

## A PRELIMINARY CENSUS OF THE MACROFUNGI OF MT WELLINGTON, TASMANIA – THE NON-GILLED BASIDIOMYCOTA

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(with two appendices)

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This work is a further contribution towards documenting the macrofungi of Mt Wellington. An earlier publication was confined to 130 named and described species of ‘agarics’, or gilled fungi. The focus of the present paper is on the non-gilled Basidiomycota with the exception of the sequestrate species, which will be the subject of a separate study. A total of 65 non-gilled species is included here. Further, the acquisition of recent information has added 11 species to the previous list of gilled fungi and enabled two of the names to be revised.

**Key Words:** Macrofungi, Mt Wellington (Tasmania), non-gilled, Basidiomycota, polypores, boletes, crust fungi, coral fungi, puffballs, stinkhorns, spine fungi, jelly fungi.

### INTRODUCTION

A preliminary census of the Mt Wellington ‘agarics’ identified 130 species of gilled fungi (Ratkowsky & Gates 2002). In this paper, the authors deal with almost all of the remaining previously-named and described Basidiomycota of the macrofungi that were not included in Ratkowsky & Gates (2002). Thus, fungi commonly referred to as ‘polypores’, ‘boletes’, ‘shelf or crust fungi’, ‘coral fungi’, ‘puffballs’, ‘stinkhorns’, ‘spine fungi’ and ‘jelly fungi’ are treated here, the exception being sequestrate fungi (‘earthballs’ or truffle-like fungi), which will be the subject of a separate study. The present work was facilitated by the recent publication of the second part of a comprehensive catalogue and bibliography of Australian fungi (May *et al.* 2003), which completed the listing of all the validly named larger basidiomycetes reported to occur in Australia.

The taxonomy of the larger homobasidiomycetes, which includes the mushrooms and related fungi, was based in the nineteenth century upon the Friesian system with its origins in Persoon (1801). Orders were delimited on the gross morphology of the fruiting bodies and their anatomical features, i.e., whether the fungi were, using informal terms, gilled, poroid, jelly-like, etc. These groupings had the advantage of easy application in the field, making ready recognition the prime factor, ignoring phylogenetic considerations. This became the dominant approach to the classification of homobasidiomycetes until the late 1980s, when attention turned towards the use of DNA to determine phylogenetic relationships. Ratkowsky & Gates (2002) used an old-fashioned concept of Agaricales, which delimited that Order as fungi with gills. Thus, genera such as *Lactarius*, *Lentinellus* and *Russula* were included in Agaricales, although they are now placed in Russulales (Kirk *et al.* 2001). In contrast, modern studies using nucleotide sequence data show a close affinity of ‘puffballs’ such as *Bovista* and *Lycoperdon* with the ‘agarics’ *Agaricus* and *Lepiota* (Moncalvo *et al.* 2002), so that they should all be grouped into Agaricales in a phylogenetic classification. Hence, some of the groupings of genera into Orders in appendices 1 and 2 may appear surprising, these following

Kirk *et al.* (2001). One example of this contrast between morphological and phylogenetic classification is that the genera *Clavaria*, *Clavicornia*, *Clavulina* and *Ramaria*, all considered informally as ‘coral fungi’, are found in four different orders in appendix 1.

### MATERIALS AND METHODS

The survey zones are those of Ratkowsky & Gates (2002), which includes a map of the survey area, details of the tracks followed and descriptions of the habitats. Fieldwork began on 1 January 1994 and was completed on 31 December 2003. During that time, 249 forays were conducted on Mt Wellington. Material collected was macroscopically described within 24 hours of collection and examined microscopically. Species identification was made by comparison of the detailed macro and micro descriptions with those of published species in the scientific literature. Voucher material for each species has been deposited in the Tasmanian Herbarium (HO) and, wherever sufficient material was available, in the National Herbarium of Victoria (MEL).

