FUNGI IN AUSTRALIA

J. Hubregtse

Part 5

A Photographic Guide to Ascomycetes

Hymenoscyphus berggrenii

F.N.C.V
Est. 1880

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A Photographic Guide to Ascomycetes

Revision 2.2

August 28, 2019

Author: J. Hubregtse
fia.hubregtse@gmail.com

Published by the
Field Naturalists Club of Victoria Inc.
E-published at http://www.fncv.org.au/fungi-in-australia/
Typeset using LaTeX

F.N.C.V
Est. 1880

Citation:

This work may be cited as:

Hubregtse J (2019) *Fungi In Australia*, Rev. 2.2,
E-published by the Field Naturalists Club of Victoria Inc., Blackburn, Victoria, Australia. Web address http://www.fncv.org.au/fungi-in-australia/

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CHAPTER 1

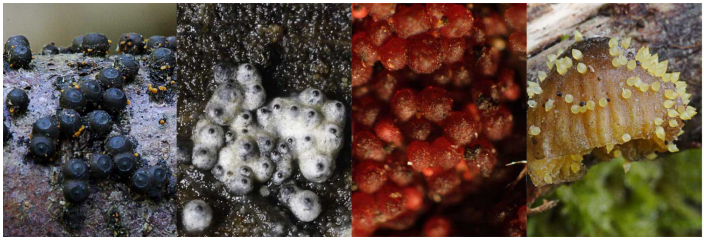
A PHOTOGRAPHIC GUIDE TO ASCOMYCETES

This photographic guide contains species that have been described in detail in *Fungi In Australia Part 2*. The fungi species have been placed in 6 broad morphological categories to facilitate identification.

Disc and Cup fungi comprises species that have their fertile layer (hymenium) in a disc-like fruit-body. The disc may or may not be supported by a stipe. The surface of the disc may be flat, concave, convex or cup-shaped and may have an irregular margin. The texture of the fruit-bodies can range from hard and brittle to soft and jelly-like, and their size can range from a fraction of a millimetre to a few centimetres.

Club and Antler fungi comprises species that have their hymenium on the outside of a club-like fruit-body, such as those belonging to earth-tongues or *Cordyceps* species. The antler-like species may consist of forked clubs or multibranched fruit-bodies.

Crust and Cushion fungi – Crust-like fungi are a large and variable complex of species that form thin, spreading fruit-bodies in a continuous layer, usually on decaying wood but occasionally on soil. Their hymenial surface may be rough, warted, wrinkled, cracked or smooth, and they usually have pores (ostioles) through which ascospores are ejected. Cushion-like fungi are normally thicker than a crust and generally do not form continuous layers. They usually consist of multiple rounded fruit-bodies that can reach a thickness of several centimetres (e.g. *Daldinia* spp.).



Flask fungi contain species that produce their ascospores usually in tiny globose chambers (perithecia). The fruit-bodies can range in size from less than a millimetre to several millimetres in diameter. In some species (e.g. *Annulohypoxylon bovei*) the flasks can bunch together to form what looks like a crust. They are commonly found on dead wood, but can occur on live wood or on other fungi (e.g. *Neobarya agaricicola*).

Honeycomb, Brain and Convoluted fungi represent the larger compound fruit-bodies, such as *Morchella* spp., which have pitted honeycomb-like fruit-bodies; *Gyromitra* spp., which have brain-like fruit-bodies; and *Hydnoplicata* spp., which have convoluted fruit-bodies.

Pin fungi are fungi that have a stipe and usually a globose head that is covered with the hymenium. For example, some thin-stiped species are in the genus *Chlorovibrissea*, while some thick-stiped species are in the genus *Leotia*.

1.1 Disc and Cup fungi

Order: Helotiales Family: Helotiaceae

Ascocoryne sarcoides

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This species colonises wet rotting logs and branches. It has a characteristic pink to pale purplish pink colour. When young it has a globular gelatinous form, and as it matures it changes into discs up to 20 mm across.

Order: Helotiales Family: Helotiaceae

Banksiamyces macrocarpus

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This disc fungus occurs only on the cones of Hairpin Banksia *Banksia spinulosa*. The discs grow in groups between the seed capsules when conditions are moist.

Order: Helotiales Family: Helotiaceae

Bisporella citrina

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This fungus produces vivid yellow, flat or slightly concave discs with no true stipe. It grows on wood (including *Banksia* cones). There are a number of very closely related species that may differ only in microscopic features.

