Cortinarioid Fungi of New Zealand

An Iconography and Key

Thirteenth Revised Edition

Introduction

Preface

This book is intended as one small step towards bridging an obvious gap in the literature on New Zealand fungi, viz. colour illustrations and descriptions of dark-spored agaricoid and gastroid species that grow in native forests. During many study visits to the country I have repeatedly experienced the need for such a publication, a need that stems from the following observations:

- The target group of fungi is well represented in New Zealand. During parts of the season it dominates the mycoflora in vast areas of the native forests.
- At the same time these species are poorly known. Only a modest number have been named, described, and published, and even fewer have been illustrated in colour.

In Europe and other parts of the world many cortinarioid fungi have proven critical as indicators of valuable biotopes and areas worthy of conservation. There is evidence that this also applies to New Zealand, which adds to the incentive to explore the target group and its role within the ecology of the region.

It is my hope that the book will inspire resident mycologists to continue studies of this important and fascinating subject. It is evident that much remains to be done and that many new species will be discovered. This book must therefore be seen as provisional in the sense that it will be subject to periodical updates as new data become available. Inevitably, also some names will be provisional, used as working names or as tentative identification, until they are later confirmed or perhaps amended.

This edition mainly reflects the results of recent research into the global *Cortinarius* taxonomy based on molecular analysis [Soop et al. 2019a]. A practical consequence is that most taxa are assigned to a *section* in the taxonomy of the genus, which helps to understand their relationships. These relationships are further illustrated by taxonomical maps, provided (on-line) with this book. The repertory amounts to about 170 colour photos and descriptions, all of *Cortinarius* species and varieties.

Karl Soop
Mora, Sweden in November 2022

Scope

Up until Edition 6, this book included various dark-spored genera encountered in New Zealand[1]. Due to space limitations, and to the emergence of literature covering a wide range of genera [e.g. Johnston et al. 2007, McMulan-Fisher et al. 2014], subsequent editions have been dedicated exclusively to the genus *Cortinarius*.

The *Cortinarii* studied in this book are circumscribed in several ways:

- The species are all native to New Zealand, many are presumed endemic. They grow in forests, predominantly with *Nothofagus* s. lato, many with *Leptospermum* or *Kunzea.* All form ectomycorrhiza with either of the mentioned arboreal genera[2]. They are all terrestrial, growing in the leaf litter of the forest floor.
- The group is naturally limited by the extent of the author's findings, and it is evident that many more *Cortinarii* exist in the country. Still, it is my contention that most common species within the stated taxonomical and ecological limits are covered. In some cases well-documented species that I have not encountered are keyed out without a picture (these are marked with a star).

Apart from *Cortinarius* (Pers.) Gray the studied species belong to the former genera:

Rapacea E. Horak
Cuphocybe R. Heim
Rozites P. Karst.
Thaxterogaster Singer

which are now synonymised with *Cortinarius* [Peintner et al. 2001b, 2002b]. These, as well as some of their subgenera, are used to inform tentative group names. The taxon *Dermocybe* Fr. is handled as a subgenus of *Cortinarius*. The cortinarioid genus *Stephanopus* M.M. Moser & E. Horak, described from Patagonia, has not been recorded from New Zealand so far. Neither has the white-spored genus *Leucocortinarius* (J.E. Lange) Singer, growing in the Northern Hemisphere (it has, moreover, been shown not to be closely related to *Cortinarius*).

Taxonomical Notes

The genus *Cortinarius* has been extensively studied during the recent decade, where analyses of relevant rDNA sequences have played a major part [e.g. Garnica et al. 2016, Salgado et al. 2018, San Fabian et al. 2018, Soop et al. 2019]. From these genetic studies emerges a picture of early evolution that originated before the break-up of Pangæa, but continued afterwards with frequent genomic exchange, as evidenced by the number of *Cortinarius* clades that are shared between the Northern and Southern Hemispheres today [Soop & Gasparini 2011, Soop et al. 2019]. Their fruit-bodies carry all the principal hallmarks of *Cortinarius* (see the next chapter), but due to steadily diverging genetic material over eons of time, there are many differences in their detailed anatomy. Indeed, no *species* has with certainty been shown to grow naturally in the temperate regions of both hemispheres, a fact attributable to a large extent to the corresponding endemicity of host-tree taxa. On the other hand, repeated studies have demonstrated that the *genus*, taken globally, is without any doubt monophyletic.

Independent evolution in the two hemispheres has led to a number of more recent *Cortinarius* clades. In the South, many species evolved in the Antarctic region during the cretaceous period. During the subsequent break-up of Gondwana, early species migrated with their host trees, mainly *Nothofagus* precursors, and their descendants are now encountered principally in New Zealand, New Caledonia, Tasmania, and Patagonia (South America). The vast majority of these appear to be endemic to either of the regions mentioned with relatively few certain cases of overlap.

From a taxonomical point of view it follows that infrageneric taxa, described from Europe and North America in the last few centuries, are in many cases ill-fitted to accommodate the species that abound in the former Gondwanan region. Traditional subgeneric and section names, all published in the North, must

[1] *Cortinarius, Hebeloma, Psathyloma, Pholiota, Descolea, Descomyces, Weraroa, Tympanella, Octaviania*.
[2] For simplicity, *Leptospermum* and *Kunzea* are here and in the following collectively designated "myrtaceous trees". Also *Nothofagus* is to be taken *s. lato,* including the new genera *Lophozonia* and *Fuscospora*.

therefore be used with some care. This is all the more important as genetic studies performed on boreal taxa reveal many cases of polyphyly.

In the taxonomy of this book *Cortinarius* is the only genus in the family Cortinariaceæ. Recently, however, a proposal (Liimatainen et al. 2022) splits the family into several genera, some of them new. The proposal is not adopted in the present Edition, but is recognised in the taxonomical maps that accompany the book in the on-line package. These maps, available as image files, illustrate the currently known phylogenetic relationships between all named New Zealand species discovered so far.

The traditional taxonomy defines a number of subgenera, mainly these:

Cortinarius	*Phlegmacium*
Dermocybe	*Myxacium*
Leprocybe	*Telamonia*

Their circumscription is based on morphology, such as viscidity and hygrophanity, or on the presence of certain metabolites (notably anthraquinonic pigments [cf. Gruber 1975, Gasparini 2004]). The genetic analyses have demonstrated that these characters are often, if not consistently, convergent. They are nevertheless practical for a quick classification, such as the one required by this book

In summary, the key and descriptions that follow use subgenera in the traditional (morphological) sense with the implicit understanding that they do not usually reflect natural affinities. On the other hand, most infrageneric groups are based on phylogenetic sections, while a few have been given names (within quotes) that neither correspond to a natural group, nor carry any nomenclatural status. Detailed taxonomical and phylogenetic information is given in the descriptions, and is then enclosed in square brackets.

What to Look for

Cortinarioid fungi generally have a *cap* and a *stipe*, although the stipe may be rudimentary in the sequestrate taxa (*truffles*, see Ch. 30). The latter often look like typical *Cortinarii* when viewed from above in their habitat, but differ by the lack of well-developed *gills*. Instead, the hymenium consists of a closed structure (*gleba*) that may be lamellate, looking like poorly developed gills, or be more loculate (chambered).

The *spores* produced by the hymenium are brownish, causing gills or gleba to darken with maturity in all species considered. A microscopic examination reveals that the spores are *verrucose*, i.e., provided with warts that may be more or less prominent.

Most cortinarioid species possess a (universal) *veil*, i.e., an exterior sheath of hyphæ that protects the young fruitbody during early development. As the mushroom grows, the veil breaks up, forming telltale patterns on the surface of the fruitbody. The abundance, shape, colour, and viscidity of these patterns are often highly significant for species determination. The veil remnants may form scales, squamules, or tufts on the cap, and girdles, bands, ring, or volva on the stipe, or again merely a thin coating. In comparison with European cortinarioid species, members of the corresponding New Zealand mycota exhibit, on average, more glutinous and sometimes more colourful veils.

In addition, the fruit-bodies possess an inner, cobwebby veil (*cortina*) that covers the young gills during development. It later collapses on the upper part of the stipe, where it may stain brown from discharged spores. It is important not to confuse this *cortinal zone* with velar girdles that may appear further down on the stipe. In some species, notably in the former genus *Cuphocybe*, the cortina is rudimentary or absent. In the former genus *Rozites* the cortina is replaced by a membranous inner veil that persists as a collar on the stipe.

A macroscopic examination of a cortinarioid collection may include the following characters, used in subsequent descriptions in this book:

- **Cap**: size, hygrophanity, viscidity, colour, surface (*cutis*) structure, aspect of the margin. Most cortinarioid fungi in New Zealand (less so in Europe) are more or less *hygrophanous*, i.e., the colour changes as the cap dries, forming streaks or concentric rings in the cutis. A viscid to glutinous cap surface is very common, and the degree of *viscidity* is an important character. It is therefore desirable to collect the specimens *in moist weather*, or at least not in a period of draught. The veil often leaves remnants (fibres, tufts, squamules) on the cutis and in particular at the margin, which must be noted. In

some cases the veil is very thin, leaving the cutis *glabrous*, in other cases the cutis is matt, fibrillose, or felty. The cap *shape* usually varies too much to provide a reliable character.

- **Gills** (*lamellæ*) or **gleba**: colour (plus edge colour, if different), and density (crowded or distant). The colour always pertains to *immature* individuals; it is therefore important to include these in a collection. *A collection consisting solely of mature specimens is seldom useful for determination*. The gills are usually adnate to notched at the stipe, and the attachment is of diagnostic value only if decurrent. In some cases the gill edges are typically serrated (finely saw-tooth shaped). The presence and colour of a **cortina** on young specimens should also be noted.
- **Stipe**: shape, colour, and veil remnants (see also next item). The shape is here an important character, pertaining to mature individuals. It may be cylindrical, clavate (tapering upwards), bulbous, tapering (downwards), or fusoid (i.e., thickest in the middle). Some species have a distinct bulb, which may be *marginate* (i.e., the bulb exhibits a sharp edge; such cases are less frequent than in Europe). Often the *apex*, i.e. the part nearest the gills, shows a variation in colour.
- **Veil**: abundance, colour, and viscidity. These extremely important characters involve observing the veil remnants on the stipe of young specimens (those on the cap being more prone to discolouring). If the fungus has a bulbous stipe, the veil often remains at or near the bulb margin and may be visible only on undeveloped individuals. Be very careful when handling the fruit-bodies; dig out the entire specimen from its substrate and *avoid touching the stipe surface*.
- **Flesh** (*context*): colour, taste and odour. It is sometimes *marbled*, that is, the flesh in the upper part of the stipe displays veins of a more saturated hue. To best appreciate the smell, it may be convenient to cut the fruitbody axially and sample the central portion of the stipital context. Some species emit a strong, sweetish odour, resembling that of honey (*melleous*), fruit, or perfume. What is termed *phlegmacioid* in the descriptions refers to a characteristic odour of "hot peanuts" or "boiled beets", by many authors called "terreous" or "earthy", a parallel I have difficulty accepting. A smell, characteristic of some fungi in the area, is here termed "paint", which means reminiscent of house paint or wall-paper (similar to that of the boreal species *Russula pseudointegra*). Other cortinarioid fungi emit a faint "hospital" smell (of iodine or iodoform), or a "raphanoid" smell (of radish or turnip), usually a mixture of both.
- **Ecology:** biotope, host plant, and mode of growth: solitary, gregarious, fasciculate (i.e., in a cluster), on the ground or on wood, should be noted. Most of the species described form *mycorrhiza* with *Nothofagus* spp., and are therefore encountered on the ground in southern beech forest. It is important to note the nearby presence of any *Leptospermum* or *Kunzea* sp., as they also form obligate mycorrhiza with many cortinarioid species.
- **Spore print:** The colour may be used to separate out a few neighbouring genera. *Cortinarius* generally produces a rusty-brown print, whereas that of *Hebeloma* and *Inocybe* is usually grey-brown to snuff brown.
- **Reactions**. Some macro-chemical reactions are important characters:
  - NaOH refers in the descriptions to a general alkaline reaction (c. 20% solution). KOH may be used instead; the ammonia reaction is usually identical or weaker. Among New Zealand species the alkaline reaction is significant mainly to distinguish certain *Cortinarius* sections, in particular *Pauperæ* and related groups. A few drops of the reagent is applied on the veil remnants of cutis and stipe, as well as on the gills. Often the reaction in the context is important, where the upper part of the stipe, or the cap, if fleshy, is selected. Observe the colour change within 30 seconds. The trivial reaction is grey to dirty brown or black; it holds for most species in subgen. *Myxacium* and *Telamonia*. A positive reaction is usually some shade of red (including orange, reddish lilac and blackish red), indicating the presence of anthraquinonic pigments or its derivatives.
  - Lugol is a solution of iodine and potassium iodide in diluted alcohol. The reaction is of interest for species in *Cortinarius* sect. *Scauri* and *Purpurascentes*, where the context quickly stains red or lilac. The trivial reaction yields the colour of the reagent itself, i.e., rusty brown. So far I have collected only a handful species in New Zealand with a positive reaction.

- Guayac is a kind of resin, dissolved in alcohol. Most *Cortinarii* exhibit a bluish green to yellow-green reaction, which needs a few minutes to emerge. The trivial reaction is no colour change.
- Formalin (30%) has a slow reaction; as a rule one must wait at least 5, sometimes up to 20 minutes. The reagent stains the context strongly lilac to reddish lilac. The trivial reaction is none or faintly rosy.
- Phenol is typically used in a 3% water solution. It commonly gives rise to a red, red-brown, or brown-violaceous reaction after a couple of minutes. The trivial reaction is no colour change.
- Fluorescence is important for many species, especially in section *Persplendidi* and related groups. The test consists of irradiating the context with UV light in a dark room; a positive reaction yields a yellow to yellow-green reflection. The reaction often works also on dried material, where it may be more concentrated.

Microscopic characters have a high diagnostic value in *Cortinarius*:

- **Spores:** size, shape, and verrucosity. Whenever possible, discharged, and therefore *mature*, spores should be sought on the cortinal zone (see above) on the stipe of a mature specimen. Most spores discussed in this work are elliptic to amygdaloid (almond-shaped), but some deviating shapes occur, and spores may be finely, moderately or grossly *verrucose* (warty). All spores in the studied group tend to look more or less yellow-brown under the lens (in a c. 5% NH_3 preparation), and the hue is of diagnostic value only if exceptionally dark or pale. — Some species have *dextrinoid* spores; i.e., they exhibit a strong orange or reddish colour when mounted in Meltzer's reagent.
- **Marginal elements:** Most *Cortinarii* exhibit a more or less fertile gill margin with trivial sterile cells that may be clavate in shape, hyaline, not or slightly encrusted, and poorly differentiated in size and shape from the basidia. Their presence is therefore rarely of diagnostic value and not reported in the descriptions in this book. On the other hand, some species possess well differentiated *cystidia* that may be used for determination.
- **Cutis:** Many species possess *gelatinised hyphæ* in the epicutis, indicating a viscid cap surface. Other hyphæ may be encrusted with coloured ornaments that have a diagnostic value.
- **Veil hyphæ:** They are preferably picked from the stipe, and their width is noted.

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Schematic Key

This key includes all species described further along in the book, as well as a number of species from various keys referenced in the text. Dark-spored taxa in other genera are sometimes keyed out when confusion with *Cortinarius* is a likely possibility. Species that I have not encountered myself, or of which I had insufficient material, are marked with an asterisk. In these cases, please see the referenced literature for descriptions.

Notes

- Please note that the key is **not** binary. There are, in other words, often more than two alternatives, all of which should be checked before making a choice.
- The key contains many cross-references between sections. For example, a species that leads to *Phlegmacium* in the main key, may later be referred to *Cuphocybe*.
- Gill colour always pertains to **immature** specimens.
- Viscidity should be evaluated in **moist** conditions. If the weather is dry, one can touch the surface of the fruitbody with lips — a less precise mode of evaluation.
- Cap measurement pertains to the diameter of mature specimens, or given for sequestrate taxa as *diameter* × *height*.
- Stipe measurement is sometimes used to distinguish between slender and robust species. It is then a question of the diameter of the upper part of the stipe on most mature specimens in a collection.
- Veil-hyphæ measurements pertain to their width.

Abbreviations

frb	fruitbody
sect.	section
sp.	spores
sp., spp.	species
→	see
±	more or less

Main Key

1	Hymenium lamellate, cap open on maturity	2
1*	Hymenium a gleba, cap more or less closed	*Thaxterogaster* & allies (Key L)
2	Stipe provided with a membranous collar	20
2*	Stipe with at most velar girdles, possibly with a woolly or glutinous collar	3
3	Cap showing distinct patches, squamules, or tufts of a non-white veil	Key A
3*	Cap glabrous, matt, or fibrillose, possibly with white veil remnants	4
4	Gills exhibiting a distinct red, orange, yellow, or olive-yellow shade (see Notes above)	5
4*	Gills white, grey, pale yellow, green, brown, or violet	6
5	Alkaline reaction distinct on cutis and gills	*Dermocybe* (Key C)
5*	Alkaline reaction trivial or nil, except possibly on stipital veil	*Telamonia* (Key J)

6(4) Cap and stipe viscid to glutinous ..... *Myxacium* (Key I)
6* Cap but not stipe viscid ..... *Phlegmacium* (Key G)
6** Cap and stipe dry 7
7 Frb distinctly hygrophanous ..... *Telamonia* (Key J)
7* Frb not or weakly hygrophanous 8
8 Whole frb immutably white (except possibly gills) ..... *Cortinarius (Rapacea) mariæ*
8* Frb at most partly white; if all-white, then darkening with age ..... Key A

20(2) Cap dry, cutis structure cellular ..... *Descolea* [→ Horak 1971]
20* Cap viscid to glutinous, cutis structure not or only partly cellular ..... *Rozites* (Key H)

Key A: *Cortinarius* p.p. & other genera

1 Gills decurrent, easily removed by scraping ..... *Austropaxillus* [→ McNabb 1999]
1* Gills notched, adnate, or free, not easily removed 2
2 Gills some shade of blue, violet, or purple (possibly with a brown component) 20
2* Gills lacking bluish tinge 3
3 Cap dry 10
3* Cap viscid to glutinous 4
4 Gill face with conspicuous chrysocystidia, sp. smooth ..... *Pholiota* [→ Soop 2005b]
4* Gill face without chrysocystidia, sp. usually verrucose 5
5 Spore print yellow-brown to rusty-brown, stipe apex not pruinose 6
5* Spore print differently coloured, stipe apex often pruinose ..... *Hebeloma* [→ Soop 2001, 2008]
6 Undeveloped frb lacking a distinct, cobwebby cortina, stipital base often piston-like or with a small bulb ..... *Cuphocybe* (Key F)
6* Cortina distinct on undeveloped frb, stipital base usually different ..... *Phlegmacium* (Key G)

10(3) Gill edge with conspicuous cystidia, sp. print grey-brown ..... *Inocybe* [→ Horak 1977]
10* Gill edge usually with smaller sterile cells, sp. print rusty-brown ..... *Persplendidi, Xenosmatæ* p.p. (Key D)

20(2) Stipe with a wide bulb, gills very crowded → *Cortinarius austrocyanites* (Key G)
20* Stipe with none or a small bulb, gills moderately crowded 21
21 Cap viscid to glutinous 23
21* Cap dry 22
22 Cap dark violaceous ..... sect. *Cortinarius* (Key B)
22* Cap covered by blackish, coarse scales → *Cortinarius ursus* (Key G)
22** Cap glabrous or with ochraceous to dirty-white velar remnants ..... *Xenosmatæ* (Key E)
23(21) Stipe distinctly violet to blue → *Cortinarius chalybæus, rhipiduranus* (Key G)
23* Stipe differently coloured → *Cuphocybe* (Key F), *Cortinarius perelegans, naphthalinus* (Key G)

Key B: *Cortinarius* subgen. *Cortinarius* [cf. Harrower et al. 2015, Moser 1986]

1 With myrtaceous trees ..... *C. kioloënsis**
1* With *Nothofagus* 2
2 Sp. obtusely elliptic, >7 µm wide, rather grossly verrucose ..... *C. carneipallidus*
2 Sp. leaner, moderately to weakly verrucose ..... *C. atrolazulinus*

Key C: *Cortinarius* subgen. *Dermocybe* *s. lato* [cf. Horak 1987]

1 Cap wholly or partially with some distinct red shade (group "Cardinales") 2
1* Cap differently coloured (including orange) 10
2 Cap viscid ..... *C. cardinalis*
2* Cap dry 4
4 Gills deep red 5
4* Gills orange to brick red 7

4**	Gills yellow to ochraceous	9
5	Cap dark wine-red, bonnet-shaped	*C. mycenarum*
5*	Cap brightly carmine red, ± convex	6
6	Many sp. <4 µm wide, with *Nothofagus*	*C. vinicolor, C. rubripurpuratus*
6*	Sp. wider, in myrtaceous wood	*C. cruentoides*
7(4)	Frb very small, cap mostly <20 mm → *C. rubrimarginatus* (Key K)	
7*	Frb larger, cap usually wider	8
8	Cap intensely orange-red, stipe yellow	*C. papaver*
8*	Cap cinnabar-red, stipe pink	*C. veronicæ*
9(4)	Cutis fibrillose to squamulose, not hygrophanous	*C. cramesinus*
9*	Cutis finely innate-fibrillose, ± hygrophanous → *C. armiæ* (Key K)	
10(1)	Gills some shade of orange	11
10*	Gills yellow without brown or olive tints	20
10**	Gills differently coloured	30
11	Cap with orange hues, among *Nothofagus*	13
11*	Cap dark brown to blackish, among myrtaceous trees	12
12	Cap dry	*C. persplendidus* (Key D)*, C. egmontianus**
12*	Cap viscid	*C. largofulgens*
13(11)	Young cap centre dark brown, orange-tinted towards margin	14
13*	Young cap ± uniformly orange	15
14	Cap dry, sp. <7 µm	*C. aurantioferreus*
14*	Cap viscid, sp. longer	*C. castaneodiscus*
15(13)	Spores <9 µm, alkaline reaction blood red → *C. araniiti* (Key K)	
15*	Spores longer, alkaline reaction olive	*C. aurantiellus**
20(10)	Frb fairly robust, stipe often >7 mm wide	*C. canarius*
20*	Frb small, stipe leaner	21
21	Taste distinctly bitter	*Pholiota chrysmoides* [→ Soop 2005b]
21*	Taste mild	22
22	Cap golden yellow with a yellow-brown disk, dry	*C. chrysma*
22*	Cap yellow-brown with a date-brown disk, slightly viscid	*C. icterinoides*
30(10)	Cap distinctly viscid to glutinous	40
30*	Cap dry or slightly viscid	31
31	Frb dry, usually with *Nothofagus*	32
31*	Frb slightly viscid, with myrtaceous trees	*C. leptospermorum*
32	Cap with greenish tints, small, mostly <30 mm	*C. lachanus*
32*	Cap brownish with orange or yellow tints, often larger	33
33	Alkaline reaction blood-red, sp. elliptic, mostly > 6 µm	34
33*	Alkaline reaction brownish, sp. subglobose, shorter	*C. elaiops*
34	Veil red	35
34*	Veil pale yellowish, brownish, or olive	36
35	Stipital veil carmine red, stipe saturated yellow	*C. promethenus*
35*	Stipital veil orange-red to brownish red, stipe pale yellow	*C. ignellus*
36(34)	Cap with a distinct orange tinge	*C. peraurilis*
36*	Cap yellow-brown, possibly with an olive tinge	37
37	Cap dry, sp. <8 µm	*C. indotatus*
37*	Cap often slightly viscid, most sp. longer	*C. sciurellus*
40(30)	Gills greenish yellow or olive yellow with a red alkaline reaction	41
40*	Gills without a greenish tinge, alkaline reaction weak on gills	*C. orixanthus*
41	Frb lean, stipe <4 mm thick, cap margin ± striate	*C. olivaceoniger*
41*	Frb usually more robust, cap margin not striate	*C. alienatus*