### RESULTS

The list of non-gilled species in appendix 1 is confined to those taxa that have been validly named and described. This was the approach taken in Ratkowsky & Gates (2002). Hence, the names of the 65 species listed in appendix 1 may be found either in May & Wood (1997) or May *et al.* (2003) or as updated by the interactive catalogue of fungi on the Royal Botanic Gardens Melbourne website ([www.rbg.vic.gov.au](http://www.rbg.vic.gov.au)). The species are arranged alphabetically within each of ten Orders, these conforming to the list given in Kirk *et al.* (2001). Wherever photographs and/or illustrations exist in readily available sources for the species listed in appendix 1, references to these are given.

Four further species of *Mycena* can be added to the list of gilled fungi in Ratkowsky & Gates (2002), and one name change made, as a result of the recent monograph

VEILINGA, E.C., 2003: *Chlorophyllum* and *Macrolepiota* (Agaricaceae) in Australia. *Australian Systematic Botany* 16: 361–370.

YOUNG, A.M., 2000: *Common Australian Fungi*. Revised Edition. University of New South Wales Press, Sydney. 154 pp.

## APPENDIX 1

### Species descriptions of Mt Wellington non-gilled Basidiomycetes

#### [Agaricales]

*Clavaria amoena* Zoll. & Moritzi – A simple, i.e., unbranched or at most sparingly branched, yellow, robust, club-like coral fungus. Illustrations – Shepherd & Totterdell (1988, p. 127), as *Clavulinopsis amoena*; Fuhrer (2001, p. 88); McCann (2003, p. 85).

*Clavaria aurantia* Cooke & Masee – Short, slender, simple orange clubs characterise this species, which may be confused with the more robust *Clavaria miniata* (q.v.) or with *Ramariopsis depokensis* (see Bougher & Syme 1998, pp. 336–7), the latter differing in microscopic details. Illustration – Robinson (2003, p. 37), as *Clavulinopsis* aff. *aurantia*.

*Clavaria miniata* Berk. – Simple clubs characterise this relatively robust orange or red club-like coral fungus. Illustrations – Macdonald & Westerman (1979, p. 101), as *Clavulinopsis miniata*; Young (2000, Plate 5), as *Clavulinopsis miniata*; Fuhrer (2001, p. 89); McCann (2003, p. 85).

*Clavaria zollingeri* Lév. – This multi-branched, violet or pink-lilac coral fungus may be confused with the similarly-coloured and branched *Ramaria versatilis* Quél. However, the white spores of the genus *Clavaria* distinguish it from the ochre-spored genus *Ramaria*. Illustrations – Fuhrer & Robinson (1992, pp. 62–3); May *et al.* (2003, plate 12).

*Fistulina hepatica* (Schaeff. : Fr.) Fr. – The ‘Beefsteak Fungus’ is a cosmopolitan, fleshy, pinkish brown, bracket-forming polypore with an unusual hymenium that is made up of separable tubes. The tubes and pores are bright pink, becoming brown with age. Illustrations – Shepherd & Totterdell (1988, p. 130); Bougher & Syme (1998, pp. 318–9); Fuhrer (2001, p. 116); May *et al.* (2003, plate 15); McCann (2003, p. 82); Robinson (2003, p. 49).

*Lycoperdon perlatum* Pers. : Pers. – This brown species, with a globose fruit body and prominent sterile base, is usually found on soil. Confusion with *L. pyriforme* (q.v.) is possible, but that species has smaller spores with less definite spines. Illustration – Shepherd & Totterdell (1988, p. 115).

*Lycoperdon pyriforme* Schaeff. : Pers. – The pear-shaped fruit body, with a greatly reduced sterile base, is usually found on wood. The spores are almost smooth. Illustrations – Fuhrer & Robinson (1992, p. 66); Hood (1992, fig. 26); Young (2000, plate 17); May *et al.* (2003, plate 27); McCann (2003, p. 100).