Order: Helotiales Family: Helotiaceae

Bisporella sulfurina

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This small, bright sulphur-yellow disc is usually found on dead wood that has been infected by a black crust fungus, which is visible as a layer of blackish tissue nearby. This species is similar to *B. citrina*, which differs by being larger, with a colour that is closer to golden yellow, and is not associated with crust fungi.

Order: Pezizales Family: Pyronemataceae

Byssonectria fusispora

Peziza fusispora *Octospora carbonigena*
Peziza carbonigena *Inermisia fusispora*

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This uncommon species forms dense colonies of discs up to 3 mm across on the ground. They may vary in colour from orangey yellow to reddish orange.

Order: Pezizales Family: Pyronemataceae

Cheilymenia coprinaria

Scutellinia coprinaria *Scutellinia michiganensis*

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This species is one of a group of small (2 to 5 mm across), difficult to distinguish dung-loving cup fungi. The small cups have hairs on their rim, and may vary in colour from yellow to orange or red.

Order: Helotiales Family: Chlorociboriaceae

Chlorociboria aeruginascens complex

Chlorosplenium aeruginascens

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This species has intensely green to blue-green discs that are attached to rotting wood by a small central stipe. When not fruiting its presence can be detected because it causes a blue-green stain in the wood.

Order: Helotiales Family: Tympanidaceae

Claussenomyces australis

Ionomidotis australis

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This species forms scattered or caespitose gelatinous dark green discs, usually found on decaying eucalypt wood. As the fruit-body dries it becomes blackish.

Order: Helotiales Family: Helotiaceae

Cordierites frondosa

Bulgaria frondosa *Ionomidotis frondosa*

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This species colonises wet rotting logs. It is characterised by gregarious black, ear-shaped or lobed fruit-bodies about 10–20 mm across. A test to help in identifying this species is to place a small piece of fruit-body in a KOH solution, and observe the release of a purple-brown pigment.

Order: Helotiales Family: Helotiaceae

Cudoniella clavus

Cudoniella aquatica

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This species is readily recognised by its pale cream to ochre fruit-body, stipitate disc, and aquatic habitat. It is found on woody debris which is either submerged in fresh water, very wet or is in the splash zone of a waterfall.

Order: Helotiales Family: Dermateaceae

Fabraea rhytismoidea

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The fruit-bodies are small discs up to 1 mm diameter and are found in colonies on the leaves of the montane daisy *Leptinella filicula*.

Order: Pezizales Family: Helvellaceae

Helvella fibrosa

Helvella chinensis *Octospora villosa*
Helvella villosa

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This species is a grey-brown stalked cup with a smooth inner surface and a hairy outer surface. It is not common and its small size and colour make it difficult to see amongst the forest litter.

Order: Helotiales Family: Hyaloscyphaceae

Hispidula dicksoniae

Cyathicula dicksoniae

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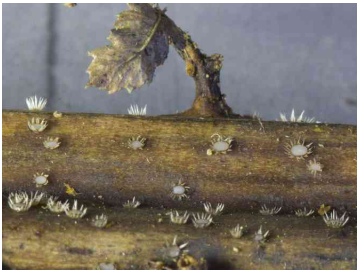

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These small beautiful fungi, which are often overlooked due to their minute size (up to 1 mm dia.) are found on dead rachises of Soft Tree Fern *Dicksonia antarctica* in wet areas.

Order: Helotiales Family: Helotiaceae

Hymenoscyphus berggrenii

Lanzia berggrenii *Pezizella nothofagi*
Mollisia nothofagi

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This tiny stipitate disc grows only on dead leaves of Myrtle Beech *Nothofagus cunninghami*, and is readily recognised by the pale colour of the disc, which has a dark brown margin. Up to 10 or more fruit-bodies may erupt on a leaf, forming black demarcation lines around each fruit-body.

Order: Helotiales Family: Helotiaceae

Hymenoscyphus sp. "olive cream with black rhizomorphs"

Cudoniella pezizoidea sensu Fuhrer (2009)

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This small disc fungus, up to 15 mm across, grows on damp shaded forest litter. When in large groups the discs can become compressed and convoluted.

Order: Helotiales Family: Helotiaceae

Hymenoscyphus sp. "white bruising orange"

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This small white disc, found on wood, can grow up to 5 mm dia., and has the unique property of developing yellow to orange bruises when touched. Although this species is relatively common, it seems that it has not been described and given a taxonomic name.

