ones you buy in the supermarket! There are a few introduced, naturally occurring European fungi that are edible including the common field mushroom (*Agaricus campestris*) which grows in pasture paddocks and the birch bolete (*Leccinum scabrum*) which is found, not surprisingly, under introduced birch trees. But you should never eat a mushroom you collect in the wild without checking carefully with someone who is knowledgeable about both its identity and edibility.

None of the fungi illustrated in this guide can be reliably identified from the photos alone. Always check with an expert to safely identify a species; for many NZ fungi edibility is not known.

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Mount Holdsworth is covered in old undisturbed forest. There are many species of plants, mosses and trees in the forest and lots of logs and dead wood, but it is dominated by beech trees. Such forests are particularly rich in fungi.



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