Key D: *Cortinarius* sect. *Persplendidi* & allies

1	Cap with distinct velar squamules, tufts, or patches	5
1*	Cap fibrillose to glabrous without obvious velar remnants	2
2	Gills very pale, often ± white, fluorescence strong	3
2*	Gills yellowish, fluorescence nil → *C. caryotis* (Key K)	
3	In myrtaceous habitat, sp. >10 µm, coarsely verrucose	*C. pholiotellus*
3*	In *Nothofagus* habitat, sp. shorter, almost smooth	4
4	Cap brownish often with a green or olive tinge	*C. pseudoeutactus*
4*	Cap dark red-brownish without greenish tinge	*C. eutactus*
5(1)	Cap covered by (yellow-) brown felt or scales, fluorescence usually distinct	10
5*	Veil not covering cap or of a different colour, fluorescence nil	6
6	Cap with dense pinkish or greyish felt or scales	*Cuphocybe* (Key F)
6*	Cap glabrous or matt with (often pale) ochraceous velar tufts or patches	7
7	Lower stipe reddish, frb usually robust	*C. xenosma, paraxenosma*
7*	Stipe whitish, frb usually slender	*C. xenosmatoides*
10(5)	Frb robust, stipe often >10 mm thick, sp. >12 µm	*C. castoreus*
10*	Frb leaner, sp. shorter	11
11	Gills intensely reddish orange	*C. persplendidus*
11*	Gills white to pale grey or yellow	12
12	Odour distinct, spicy, stipe with sparse fibrils	*C. incensus*
12*	Odour insignificant, stipe with multiple girdles	13
13	Veil ochraceous, stipe fusoid, often ± lean	14
13*	Veil umber to purple-brown, stipe mainly bulbous,	*C. ophryx*
14	Sp. <9 µm	*C. tigrellus*
14*	Many sp. longer	*C. stenophryx*

Key E: *Cortinarius* sect. *Xenosmatæ* p.p. & *Anomali*

1	Sp. elliptic to amygdaloid, stipe fairly robust, often >7 mm thick	2
1*	Sp. subglobose to ovoid, stipe usually slender (sect. *Anomali*)	10
2	Cap dark brown without red tones	3
2*	Cap differently coloured	4
3	Cap umber or grey-brown, sp. <10 µm, taste bitter	*C. exlugubris*
3*	Cap dark purple brown, many sp. longer, taste mild	*C. trichocarpus*
4(2)	Cap red-brown to mahogany-red, taste ± bitter	*C. cupreonatus*
4*	Cap differently coloured, taste mild	5
5	Stipe with greenish-blue tints, under myrtaceous trees → *C. calaisopus* (Key I)	
5*	Stipe differently coloured, under *Nothofagus*	*C. ionomataius*
10(1)	Veil white, with myrtaceous host	*C. euanomalus*
10*	Veil coloured, with *Nothofagus*	11
11	Veil ochraceous, alkaline reaction reddish lilac	*C. suecicolor*
11*	Veil reddish, alkaline reaction nil	12
12	Cap greyish	*C. rattinoides*
12*	Cap dark purplish brown	*C. durifoliorum*

Key F: *Cortinarius* group *Cuphocybe* [cf. Horak 1973a]

1	Cap dry	2
1*	Cap viscid to glutinous	4
2	Cap pink to pale buff with pinkish squamules	*C. alboroseus*
2*	Cap greyish with grey to grey-brown hairs and fibres	3
3	Gills pale brown, flesh greyish	*C. canovestitus*
3*	Gills and flesh with violaceous tints	*C. poliotrichus*
4(1)	Odour in context strong, sweetish, like honey	*C. dulciolens*

4* Odour strong like moth-balls → *C. naphthalinus* (Key G)
4** Odour different or faint 5
5 Cap golden yellow-ochre ..... *C. elaiochrous* var. *leontis*
5* Cap dark brown to olive-brown 6
5** Cap grey to greyish brown → *C. gymnocephalus, cuphomorphus* (Key I)
6 Stipe with a greenish to citrinous sheen, frb often robust ..... *C. elaiochrous*
6* Stipe yellowish grey with ochraceous squamules, frb smaller ..... *C. phæomyxa*

Key G: *Cortinarius* subgen. *Phlegmacium*

1 Stipe rooted, white, growth usually fasciculate (group *Xiphidipus*) 30
1* Stipe not rooted or not white, solitary to gregarious 2
2 Cap hygrophanous, sp. entirely smooth with a distinct germ pore ..... *Psathyloma* [→ Soop et al. 2016; cf. Soop 2005b:36]
2* Cap not hygrophanous, or if it is, then sp. verrucose without a germ pore 3
3 Stipe cylindrical to tapering 4
3* Stipe clavate or provided with a bulb 40
4 Stipe and flesh violet (sect. *Purpurascentes*) 5
4* Stipe and flesh turquoise, greenish, or sky blue 7
4** Stipe or flesh differently coloured 10
5 Frb medium size, cap often >40 mm, not or weakly hygrophanous 6
5* Frb small, hygrophanous ..... *C. kaimanawa*
6 Cap usually with fibrils and patches, under *Nothofagus* ..... *C. chalybæus*
6* Cap glabrous, under myrtaceous trees ..... *C. pseudoaustralis*
7(4) Under *Nothofagus,* cap distinctly viscid, ... *C. rhipiduranus*
7* Under myrtaceous trees, cap viscid to almost dry 8
8 Cap yellow-green to olive-green, sp. subglobose → *C. calaisopus* (Key I)
8* Cap dark olive-brown, sp. elliptic ..... *C. salmastrium*

10(4) Cap dry, covered by blackish-brown squames ..... *C. ursus*
10* Cap viscid, differently coloured 11
11 Cap and/or stipe with yellow to ochraceous veil remnants (group "Vestiti") 20
11* Veil thin, whitish 12
12 Frb small, stipe <7 mm wide, cap margin often striate → *C. verniciorum* and following taxa, (Key J), *juglandaceus* (Key I)
12* Frb medium-sized to large, stipe wider, cap margin not striate 13
13 Frb yellowish, with a bright yellow context ..... *C. memoria-annæ*
13* Cap mahogany-brown to blackish, context white → *C. picoides* 30
13** Cap vividly ochraceous to orange, context pale 14
14 Gills lavender blue, taste inconspicuous ..... *C. entheosus*
14* Gills pale brownish, taste bitter ..... *C. dulcamarus*

20(11) Odour strong, frb large, stipe mostly >10 mm thick ..... *C. naphthalinus*
20* Odour trivial, frb smaller, stipe leaner 21
21 Alkaline reaction red to orange on cutis or veil 22
21* Alkaline reaction trivial ..... *C. subgemmeus*
22 Cap with a conspicuous yellow rim from veil → *C. orixanthus* (Key C)
22* Veil differently coloured 23
23 Frb medium-sized, stipe often >7 mm thick 24
23* Frb. small, stipe leaner 25
24 Cap golden brownish yellow, sp. >9 µm ..... *C. perelegans*
24* Cap dark yellow-brown, sp. shorter ..... *C. suborixanthus*
25(23) Cap with bright yellow-brown to orange hues, context ochraceous 26
25* Cap clay-brown to grey, context whitish ..... *C. peristeris*

26	Cap orange, spores <4.5 µm wide → *C. thaumastus* (Key J)	
26*	Cap yellow-brown with a dark disk, spores wider	*C. badiohepaticus*
30(1)	Cap white or pale ochre, possibly darkening with age	31
30*	Cap with a distinct apricot to pinkish hue	*C. persicanus*
30**	Cap mahogany-brown to blackish	*C. picoides*
31	Veil very copious, dense, peronate, with myrtaceous hosts	*C. australiensis*
31*	Veil not peronate, with *Nothofagus*	32
32	Sp. >9 µm, veil fairly copious on stipe	*C. alboaggregatus*
32*	Sp. shorter, veil sparse	*C. cretax*
40(3)	Gills violaceous	50
40*	Gills dark green	*C. chlorophyllus*
40**	Gills pale without a violaceous or green tinge (sect. *Cremeolinæ*)	41
41	Cap amber yellow, with myrtaceous trees	*C. cremeorufus*
41*	Cap differently coloured, with *Nothofagus*	42
42	Cap dark grey, often with an olive tinge	*C. cremeolina* var. *subpicoides*
42*	Cap yellow-brown to red-brown	44
42**	Cap white, pale yellowish, or pale ochraceous	43
43	Frb slender with a narrow stipe-bulb, cap pale yellow with a darker disk	*C. iringa*
43*	Frb usually robust with a wide stipe-bulb, cap white to cream	*C. cremeolina*
44(42)	Cap dark red-brown to mahogany	45
44*	Cap yellow-brown	*C. subdulciorum*
45	Stipe with a marginate bulb, cap often with white veil patches	*C. myxenosma*
45*	Stipe clavate or with an indistinct bulb, cap glabrous	*C. dulciorum*
50(40)	Cap ± dry with abundant fibres or veil remnants	*C. austrocyanites*
50*	Cap viscid, ± glabrous	51
51	Cap light tan, stipe cylindrical with a small bulb	52
51*	Cap darker, stipe bulb prominent, often ± marginate	53
52	Spores >4.5 µm wide	*C. artosoides*
52*	Spores leaner	*C. artosus*
53(51)	Growing with myrtaceous trees	54
53*	Growing with *Nothofagus*	55
54	Frb small, cap usually <30 mm, taste mild	*C. minoscaurus*
54*	Frb larger, taste bitter	*C. medioscaurus*
55(53)	Cap with greenish or olive tints	*C. turcopes*
55*	Cap mahogany-brown to date-brown	56
56	Cap hygrophanous, reaction positive with iodine solutions	*C. singularis*
56*	Cap not hygrophanous, iodine reaction absent	*C. fiordlandensis*

Key H: *Cortinarius* group *Rozites* [cf. Horak 1981]

1	Gills with a bluish tinge, blue to violet often present on cap and stipe	10
1*	Frb without blue or violet hues	2
2	Cap pale tan to dull yellowish grey	4
2*	Cap white, possibly with brownish fibrils	3
2**	Cap yellow to red-brown	7
2***	Cap darker brown to umber	5
3	Under myrtaceous trees, sp. mostly <6 µm wide → *C. australiensis* (Key G)	
3*	Under *Nothofagus*, many sp. wider → *C. achrous*	4
4(2)	Alkaline reaction nil, sp. <12.5 µm	*C. achrous*
4*	Alkaline reaction (sometimes weakly) reddish on cap, many sp. longer	*C. pselioticton*
5(2)	Collar high or mid-placed on stipe, alkaline reaction red on cutis	*C. majestaticus (=Descolea m.)*

5*	Collar usually low on stipe, alkaline reaction trivial	6
6	Gills orange, sp. mostly >12 µm	*C. rugosiceps**
6*	Gills ochraceous, sp. shorter	*C. cesarioanus*
7(2)	Cap dark yellow-brown to mahogany, alkaline reaction red on cutis	*C. subcastanellus*
7*	Cap honey yellow to pale orange, alkaline reaction nil	8
8	Stipe tapering downwards, sp. mostly >11.5 µm	*C. elacatipus*
8*	Stipe cylindrical to clavate, sp. shorter	*C. pnseliocaulis*
10(1)	Cap coarsely scaly, umber to black → *C. ursus* (Key G)	
10*	Veil remnants on cap squamulose to floccose, differently coloured	*C. meleagris*

Key I: *Cortinarius* subgen. *Myxacium* [cf. Horak & Wood 1990]

1	Cap reddish or with red spots	2
1*	Cap with greenish or olive hues (possibly mixed with blue or yellow)	20
1**	Cap with bluish or violet hues	30
1***	Cap lacking red, green, or blue hues	3
2	Odour strong, like naphthalene or cooking gas	*C. indolicus*
2*	Odour faint → *C. periclymenus* (Key J), *ixomolynus*	71
3(1)	Cap some (possibly pale) shade of yellow, ochre, or brown	40
3*	Cap whitish	4
4	Frb robust, stipe often >5 mm thick	*C. cycneus*
4*	Frb small, stipe leaner	5
5	Cap soon drying, gills violaceous → *C. laquellus* (Key J)	
5*	Cap glutinous, gills pale tan or whitish	6
6	Cap chalk white	*C. olorinatus*
6*	Cap pale grey to pale buff → *C. vitreopileatus, lubricanescens*	60, 61
20(1)	Spores subglobose (sect. *Delibuti*)	21
20*	Spores amygdaloid to elliptic	23
21	Under myrtaceous trees	22
21*	In *Nothofagus* forest	26
22	Frb distinctly viscid to glutinous, mainly greyish blue-green	*C. rotundisporus*
22*	Frb weakly viscid, stipe often dry, frb mainly yellow-green to olive	*C. calaisopus*
23(20)	Alkaline reaction reddish on cap → *C. alienatus* (Key C)	
23*	Alkaline reaction trivial	24
24	Sp. >7.5 µm long	25
24*	Sp. shorter	*C. phæochlorus**
25	Frb yellow with olive components → *C. viscoviridis*	73
25*	Frb mainly greyish blue-green	*C. ærugineoconicus**
26(21)	Cap uniformly green	*C. viridipileatus*
26*	Cap predominantly yellow, usually with green zones	*C. tessiæ*
30(1)	Frb slender, stipe <6 mm thick (see Notes) → *C. lubricanescens*	60
30*	Frb robust, stipe often thicker	32
32	Cap violet at least at margin	33
32*	Cap at most with a purple sheen → *C. marmoratus*	45
33	Stipe conspicuously tall, cylindrical, cap centre dark brown	*C. bellus*
33*	Stipe clavate, medium tall, cap centre violaceous or tan	*C. taylorianus*
40(3)	Gills violaceous to bluish grey	41
40*	Gills greyish to brownish without a violet tone	50
41	Cap grey-brown, frb robust	45
41*	Cap differently coloured, frb slender	42
42	Sp. mostly >10 µm, odour distinct	43

42*	Many sp. shorter, odour trivial	44
43	Cap often >30 mm, not striate, odour farinaceous or like cucumber	*C. cucumeris*
43*	Cap normally smaller, striate, odour different	48
44(42)	Cap red-brown	*C. porphyrophœus**
44*	Cap yellow-brown → *C. pansicolor* (Key J), *C. melimyxa*	75
45(41)	Stipe covered by velar tufts and granules over full length, clamp connections absent (sect. *Defibulati*)	46
45*	Stipe ± naked or vaguely white fibrillose, clamp connections present	*C. marmoratus*
46	Gills saturated violet, veil white	*C gymnocephalus*
46*	Gills grey-blue, veil greyish to ochraceous	47
47	Cap glabrous, stipe viscid	*C. cuphocyboides*
47*	Cap fibrillose-squamulose, stipe dry	*C. cuphomorphus*
48(43)	Cap date brown, odor sweetish	*C. juglandaceus*
48*	Cap pale, odour like "engine oil"→ *C. lubricanescens*	60
50(40)	Growing with myrtaceous trees	51
50*	Growing with *Nothofagus*	53
51	Frb robust, stipe often >7 mm thick, alkaline reaction brightly red	*C. ignotus*
51*	Frb slender, stipe leaner, alkaline reaction trivial	52
52	Cap yellow-brown	*C. gemmeus**
52*	Cap dark chestnut brown → *C. castaneiceps*	72
53(50)	Cap pale argillaceous to pale buff	60
53*	Cap yellow-brown to umber	54
54	Sp. subglobose, odour sweetish → *C. viscilætus* (Key K)	
54*	Sp. elliptic to amygdaloid, odour nil or different	55
55	Sp. >10 µm	*C. vitreofulvus*
55*	Most sp. shorter	70
60(53)	Frb medium-sized, stipe often >6 mm thick, most sp. >11 µm	61
60*	Frb small, stipe leaner, sp. shorter	*C. lubricanescens*
61	Sp. elliptic, gills with scattered marginal elements	*C. viscostriatus*
61*	Sp. amygdaliform, gill edge sterile	*C. vitreopileatus*
70(55)	Cap yellow to brightly brownish yellow	73
70*	Cap darker ochraceous to mahogany-brown	71
71	Cap with dark red or umber spots, taste bitter	*C. ixomolynus*
71*	Cap ± uniformly brown, taste mild	72
72	Alkaline reaction reddish, veil thick, gelatinous	*C. pectochelis*
72*	Alkaline reaction nil, veil glutinous	*C. castaneiceps*
73(70)	Stipe fusoid, pure white	*C. melleomitis*
73*	Stipe cylindrical or tapering, dirty-white to yellowish	74
73**	Stipe clavate, largely coated with yellow gluten	*C. viscoviridis*
74	Taste distinctly bitter, cap with an orange disk	*C. electridius*
74*	Taste mild, cap with a brownish disk	75
75	Most sp. <7 üm	*C. psilomorphus*
75*	Many sp. longer.	*C. melimyxa*

Key J: *Cortinarius* subgen. *Telamonia*

1	Frb growing on twigs or other ligneous debris → *Pholiota*, *Gymnopilus, Galerina, Agrocybe* [not treated here]	
1*	Frb terrestrial	2
2	Cap distinctly viscid, at least when young (group *Myxotelamonia*)	70
2*	Cap dry	3

3	Gill edge with conspicuous cystidia, sp. print grey-brown	*Inocybe* [→ Horak 1977]
3*	Gill edge with trivial sterile cells or sp. print rusty brown	4
4	Frb medium-sized, stipe often >5 mm thick	5
4*	Frb small, stipe leaner	50
5	Gills and/or stipital context with a blue or violet component, sometimes faint	40
5*	Gills and context lacking any blue or violet hues	6
6	Stipe with a distinct yellow tinge	7
6*	Stipe white to pink, possibly zoned dirty brownish	30
7	Cap dark brown to blackish → *C. caryotis* (Key K)	
7*	Cap red-brown to orange	8
7**	Cap yellowish	9
8	Veil with a red shade, sp. subglobose <7,5 µm → *Limonii/Callistei* (Key K)	
8*	Veil pale yellow, sp. elliptic, longer	*C. vernicifer*
9(7)	Alkaline reaction nil, cap ± glabrous	*C. lamproxanthus*
9*	Alkaline reaction blood-red, cap fibrillose → *C. chrysma* (Key C)	
30(6)	Cap cinnabar to brick red, gills orange → *C. veronicæ* (Key C)	
30*	Cap conspicuously yellow to ochraceous, gills pale	31
30**	Cap darker brown, gills with a brownish shade	32
31	Cap granulose from numerous white squamules	*C. chrysoconius*
31*	Cap finely matt fibrillose	*C. peraureus*
32(30)	Gills saturated red-brown, under *Nothofagus*	*C. paraonui*
32*	Gills yellow-brown, with myrtaceous trees	*C. minilacus*
40(5)	Odour strong, nauseating	*C. dysodes*
40*	Odour trivial	41
41	Gills dark violet to purple-brown, soon ± black, stipe cylindrical	*C. carbonellus*
41*	Gills greyish violet, stipe clavate	*C. urbiculus*
50(4)	Gills with a blue to violet shade, sometimes faint	51
50*	Gills distinctly yellow, orange, or reddish (sect. *Læti*)	60
50**	Gills lacking any bluish hues, if yellow then pale or greyish yellow	52
51	Cap white → *C. laquellus*	76
51*	Cap young mouse-grey to grey-blue	56
51**	Cap dark date-brown → *C. carbonellus*	41
52(50)	Veil remnants reddish → *C. periclymenus*	71
52*	Veil remnants white, yellow, or indistinct	53
53	Cap orange to warmly apricot-yellow	*C. thaumastus*
53*	Cap tan to red-brown	54
54	Stipe base and context often tinted violet	*C. saturniorum*
54*	Frb devoid of violet colours,	55
55	Cap pale tan to light red-brown, with *Nothofagus* → *C. paraoniti*	75
55*	Cap darker brown, with myrtaceous trees	58
56(51)	Gills violaceous	57
56*	Gills brick red	*C. mysoides*
57	Taste distinctly bitter, sp. elliptic	*C. rattinus*
57*	Taste mild to slightly bitter, sp. subglobose → *C. rattinoides, durifoliorum* (Key E)	
58(55)	Cap red-brown, spores >6.5 µm long, elliptic	*C. amblyonis*
58*	Cap date brown, spores smaller, subglobose → *C. minilacus*	32
60(50)	Veil remnants coloured or indistinct, with *Nothofagus*	61
60*	Veil remnants white, with myrtaceous trees	*C. waiporianus*
61	Stipe conspicuously orange, at least at base	*C. malosinæ*