Order: Helotiales Family: Sclerotiniaceae

Hymenotorrendiella clelandii

Zoellneria clelandii *Torrendiella clelandii*

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This largish stalked disc is found on *Eucalyptus* wood and twigs, and is readily identified by its relatively large size, colour, and hairy outer surface.

Order: Helotiales Family: Sclerotiniaceae

Hymenotorrendiella eucalypti

Peziza eucalypti
Zoellneria eucalypti
Zoellneria callochaetes
Ciboria strigosa
Torrendiella eucalypti

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This small disc fungus, up to 1.5 mm diameter with dark hairs on its rim, can be easily recognised because it grows only on fallen Blackwood *Acacia melanoxylon* leaves. When it was named by the Kew Herbarium (England) it was assumed to be growing on eucalypt leaves.

Order: Helotiales Family: Rutstroemiaceae

Lanzia lanaripes

Ruststroemia lanaripes

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This species grows on rotting wood in wet forests, often in association with mosses. The fruit-bodies resemble broad-headed (up to 10 mm across) nails and have a tapering stipe.

Order: Helotiales Family: Helotiaceae

Phaeohelotium baileyanum

Discinella terrestris

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This species grows on moist soil, usually close to trees. The discs are relatively flat, and range in colour from yellow to yellow-orange.

Order: Xylariales Family: Xylariaceae

Poronia erici

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This species, which can be found throughout most of Australia, has adapted to living on relatively dry marsupial dung. The small black dots on the fruit-body are holes (ostioles) through which spores are ejected.

Order: Pezizales Family: Pyronemataceae

Aleuria aurantia

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This attractive bright orange cup fungus grows on soil, usually in small dense groups. The cups have an almost non-existent stipe at the base, and flatten with age.

Order: Pezizales Family: Pyronemataceae

Aleurina argentina

Jafneadelphus argentinus

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Usually found on soil, this species is cup-shaped when young, becoming flattish with maturity. The inner surface is dark brown to dark purple brown; the outer surface is a little darker, rough and warty.

Order: Pezizales Family: Pyronemataceae

Aleurina ferruginea

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This species of disc fungus usually has a thick rim to the disc. The upper surface of the disc is smooth and shiny, while the underside is minutely velvety, with warts toward the margin.

Order: Helotiales Family: Lachnaceae

Lachnum lachnoderma

Peziza lachnoderma *Dasyscyphus lachnodermus*

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This is one of the larger species of *Lachnum*, which can be recognised by its size (2 mm or more across) and its orangey yellow disc with the outer surface clothed with white hairs. This species is relatively common on the rotten wood of the Musk Daisy-bush *Olearia argophylla*. Note: Discs less than 1 mm across are most likely a different species.

Order: Helotiales Family: Lachnaceae

Lachnum pteridophyllum

Lachnum varians var. *pteridophyllum* *Dasyscyphus pteridophyllus*
Dasyscypha pteriodophylla *Dasyscyphus varians* var. *pteridophyllus*

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This minute disc fungus up to 0.5 mm in diameter has a golden fibrillose outer surface, while its inner surface is smooth and pale yellow. So far we have found *L. pteridophyllum* only on dead rachises of the Soft Tree Fern *Dicksonia antarctica*. Some other *Lachnum* species are found on wood in wet forests.

Order: Helotiales Family: Lachnaceae

Lachnum cf. *varians*

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This minute disc fungus up 1.5 mm in diameter has a whitish fibrillose outer surface, while its inner surface is smooth and pale yellow. The fruit-bodies are larger than those of *L. pteridophyllum*. So far we have found *Lachnum* cf. *varians* only on the rachises of dead Rough Tree Fern *Cyathea australis*. Some other *Lachnum* species are found on wood in wet forests.

Order: Helotiales Family: Lachnaceae

Lachnum virgineum

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This small goblet-shaped fungus is recognised by its size (up to 2 mm across), its overall white colour, and by the dense covering of short hairs on its outer surface. It is usually found on moist dead wood and woody debris in moist eucalypt forest and rainforest.

Order: Pezizales Family: Pezizaceae

Peziza tenacella

Humaria tenacella

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This species is found on charcoal, either after a bush fire or on the charcoal ash of old camp fires. The immature cups or discs are violet, becoming purplish brown as they mature.

Order: Pezizales Family: Pezizaceae

Peziza thozetii

Humaria thozetii

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The cups of this species are up to 40 mm across, are brown to olive-brown in colour, and grow on the ground. On the inside the cup is smooth, with tiny pits, and on the outside it is rough.