*Macrotyphula juncea* (Fr. : Fr.) Berthier – This threadlike fungus is almost inconspicuous amongst the leaves and small twigs on which it grows. The light-coloured, fertile upper portion contrasts with the brown sterile base. Illustrations – Fuhrer (2001, p. 85); McCann (2003, p. 87).

#### [Boletales]

*Boletellus obscuricoccineus* (Höhn.) Singer – The deep pink pileus and stipe contrast with the non-bruising yellow tubes and pores. The stipe is long, slender and squamulose. Illustrations – Shepherd & Totterdell (1988, p. 104); Fuhrer & Robinson (1992, p. 60); Bougher & Syme (1998, pp. 304–5); Fuhrer (2001, p. 80); Robinson (2003, p. 33).

*Boletus tasmanicus* Hongo & A.K. Mills – This medium to large bolete is characterised by its dry, dark reddish brown, finely velvety or finely roughened pileus, yellowish olivaceous tubes with reddish pores, and a subfusoid, reddish brown stipe with faint reticulations. Pores, tubes and stipe bruise blue upon cutting. Illustration – Hongo & Mills (1988, p. 354).

*Calostoma fuscum* (Berk.) Masee – A puffball in which the peridium is supported by a network composed of strands of gelatinised tissue. The more or less spherical spore sac is protected by a reddish brown, tough, outer cap that falls off at maturity, exposing the thin-walled, orange-mouthed sac. Illustrations – Shepherd & Totterdell (1988, p. 123); Bougher & Syme (1998, pp. 112–3); Fuhrer (2001, p. 94); McCann (2003, p. 102).

*Fistulinella mollis* Watling – An extremely soft, sticky, bolete with pileus colours varying through a range of creams, buffs and browns. The tubes and pores are usually pink. Illustrations – Bougher & Syme (1998, pp. 306–7); Fuhrer (2001, pp. 79 and 81); McCann (2003, p. 64).

*Podoserpula pusio* (Berk.) D.A. Reid – The buff-coloured, soft upper surface contrasts with the pink hymenial surface and stipe. An unusual species, having a multi-tiered structure on a central stipe, although it can occur with a shelf-like growth form. Illustrations – Shepherd & Totterdell (1988, p. 130), as *Cantharellus pusio*; Grgurinovic & Mallett (1996, fig. 28); Bougher & Syme (1998, pp. 326–7); Fuhrer (2001, p. 132); McCann (2003, p. 66); Robinson (2003, p. 45).

*Scleroderma cepa* Pers. : Pers. – The genus is readily recognised and separated from other ‘puffballs’ and ‘earthballs’ by its yellow-brown, hard outer peridium and olivaceous to violaceous gleba. Frequently found in soil alongside roads, or in dry sclerophyll environments. Illustrations – Macdonald & Westerman (1979, p. 135), as *S. flavidum*; Shepherd & Totterdell (1988, p. 122), as *S. flavidum*; Grgurinovic & Mallett (1996, fig. 32); May *et al.* (2003, plate 51).

#### [Cantharellales]

*Cantharellus concinnus* Berk. – Previously considered an Australian variety of a worldwide species, it is recognised by its apricot-orange colours, funnel shape, and shallow, decurrent lamellae that are often forked or tend to