61*	Stipe yellowish	62
62	Veil remnants red on stipe → *C. ignellus* (Key C)	
62*	Veil yellow or indistinct	63
63	Cap with a yellow to orange tinge	*C. luteinus*
63*	Cap dark red-brown, at least on disk	65
63**	Cap brownish, often with an olive tinge	64
64	Alkaline reaction reddish to saturated brown, sp. subglobose → *C. elaiops* (Key C)	
64*	Alkaline reaction nil, sp. elliptic	66
65(63)	Sp. elliptic, alkaline reaction red	*C. palissandrinus*
65*	Sp. subglobose, alkaline reaction weak or nil	*C. cypripedii*
66(64)	Cap and gills with red-brown shades	*C. citribasalis*
66*	Cap often with olive shades, gills yellow-brown	*C. paraxanthus*
70(2)	Gills or flesh violaceous	77
70*	Gills and flesh differently coloured	71
71	Veil remnants red	*C. periclymenus*
71*	Veil remnants yellow-brown → *C. viscilætus, caryotoides* (Key K)	
71**	Veil remnants white or inconspicuous	72
72	Cap warmly apricot-yellow to orange	74
72*	Cap dark brown	*C. opaculus*
72**	Cap paler red-brown to tan	75
72***	Cap greyish to clay brown → *C. peristeris* (Key G)	
74	With myrtaceous trees, sp. small <7.5 µm	*C. verniciorum*
74*	In *Nothofagus* forest, sp. longer → *C. thaumastus*	53
75(72)	Sp. >8 µm, cap viscid	76
75*	Most sp. shorter, cap soon drying	*C. paraonit*
76	Alkaline reaction reddish on cap, sometimes faint	*C. faucium*
76*	Alkaline reaction nil	*C. viscincisus*
77(70)	Cap white to pale violaceous	*C. laquellus*
77*	Cap brownish with a violaceous tinge → *C. kaimanawa* (Key G)	
77**	Cap brownish with an orange tinge	*C. pansicolor*

Key K: *Cortinarius* sect. *Limonii* & *Callistei*

1	Cap viscid	2
1*	Cap dry	3
2	Frb small, stipe <7 mm thick	3
2*	Frb larger → *C. perelegans* (Key G)	
3	With *Nothofagus*, sp. <9 µm	*C. viscilætus*
3*	In myrtaceous wood, sp. longer	*C. caryotoides*
5(1)	Cap brightly red to orange	6
5*	Cap darker mahogany red	8
5**	Cap umber to blackish brown	*C. caryotis*
6	Alkaline reaction strongly red on most parts of frb	7
6*	Alkaline reaction trivia	9
7	Frb small, stipe <5 mm thick, gills brilliant orange	*C. araniiti*
7*	Frb usually large, stipe thicker, gills yellowish	*C. armiæ*
8(5)	Gills mustard yellow, chrysobasidia present	*C. rubrocastaneus*
8*	Gills whitish, basidia trivial	*C. rubrodactylus*
8**	Gills orange with reddish edges	*C. rubrimarginatus*
9(6)	Cap predominantly red	*C. eucollybianus*
9*	Cap red with a red-brown to orange tinge	*C. ruficollybianus*, *collybianus*

Key L: *Cortinarius* group *Thaxterogaster* & allies [cf. Horak 1973b, Nilsen et al. 2020]

1	Cap with violet hues	2

1*	Cap brilliantly red	*Leratiomyces erythrocephalus* (= *Weraroa e.*) [→ Johnston et al. 2007]
1**	Cap whitish to pale tan, possibly with green, and/or blue zones	10
1***	Cap with predominantly brown to orange hues	20
2	Stipe absent, sp. hyaline	*Gallacea scleroderma* [→ Johnston et al. 2007]
2*	Stipe present, sp. yellow-brown	3
3	Stipe-base with membranous, volva-like veil remnants	5
3*	Veil remnants on stipe squamulose or absent	*Cortinarius violaceovolvatus* var. *viola* (= *Th. viola*), *C. diaphorus* and others [→ Nilsen et al. 2020]
5(3)	Gleba lamellate, sp. with distant, oblong warts	*C. conei**
5*	Gleba loculate, sp. with crowded, rounded warts	*C. violaceovolvatus*
10(1)	Stipe rudimentary or absent, columella dendrous or absent	11
10*	Stipe and columella manifest	13
11	Cap staining green and/or reddish	*Octaviania tasmanica* [→ Soop 2005a]
11*	Cap at most staining yellowish	12
12	Cap white to pale tan or greyish	16
12*	Cap staining yellow or orange	*Descomyces* [→ Kuhar et al. 2017; Castellano & Bougher 1993]
13(10)	Cap often pointed or bent, with a pale blue-green hue	*Clavogaster novæzelandicus* (= *Weraroa virescens*) [→ Johnston et al. 2007]
13*	Cap rounded, whitish when young	14
14	Young cap covered by white squamules	*Tympanella galanthina* [→ Horak 1970a]
14*	Young cap ± glabrous	15
15	Cap turning bluish with age, sp. smooth	*Psilocybe weraroa* (= *Weraroa novæ-zelandiæ*) [→ Johnston et al. 2007]
15*	Cap remaining greyish to white, sp. verrucose	*Cortinarius leucocephalus**
16(12)	Cap immutably white, sp. >15 µm	*Cortinarius nivalis**
16*	Cap pale tan with a geyish shade, sp.shorter	*C. anisodorus*
20(1)	Stipe rudimentary or absent	25
20*	Stipe provided with a marginate or triangular bulb	24
20**	Stipe ± cylindrical without a bulb	21
21	Smell unpleasant, fish-like	*Cortinarius pisciodorus**
21*	Smell trivial	22
22	Cap red-brown	*C. sarcinochrous** (= *Th. carneolus*)
22*	Cap tan to yellow-brown without a red component	23
23	Sp. <15 µm	*C. epiphæus*
23*	Sp. longer	*C. luteobrunneus** (= *Th. leoninus*)
24(20)	Sp. coarsely verrucose	*C. cartilagineus**
24*	Sp. almost smooth	*C. ohauensis*
25(20)	Cap orange to red-brown	26
25*	Cap yellowish	*C. flavidulus** (= *Th. luteolus*)
26	Under myrtaceous trees, columella distinct	*C. peraurantiacus* (= *Th. aurantiacus*)
26*	Under *Nothofagus*, columella thin or absent	*C. beeveroru*

Descriptions of Taxa

***Cortinarius* subgen. *Cortinarius* & allies**

Cortinarius* subgen. *Phlegmacium

Cortinarius* subgen. *Myxacium

Cortinarius* subgen. *Telamonia

Sequestrate *Cortinarius*

Please see the sections "What to look for", and "Notes" in the Schematic Key on how to interpret the characters and abbreviations used.

A few localities, where less common taxa have been encountered, are given under Ecology, expressed by abbreviated names. See the List of Localities at the end for geographical direction.

Cortinarius subgen. *Cortinarius* & allies

Under this heading we group a number of taxa that have traditionally been assigned to subgenera *Cortinarius, Dermocybe, Leprocybe*, and section *Anomali*, as well as a number of groups that appear to be endemic for the South Pacific. Groups that might be assigned morphologically to subgenera *Phlegmacium*, *Myxacium*, and *Telamonia* are treated under subsequent headings.

1. Section *Cortinarius*

The type section of the genus is characterised by saturated, dark blue to violet colours all over, a dry, velvety-granulose cap, and remarkable cheilocystidia. [The section is present on both hemispheres. It is polyphyletic with a few southern species outside the core clade around the type, *C. violaceus* (see Harrower et al. 2015a,b).]

Cortinarius carneipallidus Harrower Plate 1

Cap 55 mm, dry, not hygrophanous; blackish violet; finely and densely velvety to squamulose.

Gills violet-black to almost black.

Stipe cylindrical to clavate; violet to greyish violet with dark-violet fibrils and girdles.

Veil dark violet, fairly copious; cortina violet.

Flesh pale greyish pink, marbled dark violet; odour somewhat acerbic.

Reactions: NaOH blood red on stipital veil, red in context.

Micro: spores subglobose, not calyptrate, 10–12.3 × 8.2–9.3 µm, rather coarsely verrucose; cheilocystidia lageniform, some metuloid or filled with brownish- violet pigment, sparse, 55–70 × 15–22 µm.

Ecology: in *Nothofagus* forest, rare. Te Iringa Track.

Ref.: Harrower et al. 2015b.

A striking fungus with its dominating, dark-violet colours, robust habit and a slightly acerbic odour recalling *Lepiota cristata*. It is quite similar to the European type *C. violaceus* (L.:Fr.) Gray, which has a stronger violet flesh, a wide clavate stipe, and exhales a strong, cedar-like odour. [This taxon was often named *C. subcalyptrosporus* M.M. Moser, but the latter was described from Borneo, growing in a different habitat, and the type material has not been examined genetically.]

Two similar and rare species have been recorded from New Zealand, but only the second one nests in the type clade. ***C. atrolazulinus*** M.M. Moser (Plate 1) grows in the same habitat but has a blackish-violet flesh and smaller, less verrucose spores [Lake Gunn Track, Cascade Hut Track; see Moser 1986]. — ***C. kioloënsis*** A.E. Wood grows in myrtaceous forest (see Wood 2009, Harrower et al. 2015b).

2. Section *Pauperæ* & allies

Section *Pauperæ* (M.M. Moser & E. Horak) Soop is a complex of at least 17 similar, so far poorly studied taxa in the South Pacific. They contain predominantly anthraquinonic pigments, in analogy with the boreal section *Dermocybe* (Fr.) Gillot & Lucand, though of a different chemical composition. While *Dermocybe* consists of species with a dry, often fibrillose/scaly cap which is not hygrophanous (see e.g. Høiland 1983). *Pauperæ* includes, in addition, many hygrophanous and glabrous species. [Molecular studies have shown that the two sections are genetically close.]

Taxa in *Pauperæ* mostly exhibit a citrinous to greenish or yellow hue. Dermocyboid taxa with reddish tints are described in the following chapters.

Cortinarius indotatus (E. Horak) G. Garnier Plate 2

Basionym: *Dermocybe indotata* E. Horak

Cap 15–30 mm, dry, weakly hygrophanous; olive-brown to yellow-brown, sometimes with a darker disk, young ± olive-green frosty; finely innate fibrillose; margin olive-yellow, striate.

Gills olive-green to mustard-yellow; distant.

Stipe cylindrical; pale yellow to citrinous, young with thin, olive-yellow to dark yellow girdles and tufts; apex yellow-grey.

Veil dark yellow, occasionally with an olive tinge, later red-brown, sparse; cortina pale yellow.

Flesh pale greyish yellow to citrinous, marbled darker yellow; odour faint, ± spicy or sweetish; taste nil.

Reactions: NaOH blood red on cutis and stipital veil, weakly reddish to trivial elsewhere; guayac blue-green; phenol nil; fluorescence greenish yellow.

Micro: spores elliptic, 6–7.5 × 3.5–5 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, possibly also with myrtaceous trees, occasional.

Ref.: Horak 1987.

A small, rather inconspicuous, brownish yellow fungus with olive tints, differing from *C. olivaceoniger* (below) mainly by a dry cap.

Cortinarius sciurellus Soop Plate 3

Cap 12–35 mm, dry to slightly viscid, hygrophanous; yellow-brown with a darker umbo, finely innate fibrillose; margin paler without obvious veil remnants, sometimes with an olive or citrinous tinge when young, striate to sulcate.

Gills olive-grey to olive-yellow, rather distant.

Stipe cylindrical, dry, slender; citrinous to yellow, darkening with age, with sparse brownish fibrils.

Veil citrinous to yellow-brown, sparse; cortina pale yellow.

Flesh olive-yellow to greyish yellow; odour weak, raphanoid; taste faint like “raw peas”, sometimes ± acerbic.

Reactions: NaOH red on cutis and stipital veil, orange-red on gills; fluorescence nil.

Micro: spores elliptic, 7.5–9 × 4.5–5.5 µm, moderately to rather weakly verrucose.

Ecology: in *Nothofagus* forest, occasional. Murray Creek, Bridle Track.

Ref.: Soop 2014.

A small yellow-brown fungus, easily mistaken in the field for a *Telamonia*, while the alkaline reaction indicates section *Pauperæ*, a position corroborated by molecular data. The species resembles *C. indotatus* (above), which produces distinctly smaller spores.

C. leptospermorum (E. Horak) G. Garnier (Plate 2), growing in myrtaceous woods, is difficult to separate from *C. indotatus* [St Arnaud Camp Site, Lee Valley, Northwood; see Horak 1987 as *Dermocybe l.*]. Cf. similar telamonioid species (cf. *C. paraxanthus* and allies), which, however, lack the alkaline reaction.

Cortinarius elaiops Soop Plate 3

Cap 15–50 mm, dry, hygrophanous, brownish yellow with an olive-brown to olive-black disk, sometimes with an orange tinge, finely to rather coarsely innate fibrillose; margin olive-yellow, with darker, yellow-brown fibrils, not striate.

Gills olive-yellow to pale cinnamon.

Stipe cylindrical, tall, slender, often ± dilated at base; pale yellow to citrinous from an absorbing sheen, with sparse, thin, brownish to orange fibrils and bands.

Veil yellow-brown, blushing orange-red, sparse; cortina pale yellow to white.

Flesh olive-brown in cap, contrastingly yellow-brown to olive yellow in stipe; odour and taste raphanoid.

Reactions: NaOH red to warmly dark brown, weakly red on gills and context; formalin, guayac, phenol nil.

Micro: spores subglobose, 5.5–7 × 4.5–5.5 µm, moderately verrucose; marginal elements vesiculose 12–20 µm.

Ecology: In *Nothofagus* forest, occasional.

Ref.: Gasparini & Soop 2008.

This rather common fungus is easily recognised from its round, mustard-yellow cap with a darker centre, resembling an eye. This is often enough to separate it from *C. indotatus* (above), which moreover has a stronger red alkaline reaction and a different spore shape. It is also similar to *C. paraxanthus*, which presents a darker, more uniformly coloured cap and significantly larger spores. [Despite its telamonioid habit and dull alkaline reaction, *C. elaiops* belongs to sect. *Pauperæ.*]

Cortinarius chrysma Soop Plate 1

Cap 15–45 mm, dry, weakly or not hygrophanous; golden yellow, young yellow-brown which persists at the centre; finely innate fibrillose to finely granulose-squamulose, margin not striate.

Gills pure yellow to citrinous.

Stipe cylindrical to clavate; pale yellow with a few brownish-yellow fibres near base, apex paler.

Veil dark yellow to brownish yellow, sparse; cortina pale yellow.

Flesh pure yellow; odour agaricoid to faintly raphanoid; taste nil.

Reactions: NaOH blood red on cutis and gills, red to vinaceous on stipital veil, weaker red to orange in context; guayac nil; fluorescence nil.

Micro: spores elliptic to amygdaloid, 8–10 × 4.5–5.5 µm, moderately and rather sparsely verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 1998, Horak 197x as *Dermocybe aurata* ined.

A beautifully golden-yellow fungus, somewhat resembling *C. canarius*, but smaller and with more pure yellow tints. A form with an orange tinge has also been found [Craigieburn].

C. icterinoides (E. Horak) G. Garnier (Plate 2) is paler with a weaker alkaline reaction and somewhat shorter spores. It is rare in the same habitat (Kepler Track, Boyle River, St Arnaud Range, Harwoods Hole; see Horak 1987 as *Dermocybe i.*). [As shown by molecular studies, the two species are distinct but closely related in section *Chrysmata* Soop. They deviate from *Pauperæ* by their more pure yellow colours, and, like *C. alienatus* (below), are sisters to the section.]

Pholiota chrysmoides Soop, common on ligneous debris in southern-beech forests, is easy to confuse with these taxa, but is frankly hygrophanous with a bitter context [see Soop 2001, 2005b]. — Also *Tricholoma koura* Leonard ined., fairly frequent in the same habitat, displays brilliantly orange-yellow colours and is easily mistaken for a member of this group, but the spores are hyaline.

Cortinarius alienatus (E. Horak) G. Garnier Plate 3

Basionym: *Dermocybe alienata* E. Horak

Cap 20–70 mm, glutinous, not hygrophanous; yellow to olive-yellow or olive-grey with a darker, olive-brown to olive-green or even blackish disk; glabrous; margin paler, olive-tan, not striate.

Gills pale yellow-green to citrinous, rather thick.

Stipe clavate to cylindrical, viscid; yellow to citrinous or greyish citrinous, thinly fibrillose.

Veil yellow-green to olive-brown, glutinous, sparse; cortina pale yellow.

Flesh yellow to citrinous; odour faintly raphanoid; taste nil.

Reactions: NaOH orange to red on flesh, veil and gills, blood red on cutis; guayac, phenol nil; fluorescence weakly yellow.

Micro: spores elliptic, 6.5–8.5 × 4.5–5.5 µm, moderately verrucose.

Ecology: In *Nothofagus* or myrtaceous forest, common.

Ref.: E. Horak 1987.

A fairly large fungus, glutinous, with dark olivaceous and yellow hues, encountered in many southern-beech forests. A form also occurs with a bulbous, phlegmacioid stipe. [*C. alienatus* contains pigments that are found in the European species *C. atrovirens* Kalchbr. It forms a complex of at least three taxa, of which the type was described from myrtaceous forest. The taxon described here has been named var. ***nothofagi*** ined.]

C. olivaceoniger (E. Horak) G. Garnier is similar and possesses similar spores, but is slender with more yellow components. It is rare, growing in the same habitat (Te Iringa Track; see Horak 1987 as *Dermocybe o.*]. [*C. olivaceoniger* belongs to sect. *Walkeri* (below).]

Cortinarius lachanus Soop & M. Wallace Plate 3

Cap 9–12 mm, dry, weakly hygrophanous; green to yellow-green, yellowing towards the margin when older, innate fibrillose; margin, ± sulcate, later striate.

Gills greenish yellow, distant.

Stipe cylindrical, dry, slender; citrinous, pale turquoise at apex, brown-yellow towards base.

Veil citrinous, sparse.

Flesh pale green; odour and taste nil.

Reactions: NaOH blood red on cutis, elsewhere brownish red.

Micro: spores amygdaloid, 8.5–10 × 4.5–5.5 µm, very weakly verrucose.

Ecology: in *Nothofagus* forest, very rare. Murray Creek, Kaimanawa mountains.

Ref.: Soop 2016; possibly Horak 197x as *Dermocybe viridovelutina* ined.

A minuscule cortinar with more pure green hues than *C. indotatus* and others described above.

C. walkeri Cooke & Massee (= *C. austrovenetus* Cleland) is larger and viscid; being an introduced Australian species it grows with *Eucalyptus* (see Cleland 1934, Fuhrer 1985, Gasparini 2007b). [It is closely related to *C. lachanus* in sect. *Walkeri* Soop, which counts at least three other species in the South Pacific.]

3. Group “Cardinales”

Fruitbodies are vividly coloured: cap and veil exhibit some shade of red, purple, or orange. If the cap is more ochraceous but the veil is reddish, see the next group. [This is phylogenetically a loosely composed assembly of taxa.]

Cortinarius cramesinus (E. Horak) G. Garnier Plate 5

Basionym: *Dermocybe cramesina* E. Horak

Cap 20–50 mm, dry, not hygrophanous; intensely deep crimson red, disk slightly darker with a brownish shade when older, strongly fibrillose to granulose-scaly, margin with red fibrils.

Gills orange-brown to dark brownish yellow, edge paler; moderately crowded.

Stipe cylindrical to weakly clavate; brightly yellow when young, blushing pale red, densely covered by red tufts and girdles.

Veil saturated red, copious; cortina white to greyish yellow.

Flesh orange red to orange yellow, marbled red to orange; odour of raw potatoes, taste faint, raphanoid.

Reactions: NaOH deep blackish red on cutis, dark red elsewhere; guayac nil; fluorescence faint.

Micro: spores elliptic, 5.5–7.5 x 4–5.2 µm, rather weakly verrucose.

Ecology: in *Nothofagus* forest, rare. Mackay Creek, Klondyke Spur Track, St Arnaud Range.

Ref.: Horak 1987.

A spectacular species with an intensely crimson hue, seemingly dripping with red pigment and contrasting with the ochraceous gill colour. It may be difficult to distinguish from *C. papaver* (below), which has an overall more orange-red colour, smoother cutis, and a fusoid stipe. *C. cardinalis* (below) exhibits a similar colour combination, but is viscid and more vinaceous red.

Cortinarius cardinalis (E. Horak) G. Garnier Plate 5

Basionym: *Dermocybe cardinalis* E. Horak

Cap 20–40 mm, viscid, not or weakly hygrophanous; carmine to lilac-red or wine-red with a lacquered finish, later more wine-brown, glabrous to finely innate fibrillose.

Gills orange-brown to brick brown.

Stipe cylindrical to slightly fusoid, viscid; pale or pinkish grey to greyish yellow with thin, red-lilac fibrils; lower part ± coated by viscid, lilac-red to wine-red girdles.

Veil viscid, red to lilac-red, fairly copious; cortina pale red.

Flesh pale red-brown to orange-brown, redder in stipe-base; odour fairly strong, raphanoid; taste same but weaker.

Reactions: NaOH black on cutis and stipital veil, dark red to black on gills, olive-grey to trivial in context.

Micro: spores elliptic, 8–10 × 5.2–6.2 µm, moderately to weakly verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak 1987, and "*Cortinarius sp.*" (#73) in Taylor 1973, "*Cortinarius sp.*" (#15) in Horne 2000.

This species is well characterised by its viscidity and red coloration, contrasting against the brownish gills. Its wine-red or mahogany-red cap, glistening like varnish (cf. *Ganoderma lucidum*), never fails to attract attention in the forest.

Cortinarius cruentoides Soop Plate 6

Cap 10–30 mm, dry, weakly hygrophanous; dark carmine red, later fading with a brownish tinge; minutely squamulose to granulose, later innate fibrillose; margin often paler with sparse red fibrils, striate.

Gills intensely carmine red; edge often more saturated; distant.

Stipe cylindrical, slender; red to pale red, with red tufts and fibrils.

Veil dark red to purple red, rather copious.

Flesh grey-white with a pink tinge, marbled red; odour and taste nil.

Reactions: NaOH blood red everywhere.

Micro: spores elliptic to subglobose, 6.5–7.5 × 4–5 µm, moderately to fairly coarsely verrucose.

Ecology: in myrtaceous forest, uncommon. Maclean Track, Northwood, Horton Res.

Ref.: Soop 2014.

A small fungus, red-coloured all over like the boreal *C. sanguineus* Fr., and found in myrtaceous forest. *C. cramesinus* (above) is larger and does not possess red gills. [Along with several Australian species, *C. cruentoides* belongs to sect. *Cruentoides* Soop, sister to sect. *Dermocybe*.]

In *Nothofagus* forests there exist several rare species that are similar to *C. cruentoides,* but even smaller (cap <13 mm). ***C. vinicolor*** (E. Horak) G. Garnier [Cameron Track, Lake Waikareiti] and ***C. rubripurpuratus*** Soop (= *Dermocybe purpurata* E. Horak, *C. purpuratoides* G. Garnier; Arthur's Pass) both produce somewhat leaner spores, the former being distinguished by their coarse ornamentation [see Horak 1987, Soop 2008]. — ***C. mycenarum*** Soop (Plate 6) is dark wine-red all over. It has the habit of a small *Mycena*: thin-fleshed with a very thin stipe and a bonnet-shaped cap. The spores are subglobose, rather coarsely ornamented [see Soop 2016; Harwoods Hole].