Order: Pezizales Family: Pezizaceae

Peziza varia

Peziza cerea *Peziza repanda* – probable
Peziza micropus

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This pale brown cup fungus is medium to large in size. It flattens with age, and can produce cups up to 150 mm across. It grows on dead wood, woodchip mulch, rich soil, sandy soil, and occasionally on burnt soil, as well as herbivore dung.

Order: Pezizales Family: Pyronemataceae

Scutellinia scutellata complex

Peziza scutellata

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This is the most common member of a small group of similar looking cup-like fungi with eyelash-like hairs radiating from the margin. It ranges in size from 2 to 15 mm, and can be identified by its bright orange-red inner surface and long dark brown to black eyelash-like hairs. It grows on damp soil or rotting wood.

Order: Pezizales Family: Pyronemataceae

Sowerbyella rhenana

Aleuria rhenana

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This species grows on the ground, individually or as groups of cups that stay cup-shaped as they age. Unlike *Aleuria aurantia* each cup has a distinct pale stipe.

Order: Pezizales Family: Sarcosomataceae

Urnula campylospora

Peziza campylospora *Plectania campylospora*

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This species consists of large dark brown rubbery cups, which are smooth on the inner surface and rough-textured on the outer surface. It sometimes forms colonies on damp rotting wood.

1.2 Club and Antler fungi

Order: Pezizales Family: Helvellaceae

Underwoodia beatonii

Helvella beatonii

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This species is readily recognised by its waxy, blunt club-shaped fruit-bodies. The colour of the upper portion can be brown to black, while the lower portion (stipe) is white. The interior of the fruit-body has hollow longitudinal chambers. It is usually found in sandy areas, in association with eucalypts, sheoaks, and melaleucas.

Order: Xylariales Family: Xylariaceae

Xylaria castorea

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This club-shaped fungus is usually found on rotting wood in wet forests. The normally black fruit-body may sometimes have a white powdery coating of asexual spores (conidia). Its sexual spores are black. The flesh is white.

Order: Hypocreales Family: Cordycipitaceae

Cordyceps cranstounii

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This species parasitises moth larvae. It usually forms cream-coloured club-shaped fruit-bodies covered in pores. The tissue connecting the fertile head to the moth larva is branched and fibrous. It also appears to parasitise *Cordyceps robertsii* when both fungi are present in the same moth larva.

Order: Hypocreales Family: Cordycipitaceae

Cordyceps gunnii

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The club-shaped fruit-body is yellowish at the base, and the fertile head is initially a dark olive-green colour that becomes blackish as it dries. It is usually found near wattle trees *Acacia* spp., because it parasitises the larvae of the Australian ghost moths *Oxycanus* spp., which feed on the wattle tree roots. The second image shows a moth larva infected by this fungus.

Order: Hypocreales Family: Cordycipitaceae

Cordyceps hawkesii

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This species can be readily differentiated from *C. gunnii* by the lighter coloured fertile region, which has a sharp demarcation with the stem. It can be found in similar regions to *C. gunnii*.

Order: Hypocreales Family: Cordycipitaceae

Cordyceps takaomontana

Paecilomyces tenuipes *Isaria tenuipes*
Isaria japonica

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The asexual form of this species consists of yellowish stipes with a white feathery covering. The sexual form is a small yellow to orange-buff club-shaped fruit-body. The parasitised host is the pupa of a Lepidopteran (moth or butterfly) larva.

Order: Hypocreales Family: Ophiocordycipitaceae

Ophiocordyceps robertsii

Cordyceps robertsii

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This species parasitises moth larvae and is readily identified by its long slender spear-like shape. The fertile head is clearly distinct from the stipe. This species sometimes appears to be parasitised by *Cordyceps cranstounii*, which causes creamy outgrowths on the fertile head.

Order: Geoglossales Family: Geoglossaceae

Geoglossum umbratile

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This blackish earth-tongue is a relatively common. It has a variable morphology, making it difficult to identify in the field. As with all earth-tongues, microscopic examination is necessary if identification to species level is required.

Order: Geoglossales Family: Geoglossaceae

Glutinoglossum australasicum

Geoglossum glutinosum *Glutinoglossum glutinosum*

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Most earth-tongues that are glutinous or viscid, belong to the genus *Glutinoglossum*. As with all earth-tongues microscopic examination is necessary if identification to species level is required.