- apricot-pink, irpicoid (i.e., having broken or irregular spines and grooves) fertile surface, tending to form tiers and cover large areas of the trunks of standing dead trees. The abhymenial surface may have distinct, concentric zones. Previously known by the synonyms *Irpex brevis* or *Irpex zonatus*. Illustrations – Grgurinovic & Mallett (1996, fig. 43); McCann (2003, p. 73).
- Aurantiporus pulcherrimus* (Rodway) P.K. Buchanan & Hood – A soft, strawberry-red bracket, often but not exclusively found on dead myrtle (*Nothofagus cunninghamii*) in wet forests. Illustrations – Marks *et al.* (1982, p. 87), as *Tyromyces pulcherrimus*; Fuhrer & Robinson (1992, p. 79); McCann (2003, p. 79).
- Australoporus tasmanicus* (Berk.) P.K. Buchanan & Ryvarden – This bracket fungus is noteworthy for the small area of its usually dark brown abhymenial surface relative to its pale brown, whitish or pinkish hymenial surface. Illustration – Fuhrer & Robinson (1992, p. 76).
- Byssomerulius corium* (Pers.:Fr.) Parmasto – Whitish, sometimes with pale brown hues, this thin, sheet-forming polypore has varying amounts of development of shelf-like growth and a soft, almost tissue-like texture. Usually on small twigs and branches. Illustrations – Cunningham (1963, plate V, fig. 3), as *Merulius corium*; Hood (1992, fig. 32), as *Meruliopsis corium*.
- Fomes hemitephrus* (Berk.) Cooke – A common hoof-shaped polypore on wood, whitish in youth, becoming browner with age. The hymenial and abhymenial surfaces are separated internally by a narrow but clearly defined orange zone. It may be confused with *Ganoderma applanatum* (q.v.), but the hymenial surface doesn't bruise as markedly as that of the latter species. Illustrations – Marks *et al.* (1982, p. 88), as *Heterobasidium hemitephrum*; Fuhrer & Robinson (1992, p. 76), as *Fomitopsis hemitephrum*; Mallett & Grgurinovic (1996, fig. 19), as *Fomitopsis hemitephra*; May *et al.* (2003, plate 43).
- Fomitopsis lilacinogilva* (Berk.) T.E. Wright & J.R. Deschamps – Its lilac colouration distinguishes this fungus from all other polypores found on logs and stumps in Tasmania. Illustrations – Macdonald & Westerman (1979, p. 115), as *Trametes lilacino-gilva*; McCann (2003, p. 78).
- Ganoderma applanatum* (Pers.) Pat. – One of the best-known polypores worldwide, the 'Artist's Conk' is a large brown, bracket-forming fungus noted for its white hymenial surface that readily bruises brown when marked. Illustrations – Macdonald & Westerman (1979, p. 109); Shepherd & Totterdell (1988, p. 135); Fuhrer & Robinson (1992, p. 77); Young (2000, plate 15); McCann (2003, p. 75); Robinson (2003, p. 47).
- Gloeoporus taxicola* (Pers.:Fr.) Gilb. & Ryvarden – A soft, resupinate polypore with the hymenial surface made up of purple-vinaceous folds and reticulations, the growing edge much paler. Found on the undersides of wet, dead logs. Illustration – Fuhrer & Robinson (1992, pp. 72–3), as *Merulius ravenelii*.
- Grifola colensoi* (Berk.) G. Cunn. – The compound fruit body, up to 40 cm diameter, is made up of numerous, large overlapping lobes up to 15 cm long radiating outwards from a common attachment. The abhymenial surface is brown to blackish, whereas the hymenial surface is cream to buff at first, becoming darker with age. Illustration – Shepherd & Totterdell (1988, p. 136), as *G. aff. frondosa*. Many or all Tasmanian records of *G. frondosa* are probably misidentifications of *G. colensoi*.