Cortinarius papaver Soop Plate 5

Synonym: *C. austrocinnabarinus* Jones & May

Cap 25–65 mm, dry, not hygrophanous; intensely and deeply orange-red to cinnabar; finely innate fibrillose; margin paler with red tufts.

Gills yellow-brown, soon orange.

Stipe fusoid, often rooted; yellow to greyish yellow, young ± covered by orange-red tufts and girdles.

Veil orange-red to cinnabar, fairly copious; cortina pale red to white.

Flesh yellow, marbled slightly red; odour and taste nil.

Reactions: NaOH blood red to almost black on cutis, red to violet in context, blood red on gills and stipe; guayac trivial; fluorescence yellow.

Micro: spores obtusely elliptic to subglobose, 5.5–7 × 4.5–5.5 µm, moderately to weakly verrucose.

Ecology: in *Nothofagus* forest, fasciculate, rare. St Arnaud Range, Klondyke, Lake Daniel Track.

Ref.: Soop 2001; Jones & May 2008 as *C. austrocinnabarinus*; Fuhrer 1985 as *C.* aff. *cinnabarinus.*

A remarkable fungus, characterised by brilliant, intensely orange-red colours. The yellow stipe is more or less fusoid in shape and amply provided with orange-red veil remnants. *C. papaver* has also been collected in Tasmania under the above synonym. It resembles *C. veronicæ* (below) but differs by more saturated, orange colours, and a more fibrillose cap. Cf. *C. araniiti.*

Cortinarius veronicæ Soop Plate 5

Cap 20–50 mm, dry, weakly hygrophanous; brilliantly cinnabar-red, later brownish red to ochre with a pink tinge; finely innate fibrillose, almost glabrous; margin not striate, often with reddish fibrils.

Gills brilliantly red-orange to brick red.

Stipe cylindrical, pink to yellowish pink, ± covered by cinnabar girdles and zones, sometimes even peronate with a small collar.

Veil red to cinnabar-red or pink; fairly sparse to copious; cortina pale red to white.

Flesh pale yellow to greyish yellow, darkening; taste slightly raphanoid; odour nil.

Reactions: NaOH blood red on cutis, reddish lilac to red on gills, bluish lilac on stipital veil, trivial in context; guayac grey-green; phenol red; formalin nil; fluorescence yellow.

Micro: spores subglobose, 5.5–7.5 × 4.5–5.5 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 1998, 1998a.

A beautiful fungus with tender cinnabar-red to pink hues, while the gills tend more towards orange. It recalls the European *C. cinnabarinus* Fr., but contains different anthraquinonic pigments as shown by a chromatographic study, which moreover indicates that *C. veronicæ* could be highly poisonous. [It is the type of sect. *Veronicæ* Soop, sister to sect. *Leprocybe* (Bidaud et al. 2021; see *Persplendidi* below).]

The variety ***dilutus*** Soop, often fasciculate, presents duller, more ochraceous or orange tints, and is frankly hygrophanous with a thinner, orange-coloured veil (see Soop 2002, 2003).

4. Section *Ignelli* & allies

Fruitbodies resemble those in the previous group, except that the cap colour is not reddish. The veil and often the gills, however, exhibit conspicuous orange or red colours.

Cortinarius ignellus Soop Plate 4

Cap 15–30 mm, dry, hygrophanous; yellow-brown with a date-brown centre, sometimes with an olive tinge, young wholly orange-brown; finely innate fibrillose; margin orange-brown to yellow, striate.

Gills yellow-brown to olive yellow.

Stipe cylindrical, slender; pale yellow to brownish yellow with sparse, red to orange-red girdles; apex white.

Veil orange-red to brick red, later red-brown, rather sparse; cortina yellowish.

Flesh pale yellow; odour and taste nil.

Reactions: NaOH blood red on cutis and stipital veil, else trivial.

Micro: spores obtusely elliptic to subglobose, 7–9 × 5.7–7 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2002.

This fungus looks like a *Telamonia*, but is well characterised by the red velar bands on the stipe. The alkaline reaction indicates that the pigment is anthraquinonic in nature. [*C. ignellus* is the type of sect. *Ignelli* Soop, along with *C. castaneodiscus* (below).]

C. peraurilis Soop & Dima (Plate 2), is a very small species found with *Nothofagus*, wholly lacking olive or citrinous tints. The cap, barely 25 mm in diameter, is bright orange coloured, but the veil is paler, sometimes almost white [Totara, Kepler Track; see Soop et al. 2018].

Cortinarius castaneodiscus (E. Horak) G. Garnier Plate 4

Basionym: *Dermocybe castaneodisca* E. Horak

Cap 15–30 mm, viscid, sometimes slightly so, hygrophanous; golden to brownish orange or yellow-brown, young umber to blackish brown persisting at the disk; convex with a papilla, margin later ± striate.

Gills brownish orange to orange-yellow; fairly distant.

Stipe sometimes viscid, slender, tough, cylindrical to weakly clavate, brilliant yellow with orange-brown bands and fibrils; apex pale yellow.

Veil yellow-brown to orange-brown, sparse; cortina yellow.

Flesh yellow to greyish yellow; odour fairly strong, raphanoid; taste nil.

Reactions: NaOH cherry red on cap, stipital veil, and flesh, weaker on gills; guayac blue-green; fluorescence yellow.

Micro: spores obtusely elliptic, 7.5–8.7 × 5–6 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak 1987.

A small fungus, characterised by a brilliantly yellow stipe, contrasting against the darker orange-tinted cap with a conspicuously dark centre. Normally the fruitbodies are frankly viscid. Cf. *C. ignellus* (above), which is dry and presents a red veil.

Cortinarius promethenus Soop Plate 6

Cap 25–40 mm, dry, not hygrophanous; yellow-brown with a darker disk, innate fibrillose to granulose with brownish tufts; margin paler with thin, red fibrils.

Gills yellow-brown.

Stipe somewhat fusoid, saffron yellow with fiery red bands and fibrils on lower half, apex pale yellow.

Veil carmine red, rather copious; cortina pale yellow.

Flesh pale yellow, marbled darker yellow-brown; odour faint, raphanoid; taste nil.

Reactions: NaOH blood red on all parts; fluorescence yellow.

Micro: spores elliptic, 6.3–8 × 4.5–5.5 µm, moderately to rather weakly verrucose. Some marginal elements filled with a golden, grainy substance, Veil hyphæ × 4–5 µm.

Ecology: in *Nothofagus* forest; very rare. Waipori Falls.

Ref.: Soop 2010.

A strange and rare fungus exhibiting flame-like, red velar bands on the stipe, being otherwise rather dull ochraceous in colour. The species has so far been recorded mainly from the Dunedin area. [It is closely related to *C. cramesinus* (above).]

Cortinarius aurantioferreus Soop Plate 6

Cap 10–30 mm; dry, not hygrophanous; orange-brown, centre darker red-brown to umber; finely innate fibrillose to yellow squamulose; margin reddish orange with fine orange-brown fibrils.

Gills intensely red-orange to orange-red with a yellow edge.

Stipe cylindrical; citrinous to golden-yellow, sometimes with an olive shade; darkening to grey-brown or black from base, apex paler.

Veil orange-brown, later wine-brown; sparse; cortina dark yellow.

Flesh dirty yellow, darkening to dirty brownish or black in stipe-base; odour faintly raphanoid; taste nil.

Reactions: NaOH dark red to black in flesh, blood red on gills, wine red to dark red on cutis and stipital veil; fluorescence nil.

Micro: spores obtusely elliptic, 5–6.5 × 3.5–4.5 µm, finely punctuate.

Ecology: in *Nothofagus* forest, uncommon. Tawanui, Adams Track, St Arnaud Lodge, Cascade Hut Track, Te Iringa Track, Matawai.

Ref.: Soop 2001.

A small, dark cortinar with beautifully orange gills and an often blackening stipe. With its fibrillose cap *C. aurantioferreus* evokes species in the boreal section *Dermocybe* (e.g. *C. fervidus* P.D. Orton).

C. largofulgens (E. Horak) G. Garnier is quite similar and genetically close. It differs by a darker, slightly viscid cap and grows with myrtaceous trees [Black Hill Track]. — ***C. egmontianus*** (E. Horak) G. Garnier, also rare in myrtaceous woods, has a blackish disk, strongly orange gills, and somewhat wider spores (see Horak 1987 for both species).

5. Section *Persplendidi*

Sect. *Persplendidi* Soop & Dima contains species presenting a brightly yellow stipe and often a darker, squamulose cap. Fruitbodies emit a strong fluorescence in UV light, in analogy with the boreal section *Leprocybe* (M.M. Moser) Melot. [These two sections form sister clades that are endemic to their respective hemispheres.]

Cortinarius persplendidus Gasparini Plate 7

Basionym: *Dermocybe splendida* E. Horak

Cap 20–35 mm, dry, not hygrophanous; dark orange-brown to umber, sometimes almost black, innate fibrillose to granulose.

Gills saturated orange to orange-red.

Stipe cylindrical to ± clavate, yellow to saffron-yellow, reticulate from dark brown fibrils and tufts on lower part, sometimes terminating in a small ring, apex pale yellow.

Veil red-brown, blackening, rather sparse; cortina pale yellow.

Flesh yellow to yellow-brown; odour raphanoid; taste nil.

Reactions: NaOH black on cutis, purple-red on stipital veil, blood red on context and gills; guayac nil; fluorescence weakly yellow or nil.

Micro: spores obtusely elliptic to subglobose, 7–9 × 5.5–6.8 µm, coarsely verrucose.

Ecology: in myrtaceous forest; uncommon. Evansdale Glen, Albany.

Ref.: Horak 1987 as *Dermocybe splendida.*

This beautiful fungus is recognised from its dark cap, brilliantly orange-red gills and growth in myrtaceous copses. It recalls members of the boreal section *Dermocybe* as well as *C. aurantioferreus*

(above), which is smaller with smaller spores. [The name has often been used for a similar taxon (*C. austrosplendidus* nom. nov.) in Australia, which is genetically distinct (see Bougher & Syme 1998, Gasparini 2006).]

Cortinarius canarius (E. Horak) Gasparini Plate 1

Basionym: *Dermocybe canaria* E. Horak

Cap 25–65 mm, dry, weakly hygrophanous; golden-yellow to pale brown-yellow, later darkening with an olive-brown tinge, finely innate fibrillose; margin not striate, young with thick, fibrillose, yellow fringes.

Gills saturated yellow to orange-yellow; fairly crowded.

Stipe cylindrical to clavate or ± fusoid, often robust; brilliantly yellow to citrinous with yellow to orange girdles and zigzag bands that later turn ± reddish, sometimes almost peronate with a small collar; base sometimes with orange spots; mycelium strongly yellow.

Veil saturated yellow, often dark, blushing to orange or red, fairly copious; cortina pale yellow to white.

Flesh brilliantly yellow, often whitish in stipe centre; odour nil; taste faint, unpleasant or somewhat bitter.

Reactions: NaOH blood red on gills, stipital veil, and cutis, weaker in flesh; guayac orange on gills, else blue-green; phenol red; formalin, lugol nil; fluorescence distinctly yellow.

Micro: spores elliptic, 7–9 × 4.5–5.5 µm, weakly verrucose.

Ecology: in *Nothofagus* forest, very common.

Ref.: Horak 1987, Soop 1998a, and "*Cortinarius sp.*" (#74) in Taylor 1973.

This common and quite robust species is characterised by its brilliantly golden to citrinous-yellow tints, especially on the stipe, which makes it visible from far away. When soaked or old, the cap colour darkens to olive or brownish. The veil turns distinctly red after collection, probably from oxidation. *C. canarius* also occurs in Australia. [This species is genetically a sister to *Persplendidi*.]

Cortinarius ophryx Soop Plate 7

Cap 30–45 mm, dry, not hygrophanous; yellowish grey but densely covered by a dark-brown felt and squamules, disk umber or black.

Gills pale citrinous yellow; rather crowded.

Stipe with a rounded bulb, often with a pointed base; pale yellow to brilliantly citrinous, with numerous dark grey-brown to red-brown girdles and squamules, terminating in an adpressed collar; apex paler.

Veil dark grey-brown to blackish brown, later purple-brown, fairly copious; cortina white to pale yellow.

Flesh intensely yellow, sometimes paler; odour faintly raphanoid; taste nil.

Reactions: NaOH slowly reddish on bulb, else trivial; formalin, guayac and phenol nil; fluorescence strongly greenish yellow to whitish yellow.

Micro: spores obtusely elliptic to subglobose, 8.7–11 × 6.5–8.2 µm, coarsely verrucose; marginal elements crowded, vesiculose.

Ecology: in *Nothofagus* forest, occasional, often solitary.

Ref.: Soop 2010, and possibly Horak 197x as *C. ornaticeps* ined.

An interesting, medium-sized fungus with a strong fluorescence in the context. The stipe is fusoid or bulbous, often robust, but slimmer forms are sometimes seen. These characters evoke the boreal *C. cotoneus* Fr., type species of the sister section *Leprocybe*. Cf. *C. castoreus* (below), which, however, is considerably more robust and produces very large spores.

There exist several similar and genetically affine taxa that are only partly unravelled (Plate 7). ***C. stenophryx*** ined. is difficult to separate, but the veil and cap are somewhat paler, more yellow-brown, and the stipe is often slimmer [see Soop et al. 2022b; Tawhai, Clements Rd, Kepler Track, Matawai]. — ***C. tigrellus*** Soop is very rare, growing in the same habitat. It differs by a more slender habit, and a less dark, red-brown veil [Cascade

Hut Track; see Soop 2002, 2013]. *C. tigrellus* also resembles the European *C. humicola* (Quél.) Mre, which has been shown to be genetically remote in subg. *Telamonia*..

6. Section *Limonii*

Most taxa in section *Limonii* Kühner & Romagn. present vivid red-brown and yellow colours, and often react with alkaline solutions, while the fluorescence generally is weak or absent. [The section, with the boreal *C. limonius* (Fr.:Fr.) Fr. as type, is bihemispherical with the centre of diversity in New Zealand. It is part of the former subgen. *Leprocybe* M.M. Moser, which has been shown to be polyphyletic.] Cf. the next group, which contains similar taxa.

Cortinarius armiæ Soop Plate 11

Cap 30–70 mm, dry, ± hygrophanous; warmly mahogany red to orange-brown, glabrous to finely innate fibrillose; margin with sparse orange fibrils, not striate.

Gills yellow-brown to greyish yellow.

Stipe cylindrical to tapering, slender, yellow to saffron yellow with reddish, felty tufts and bands; base flushing darker yellow-brown; apex yellow-white.

Veil orange-red to wine red, fairly copious; cortina yellow to whitish yellow.

Flesh pale yellow to saffron, young marbled orange in stipe-base; odour and taste nil.

Reactions: NaOH intensely red on cutis and stipital veil, blackish red in context, fluorescence nil.

Micro: spores elliptic to subglobose, 6-8 × 4.5–5.5 µm, rather weakly verrucose.

Ecology: in *Nothofagus* forest, often fasciculate, occasional.

Ref.: Soop 2010.

A beautiful red and yellow fungus that can become quite large, often growing in clusters. It is macroscopically almost identical to *C. eucollybianus*, differing from the latter mainly by a strong, red alkaline reaction and a tapering stipe.

C. araniiti Soop (Plate 10) is closely related, but small and orange coloured all over. It reacts blood red with alkaline solutions, and its spores measure 7–8.2 × 5.7–6.5 µm. This species seems to be very rare, growing with *Nothofagus* [Craigieburn; see Soop 2014]. — ***C. aurantiellus*** (E. Horak) G. Garnier in the same habitat differs by a coarsely fibrillose cap and larger spores (see Horak 1987 as *Dermocybe a*.).

Cortinarius caryotis Soop Plate 10

Cap 20–65 mm, dry, not hygrophanous; dark mahogany to blackish brown; matt, velvety from fine, yellowish fibrils and adpressed tufts that later absorb; young ochraceous frosty; margin young with greyish-yellow patches, not striate.

Gills yellow-ochraceous to greyish yellow, often fairly dark; edge paler; rather thick; crowded.

Stipe cylindrical; greyish yellow, zoned and girdled by red to brownish-red or orange-brown fibrils and tufts; apex pale yellow.

Veil ochraceous, darkening to orange-brown or brown-red; fairly copious; cortina white to pale yellow.

Flesh yellow to brownish yellow, darker red-brown in stipe-base; odour faint; taste nil or slightly astringent.

Reactions: NaOH red on cutis and stipital veil, sometimes strongly, elsewhere weaker; phenol strongly red-brown; guayac nil; fluorescence nil.

Micro: spores subglobose to obtusely elliptic, 5.2–7 × 4.5–5.7 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, common.

Ref.: Soop 2001, Horak 197x as *Hydrocybe castaneosquamosa* ined.

A common species recognised by its umber, dry cap which becomes almost black on older specimens, the rather dark yellow-ochre gills, and the reddish-brown veil on the stipe. *C. viscilætus* (below) is similar, but smaller with a viscid cap. Also cf. *C. eutactus* and allies.

Three rare species are macroscopically rather similar and genetically close: ***C. caryotoides*** Soop & J.A. Cooper (Plate 10), growing with myrtaceous trees [Boyle River; see Soop et al. 2018], differs by a viscid cap and larger spores (9–11 × 5.7–6.3 µm). — ***C. rubrocastaneus*** (Soop) Orlovich & Oliver (Plate 11) is leaner and possesses mustard yellow gills with spectacular chrysocystidia and chrysobasidia (see Soop 2000 as *Gymnopilus r.*; Orlovich & Oliver 2002). It produces similar spores as *C. caryotis* and grows in the same habitat [Arthurs Pass]. — ***C. rubrimarginatus*** Soop (Plate 10) is a minuscule species, exhibiting similar chrysocystidia, but the gills are brick red with a deep-red edge [Floral Saddle; see Soop et al. 2018]. Cf. *C. palissandrinus*.

Cortinarius viscilætus Soop Plate 39

Cap 10–30 mm, viscid, sometimes almost dry, hygrophanous; brightly brownish yellow to brownish orange or golden brown, disk date-brown; glabrous; margin paler, striate, long involute.

Gills brownish yellow to grey-yellow, soon orange, edge paler, rather distant.

Stipe cylindrical to tapering, often tall, tenacious, viscid to almost dry; pale yellow with yellow-brown to red-brown fibrils and zones; sometimes with red spots at base; apex greyish.

Veil brownish red to dark yellow-brown, rather sparse; cortina pale yellow.

Flesh brownish orange to ochraceous (lacking any violet shades); odour sweetish; taste ± raphanoid.

Reactions: NaOH red to red-brown on cutis, sometimes faint.

Micro: spores subglobose, 6.5–8.2 × 5–6.5 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2001.

A small, tough and sticky fungus with conspicuously golden hues, recalling the European *C. lætus* M.M. Moser. It differs from *C. melimyxa* mainly by its subglobose spores, but may also be recognised by the darker cap centre.

7. Section *Collybiani*

C. sect. *Collybiani* Niskanen & Liimat. forms the southern part of subgen. *Callistei* Liimat. et al. The taxa present vivid colours and thereby resemble those in section *Limonii* (above). [The subgenus is bihemispherical, where the northern part constitutes sect. *Callistei* (Liimat. et al.) Soop et al.]

Cortinarius collybianus Soop Plate 9

Cap 20–50 mm, dry, hygrophanous; dark orange-red to apricot-brown; glabrous to very finely innate fibrillose, sometimes finely reddish granulose; margin young with thin orange-yellow fibrils.

Gills pale yellow-brown to greyish ochre; rather thick.

Stipe cylindrical to slightly clavate; young pale yellow, later dark yellow, with dense, reddish fibrils or girdles, flushing orange-brown to yellow-brown from base.

Veil orange-red to orange-brown, fairly copious, often sparse; cortina white to pale yellow.

Flesh white to yellowish, marbled yellow; odour faint like wax candles; taste nil.

Reactions: NaOH trivial; guayac weakly blue-green; phenol blood red; fluorescence nil.

Micro: spores subglobose, 5.7–7.5 × 5–6 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, uncommon.

Ref.: Soop 2001; maybe "*Cortinarius sp.*" (#79) in Taylor 1973.

This conspicuous fungus is easily recognised from its beautifully warm colours: apricot or reddish cap and yellow stipe. Cf. *C. vernicifer* and *C. veronicæ*.

There are several closely related taxa that are difficult to separate from *C. collybianus* (Plate 9). They all have yellowish gills (cf. *C. rubrodactylus* below). ***C. eucollybianus*** Soop has a predominantly red cap. It is fairly common in the same habitat [Kepler Track; see Soop et al. 2018]. — ***C. ruficollybianus*** ined. is more red-brown in colour. Cf. *C. armiæ* (above).

Cortinarius rubrodactylus Soop Plate 9

Cap 30–85 mm, dry to slightly waxy, not hygrophanous, fleshy; saturated mahogany red, sometimes with a copper or purple tinge; finely squamulose; margin long involute with sparse fibrils.

Gills white to greyish white, rather thick.

Stipe robust, cylindrical to tapering, stiff; yellowish white to brown-yellow, with multiple thin red-brown girdles; apex ± white.

Veil purple-brown to red-brown, rather sparse; cortina white.

Flesh white with a faint yellow tinge; odour distinct like wax candles; taste nil.

Reactions: NaOH dark red on cutis and stipital veil, else trivial; fluorescence nil.

Micro: spores subglobose to obtusely elliptic, 6.5–8.5 × 5–6 µm, moderately to rather weakly verrucose fluorescence nil.

Ecology: in *Nothofagus* forest, often fasciculate; rare. Deer Flat, Craigieburn.

Ref.: Soop 2013.

A large and fleshy fungus, recognised by its mahogany-red cap, contrasting against the white gills when young. It recalls *C. armiæ* (above), which is redder with more lively hues and coloured gills.

8. Section *Crassi* & allies

Also this group consists of ochraceous or yellowish taxa, but their context shows a strong fluorescence in UV light. [Despite this property the members are not closely related to sect. *Persplendidi*, occupying disparate positions in the phylogeny.]

Cortinarius castoreus Soop Plate 11

Cap 40–100 mm or larger, fleshy; dry, not hygrophanous; covered by thick, dense, date-brown to dark yellow-brown scales or granules, young almost downy; margin young involute with brown tufts.

Gills pale grey; crowded, rather thick.