Order: Geoglossales Family: Geoglossaceae

Glutinoglossum methvenii

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These small earth-tongues can be tentatively identified by their viscid to glutinous fruit-bodies. Most earth-tongues that are glutinous belong to the genus *Glutinoglossum*, and require microscopic examination for positive identification.

Order: Geoglossales Family: Geoglossaceae

Trichoglossum hirsutum

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A distinguishing feature of *Trichoglossum* species is that they have short stiff bristles covering the fruit-body. To see these bristles a hand lens is required. Microscopic examination is needed to identify to species level in the *Trichoglossum* genus.

Order: Geoglossales Family: Geoglossaceae

Trichoglossum walteri

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A distinguishing feature of *Trichoglossum* species is that they have short stiff bristles covering the fruit-body. This is one of the few species of *Trichoglossum* that is found on the trunks (caudices) of tree ferns, but for positive identification microscopic examination is necessary.

1.3 Crust and Cushion fungi

Order: Hypocreales Family: Cordycipitaceae

Cordyceps bassiana

Beauveria bassiana

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The white mycelium infecting the insects is the asexual stage of *Cordyceps bassiana*. This highly virulent parasitic fungus is capable of infecting a wide range of insects. The sexual club-like *Cordyceps* stage has not been found in Australia. This fungus has been cultivated for use in biological control of insect pests.

Order: Hypocreales Family: Hypocreaceae

Hypocreopsis amplectens

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The fruit-body consists of a central region with irregular radiating lobes. It has a dull rust-brown surface and it is white within. It often occurs on dead tea-tree branches, and is usually found in association with *Hymenochaete* species (a crust fungus).

Order: Xylariales Family: Hypoxylaceae

Hypoxylon aff. *rubiginosum*

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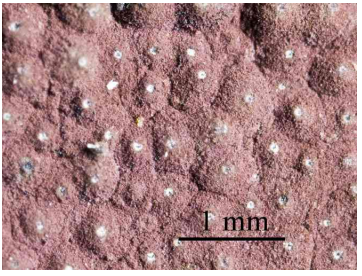

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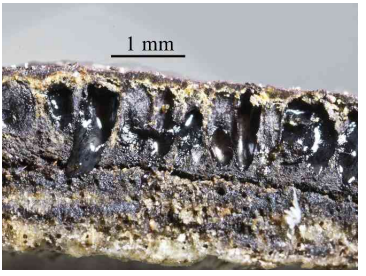

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This species is recognised by the largish patches of purplish crusts it forms, generally on decorticated dead wood of *Pomaderris* spp. It is usually found in association with other black crusts, possibly other *Hypoxylon* or *Hypocrea* species.

Order: Pezizales Family: Pyronemataceae

Pyronema omphalodes

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This fungus appears after fire, and is often found amongst the ashes of camp fires. It usually forms obvious bright orange compact colonies of small fruit-bodies (up to 1 mm across) on burnt soil. These colonies often have a white mycelial margin.

Order: Hypocreales Family: Hypocreaceae

Trichoderma aff. *gelatinosum*

Hypocrea aff. *gelatinosa* (Teleomorph)

This wood-inhabiting species is recognised by its yellow to greenish yellow cushion-like fruit-bodies which are dotted with dark green spore-bearing structures. Although similar looking species occur in Europe, this one is most likely an unnamed species.

Order: Hypocreales Family: Hypocreaceae

Trichoderma victoriense

Hypocrea victoriensis

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This distinctive fungus forms yellow cushions or patches on which ostioles (pores through which spores are released) are clearly visible. This species can be found in wet forests, usually on the underside of dead wood. Previously known in Australia and New Zealand as *Hypocrea sulphurea*.

Order: Xylariales Family: Xylariaceae

Daldinia grandis

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The fruit-bodies are hemispherical or rounded cushion-shaped, initially pinkish grey to brownish purple, becoming brittle and charcoal-black with age. They are concentrically zoned within. Found on dead wood in wet forests.

Order: Xylariales Family: Hypoxylaceae

Hypoxylon howeianum

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This species is recognised by the hemispherical shape of its fruit-bodies and their rust to brown colour. Two types of fruit-bodies usually appear together — the brownish hemispherical fertile form, and the brownish rope-like sterile (conidial) form.

Order: Hypocreales Family: Hypocreaceae

Trichoderma nothescens

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The fruit-bodies of the sexual stage are hemispherical cushions up to 4 mm diameter, either scattered, gregarious, or crowded, then turning smooth and pale brown, becoming darker brown with age; surface peppered with ostioles from embedded perithecia. Found on dead hardwood bark.