- Junghuhnia rhinocephala* (Berk.) Ryvarden – The coffee, bay, chestnut, or rusty colours of this small shelf-like or sheet-forming polypore, and especially its distinctive, pleasant, sweet odour, persisting long after drying, make this species recognisable in the field. Microscopically, the abundant crystal-coated 'metuloids' aid in identification. Illustrations – Berkeley (1859, plate 182, fig. 8), as *Polyporus rhinocephalus*; Hood (1992, fig. 70), as *Trichaptum rhinocephalum*.
- Mycocacia subceracea* (Wakef.) G. Cunn. – Forming golden yellow patches on the undersides of fallen branches or small logs, this resupinate fungus has its spore-bearing basidia located on small spines. Illustrations – Fuhrer (2001, p. 109); McCann (2003, p. 72).
- Neolentiporus maculatissimus* (Lloyd) Rajchenb. – A species that forms medium-sized brackets on the sides of trees and logs, the pores of the hymenial surface often exceeding 1 mm diameter, with the brownish abhymenial surface varying from almost smooth in youth to markedly scaly. Illustrations – Fuhrer (2001, p. 121); May *et al.* (2003, plate 48).
- Podoscypha petalodes* (Berk.) Pat. – Forming orangy brown, leathery rosettes usually near the base of trees, this fungus has concentric bands on its abhymenial surface and a smooth hymenial surface. Illustrations – Fuhrer (2001, p. 133); May *et al.* (2003, plate 59); McCann (2003, p. 83).
- Polyporus melanopus* (Sw.:Fr.) Fr. – A tough, leathery polypore on wood with a dark brown stipe, white hymenial surface and a smooth, off-white, brown or dark blood-red pileus. Illustrations – Hood (1992, fig. 91); McCann (2003, p. 81), as *Polyporus* sp.
- Postia caesia* (Schrad.:Fr.) P. Karst. – This is a species complex, the species of which have small, sausage-shaped spores. All forms, whether soft and spongy, or firm and thin, are sessile on wood and turn greenish blue when bruised. Australian and New Zealand forms described under *Polyporus setiger* Cooke belong to this complex. Its appropriate generic position as a *Postia*, *Tyromyces* or an *Oligoporus* is yet to be determined. Illustrations – Hood (1992, fig. 81), as *Tyromyces setiger*; Courtecuisse & Duhem (1995, fig. 100), as *Oligoporus caesius*; Hood (2003, fig. 83), as *Tyromyces setiger*.
- Postia dissecta* (Lév.) Rajchenb. – A thin polypore with individual fruit bodies rarely exceeding 3 cm diameter, forming tiered shelves often at the end of cut logs. Pileus brownish, often with concentric bands, the hymenial surface white. Illustration – Hood (1992, fig. 93), as *Polyporus exiguus*.
- Postia pelliculosa* (Berk.) Rajchenb. – A spongy polypore with a brown, hairy abhymenial surface and a white or pinkish hymenial surface. It also occurs with a black, hairy abhymenial surface and a yellow hymenial surface. Illustrations – Marks *et al.* (1982, p. 87), as *Tyromyces pelliculosus*; Hood (1992, fig. 82); McCann (2003, p. 79).
- Pycnoporus coccineus* (Fr.) Bondartsev & Singer – A polypore that forms conspicuous orange-red brackets or shelves on dead wood. Illustrations – Macdonald & Westerman (1979, p. 113), as *P. cinnabarinus*; Bougher & Syme