Stipe cylindrical, often ± clavate or tapering; yellow-brown, lower half covered by thick, squamulose, dark-brown girdles, sometimes ending in a collar; apex yellowish white.

Veil yellow-brown to date-brown, copious; cortina white; mycelial felt with white rhizoids.

Flesh white to pale tan; odour nil; taste with a ± bitter after-taste.

Reactions: NaOH black to reddish black on cutis, else trivial; lugol trivial; fluorescence pale yellow.

Micro: spores obtusely elliptic to subglobose, 14–17.5 × 10–12 µm, moderately to rather strongly verrucose; marginal elements vesiculose to clavate, 25–40 × 10–12 µm.

Ecology: in *Nothofagus* forest, common.

Ref.: Soop 2005, Horak 197x as *C. megaspermus* ined.

Most visitors to a native beech forest have seen this common, large, conspicuous fungus with brown scales all over. Also the spores are unusually large. The scaly coating and the pale gills evoke an enormous *Inocybe*. [Molecular analysis has shown that *C. castoreus* is closely related to *C. mariæ* in sect. *Rapacea* (Ch. 11).] Cf. *C. ursus*.

Cortinarius incensus Soop — Plate 8

Cap 15–55 mm, slightly but distinctly viscid, weakly or not hygrophanous; pale yellowish but covered by thick, yellow-brown squamules, centre almost tessellated; margin with orange-brown fibrils, sometimes appendiculate.

Gills pale grey to greyish yellow; edge white, fimbriate.

Stipe cylindrical, slender, often with a small bulb or slightly clavate; pale yellow to almost white, staining ochre, with thin yellow-brown fibrils and tufts.

Veil yellow-brown to orange-brown, fairly copious; cortina white to greyish yellow.

Flesh pale yellow, darker in stipe-base; odour strong, spicy like incense; taste faint, ± acerbic.

Reactions: NaOH yellow in context, red-brown to red on cutis and stipe, nil on gills; guayac blue-green; phenol, formalin nil; fluorescence distinct, greenish yellow.

Micro: spores elliptic to subamygdaloid, 9–11 × 5.7–6.7 µm, moderately verrucose; marginal cells numerous, 15–40 × 6.5–8 µm, sometimes with an asymmetric, flattened head.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2002.

Also this fungus recalls an *Inocybe* from its colours, its appendiculate cap margin. and the slender stipe with a small bulb. It is also interesting to note that it typically smells like *I. corydalina* found in the Northern Hemisphere. [*C. incensus* is the type of sect. *Incensi* Soop, which counts at least two other species from the South Pacific.]

Cortinarius eutactus Soop — Plate 8

Cap 30–70 mm, dry to slightly viscid, not hygrophanous; evenly and handsomely dark red-brown to mahogany brown or blackish brown; innate fibrillose; margin with thin, reddish fibrils.

Gills white to yellow-grey, crowded.

Stipe cylindrical to somewhat clavate; white, soon flushing brownish red from apex with thin, red-brown fibrils; base with a white mycelial coating.

Veil red-brown to brick red, rather sparse; cortina white.

Flesh white, ± brownish in cap; odour and taste nil.

Reactions: NaOH red on cutis, sometimes indistinctly, else trivial; guayac blue; phenol weakly rosy; fluorescence white.

Micro: spores amygdaloid to subelliptic, 6.5–8.5 × 3.5–4.5 µm, weakly verrucose; cheilo- and pleurocystidia numerous, 25–35 × 7 µm, clavate to irregular with greyish or yellowish contents.

Ecology: in *Nothofagus* forest, rare. Hawdon, St Arnaud.

Ref.: Soop 2005, Horak 197x as *C. retipes* ined.

A rather robust fungus, characterised by its very dark cap and contrasting white stipe that blushes brownish red. Cf. *C. picoides* and *C. xenosma*. [*C. eutactus* is genetically close to the boreal species *C. crassus* Fr., which also displays conspicuous cheilocystidia (sect. *Crassi* Melot).]

C. pseudoeutactus ined. (Plate 8) is very similar, but often has an olivaceous or greenish tint on the cap. [It belongs genetically to sect. *Rubicunduli* (cf. *C. subgemmeus*), sister to sect. *Crassi*.]

Cortinarius pholiotellus Soop — Plate 21

Cap 20–35 mm, dry, not hygrophanous; evenly date-brown; matt, slightly fibrillose to granulose; margin long involute.

Gills white, mature with a white edge.

Stipe cylindrical, pale yellow, apex white, lower part covered by thick, orange-brown to yellow-brown girdles.

Veil intensely orange-brown to red-brown; copious; cortina white to greyish.

Flesh whitish to pale tan; odour faint like "paint", taste nil.

Reactions: NaOH reddish black on cutis and stipital veil, red-brown on gills and context, $FeCl_3$ nil; fluorescence intensely golden-yellow.

Micro: spores amygdaloid, 10–12.5 × 6–7.5 µm, rather coarsely verrucose, fairly dark.

Ecology: in myrtaceous forest, very rare. Waipori Falls.

Ref.: Soop 1998.

Shares the unusual traits of white gills (when young) and a reddish veil with *C. eutactus* (above). It is further characterised by long, amygdaloid, strongly ornamented spores, and growth under myrtaceous trees. *C. pholiotellus* has so far been reported only from the Dunedin and Auckland areas. Cf. *C. caryotis* (above), which differs by its coloured gills and shorter spores. [Genetically this species appears related to sect. *Infracti* (Kühner & Romagn.) Moënne-Locc. & Reumaux; see Liimat. et al. (2022).]

9. Section *Xenosmatæ* & allies

Section *Xenosmatæ* Soop regroups a number of typical members of the cortinarioid flora of New Zealand, mainly characterised by a well-developed, often thick and membranous veil, formed by fairly thick hyphæ (6–20 µm). The veil is ochraceous, always prominent on the cap, often also on the stipe. Cf. the *Cuphocybe* group (below). [The section has been shown to be polyphyletic.]

Cortinarius xenosma Soop — Plate 12

Cap 30–70 mm, dry, not hygrophanous; dark grey-brown to dark copper brown; long covered by thick, ochre to greyish yellow fibres and patches, margin garnered by thick, membranous, dirty-ochre tufts.

Gills pale grey-brown to grey.

Stipe cylindrical, sometimes with a bulb; greyish yellow with a reddish tone and reddish fibrils, apex pale grey; sometimes with an ochre, membranous girdle, base sprouting greyish-yellow rhizoids.

Veil greyish ochre, blushing red, copious; cortina white.

Flesh greyish white to pale greyish yellow, blushing; odour faint, like "raw potato"; taste faint with an unpleasant after-taste.

Reactions: NaOH slowly yellowish on stipital veil, else trivial, guayac weakly blue-green, phenol weakly red; formalin nil; fluorescence nil.

Micro: spores elliptic, 7–9 × 4.5–5.2 µm, weakly to moderately verrucose; veil hyphæ × 6–10 µm, hyaline to brownish.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2002; maybe "*Cortinarius sp.*" (#75) in Taylor 1973.

This is a fairly robust fungus with a sombre cap, almost covered by a dirty-ochre veil when young. The blushing context and stipe, paired with the pale gills are also good characters (cf. *C. myxenosma*). The alkaline reaction is interesting as it seems to remove this red pigment (cf. *C. periclymenus*).

C. paraxenosma Soop & Dima (Plate 12) is genetically well separated, but morphologically almost identical to *C. xenosma* and grows in the same habitat [Cascade Hut Track, Te Iringa Track]. It displays a more rosy hue and has slightly smaller spores (see Dima & Soop 2020). — ***C. trichocarpus*** Soop (Plate 12) is even more robust with an equally abundant veil, but differs by a violaceous tinge in gills and context and larger spores (9.5–12 × 5.5–6.8 µm). It is rare, growing in *Nothofagus* forest [see Soop 2016; Arthurs Pass]. See further *C. ohauensis*.

Cortinarius xenosmatoides Soop — Plate 13

Cap 20–40 mm, dry, weakly or not hygrophanous; dark mahogany brown to umber, finely innate-fibrillose with pale ochraceous patches and fibrils; margin not striate.

Gills red-brown, moderately crowded to fairly distant.

Stipe cylindrical, white to pale yellow-brown with rather dense brown fibrils, coated pale ochraceous at base.

Veil greyish ochre, darkening to red-brown, fairly copious.

Flesh greyish yellow, marbled yellow-brown with a pale horn-rim near stipital cortex; odour faint, raphanoid or like wax candles; taste none.

Reactions: NaOH nil.

Micro: spores elliptic, 7–8 × 5–5.5 µm, weakly verrucose.

Ecology: in *Nothofagus* forest, uncommon. St Arnaud Range, Harwoods Hole.

Ref.: Soop 2016.

This fungus looks like *C. xenosma* (above), but without the typical reddish tinge on the stipe. It also deviates by being more slender in average habit, and by the brick-coloured lamellae. [Molecular data show that the two species are genetically remote, placing *C. xenosmatoides* in the dermocyboid sect. *Icterinula* M.M. Moser. This is remarkable, since it is a definitely telamonioid species, devoid of alkaline reaction.]

A similar species in myrtaceous wood is ***C. minilacus*** Soop, J.A. Cooper & Dima (Plate 13). It differs mainly by its yellow-brown gills and small, subglobose spores. Being a small, telamonioid fungus, it may also be confused with *C. amblyonis* Soop, which deviates mainly by a more red-brown pileus (St Arnaud Camp Site, Northwood; see Soop et al. 2018). [Genetically, *C. minilacus* forms a well-defined clade (sect. *Minilaci* ined.) together with at least 13 so far undescribed taxa in the South Pacific.] — Another similar species is ***C. xenophylon*** ined. (Plate 13), which is the first confirmed species belonging to subgen. *Telamonia* s. str. (Ch. 25) that grows naturally in the Southern Hemisphere.

Cortinarius cupreonatus Soop — Plate 12

Cap 30–50 mm, dry, not or weakly hygrophanous; rather dark red-brown to mahogany-red; finely innate fibrillose, scattered with ochraceous, pointed squamules and patches, disk ± granulose; margin young with dark ochraceous tufts.

Gills saturated violet to greyish purple, edge long violet; crowded.

Stipe cylindrical to clavate; pale violet to greyish, soon flushed yellow-brown from base; ± covered by thick, yellow-brown tufts and girdles; apex grey-violet.

Veil yellow-brown, copious; cortina pale violet to white.

Flesh dirty whitish to pale tan, marbled violet, staining yellow or brown from base; odour faint like "paint"; taste unpleasant, ± bitter; drying yellow-brown.

Reactions: NaOH red on cutis, pink on gills and context, red to purplish black on stipital veil; fluorescence bluish, yellow on exsiccata.

Micro: spores elliptic to subamygdaloid, 7–9 × 4–5 µm, weakly to moderately verrucose; veil hyphæ × 5–8 µm, red-brown.

Ecology: in *Nothofagus* forest, sometimes ± fasciculate, common.

Ref.: Soop 2001.

Characterised by its warmly mahogany-red cap, punctuated by thick, yellow-brown veil remnants. This species differs from *C. xenosma* (above) mainly by the — often strongly — bitter taste, bluish gills, and positive alkaline reaction. Cf. *C. phœomyxa*, which possesses a viscid cap and lacks a cortina.

C. exlugubris Soop is similar and genetically close, but displays lugubrious, grey-brown tints. It is very rare, growing in the same habitat [Hawdon; see Soop 2001, 2013]. [Molecular markers place these two species in sect. *Carbonelli* (Ch. 26).]

Cortinarius ionomataius Soop Plate 13

Cap 30–70 (–120) mm, dry, not hygrophanous; mouse-grey to bluish grey with a yellow-brown, granulose to squamulose coating on disk, which gradually turns orange-brown, sometimes entirely orange when old; margin involute, brownish violet to greyish violet, young with (often thick) yellow-brown fringes and fibrils.

Gills saturated violet to greyish blue.

Stipe cylindrical to clavate; grey to bluish grey, pallescent; with (sometimes thin) ochraceous fibrils and tufts; apex violet to greyish violet.

Veil ochraceous to brownish yellow, rather copious; cortina grey to pale lilac.

Flesh greyish violet to pale grey, marbled blue to violet, young often entirely violet, later pale yellow especially in stipe-base; odour distinct like "paint"; taste faint, somewhat unpleasant.

Reactions: NaOH trivial, sometimes vaguely red-brown on cutis; formalin, lugol nil; phenol weakly yellow; guayac slowly green.

Micro: spores elliptic to subamygdaloid, 7.5–9.5 × 4.5–5.5 µm, weakly verrucose; veil hyphæ × 7–10 µm.

Ecology: in *Nothofagus* forest, common.

Ref.: Soop 2005, Horak 197x as *Phlegmacium exlavatum* ined.

A medium-sized to large fungus with a characteristic smoky, grey-blue tint that often turns ochre-yellow, later orange-brown at the cap centre. Older specimens may be completely orange without any remaining violaceous tints, with risk for confusion. The smell is quite characteristic, reminiscent of house paint or wall-paper. *C. ionomataius* somewhat resembles *C. suecicolor*, which is more slender and produces subglobose spores.

Variation in the blue pigment makes this common mushroom quite polymorphic and sometimes tricky to recognise. There exists a yellow to orange form wholly devoid of blue, while another form (***ionosaphis*** ined.) is strongly violet, including the stipe, making it resemble the common exotic species *Lepista nuda*. In this form the cap is violet, spotted by the ochre veil (see Soop 2013).

10. Section *Cuphocybe* & allies

Only six species were described in the former genus *Cuphocybe* R. Heim, which is almost endemic for New Zealand. They differ from other *Cortinarii* mainly by lacking a cortina. But a close examination of young fruitbodies at the point of opening their caps reveals that the thick veil consists of (at least) two layers — often of different shades of colour — that rupture simultaneously. These layers, which are more cottony than cobwebby, then distribute as scales, tufts, and girdles along the full length of the stipe as well as on the cap, as they expand. Since there is no genuine cortina the stipe lacks the cortinal zone that tends to split the velar pattern on fruitbodies of other *Cortinarii* (see "What to Look For" in the Introduction).

Fruitbodies typically possess a cylindrical stipe provided with a small piston-like or rounded bulb, large, elliptic spores, and epimembranal encrustations in the epicutis. See also sect. *Defibulati* (Ch. 23), which contains similar taxa. [Molecular studies (Peintner et al. 2002a, 2002b) have demonstrated that *Cuphocybe* is included in *Cortinarius*, where it is polyphyletic.]

Cortinarius alboroseus (R. Heim) E. Horak et al. Plate 14

Basionym: *Cuphocybe alborosea* R. Heim

Cap 35–80 mm, dry, not hygrophanous, pink, pale brownish red towards margin, young with a grey-yellow sheen, covered by adpressed tufts or squamules.

Gills pale cinnamon, serrate.

Stipe cylindrical with a piston-like base, white to pale buff, covered all over by tiny, reddish tufts or squamulose zones.

Veil brownish pink, fairly copious; cortina absent.

Flesh ± white; odour faintly aromatic.

Reactions: NaOH, lugol, guayac, formalin trivial.

Micro: spores elliptic, 12.7–17 × 7.6–9.2 µm, rather strongly verrucose and dark; marginal elements absent.

Ecology: in *Nothofagus* forest, common.

Ref.: Horak 1973a, Soop 1998a.

An interesting species, visible from far away in most native beech forests due to its pinkish coloration, which turns more brownish with age. The stipe displays pink velar tufts on its full length and often ends in a small piston-like bulb.

Cortinarius canovestius Soop — Plate 14

Cap 25–50 mm, dry, hygrophanous, grey-brown to pale tan, irregularly covered by greyish-yellow radial fibrils, sometimes with tufts and patches, elsewhere glabrous to finely innate fibrillose.

Gills pale cinnamon, rather distant.

Stipe cylindrical to slightly clavate, greyish white with thick greyish girdles and tufts, apex pale yellow.

Veil pale yellow to greyish yellow, fairly copious; cortina not seen.

Flesh greyish, marbled yellow in stipe-base, often fragile; odour faint, raphanoid; taste nil.

Reactions: NaOH trivial.

Micro: spores elliptic, 9–10.5 × 5.5–6.5 µm, moderately verrucose.

Ecology: in myrtaceous forest, uncommon. St Arnaud Campsite & Lodge, Boyle River.

Ref.: Soop 2014.

This species could be described as a *C. alboroseus* (above) without pink colours, growing in a different habitat. The greyish veil remnants on the cap often form radially oriented hairs, reminiscent of a balding head, and the fruitbody is typically airy and brittle. [Molecular studies show that *C. canovestius* belongs to sect. *Subcastanelli* (Ch. 19).] Cf. *C. poliotrichus*.

Cortinarius elaiochrous E. Horak, M.M. Moser, Peintner & Vilgalys — Plate 14

Basionym: *Cuphocybe olivacea* R. Heim

Cap 35–90 mm, glutinous, ± hygrophanous; olive-green to dark olive-brown, centre olive-black to red-brown (drying orange); glabrous but with scattered olive-yellow scales and patches; margin later striate.

Gills olive-grey, sometimes with a violet tinge, often veined; edge serrulate.

Stipe cylindrical or slightly dilated towards base, sometimes with a piston-like bulb; dry; grey with a faint violet tinge; coated by brilliantly lemon-green, later olive-brown to olive-yellow, thick girdles and squamules; apex olive-green, pruinose to squamulose.

Veil olive-brown to olive-yellow, copious; cortina absent.

Flesh olive-yellow to greyish yellow, faintly marbled greenish or blue-grey in some specimens; odour nil; taste ± bitter.

Reactions: NaOH red on cutis and stipital veil, gills and context nil; fluorescence yellow in cap context, else nil.

Micro: spores elliptic, 10.5–15.5 × 7–8.5 µm, moderately, densely verrucose; marginal elements absent.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak 1973a, Taylor 1973.

A dark, glutinous fungus with olive hues that rapidly disappear on dry or old specimens, making identification difficult. Fresh specimens usually have a strikingly handsome citrinous-greenish sheen on the upper part of the stipe, which is quite characteristic. Gills and context sometimes display a blue shade, and there may be an orange tinge on the cap making this a really colourful species. [*C. elaiochrous* is the type of sect. *Cuphocybe* (R. Heim) Soop.]

The rare variety ***leontis*** Soop (Plate 14) is characterised by a strikingly golden-yellow cap and stipe [Te Iringa Track, Cascade Hut Track, Matawai; see Soop 2005].

Cortinarius phæomyxa (E. Horak) Peintner, E. Horak, M.M. Moser & Vilgalys Plate 15

Basionym: *Cuphocybe phæomyxa* E. Horak

Cap 20–45 mm, glutinous, weakly hygrophanous; dark yellow-brown to chocolate-brown; densely spotted by ochre to greyish ochre patches or squamules, sometimes absorbing with age and then leaving the cutis rough to almost glabrous, orange-brown; margin with dense tufts, sometimes sulcate.

Gills grey to pale grey-brown.

Stipe cylindrical, sometimes with a small, rounded bulb, dry; pale yellowish grey; covered by ochre scales and fibres; apex grey-white, pruinose.

Veil ochre to pale greyish ochre; copious; cortina absent.

Flesh grey to buff, grey-brown near cortex; odour nil or faint like "paint"; taste nil.

Reactions: NaOH red-brown to blood red on cutis and stipe, red-orange on gills and context; fluorescence nil.

Micro: spores elliptic to subamygdaloid, 11–15.5 × 7–8.7 µm, weakly to moderately verrucose; marginal elements clavate, crowded.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak 1973a.

Smaller than the other members of the group, the species is characterised by a chocolate-brown cap, studded with ochraceous dots and patches. When mature, these veil remnants often absorb in the slime, turning the cutis orange-brown, which makes it hard to relate older specimens to younger ones growing from the same mycelium. [Genetically, *C. phæomyxa* is closely related to the sequestrate ***C. cartilagineus*** (Cunn.) Peintner & M.M. Moser, also found in New Zealand (see Horak 1973b as *Thaxterogaster c.*).]

Cortinarius dulciolens E. Horak, M.M. Moser, Peintner & Vilgalys Plate 15

Basionym: *Cuphocybe melliolens* Soop

Cap 30–75 mm, viscid, weakly hygrophanous; pale greyish brown to dark yellow-brown, sometimes darker, almost black, centre later more red-brown, often veined by hygrophanous streaks and spots; coarsely innate fibrillose to granulose; margin with thick, brownish tufts, not striate.

Gills pale cinnamon to argillaceous, sometimes with a violet tinge; crowded.

Stipe cylindrical to clavate, often with a small, round or piston-like bulb; dry, fibrillose; white, later darkening from red-brown fibres, tufts and squamules.

Veil pale ochraceous, darkening to red-brown, fairly copious; cortina absent.

Flesh white, slightly greying or yellowing, yellowish in cap, sometimes faintly marbled violet; odour sweetish, melleous, usually strong; taste nil to faintly fetid.

Reactions: NaOH trivial, lugol nil, guayac greyish green; fluorescence pale yellow.

Micro: spores elliptic to subamygdaloid, 12.5–15.5 × 7–8.5 µm, coarsely verrucose, dark; marginal elements clavate; clamp connections present.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 1998 as *Cuphocybe melliolens*, Horak 197x as *Phlegmacium mephiticum* ined.

The species is primarily characterised by the distinct honey smell, best sampled in the context of the lower part of the stipe. It is also distinguished by grey-brown hues, strongly darkening to warmly brown with an almost black cap. This change is due to the darkening veil, which turns more or less red-brown on the stipe. Occasionally specimens are found with a violet tinge on gills and in stipe context.

C. atropileatus A.R. Nilsen & Orlovich, growing in the same habitat, is genetically distinct, but morphologically difficult to separate from *C. dulciolens*; possibly the spores are slightly smaller (see Nilsen &

al. 2018). [Both are members of sect. *Dulciolentes* Soop, which encompasses at least 13 species in the South Pacific and Central America, many of which sequestrate (see further *C. beeverorum*).]

11. Section *Rapacea*

The single published species in the former genus *Rapacea* E. Horak looks like a typical member of *Cortinarius* sect. *Sericeocybe* P.D. Orton ex Nezdojm. The spore print is not rusty brown, however, but olivaceous yellow, and the spores appear smooth in a light-microscope. In fact, SEM examination reveals a spore structure usually not found in *Cortinarius*, but molecular studies have demonstrated that *Rapacea* is nevertheless part of *Cortinarius* (Peintner et al. 2002a, 2002b), where it is the type of sect. *Rapacea* (E. Horak) Soop (see *C. castoreus*).