1.4 Flask fungi

Order: Xylariales Family: Hypoxylaceae

Annulohypoxylon bovei

Hypoxylon bovei

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This fungus grows on dead Myrtle Beech *Nothofagus cunninghamii* wood. It is made up of clusters of small black spherical flasks containing spores that are released through slightly papillate ostiolar openings (like small volcanoes) surrounded by a raised margin.

Flask Fungi

Order: Xylariales Family: Hypoxylaceae

Annulohypoxylon bovei var. *microspora*

Hypoxylon bovei var. *microspora* *Annulohypoxylon bovei* var. *microsporum*

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This crust fungus grows on dead wood. The crust patch can be quite large, 200 mm × 50 mm or more, and is made up of small spherical flasks containing spores that are released through slightly papillate ostiolar openings (like small volcanoes) surrounded by a raised margin.

Order: Sordariales Family: Lasiosphaeriaceae

Lasiosphaeria ovina

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This species grows on rotting, decorticated wood in wet forests. It is recognised by its very small, white woolly spherical fruit-bodies, each with a blackish papilla on the top. The fruit-bodies are usually so small that a large number growing in a compact group looks like a white crust.

Order: Hypocreales Family: Nectriaceae

Nectria sanguinea

Sphaeria sanguinea *Nectria episphaeria*

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This tiny, scarlet or dark red flask fungus, less than half a millimetre across, grows profusely across the surface of a charcoal-coloured crust fungus *Biscogniauxia* sp., which it parasitises. Both species are normally found on dead wood.

Order: Hypocreales Family: Clavicipitaceae

Neobarya agaricicola

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This very small yellow parasitic flask fungus is often seen on the fruit-bodies of small agarics such as *Galerina* spp. that grow on wood.

1.5 Honeycomb, Brain and Convoluted fungi

Order: Cyttariales Family: Cyttariaceae

Cyttaria gunnii

Cyttaria septentrionalis

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This species is a parasite on Myrtle Beech *Nothofagus cunninghamii*. The fruit-bodies are soft, and form in clusters on galls during November or December. If the main trunk becomes badly infected this fungus can kill the tree.

Order: Pezizales Family: Morchellaceae

Morchella australiana

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Morchella australiana is a member of the *Morchella elata* group of morphologically similar species. A characteristic feature of these species is the presence of prominent vertical ridges on the fertile head of the fruit-body. These fungi grow on the ground, mostly in unburnt native woodlands.

Order: Pezizales Family: Morchellaceae

Morchella esculenta group

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This species has a sub-conical to subglobose head with an irregular network of ridges and pits, suggesting that it belongs to the *Morchella esculenta* group. It is found on the ground, usually amongst tea tree *Leptospermum* and *Eucalyptus* species.

Order: Pezizales Family: Pezizaceae

Hydnoplicata convoluta

Peziza whitei *Hydnoplicata whitei*

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This species is unusual because of its highly convoluted fruit-body with a complex arrangement of irregular chambers. It usually grows hidden below litter, or just poking through the soil. It has a fragile texture.

1.6 Pin fungi

Order: Helotiales Family: Vibrisseaceae

Chlorovibrissea bicolor

Vibrissea bicolor

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This rare species of pin fungus colonises rotting waterlogged or semi-submerged wood in gullies in wet eucalypt and rainforest. The fruit-bodies are about 20 mm high with a yellow-green fertile head (5 mm across) on a dark stipe.

Order: Helotiales Family: Vibrisseaceae

Chlorovibrissea melanochlora

Vibrissea melanochlora

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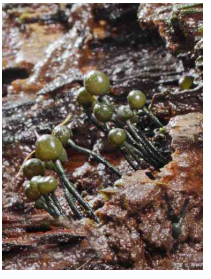

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This species of pin fungus colonises rotting wood in gullies in wet eucalypt and rainforest. The fruit-bodies are about 30 mm high with a dark green fertile head (7 mm across) on a very dark green to almost blackish stipe.

Order: Helotiales Family: Leotiaceae

Leotia lubrica

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This small jelly-like fungus grows on the ground amongst leaf litter in wet forests. It is identified by its globular fertile head on a stipe about 50 mm long, and its colour, which ranges from yellow-green to yellow or olive-brown.

Order: Helotiales Family: Vibrisseaceae

Vibrissea dura

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This uncommon species, which has a gelatinous texture, grows on decaying wood in wet forest and rainforest. It usually grows in small groups, and has no trace of green in its fruit-body.

SPECIES INDEX