p. 143); Fuhrer & Robinson (1992, p. 80); Fuhrer (2001, p. 141); May *et al.* (2003, plate 60); McCann (2003, p. 92).

*Tremella mesenterica* Retz.:Fr. – Similar to *T. fuciformis* (q.v.) in its brain-like, convoluted form, but differs in its yellow to orange colours and its preference for drier

environments. Illustrations – Shepherd & Totterdell (1988, p. 143); Grgurinovic & Mallett (1996, fig. 19); Fuhrer (2001, pp. 138 and 141); May *et al.* (2003, plate 62); McCann (2003, p. 92); Robinson (2003, p. 57).

## APPENDIX 2

### Additions and corrections to records of gilled Basidiomycota in Ratkowsky & Gates (2002)

#### [Agaricales]

*Cheimonophyllum candidissimum* (Berk. & M.A. Curtis) Singer – The small, fan-shaped, fruit bodies are white, soft-fleshed, and occur on rotting wood. Illustration – McCann (2003, p. 42).

*Dermocybe canaria* E. Horak – A medium to large fungus, yellow in all its parts, that turns brown with age. Illustration – McCann (2003, p. 20).

*Macrolepiota clelandii* Grgur. – This species was listed in Ratkowsky & Gates (2002) as *M. konradii* (Huijsman ex P.D. Orton) M.M. Moser. However, Vellinga (2003) showed that the name *M. konradii*, as well as the names *M. gracilenia* (Krombh.) Wasser, *M. procera* (Scop. : Fr.) Singer, and *M. mastoidea* (Fr. : Fr.) Singer, refer to European species and have been misapplied by Australian authors to what is really a single, native species, *M. clelandii*. Illustrations – see the list in Ratkowsky & Gates (2002).

*Mycena albidofusca* Grgur. – This is a small species with a brown pileus and a blister-like or whitish central disc and translucent-striate margin. Illustrations – Grgurinovic (2003, plate 14); McCann (2003, p. 53).

*Mycena carmeliana* Grgur. – A brown species with orange hues, recognised by its sulcate margin, bleach odour, and orange basal disc. Illustration – Grgurinovic (2003, plate 28).

*Mycena mulawaestris* Grgur. – A medium-sized species with a dark brown, glutinous pileus. Illustration – Grgurinovic (2003, plate 21).

*Mycena nargan* Grgur. – A medium to large, conical, dark-brown species, distinguishable by small, white particles that cover the pileus in youth. Illustration – Grgurinovic (2003, plate 23).

*Mycena vinacea* Grgur. – This species was listed in Ratkowsky & Gates (2002) as *Mycena pura* (Pers.:Fr.) P. Kumm. According to Grgurinovic (2003), all Australian records purporting to be *M. pura* are either *M. vinacea* Cleland or another related species, *M. nullawarrensensis* Grgur., with the latter not yet known outside Victoria. Tasmanian material fits the description of *M. vinacea*, and, to the two illustrations cited in Ratkowsky & Gates (2002) as *M. pura*, one can add Grgurinovic (2003, plate 3), McCann (2003, p. 54), and Robinson (2003, p. 25, as *M. pura*).

*Pholiota aurivella* (Batsch.:Fr.) P. Kumm. – Characterised by a lemon-yellow or golden-brown, thickly glutinous pileus in which dark brown or tawny brown scales are immersed in the gluten layer.

#### [Russulales]

*Lactarius stenophyllus* Berk. – Pileus centrally depressed, with lemon-coloured shades and concentric zones that may fade in age or which are sometimes indistinct, lamellae adnate to subdecurrent, close to crowded, yellow with pale peach or apricot hues. Stipe stout, white or tinted pale peach or pale apricot. Latex white, with a bitter aftertaste. Illustration – Berkeley (1859, plate 181, fig. 8).

*Lentinellus hepatotrichus* (Berk.) D.A. Reid – This species, in common with the other species of the genus, is characterised by conspicuously serrate or eroded lamellar margins and amyloid, verrucose spores. The sessile, dark brown pileus is generally densely hairy, with tufts of shaggy hairs covering most of the upper surface. Spores small, 3–5 x 3–4 µm. A member of the *L. ursinus* (Fr. : Fr.) Kühner complex and separated from *L. pulvinulus* (q.v.) mainly by its smaller spores. Illustration – Fuhrer & Robinson (1992, p. 47), as *Lentinellus* sp.

*Lentinellus omphalodes* (Fr.) P. Karst. – This is the only one of the Tasmanian species of the genus with a well-developed stipe, which may be central or eccentric. We have recently learned (R.H. Petersen, pers. comm., 7 January 2004) that this species should now be called *L. micheneri* (Berk. & M.A. Curtis) Pegler.

*Lentinellus pulvinulus* (Berk.) Pegler – The sessile, light brown to buff pileus is pubescent near the attachment but tends to be glabrous near the margin. Spores 5–7 x 4–6 µm. Believed to be closely related to *L. flabelliformis* (Bolton : Fr.) Ito. Separated from *L. hepatotrichus* (q.v.) mainly by its larger spores.