Cortinarius mariæ (E. Horak) E. Horak, Peintner, M.M. Moser & Vilgalys Plate 42

Basionym: *Rapacea mariæ* E. Horak

Cap 30–55 mm, dry, not hygrophanous; chalk white, immutable (except slightly greying or yellowing when very old); matt, smooth; margin not striate, long involute.

Gills white to pale grey, becoming pale olive-ochre on maturity.

Stipe clavate, sometimes with a pointed root; white, silky with adpressed thin white girdles and white rhizoids.

Veil white; fairly sparse; cortina white, copious.

Flesh white; odour nil to faintly acidulous (possibly like castor oil); taste nil.

Reactions: NaOH nil; formalin pink (15 min.), strongest in stipe-base; lugol, guayac nil.

Micro: spores elliptic to citriform, 13–18.5 × 8.2–11 µm, apparently totally smooth, dextrinoid, yellow-brown, not pale; spore print olivaceous-yellow; marginal elements clavate, abundant.

Ecology: in *Nothofagus* forest, often at the base of trees, mostly solitary, common.

Ref.: Horak 1999, "*Cortinarius sp*." (#78) in Taylor 1973, Gasparini 2007.

This common, sometimes very common, cortinarioid fungus is found in virtually all native-beech forests. It is easy to discover, being immutably white all over, a character not seen in other white *Cortinarii*, which all tend to discolour with age (to a yellow, brown, or grey shade). Although the odour should be strong, sweetish according to the protologue, all collections included in this study lack a distinct smell. The species also occurs in Tasmania and in Papua New Guinea.

12. Section *Anomali*

Members of sect. *Anomali* Konrad & Maubl. are characterised by subglobose spores and a yellow, ochraceous, or reddish veil. [The section as well as its sister section *Bolares* Kühner & Romagn. is bihemispherical The latter counts at least one (undescribed) species in New Zealand, while the other sister section *Spilomei* (Moënne-Locc. et al.) Consiglio et al. appears to be boreal.] See Dima et al. (2016).

Cortinarius suecicolor Soop Plate 16

Cap 15–60 mm, dry, weakly or not hygrophanous; pale grey-brown to purplish brown, even blackish brown, ± covered by coarse, ochre fibrils and felty zones, disk later orange-brown and slightly granulose; margin with orange-ochre fringes, often slightly corrugated, lacerate when old.

Gills saturated dark grey-blue, distant.

Stipe cylindrical to slightly clavate, often flattened and tough; silvery greyish violet with ochre tufts and belts, young with a strongly violet apex.

Veil greyish yellow to pale ochre, darkening to orange-ochre, copious; cortina pale grey to violet grey.

Flesh deep blue when young, darkening to dark bluish grey, later flavescent in stipe; odour faintly raphanoid; taste nil.

Reactions: NaOH red on context and gills, often only weakly, else nil; guayac blue-green to yellow-green; lugol nil.

Micro: spores subglobose, 6–7.5 × 5.5–6.5 µm, moderately to rather coarsely verrucose; marginal cells numerous, vesiculose, some lachrymiform or capitate, 18–30 × 6 µm; veil hyphæ × 6–10 µm, hyaline.

Ecology: in *Nothofagus* forest, uncommon. Te Iringa Track, Cascade Hut Track, Kiko Track.

Ref.: Soop 2002.

A fairly inconspicuous fungus when encountered in the field, but when cut it displays characteristic dark-blue context and gills, contrasting against the yellowish veil. Cf. *C. tessiæ*, which has similar spores, but is glutinous with a sparse veil.

Cortinarius rattinoides Soop Plate 16

Cap 15–40 mm, dry, hygrophanous, fragile; mouse-grey to grey-brown, more red-brown on disk, young tinted violet outside disk, irregularly and coarsely reddish fibrillose; margin with brick red tufts or brown fibrils, strongly fimbriate, when old lacerate.

Gills intensely dark violet, soon evanescent, rather distant, sinuate but not thick.

Stipe cylindrical, slender; young silvery violaceous, later dirty white with reddish to wine-brown girdles and tufts, apex white.

Veil brick red, soon brownish red, fairly copious; cortina grey, rudimentary.

Flesh deeply dark violet, soon grey-brown, fragile; odour nil to vaguely raphanoid; taste nil to somewhat bitter.

Reactions: NaOH nil.

Micro: spores subglobose, 6.5–8.5 × 5.5–6.5 µm, moderately to rather coarsely verrucose; veil hyphæ pale yellow-brown, × 6–10 µm.

Ecology: In *Nothofagus* forest, occasional. Greyneys Shelter, Lake Waikareiti, Te Iringa Track, Kiko Track, Matawai.

Ref.: Gasparini & Soop 2008.

A greyish, fragile fungus with a cap that rapidly gets torn at the margin ("scare-crow look"). Very young specimens display dark-violet flesh and gills, a hue that quickly disappears. The veil is usually distinctly reddish. The species resembles *C. spilomeus* (Fr.:Fr.) Fr. in the Northern Hemisphere. It is less robust than *C. suecicolor* (above) and exhibits more greyish colours, while *C. mysoides* differs by reddish gills.

Cortinarius durifoliorum Soop & Dima Plate 16

Cap 15–50 mm, dry, hygrophanous; dark red-brown to grey-brown with a purple shade, innate fibrillose; margin with a pink flush and brown-red fibrils, sulcate when older.

Gills red-brown with a distinct violet tinge, moderately crowded.

Stipe cylindrical, slender, tough; silvery white to pale grey with a violet tinge and brownish-red fibrils and tufts.

Veil brown-red to purple brown, rather copious.

Flesh pale red-brown to grey, young marbled violet; odour and taste faintly raphanoid.

Reactions: NaOH trivial.

Micro: spores subglobose, 6.8-8.5 × 5.5–7 µm, rather coarsely verrucose.

Ecology: in *Nothofagus* forest, uncommon. Tawanui, Kepler Track, Blue Pools, Klondyke Spur Track.

Ref.: Soop et al. 2018.

This species is as fragile as the similar *C. rattinoides* (above), but differs by its more purple hues.

The almost identical ***C. sclerophyllorum*** Gasparini is described from Tasmania, but has also been collected in New Zealand. [The latter three species are closely related genetically within sect. *Anomali*.]

Cortinarius eunomalus Soop Plate 16

Cap 15–30 mm, dry, weakly or not hygrophanous; ± coated by a pale-violet almost white frosty pruina, absorbing to grey-brown, very finely innate fibrillose; margin with a white-fibrillose rim.

Gills pale violet, sometimes with a greyish tinge, moderately crowded.

Stipe cylindrical, tall; white to pale violet.

Veil white with a faint violet tint, sparse; cortina white.

Flesh young pale violet, soon grey to greyish yellow; odour faintly raphanoid; taste ± bitter.

Reactions: NaOH trivial.

Micro: spores obtusely elliptic to subglobose, 6-8.2 × 4.5–5.5 µm, moderately to rather weakly verrucose.

Ecology: in myrtaceous forest, uncommon. St Arnaud Lodge, Boyle River Track.

Ref.: Soop et al. 2018.

The fungus evokes a boreal *C. anomalus* (Fr.:Fr.) Fr. growing in *Kunzea* forest. It is paler than the other species described above, and is the only one with a white veil. [*C. euanomalus* is basal to sect. *Anomali.*]

Cortinarius subgen. *Phlegmacium*

Subgenus *Phlegmacium* (Fr.) Trog is defined by a viscid cap and a dry stipe, but the cap of some species, in southern as well as northern parts of the world, is only slightly viscid or even dry. The habit is often robust with a fleshy cap and stipe, but many southern *Phlegmacia* are of a modest size, a few being unique in the subgenus by their small stature. [One may note that assignment of small, more or less hygrophanous taxa either to *Phlegmacium* or to subgen. *Telamonia*, where some viscid species occur (Ch. 27), is often arbitrary.]

[As shown by molecular studies (Garnica et al. 2005, Peintner et al. 2004), *Phlegmacium* is highly polyphyletic even when restricted to the Northern Hemisphere. Moreover, some sections that abound in the North (e.g., *Multiformes, Glaucopodes*, *Calochroi* including *Fulvi*, and *Cærulescentes*) appear to be absent in New Zealand as elsewhere in the South Pacific. Conversely, many phlegmacioid groups and sections reported here are endemic to the area.]

13. Group "Vestiti"

This group is characterised by fruitbodies with an ochraceous or pale brownish veil, often visible on the cap, which makes them resemble those in sect. *Xenosmatæ* (Ch. 9). [The taxa are genetically disparate, and several are singletons in the phylogeny.]

Cortinarius perelegans Soop Plate 22

Cap 30–55 mm, viscid to glutinous, not or weakly hygrophanous; brightly golden yellow to orange-brown, centre dark yellow-brown to blackish; glabrous to ± granulose or rugose with sparse, yellowish scales; margin paler, somewhat striate when old.

Gills argillaceous, sometimes with a faint violet tinge; conspicuously thick.

Stipe cylindrical to somewhat clavate, also fusoid; dry; pale yellow to whitish with thin yellow-brown fibrils, staining pale yellow-brown especially at base.

Veil yellow-brown, fairly copious to fairly sparse; cortina white.

Flesh pale greyish buff to pale yellow, grey-brown in cap; odour nil to faintly raphanoid; taste nil.

Reactions: NaOH brownish red to cherry-red on cutis, else trivial; guayac nil or weakly green; lugol, formalin nil; fluorescence yellowish.

Micro: spores amygdaloid, 9.5–12 × 5–6.5 µm, moderately to rather weakly verrucose; veil hyphæ × 7–10 µm, yellow-brown.

Ecology: in *Nothofagus* forest, often fasciculate, occasional.

Ref.: Soop 2001.

This rather frequent *Cortinarius* is recognised from its golden brownish and yellow hues. The cap is viscid with a conspicuously dark centre, sometimes with ochraceous tufts.

C. badiohepaticus ined. (Plate 44), rare in the same habitat (Mckay Creek) is similar but more slender. The cap is brilliantly orange-brown with a darker, almost black centre, and the spores are leaner (7.5–8.7 × 4.5–5.2 µm; see Johnston et al. 2007). [The species belongs to the isolated bihemispherical section *Lustrabiles* Niskanen & Liimat.]

Cortinarius naphthalinus Soop Plate 19

Synonym: *C. fulvoiubatus* Gasparini

Cap 30–60 mm, glutinous, not hygrophanous; yellow-brown, later dark brown, disk sometimes with an orange tinge, glabrous; margin paler, with whitish, thick, appendiculate fringes.

Gills pale brownish grey, sometimes with a faint violet tinge.

Stipe dry, cylindrical to tapering; whitish with red-brown to purple-brown bands and squamules, often provided with a collar on upper part.

Veil pale yellow-brown to red-brown, darkening, rather copious; cortina white, ± membranous.

Flesh white to pale tan; odour strong of naphthalene; taste faint, unpleasant.

Reactions: NaOH cherry red on cutis, red to somewhat purple on stipital veil, else trivial.

Micro: spores elliptical, 9.3–11.5 × 6.5–8 µm, coarsely verrucose.

Ecology: in *Nothofagus* forest, rare. Kowai Bush, Greyneys Shelter, Kiko Track.

Ref.: Soop 2001, Gasparini 2007 as *C. fulvoiubatus.*

A robust and remarkable fungus, easily recognised from its strong "moth-ball" smell. The collar on the stipe and the copious veil, leaving tufts on most of the fruitbody, are traits that recall both *Rozites* and *Cuphocybe* (Ch. 10, 19); also cf. *C. majestaticus.* The species has also been collected in Tasmania.

Cortinarius subgemmeus Soop Plate 8

Cap 15–35 mm, viscid, hygrophanous; yellow-brown to greyish yellow, maculated umber to blackish brown, later blushing to orange-brown, ± covered when young by pale ochraceous granules and fibres; margin ± striate, often with red spots.

Gills pale tan to greyish yellow, soon with a pink flush.

Stipe cylindrical, weakly viscid to dry; pale grey to greyish yellow or yellow-brown, often blushing, with thin, yellowish bands; mycelial felt white.

Veil pale grey to pale ochraceous, blushing and darkening, rather copious to sparse; cortina white.

Flesh whitish to yellow-brown, contrastingly dark brown in cap, later often with a pink flush; rather tough; odour and taste nil.

Reactions: NaOH trivial or weakly red-brown on cutis; guayac strongly yellow-green; formalin nil.

Micro: spores elliptic to subfusoid, 6-8 × 3.5–4.5 µm, rather weakly verrucose; cheilo- and pleurocystidia numerous, 40–80 (100) × 6–10 µm, irregular, sometimes capitate with yellowish droplets; veil hyphæ × 5–7 µm, greyish.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2002, possibly Horak 197x as *Phlegmacium inocybeum* ined.

A small, yellowish fungus whose context colour changes abruptly from cap to stipe. [Molecular studies have shown that *C. subgemmeus* is closely related to the boreal *C. rubicundulus* (Rea) Pears., type of section *Rubicunduli* Soop et al., sister to sect. *Crassi* (Ch. 8), Both species have conspicuous cystidia on the lamellar edge.]

Cortinarius orixanthus Soop Plate 4

Cap 20–60 mm, viscid, hygrophanous, sometimes weakly; warmly yellow-brown with a faint orange tinge, disk darker, slightly red-brown, young with a thin yellow frost; glabrous to innate fibrillose; margin greyish yellow, often with a conspicuous yellow rim, not striate.

Gills yellow-grey.

Stipe cylindrical to clavate, dry; dirty white to yellowish with sometimes thick yellow girdles on lower part, apex white.

Veil yellow, fairly copious to sparse.

Flesh yellow to yellow-brown, sometimes with a red-brown tinge; odour faintly raphanoid; taste nil or slightly fetid.

Reactions: NaOH strongly yellow-orange to red on cutis and stipital veil, sometimes weaker so; guayac green.

Micro: spores elliptic, 6.5–8.2 × 4–5 µm, rather weakly verrucose.

Ecology: In *Nothofagus* forest, occasional.

Ref.: Gasparini & Soop 2008.

The fruitbodiy may look like a *Telamonia* when small or in dry conditions, but is usually recognised by a remarkable yellow rim on the cap, often paired by yellow veil girdles on the stipe, and by the alkaline reaction. Cf. *C. viscoviridis*, which also presents a yellow rim, but whose stipe is glutinous.

C. suborixanthus ined. (Plate 4) is similar but more glutinous and the veil is white, darkening to red-brown. It is rare, growing in the same habitat [Craigieburn]. [The two species are closely related and genetically affine to the dermocyboid taxa (Ch. 2).] Cf. *C. dulcamarus*.

Cortinarius peristeris Soop Plate 22

Cap 15–50 mm, viscid to glutinous, weakly hygrophanous; clay grey to grey-brown, darker when older, ± covered by tiny whitish to pale yellow-brown pustules or squamules; margin paler with brownish fibrils, not striate.

Gills pale grey to pale grey-brown, rather crowded.

Stipe cylindrical, sometimes with a small bulb, thin, dry to slightly viscid; white to pale greyish yellow, flushing ochraceous with brownish fibrils from base.

Veil white to pale grey-yellow, later more ochraceous, rather copious.

Flesh white to pale tan, often with a brown horn-rim, darker in stipe-base; odour faint ± like iodoform; taste slightly fetid.

Reactions: NaOH red-brown to red on cutis and stipital veil, else nil; guayac nil.

Micro: spores elliptic, 6.5–7.7 × 3.5–4.5 µm, rather weakly verrucose.

Ecology: in *Nothofagus* forest, uncommon. Mackay Creek, Kepler Track, Te Anau Downs, Boyle River.

Ref.: Soop 2010.

A slim phlegmacioid species, easily recognised from its slimy, dove-grey cap studded with whitish granules from the veil. The cap darkens strongly with age. It may recall a pale form of *C. phæomyxa*, which, however, possesses a thicker veil and lacks a cortina.

14. Section *Cremeolinæ* & allies

Section *Cremeolinæ* Soop is characterised by a white, often sparse veil and a stipe provided with a more or less distinct and marginate bulb. The taxa therefore resemble those in the boreal sister section *Multiformes* (see Brandrud et al. 2014).

Cortinarius cremeolina Soop Plate 20

Cap 25–65 mm, viscid, not or weakly hygrophanous; white to cream or ivory yellow, disk sometimes darker with an ochraceous tinge; cutis thick, tough, elastic, glabrous; margin long involute.

Gills white to yellowish, crowded.

Stipe with a usually wide, marginate bulb; white with sparse white fibrils.

Veil white, sparse to fairly copious; cortina white.

Flesh white, ± marbled ochraceous; darkening in cap to ochraceous on manipulation; odour faint, melleous or fruity; taste nil to faintly bitter.

Reactions: NaOH nil, guayac weakly green, lugol strongly brown.

Micro: spores elliptic to subamygdaloid, 7.5–9.5 × 4.5–5.5 µm, moderately to rather weakly verrucose.

Ecology: in *Nothofagus* forest, common.

Ref.: Soop 2001, 2016.

This fungus is characterised by white or creamy colours, a bulbous stipe, and a tenacious cap which may display an almost porcelain-like finish. It therefore recalls the European *C. multiformis* Fr.

C. cremeolina, the section type, is closely related to a host of similar taxa (Soop 2016), among which one may note ***C. iringa*** Soop (Plate 20). This deviates by a darker ochraceous cap when young, a slender stipe with a small, rounded bulb, and slightly shorter spores [Bridle Track, Te Iringa Track, Cascade Hut Track; see Soop 2002]. — ***C. cremeorufus*** Soop (Plate 20) is similar but possesses an amber-yellow cap and grows in myrtaceous forests [see Soop 2016; Waipori Falls]. — *C. cremeolina* var. ***subpicoides*** Soop (Plate 20; see Soop 2010) differs by a handsome, dark grey cap, often with an olivaceous tone, which also appears on the upper part of the stipe but usually not in the context. This fairly common variety may be difficult to differentiate from *C. picoides*, which has been shown to be genetically remote.

Cortinarius artosoides ined. Plate 43

Synonym: *C. austroalbidus* Clel. & Harris s. auct.

Cap 30–55 mm, viscid, not hygrophanous; tan to greyish-yellow, finely granulate when young, finely innate-fibrillose; margin with a faint violet tinge, not striate.

Gills violet, moderately crowded.

Stipe dry, cylindrical to clavate; white with a pale violet coating.

Veil pale violet, sparse; cortina pale violet.

Flesh pale violet; odour and taste nil.

Reactions: NaOH insignificant.

Micro: spores obtusely ellipsoid, 9.8–12.5 × 6.8–7.5 µm, rather coarsely verrucose.

Ecology: in *Nothofagus* forests, uncommon. Lewis Pass.

A handsome fungus with pale yellow and violaceous hues. It recalls *C. artosus* (below), which has leaner spores, as well as *C. ionomataius,* which has a dry pileus and longer spores. [The taxon is genetically close to sect. *Alboaggregati* (below).]

C. artosus Soop (Plate 21) presents a pale cap, similar to that of *C. cremeolina* type, but the gills and stipe are tenderly lilac (spores 9.7–11.2 x 5–6.3 µm). It is rare, growing in *Nothofagus* forests [Workman Track; see Soop 2014]. [Molecular evidence shows that this is one of the few South Pacific cortinars in the bihemispherical section *Elastici* (Fr.) Henn.]

Cortinarius dulciorum Soop Plate 21

Cap 25–65 mm, viscid, not or weakly hygrophanous; warmly red-brown with a mahogany or dark apricot hue, glabrous to very finely innate fibrillose; margin paler, more yellow-brown.

Gills white, crowded.

Stipe clavate to bulbous; white, young peronate from a rather thick white coating, sometimes terminating in an adpressed collar, later flushing pale brownish.

Veil white, sparse to fairly copious; cortina white.

Flesh soft; white, later flushing ochraceous; odour rather strong, sweet like honey; taste faint, rather pleasant.

Reactions: NaOH pink with a yellow tinge in context, brownish red on cutis, else nil; guayac weakly grey-green.

Micro: spores elliptic to amygdaloid, 6-8 × 3.5–4.5 µm, weakly verrucose.

Ecology: In *Nothofagus* forest, occasional. Kepler Track, Murray Creek, Lake Daniel Track, St Andrew Range, Kiko Track.

Ref.: Gasparini & Soop 2008.

A handsome fungus with a warmly apricot-coloured cap and a white stipe. The smell is distinctly sweet, like that of some members of the sister section *Cremeolinæ*.

C. subdulciorum ined. (Plate 43), in the same habitat, has a more yellow-brown cap with a yellow-brown tinge on the upper stipe, and the veil is sparser, almost invisible. [Genetically the species belongs to sect. *Olorinati* (Ch. 20).]

Cortinarius myxenosma Soop Plate 22

Cap 25–70 mm, viscid, not hygrophanous; warmly mahogany brown to red-brown with a darker almost black disk, paler red-brown towards margin, innate fibrillose with white veil tufts and patches.

Gills white, rather crowded.

Stipe with a marginate to rounded bulb; white to pale yellow-brown, flushing red-brown from base, with a white coating on bulb.

Veil white, ± blushing to brownish red, fairly copious; cortina white.

Flesh greyish tan to white, marbled pale brown; odour sweetish; taste raphanoid, often ± bitter.

Reactions: NaOH red on stipital veil and on pale areas of the cutis, weakly red in context; guayac greyish green.

Micro: spores amygdaloid to subelliptic, 7.5–9.5 × 4.5–5.5 µm, moderately to rather weakly verrucose.

Ecology: In *Nothofagus* forest, uncommon. Borland Lodge, Waimakariri, Boyle River, Murray Creek, St Arnaud Range, Clements Rd.

Ref.: Gasparini & Soop 2008.

This fungus recalls *C. xenosma*, but is viscid and the stipe possesses a bulb that is sometimes wide and marginate. It differs from *C. dulciorum* (above) mainly by the persistent veil, visible on the cap, and by its larger spores.

15. Section *Alboaggregati* & allies

This is a dominating group of *Phlegmacia* in New Zealand, and it borrows morphological traits from stirps *Xiphidipus* in South America (see Moser & Horak 1975), as well as from sections *Arguti* and *Claricolores* in the Northern Hemisphere. Taxa are characterised by a fusoid stipe which is often tall and rooting, fasciculate mode of growth, crowded gills, and mostly trivial chemical reactions. [Genetically, the group has been shown to be rather heterogeneous.]

Cortinarius cretax Soop Plate 23

Cap 25–60 (110) mm, viscid, not hygrophanous, uniformly white, occasionally slightly yellowing at disk, glabrous to finely innate fibrillose; margin thinly felty when young.

Gills white to grey-white; very crowded, not serrulate.

Stipe tapering, rooting; white, with a white, fibrillose coating, often thinly peronate.

Veil white, sparse; cortina white.

Flesh white; odour nil or faint like "paint"; taste nil.

Reactions: NaOH, formalin nil; guayac blue-green, phenol weakly red.

Micro: spores oblong fusoid-amygdaloid, 6.8-8.2 × 3–4 µm, finely punctuate.

Ecology: in *Nothofagus* forest, fasciculate, occasional. Lake Gunn, Borland Lodge, Te Anau Downs, Te Iringa Track.

Ref.: Soop 2002, Horak 197x as *Phlegmacium radicatum* ined.

A typical member of a group of white, rooting, fasciculate *Cortinarii* that form a common element in the native forests. Both habit and spore shape recall taxa in the boreal section *Claricolores*. [The species is the type of sect. *Cretaces* Soop & Dima, which includes several of the *Xiphidipus* taxa mentioned above.]

Cortinarius alboaggregatus Soop Plate 23

Cap 35–75 (140) mm, viscid, not hygrophanous; white to ivory with a faintly yellow to buff disk, later pale ochre; glabrous to finely innate fibrillose; margin long involute, upturned when old.

Gills white to greyish white, crowded, somewhat serrulate.

Stipe tapering to fusoid, often deeply rooted; white with rather thick, white girdles, sometimes peronate with a small, thin collar.

Veil white, copious; cortina white.

Flesh immutably white; compact, tough in stipe; odour and taste nil.

Reactions: NaOH trivial; formalin nil; guayac strongly blue-green.

Micro: spores oblong fusoid-amygdaloid, 10.5–13.5 × 5.5–6.5 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, fasciculate, common.

Ref.: Soop 2005, Horak 197x as *Phlegmacium serratum* ined.

This fungus may become very large. It is characterised by white colours all over, a rooting stipe, and elongated spores. Macroscopically it is almost indistinguishable from *C. cretax* (above), but one may observe the more copious veil and the somewhat darkening cap. A definite identification usually requires a spore check. [The species is the type of sect. *Alboaggregati* Soop.]

C. australiensis (Cleland & Cheel) E. Horak (Plate 23), is similar but of a gigantic size. It is described from *Eucalyptus* forest in Australia, but has also been recorded with myrtaceous trees in New Zealand [Black Hill Track; see Horak 1983, Cleland 1934 as *Rozites a*., Bougher & Syme 1998]. It possesses a very abundant and peronate veil that leaves a massive, membranous collar on the stipe. — A second similar Australian species, ***C. victoriaënsis*** Liimat., has also been recorded from New Zealand. [These taxa form a small, isolated clade in the phylogeny.]

Cortinarius persicanus Soop Plate 23

Cap 30–65 mm, viscid, not hygrophanous; pink to peach yellow, disk often redder; ± glabrous, sometimes sparsely fibrillose; young darker brownish red and finely white-frosty; margin pale tan, young involute with a white rim.

Gills white to pale tan; crowded.

Stipe tapering, deeply radicant; white with thin, white girdles and fibrils, occasionally flushed pale brownish yellow on lower part.

Veil white, sparse to fairly copious; cortina white.

Flesh white, compact; odour and taste unpleasant, ± metallic.

Reactions: NaOH nil to weakly wine-red on cutis; guayac, formalin nil; phenol red to pink.

Micro: spores amygdaloid to elliptic, 6.5–8.5 × 3.8-4.5 µm, weakly verrucose.

Ecology: in *Nothofagus* forest, fasciculate, occasional.

Ref.: Soop 2001, Gasparini 2007, Horak 197x as *Phlegmacium hebelomaticum* ined.

This fungus recalls *C. cretax* (above), but the cap is beautifully and tenderly peach pink. A form with a more ochraceous-yellow cap also occurs. The taste might be called "metallic", but is sometimes more farinaceous or reminding of "paint" (see the Introduction). *C. persicanus* has also been found in Tasmania.

Cortinarius memoria-annæ Gasparini Plate 24

Cap 30–75 mm, viscid to almost dry, not hygrophanous, cutis rather thick and tough; diluted yellow to pale brownish yellow with a whitish pruina; innate yellow-brown fibrillose to granulose; margin somewhat paler.

Gills yellow to whitish, crowded.

Stipe cylindrical to tapering, tough; citrinous to pale yellow with a white, fibrillose coating below, flushing strongly yellow towards base on manipulation; young with very thin, yellow-brown fibrils.

Veil yellow-brown, very sparse; cortina white.

Flesh saturated yellow with a faint citrinous tinge, contrasting against the exterior, darkening on exposure; odour and taste nil, exsiccata brilliantly yellow.

Reactions: NaOH strongly yellow in flesh and on stipital veil, else nil; guayac green-blue; fluorescence yellow.

Micro: spores elliptic to amygdaloid, 7.5–10 × 4.5–5.5 µm, moderately to rather weakly verrucose.

Ecology: in myrtaceous forest, possibly also with *Nothofagus*, gregarious to fasciculate, rare. Te Anau Downs, Deer Flat, St Arnaud Camp Site.

Ref.: Gasparini 2007.

A yellowish fungus with a contrasting, chrome-yellow flush in the context. This coloration is accentuated by manipulation or with alkaline reagents and is very evident in dried material, which also fluoresces (it contains the unusual chromogen vanillic acid). *C. memoria-annæ* is originally described from Tasmania, where it is common under *Eucalyptus*. [Molecular studies show that this is one of the few South Pacific phlegmacioid species that are closely related to subg. *Phlegmacium* s. str.]

Cortinarius picoides Soop Plate 24

Cap 30–65 mm, viscid, not hygrophanous; chestnut-brown to dark grey-brown, sometimes with a rosy tinge, disk often darker, blackish brown, finely innate fibrillose; margin with white, appendiculate fringes, sometimes wrinkled.

Gills greyish white, crowded.

Stipe cylindrical to tapering and radicant; white, staining brownish on bruising and with age.

Veil white, rather sparse; cortina white.

Flesh white, sometimes flushing brownish on exposure; odour and taste nil.

Reactions: NaOH inconsistently red to red-brown on cutis and stipital veil (see below), guayac greyish green.

Micro: spores fusoid to subamygdaloid, 6.5–8.2 × 3.3–4.5 µm, weakly verrucose.

Ecology: in *Nothofagus* forest, often fasciculate, occasional.

Ref.: Soop 2001.

An intriguing species with a dark cap and a contrasting white stipe, long and tapering when growing clustered. Occasionally the cap is warmly mahogany-brown or tan with a more coloured context. The red alkaline reaction may be difficult to observe on dark caps, but is sometimes distinct. [The species is genetically close to the boreal *C. turmalis* Fr. in sect. *Turmales* Soop et al., which also contains a species from New Caledonia.]

Cortinarius entheosus Soop Plate 21

Cap 25–60 mm, viscid, weakly hygrophanous; tan to yellowish with a brownish orange centre, greyer towards the margin, glabrous to finely innate-fibrillose; margin flushing violet, hardly striate.

Gills saturated lavender violet; thick.

Stipe cylindrical to ± fusoid; dry; white fibrillose with a faint violet sheen when young, absorbing to dirty greyish yellow; apex violet.

Veil white to pale violet, fairly copious; cortina white.

Flesh grey buff, marbled violet; odour faint of *Syringa* flowers, taste strong but hardly unpleasant.

Reactions: NaOH nil.

Micro: spores elliptic to amygdaloid, 8.2–10 × 5–6 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, rare. Totara, Kepler Track.

Ref.: Soop 2016.

This beautiful, but rare fungus presents bright and warm colours with an apricot tinge on the cap and violet gills.

It is the type of section *Entheosi* Soop, which also counts ***C. ærugineoconicus*** E. Horak, a myxacioid fungus in the same habitat (see Horak & Woos 1990). The latter differs mainly by having a more greenish cap and somewhat smaller spores.

16. Section *Scauri* & allies

Section *Scauri* (Fr.) Hennings, present in both hemispheres, is characterised by a bulbous stipe and violet hues, especially in context and gills, which react positively with iodine solutions (lugol). In addition many taxa display greenish tints on veil and gills. [Only the first two species below belong to the section.]

Cortinarius singularis Soop Plate 26

Cap 25–50 mm, viscid, more or less hygrophanous; warmly mahogany-brown to red-brown with darker hygrophanous veins, sometimes more yellow-brown on the disk; finely innate fibrillose to glabrous; margin with a violet rim when young, occasionally finely sulcate or striate.

Gills saturated violet; immutable on handling; moderately crowded.

Stipe with a marginate bulb, dry; silvery pale violet, later fading to yellow-brown, immutable on pressure, bulb margin with thin, violet fibrils; apex violet.

Veil violet to red-violet, pallescent, finally ± ochraceous, sparse; cortina white to pale violet.

Flesh grey-brown to violet, immutable on pressure, marbled saturated violet; odour none or faintly sweetish; taste unpleasant.

Reactions: NaOH trivial; lugol (often weakly) violet to purple-brown; guayac grey-green.

Micro: spores elliptic to amygdaloid, 8.5–10.5 × 5–6.5 µm, rather coarsely verrucose.

Ecology: in *Nothofagus* forest, solitary, occasional.

Ref.: Soop 2005, Horak 197x as *Phlegmacium turbinellum* ined.

A medium-sized fungus with handsome, mahogany-brown and violet hues and a bulbous stipe. It is encountered in most native beech forests, but usually only as single specimens or at most in small numbers. The positive lugol reaction — often weak or even absent if the fruitbody is old or dry — confirms the affinity to the boreal *C. scaurus* (Fr.:Fr.) Fr., which is macroscopically quite similar and also tends to grow solitarily.

Cortinarius chlorophyllus Soop Plate 26

Cap 20–45 mm, viscid, not hygrophanous; dark yellow-brown to umber with an olive tinge, innate-fibrillose.

Gills dark greyish green to olive green, moderately crowded, edge paler.

Stipe with a wide, marginate bulb, violaceous, greying towards base with a yellowish coating on bulb margin.

Veil ochraceous yellow, rather sparse; cortina pale yellow-green.

Flesh grey-violet; odour none or faintly sweetish; taste faint, pleasant.

Reactions: NaOH blood red on stipital veil; lugol blood red.

Micro: spores amygdaloid to subelliptic, 7.5–9 × 5–6 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, solitary, rare. Lake Gunn, Te Iringa Track.

Ref.: Soop 2014.

Another typical exponent of section *Scauri.* It is quite similar to *C. singularis* (above) and genetically close, but the gills are handsomely green, while the spores are smaller and markedly less verrucose.

Cortinarius medioscaurus Soop Plate 26

Cap 25–50 mm, viscid, weakly hygrophanous; warmly yellow-brown with innate darker fibrils, disk ± red-brown, occasionally with a pale yellow coating; margin paler, striate.

Gills greyish violet, immutable on handling, fairly crowded.

Stipe with a wide marginate bulb; silvery violet, immutable on handling, soon yellow-brown, apex violet, bulb with a yellowish coating.

Veil greyish yellow to pale yellow, fairly copious.

Flesh white to pale violet, marbled violet; odour nil; taste distinctly bitter.

Reactions: NaOH dark red on stipital veil, weakly red or nil on cutis; guayac, lugol, and phenol nil.

Micro: spores elliptic to amygdaloid, 9.3–11.7 × 5.5–6.8 µm, rather coarsely verrucose, dark.

Ecology: in myrtaceous forest, occasional. Black Hill Track, Mangatanga Track, Horton Res., Northwood.

Ref.: Soop 2014.

This *Phlegmacium* is characterised by a wide bulb and brownish-purple shades. It is quite similar to *C. singularis* (above), but produces larger spores and grows with myrtaceous trees. Moreover, *C. medioscaurus* does not react with iodine solutions.

The Australian ***C. austrovaginatus*** Gasparini has been found under *Nothofagus* in New Zealand (see Gasparini 2007). It is quite similar, but the gills have a tendency to sequestrate development, being thick and wavy. [Both belong to sect. *Austrovaginati* Soop, which also includes a very rare, fully sequestrate member, ***C. conei*** (R. Heim) Peintner & M.M. Moser (see Horak 1933b). — ***C. minoscaurus*** Soop (Plate 26), is found in myrtaceous woods, where it is very rare (Waipori Falls; see Soop 2001). It is smaller than *C. medioscaurus,* but differs mainly by slightly larger, stronger ornamented spores (10–12.5 × 6–7.5 µm) and a mild taste. [It is also genetically well separated.]

Cortinarius fiordlandensis Soop Plate 24

Cap 25–50 mm, viscid, not hygrophanous, evenly date brown to dark red-brown; glabrous to innate fibrillose; margin with thin, brownish fibrils.

Gills intensely dark violet to reddish violet.

Stipe with a rather wide marginate bulb; pale yellowish, blushing with rusty-brown fibrils from base, shining pale violet above.

Veil red-brown, sparse; cortina pale violet.

Flesh pale violet, blushing red-brown in lower stipe; odour and taste nil.

Reactions: NaOH dark red to purple-brown on cutis and stipital veil; lugol nil.

Micro: spores oblong elliptic, 9–10.5 × 5–6 µm, moderately verrucose.

Ecology: In *Nothofagus* forest, rare. Mackay Creek, Borland Lodge.

Ref.: Soop 2010.

A dark brown and violet *Phlegmacium* with an unusual red-brown veil colour. It is quite similar to *C. chalybæus* (below) from which it differs mainly by a bulbous stipe, elongated spores and a lack of iodine-based reaction.

17. Section *Purpurascentes*

Section *Purpurascentes* M.M. Moser, present in both hemispheres, is characterised by the same violet hues and the same iodine reaction as its sister section *Scauri* (above), but the stipe is usually cylindrical in shape. In addition, the violet tone of gills and context often stain deeper violet on manipulation, but the staining is weaker or absent if the fruitbody is not moist and fresh (see Saar et al. 2014).

Cortinarius chalybæus Soop — Plate 27

Cap 20–70 mm, viscid to glutinous, weakly or not hygrophanous; umber to blackish brown with a faint, purple tinge; coarsely innate fibrillose or granulose, often with sparse, grey to pale ochre patches or tufts; margin violet, when mature striate to rimose, often denticulate.

Gills saturated violet, sometimes darkening on pressure.

Stipe cylindrical to clavate; brilliantly lilac-blue, partly coated silvery pale violet, with thin, violaceous fibrils and bands; apex pale blue to white.

Veil violet to dark violet, sparse; cortina white to pale violet.

Flesh persistently violet, marbled darker violet, often darkening on pressure; odour faint, rubbery to sweetish; taste nil.

Reactions: NaOH trivial; lugol reddish violet; guayac weakly blue-green; phenol weakly red.

Micro: spores elliptic to subamygdaloid, 8–10 × 5.5–6.5 µm, rather coarsely verrucose.

Ecology: in *Nothofagus* forest, common.

Ref.: Soop 2002.

Mainly characterised by the dark-brown hue of the cap and the saturated violet of other parts of the fruitbody. The smell is fruity with a peculiar rubbery component, recalling that of the common exotic species *Lepista nuda*.

C. pseudoaustralis ined. (Plate 27) is similar with a mahogany-brown, more or less glabrous cap. It is rare, growing in myrtaceous woods [Boyle River, St Arnaud West Bay]. [The species has been named *C. australis* Gasparini in New Zealand, which is a closely related species described from Tasmania (see Gasparini 2007),]

Cortinarius kaimanawa Soop — Plate 27

Cap 5–30 mm, viscid, hygrophanous; greyish yellow to yellow-brown, centre often date-brown with a purple tinge, young with a pale-violet shade; coarsely innate fibrillose; margin paler with a violaceous rim.

Gills saturated violet, occasionally with a faint reddish tinge.

Stipe cylindrical to somewhat clavate, dry to slightly viscid; violet, young with a pale violaceous coating.

Veil white to violaceous; cortina white with a faint violet or yellowish tinge.

Flesh greyish violet, saturated blue in stipe-base, sometimes darkening on pressure; odour nil to faintly sweetish; taste nil to slightly leguminous.

Reactions: NaOH weakly and inconsistently red-brown on cutis, flesh and stipital veil; guayac weakly greyish green, phenol nil.

Micro: spores obtusely elliptic, 6.8-8.5 × 4.5–6 µm, moderately to rather weakly verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2002.

This not so rare, but easily overlooked species recalls *C. chalybæus* (above), but is smaller with a brighter cap colour; also the spores are smaller. The context is violet with a strong, blue tint in the stipital base of most specimens.

Cortinarius rhipiduranus Soop Plate 27

Cap 15–45 mm, viscid, not hygrophanous, dark yellow-brown to blackish brown with an olive tinge, young often covered by pale ochre spots, tufts and fibrils, else glabrous to finely innate fibrillose.

Gills blue-grey to turquoise, edge slightly paler.

Stipe cylindrical, dry; whitish to turquoise blue, ± shimmering on upper half, flushing brown below with pale yellow tufts, apex pale blue.

Veil pale ochraceous, often copious**;** cortina white to yellowish grey.

Flesh dark blue-green to blackish green, yellow-green to violaceous in stipe-base, ± immutable on pressure; odour faint; taste nil.

Reactions: NaOH red on cutis and context, else trivial; guayac weakly yellow-green; lugol brownish to reddish violet.

Micro: spores elliptic, 7.5–9.3 × 5–6 µm, moderately verrucose.

Ecology: In *Nothofagus* forest, occasional. Kepler Track, Totara, Bridle Track, St Arnaud Range, Rimutaka.

Ref.: Gasparini & Soop 2008, possibly Horak 197x as *Phlegmacium æruginosum* ined.

A striking fungus with a spectacular turquoise tint in the context and on the stipe when fresh. It is quite similar to *C. chalybæus* (above), but can usually be separated by the context colour, by its trivial smell and positive alkaline reaction. Cf. the following group, which also contains taxa with greenish-blue hues.

18. Section *Austrocyanites* & allies

Taxa in this group present blue or violet gills, and often sky-blue or turquoise colours on other parts of the fruitbody. Cf. section *Delibuti* (Ch. 24).

Cortinarius turcopes Soop Plate 25

Cap 25–70 mm, viscid to glutinous, not hygrophanous, olive-grey to olive-green with an ochraceous disk, young darker with viscid, violet, ± radial streaks, later staining grey to olive-brown; glabrous to ± granulose; margin sometimes slightly yellowish or orange.

Gills violet to blue-grey, sometimes with a green tinge, rather crowded.

Stipe clavate to cylindrical with a rounded or slightly marginate bulb; strikingly turquoise blue to grey-blue with a ± viscid, violaceous coating on lower half, apex shining pale blue to white.

Veil white to pale violet, oxidising olive-grey, ± viscid, sparse; cortina white.

Flesh silvery grey-blue to turquoise, intensely blue in stipe-base; odour nil to ± sweetish; taste nil.

Reactions: NaOH red to orange-brown on cutis and context, often weak; guayac and lugol nil.

Micro: spores elliptic to amygdaloid, 8.5–10.5 × 5.5–6.2 µm, finely and densely verrucose.

Ecology: In *Nothofagus* forest, uncommon. Kepler Track, Te Anau Downs, Waipori Falls, Craigieburn, Woodside Glen, Rimutaka.

Ref.: Soop 2010.

A beautiful fungus with turquoise colours. It differs from *C. rhipiduranus* (above) by more violet shades, a bulbous stipe, longer spores and lack of iodine-based reaction.

C. viscostriatus E. Horak (Plate 25) is a slender species with a viscid stipe in the same section [*Turcopedes* Soop, Orlovich & Dima]. It has been found in the same habitat with the same turquoise coloration [Kepler Track], but was described as a *Myxacium* with drab, greyish-brown hues (Horak & Wood 1990). — ***C. salmastrium*** Soop (Plate 28), is a small, viscid fungus with dark turquoise and olivaceous colours and a slender stipe, growing in myrtaceous forests [Black Hill Track; see Soop et al. 2018]. [These characters recall *C. salmaster* Gasparini, described from Tasmania, an affinity which is corroborated by molecular markers (sect. *Salmaster* Soop).] Cf. *C. pseudoaustralis* (above).

Cortinarius austrocyanites Soop Plate 25

Cap 40–100 mm, dry to slightly viscid, not hygrophanous, fleshy; pale greyish yellow to olive-grey, covered by coarse, radial, grey fibres; more granulose near centre, sometimes with black spots; margin with pale grey, silvery velar remnants.

Gills greyish blue, very crowded.

Stipe very robust, clavate with a rounded to marginate bulb; pale greyish blue, coated white near bulb, apex nicely blue.

Veil pale grey to white (possibly with a faint violet tinge), copious; cortina white with a faint, blue shade.

Flesh white, greyish blue near cortex and in cap, marbled greyish blue to turquoise; compact; odour nil or faintly like "paint", taste nil.

Reactions: NaOH red-brown to black on cutis, context and sometimes gills reddish lilac; guayac green-blue; phenol red; lugol and formalin nil.

Micro: spores elliptic, 9–11.7 × 5.5–7 µm, moderately to rather weakly verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2001, Gasparini 2007.

This magnificent fungus is characterised by its robustness and by the almost dry cap with a mottled structure, which acts as a camouflage among the leaf litter. The greyish blue tints (especially on gills and stipe) evoke the European *C. cyanites* Fr. The species has also been collected in Tasmania.

C. poliotrichus ined. (Plate 25), is similar but more slender, and the spores are smaller (8.2–10 × 5–6 µm). It is rare, growing in the same habitat [Te Iringa Track]. [These taxa are genetically close (sect. *Austrocyanites* Soop).]

Cortinarius ursus Soop Plate 24

Cap 35–70 mm, dry, not hygrophanous; coated by coarse, shaggy, umber to blackish brown, concentric scales (1–1.5 mm high), forming a disc at centre; background slightly paler, young with a purple tinge.

Gills saturated dark violet, crowded.

Stipe cylindrical to tapering or fusoid; pale pink to grey-violet, soon purple-brown; violet-brown to blackish brown from a peronate, fibrillose veil, terminating in a membranous, erect collar; apex violet.

Veil membranous, tenacious, rosy, turning purple-brown, copious; cortina greyish, confluent with veil.

Flesh greyish white, ± yellow in stipital base, strongly and persistently marbled violet; odour and taste nil.

Reactions: NaOH, guayac trivial.

Micro: spores amygdaloid, 10–12 × 6–7 µm, almost smooth; marginal elements crowded, clavate to capitate.

Ecology: in *Nothofagus* forest, rare. Te Anau Downs, Boyle River, St Arnaud Range.

Ref.: Soop 2001, "*Cortinarius* sp." #13 in Horne 2000, possibly Horak 197x as *C. squarrosus* ined.

This large, black, grossly squamose fungus can hardly be overlooked. It is further characterised by the deeply violet gills, a dry cap, and a peronate veil. The spores appear almost smooth under a light-microscope, but an SEM examination reveals the presence of low, connected or oblong warts. Due to the presence of a membranous collar and an indistinct cortina, the species forms a borderline case to *Rozites* (below). Cf. *Inocybe strobilomyces* E. Horak (1977), which differs, among others, by its pale gills (see Taylor 1973).

19. Section *Rozites* & allies

The former genus *Rozites* P. Karst. is well-known in Europe from its type and only species in the area, *Cortinarius caperatus* Fr. The New Zealand species are more hygrophanous, often with a striate cap margin, and more glutinous. They otherwise exhibit all the characters of the type, such as a membranous inner veil

that forms a ring or collar on the stipe and thus replaces the cortina. As in *Cuphocybe* (Ch. 10), the stipe of southern *Rozites* is often provided with a small piston-like bulb.

[Molecular studies (Peintner et al. 2002a, 2002b) have demonstrated that *Rozites* is included in *Cortinarius*. The bihemispherical section *Rozites* (P. Karst.) Soop et al., with the common boreal type *C. caperatus* Fr., counts several species from the South Pacific, of which *C. meleagris* (below) is the only known New Zealand representative. Other southern species that were traditionally assigned to *Rozites* make up the austral section *Subcastanelli* and other groups.]

Cortinarius cesarioanus A. R. Nilsen & Orlovich. Plate 19

Cap 35–80 mm, glutinous, hygrophanous in dark rings or streaks; dark yellow-brown with a paler centre; coarsely innate fibrous with thick, imbricate, greyish white to reddish, darkening tufts and squamules, gathered mainly at disk; margin striate to rimose when old.

Gills cinnamon to brownish pink, occasionally with an evanescent blue shade; crowded.

Stipe cylindrical to clavate, often with a small, rounded or wedge-shaped bulb; pale yellow to pale grey, banded above collar by zigzag, ochre to brownish pink girdles, dark fibrillose below when older; collar pendulous, striate, membranous, dirty pale-yellow, often placed near base.

Veil greyish white to reddish brown, darkening, copious.

Flesh grey to pale grey-brown, ± marbled darker grey or violet; odour and taste nil.

Reactions: NaOH nil.

Micro: spores elliptic to subamygdaloid, 9–11 × 5.5–7 µm, moderately verrucose, not dextrinoid.

Ecology: in *Nothofagus* forest, common to very common.

Ref.: Nilsen et al. 2021; Horak 1981 as *C. subcastanellus* pp, Soop 1998a as *C. subcastanellus*.

A common species in all southern-beech forests. It is distinguished from the other members of the group by its dark hues: yellow-brown, darkening with age to almost umber, and by the collar normally being placed low on the stipe, sometimes even on the bulb. *C. majestaticus* (below) in the same habitat is quite similar, but lacks conspicuous veil remnants on the cap, which often displays an olive shade.

[This taxon has long been interpreted as *C. subcastanellus* (below), and was named so in previous editions of this book. Molecular studies have shown, however, that at least part of the holotype of the latter is *C. wallacei* (Nilsen et al. 2021). Both species are part of sect. *Subcastanelli* Soop.]

Cortinarius subcastanellus E. Horak, Peintner, M.M. Moser & Vilgalys. Plate 19

Basionym: *Rozites castanellus* E. Horak & G.M. Taylor
Synonym: *Cortinarius wallacei* Soop

Cap 25–55 mm, glutinous, weakly or not hygrophanous; warmly red-brown to yellow-brown; glabrous to innate fibrillose; margin ± striate.

Gills pale cinnamon, soon with an orange tinge.

Stipe cylindrical, often with a small, rounded bulb; white to pale grey-brown, with sparse red-brown fibrils and bands below the collar, which is membranous, greyish yellow, striate, and placed high.

Veil red-brown, sparse.

Flesh pale tan; odour nil or faint, ± like wax candles.

Reactions: NaOH red-brown to red on cutis and context; guayac strongly blue-green.

Micro: spores ± obtusely elliptic, 8–9.5 × 5–6 µm, moderately verrucose, strongly dextrinoid.

Ecology: in *Nothofagus* forest, uncommon. Cameron Creek, Lake Daniel Track, Te Iringa Track, Cascade Hut Track.

Ref.: Horak 1981, Nilsen et al. 2021; Soop 2014 as *C. wallacei*.

This fungus recalls *C. cesarioanus* (above), with which it is closely related and has often been confused, but presents a handsome, mahogany-brown cap, which is almost devoid of veil remnants. It also differs by the placement of the stipital collar, the alkaline reaction, and the dextrinoid spores.

Cortinarius majestaticus (E. Horak) T.P. Anderson & Orlovich Plate 19

Basionym: *Descolea majestatica* E. Horak

Cap 30–60 mm, glutinous, weakly or not hygrophanous; dark yellow-brown, young with a distinct, olivaceous tinge, later darkening to umber, glabrous without veil remnants; margin striate to sulcate.

Gills cinnamon, fairly thick.

Stipe cylindrical, tall, rather stiff; yellow-brown to pale yellowish grey, with thick yellow-brown fibres or girdles on lower half; collar grey-brown, membranous, rather thick, erect, connected to cap margin when young, later fragmented, striate above, placed on upper half; apex pale grey, base darkening.

Veil yellow-brown, sparse to fairly copious; cortina membranous.

Flesh dirty white to yellowish white, with an olivaceous tinge in cap, brownish in lower stipe; odour faint, phlegmacioid; taste nil.

Reactions: NaOH red on cutis, vaguely red in context, nil on gills.

Micro: spores amygdaloid, 11–14 × 7–8.5 µm, coarsely to very coarsely verrucose; cutis with gelatinised hyphæ, hypodermal cells with vesiculose ends.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Anderson & Orlovich 2016; Horak 1971; Soop 2008 as *Descolea m*.

A robust fungus, characterised by a smoky-olivaceous, sometimes olive-black hue that may be absent on dry specimens but is usually distinct. The fruitbody reacts positively with alkaline solutions. The ring is usually placed high on the stipe, in contrast to that of *C. cesarioanus* (above), which is otherwise rather similar. [The species was originally placed in the genus *Descolea,* due to the partly cellular cutis hyphæ, but has been shown by molecular markers to belong to *Cortinarius*, where it forms a small austral clade (sect. *Majestatici* Soop).]

Cortinarius achrous E. Horak, Peintner, M.M. Moser & Vilgalys Plate 18

Basionym: *Rozites pallidus* E. Horak & G.M. Taylor

Cap 30–55 mm (also larger), glutinous, concentrically hygrophanous; white to pale yellow-buff; disk often stronger yellow-brown with thick, white patches swimming in slime; margin strongly striate (30–50% of radius), rimose when old.

Gills pale grey; moderately crowded.

Stipe cylindrical to clavate, sometimes piston-like; white, somewhat yellowing and staining brownish from base; white pustulate above collar, naked below; collar white, striate, membranous, first connected to cap margin, then erect, 2–3 mm wide, placed on upper half.

Veil white, copious.

Flesh white; odour faint, somewhat waxy; taste nil.

Reactions: NaOH nil.

Micro: spores elliptic to subamygdaloid, 9.5–13 × 6-8 µm, moderately verrucose, not dextrinoid.

Ecology: in *Nothofagus* forest, common.

Ref.: Horak 1981.

This quite common species is palest in the group with greyish or whitish yellow hues all over and a strongly striate or even ragged cap margin when adult. Cf. *C. pselioticton* (below).

C. pseliocaulis Soop & J.A. Cooper (Plate 18) possesses an evenly yellow-tinted cap, but is otherwise rather similar and grows in the same habitat [Boyle River; see Soop et al. 2018]. — There exist several other closely related taxa, including *C. pselioticton* (below), some unnamed, that are difficult to distinguish morphologically from *C. achrous*. One may possibly be identified as ***C. elacatipus*** E. Horak, Peintner, M.M. Moser & Vilgalys. It differs from *C. achrous* by warmer yellow colours and a tapering stipe (see Horak 1981 as *R. fusipes*, Soop 2019b). [They are all sisters to sect. *Rozites*.]

Cortinarius pselioticton Soop Plate 18

Cap 30–60 mm, viscid, hygrophanous; greyish to brownish yellow with a darker disk, flushing orange to grey-brown, rather coarsely innate fibrillose; margin more greyish, weakly striate to sulcate.

Gills greyish white, occasionally with a faint, blue tinge.

Stipe weakly clavate to cylindrical, sometimes with a small, piston-like bulb, dry; white, fibrous below collar, flushing yellow-brown to orange from base; collar thin, pendulous, grey-white, ± striate.

Veil yellow-brown, oxidising to red-brown, rather copious**.**

Flesh grey-white to yellow-white, darker in stipe-base, sometimes with a faint bluish tinge; odour and taste nil.

Reactions: NaOH distinctly, but slowly and often weakly red to brownish red on cutis and stipital veil, else nil; guayac strongly blue-green.

Micro: spores elliptic to amygdaloid, 10.5–13.5 × 6.5–8.2 µm, moderately to rather coarsely verrucose, dextrinoid; cheilocystidia clavate to subcapitate, 40–50 µm.

Ecology: In *Nothofagus* forest, occasional.

Ref.: Gasparini & Soop 2008.

A rather drab-coloured species with a hue and habit that may recall an *Armillaria*. It is paler than *C. pseliocaulis* (above), from which it is also distinguished by a positive alkaline reaction.

C. rugosiceps (E. Horak & G.M. Taylor) E. Horak et al. is similar, but presents a darker cutis and orange gills (see Horak 1981 as *Rozites r.*).

Cortinarius meleagris (E. Horak & G.M. Taylor) E. Horak et al. Plate 18

Basionym: *Rozites meleagris* E. Horak & G.M. Taylor

Cap 30–65 mm, viscid, hygrophanous; whitish grey to pale greyish blue with a grey-brown to tan centre, young often purple-brown; glabrous with dense, silvery squamules outside disk; margin often striate.

Gills violaceous or grey with a persistent bluish tinge; often thick, somewhat veined.

Stipe clavate to cylindrical with a small piston-like bulb; silvery pale violet to white, staining faintly yellowish with a white, membranous, fragile, erect to pendulous collar, striate above, placed on upper half; apex stronger violet, ± pruinose.

Veil white to pale yellow, sparse to rather thick and copious.

Flesh white, marbled blue to faintly yellowish; odour nil or sweetish melleous; taste ± raphanoid.

Reactions: NaOH trivial; guayac blue-green, phenol nil.

Micro: spores subglobose to ovoid, 9.5–12.5 × 7.5–9.3 µm, moderately verrucose, dextrinoid.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak 1981.

This is the only common New Zealand *Rozites* with bluish tints. Cap and gills are usually pale, but sometimes darker, ash-grey. The taxon is further characterised by small, silvery squamules on the cap, which, however, are readily washed off by rain. The spores are dextrinoid (tinted golden orange in iodine solutions), which appears to be characteristic of sect. *Rozites*.

Cortinarius subgen. *Myxacium*

Subgenus *Myxacium* (Fr.) Trog is traditionally composed of species whose cap and stipe are in principle viscid (due to a viscid veil), but sometimes the stipe is only weakly so, which may lead to wrong identification This definition also includes species from subgenus *Paramyxacium* E. Horak & M.M. Moser (1975). Cf. the group *Myxotelamonia* (Ch. 27).

[Molecular studies have shown that the traditional subgen. *Myxacium* is polyphyletic, where in particular section *Delibuti* (Ch. 24) and the group around sect. *Vibratiles* (Ch. 22) form segregate clades (Seidl 2000, Soop et al. 2021). Among the sections of subgen. *Myxacium* s. str., the type section *Myxacium* (Fr.) Gillot &

Lucand appears to be absent in the South Pacific, whereas *Defibulati* (Ch. 23) is bihemispherical. The remaining sections (*Marmorati, Cuphomorphi,* and *Quadrispora*) are only found in the South.]

20. Section *Cycnei* & allies

Section *Cycnei* Soop, endemic to the South Pacific, contains glutinous fungi, mostly of a whitish or violaceous coloration (see Soop 2018, and Salgado et al. 2018 as sect. *Magellani*). All species in the group, except the last one, belong to the section. Cf. sect. *Marmorati* (below), where pale taxa also occur.

Cortinarius cycneus E. Horak Plate 31

Cap 20–85 mm, glutinous, not hygrophanous; white, sometimes with a very faint violaceous sheen; glabrous; margin not striate.

Gills pale grey-brown with a pink flush.

Stipe cylindrical to weakly clavate; glutinous; white, sometimes with a faint, violaceous sheen.

Veil hyaline, copious; cortina white.

Flesh white, young with a faint greyish violet tinge; odour nil or faint, ± unpleasant.

Reactions: NaOH yellow in stipe-base context, otherwise nil; guayac weakly blue-green; phenol red near cutis.

Micro: spores elliptic to subamygdaloid, 9.5–12 × 5.5–7 µm, rather strongly verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak & Wood 1990.

This handsome fungus is entirely white, which motivates the epithet ("swan"). One may note that the protologue gives slightly smaller spores.

Another white species in the same habitat, ***C. olorinatus*** E. Horak, is more slender and also the spores are leaner (see Horak & Wood 1990). [This is the type of the austral section *Olorinati* Soop & Dima (see Dima & Soop 2020).]

Cortinarius lubricanescens Soop Plate 31

Cap 10–45 mm, glutinous, hygrophanous; white to greyish white, often with a violet shade, rarely intensely red-lilac, centre sometimes slightly yellow, darkening, glabrous; margin ± striate, finally sulcate.

Gills white to greyish white, sometimes with a violet or pink tinge.

Stipe cylindrical, tough, slender, glutinous; white, sometimes with a faint, violaceous shade, rarely entirely violet, slimy veil forming a small collar or girdles, flushing brownish from base, apex paler.

Veil hyaline, often with a faint, violet tinge, rarely red-lilac, copious; cortina rudimentary, white, or absent.

Flesh white to pale violet, rarely deep violet in cap, flushing yellow-brown in stipe-base; odour rather strong, like "lubricant"; taste nil.

Reactions: NaOH grey-violet to trivial on gills, otherwise nil; guayac greyish green; phenol nil.

Micro: spores amygdaloid to elliptic, 9–11.5 × 5.5–6.5 µm, moderately verrucose; marginal elements numerous, clavate to vesiculose, 25–40 × 15–18 µm, some filled with a greyish substance.

Ecology: in *Nothofagus* forest, often fasciculate, occasional.

Ref.: Soop 2001, Horak & Wood 1990 as *C. magellanicus*.

A smallish, pale, slimy fungus that resembles a slender *C. cycneus* (above), but has less pure white, often greying colours. It also recalls *C. vitreopileatus* (below), which is more robust with larger spores. *C. lubricanescens* is further characterised by its typical odour of "engine lubricant" or "vaseline". Forms with a violet shade may evoke *C. cucumeris* (below), which is larger with a different habit and a different smell. Cf. *C. pansicolor.*

A rare, deep violet form (Plate 31) has often been named *C. "magellanicus"* in New Zealand [Lake Waikareiti, Floral Saddle, Te Iringa Track]. It is a beautiful fungus, entirely violet to reddish lilac. [*C. magellanicus* Speg., described from Patagonia (Horak & Moser 1975, Salgado et al. 2018), has been shown to belong to the section, but is genetically separated from the taxon found in New Zealand.]

Cortinarius cucumeris E. Horak Plate 31

Cap 20–50 mm, glutinous, not or weakly hygrophanous; date-brown to yellow-brown, often pale with a faint, violaceous shade; glabrous; campanulate with a narrow umbo; margin not or slightly striate.

Gills pale violet to bluish pink.

Stipe cylindrical, glutinous; white with a violet sheen; ± peronate from thick, glutinous, white to pale violaceous girdles ending in a collar; apex white.

Veil hyaline with a pale violet tinge; cortina rudimentary.

Flesh pale violet to white; odour farinaceous or like fresh cucumber; taste farinaceous.

Reactions: NaOH, guayac nil.

Micro: spores elliptic to subamygdaloid, 9.3–12 × 5.7–6.5 µm, moderately to fairly coarsely verrucose.

Ecology: in *Nothofagus* forest, common.

Ref.: Horak & Wood 1990.

A common, but fairly anonymous myxacioid fungus with brownish and pale violet tones, until one samples the smell, which is quite characteristic, like cucumber or rancid flour.

Cortinarius indolicus E. Horak Plate 33

Cap 20–35 mm, glutinous, weakly hygrophanous; pale grey to pale grey-brown with a red centre; glabrous; margin weakly striate, later sulcate.

Gills pale grey.

Stipe cylindrical, often with a small, round bulb, glutinous; grey-white, young covered by reddish gluten, later with red spots and numerous, thick, red girdles on lower part, ending in a small collar studded with red-brown squamules.

Veil hyaline with a red shade, copious; cortina rudimentary.

Flesh dirty grey to greyish tan; odour very strong of naphthalene, sometimes more gas-like; taste nil.

Reactions: NaOH trivial.

Micro: spores broadly amygdaloid, 11.7–15 × 7–8.5 µm, moderately to fairly coarsely verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak & Wood 1990.

A spectacular species with red spots and red, stair-like girdles on the stipe, which darken to red-brown after collection. It is also unmistakable from the stench of naphthalene ("moth-balls"), sometimes mixed with a propane-like component (cf. the boreal *Tricholoma sulphureum* and allies). [This taxon is sister to sect. *Subcastanelli* (Ch. 19).] Cf. *C. periclymenus*, which is sometimes viscid.

21. Section *Marmorati* & allies

Sect. *Marmorati* Soop, endemic to the South Pacific, comprises glutinous and rather robust taxa with a combined brown, violet, and white coloration and large spores, recalling taxa in the boreal section *Myxacium*, which is closely related. Cf. sect. *Defibulati* below.

Cortinarius marmoratus E. Horak Plate 29

Synonym: *C. anauensis* Soop

Cap 25–60 mm, glutinous, not or weakly hygrophanous; purple-brown to chocolate-brown, centre paler grey to ochraceous, glabrous; margin sometimes striate or sulcate.

Gills deeply violet or greyish with a violet edge.

Stipe cylindrical, sometimes with a small rounded or piston-like bulb, viscid; white to violaceous-grey, staining ochraceous from base.

Veil pale violaceous, sparse; cortina gelatinous.

Flesh grey-white, marbled faintly violet, more ochraceous in stipe-base; odour nil; taste faint ± fetid.

Reactions: NaOH ± red-brown on cutis, else trivial; guayac, lugol trivial.

Micro: spores amygdaloid, 12–15 × 6.5–8 µm, moderately verrucose; marginal elements clavate to vesiculose, 35 × 15 µm; clamp connections present.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak & Wood 1990, Soop 2001 as *C. anauensis*, possibly Horak 197x as *Myxacium umbrinum* ined.

The diffuse pale-grey centre of an otherwise dark cap forms a hygrophanous patch, like in marble, which is quite characteristic. The species somewhat resembles *C. taylorianus* (below), but mature caps are usually darker and devoid of blue or violet tints.

Cortinarius vitreopileatus E. Horak Plate 29

Cap 20–50 mm, glutinous, hygrophanous; white to greyish white, often with a yellow tinge mainly on disk, glabrous; margin striate.

Gills pale grey to pale cinnamon, sometimes with a faint violet or pink flush.

Stipe cylindrical to slightly clavate, tough, glutinous; white, later flushing yellow from apex.

Veil hyaline, copious; cortina white, rudimentary.

Flesh white; odour and taste nil.

Reactions: NaOH trivial, sometimes weakly reddish on cutis; guayac weakly green-yellow.

Micro: spores amygdaloid, 11–14 × 6.5–8 µm, moderately verrucose; marginal elements crowded, clavate to vesiculose, 25–30 × 10–12 µm; clamp connections present.

Ecology: in *Nothofagus* forest, common to very common.

Ref.: Horak & Wood 1990.

This common fungus in southern beech forest is extremely glutinous in moist weather, with slime up to 3 mm thick. It is not brilliantly white like *C. cycneus* (above), the cap tending to dirty whitish or pale brownish. In some collections the stipe turns yellow on mature specimens, especially after frost.

Cortinarius vitreofulvus Soop Plate 29

Cap 35–50 mm, glutinous, hygrophanous; tan with greyish white zones when young, later darker yellow-brown, glabrous; margin paler when young, later striate.

Gills white to greyish white.

Stipe cylindrical to slightly clavate, viscid; white, later flushing yellow from apex.

Veil hyaline, ± brunnescent, copious; cortina rudimentary.

Flesh white; odour and taste nil.

Reactions: NaOH reddish on brown zones of cutis, elsewhere trivial.

Micro: spores amygdaloid, 10.5–12 × 6.5–7.5 µm, strongly verrucose; marginal elements numerous, clavate to vesiculose, 18–27 × 9–12 µm; clamp connections present.

Ecology: in *Nothofagus* forest, uncommon. Kepler Track, Cascade Hut Track.

Ref.: Soop 2016.

A typical *Myxacium* with a thick gluten on most of the basidiome. It resembles *C. vitreopileatus* (above), which may be separated by its pale pileus colour and less verrucose spores. [Both cortinars are members of sect. *Marmorati.*]

The section also contains ***C. vitreopallidus*** Soop (Plate 29) and at least two undescribed species in the country. They are all similar to *C. vitreofulvus*. (See Soop & Dima 2021; Boyds Creek, Totara, Kowai Bush).

Cortinarius bellus E. Horak — Plate 28

Cap 25–65 (100) mm, glutinous, weakly or not hygrophanous; date-brown, pale tan towards the margin, warmly but pale purple-brown when young; margin sometimes violaceous, later striate.

Gills saturated violet; edge deeper violet.

Stipe cylindrical, tall, stiff, sometimes with a small, rounded bulb; glutinous; lilac-violet, apex and base paler.

Veil hyaline with a violet tinge, copious; cortina greyish.

Flesh violet, later paler with yellow parts, whitish near stipe-base; odour nil.

Reactions: NaOH trivial.

Micro: spores amygdaloid, 10.5–13 × 6–7 µm, coarsely verrucose, rather dark; clamp connections present.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak & Wood 1990, and possibly "*Cortinarius sp.*" (#76) in Taylor 1973.

This beautiful fungus is distinguished by its tall stature and dark brown and blue colours, bearing a certain likeness to the European *C. stillatitius* Fr. Microscopically *C. bellus* is characterised by its grossly ornamented spores. [Genetically the taxon forms a sister clade to sect. *Marmorati*.]

Cortinarius taylorianus E. Horak — Plate 33

Cap 30–90 mm, glutinous, elastic, not hygrophanous; pale tan with a violet tinge towards the margin or more uniform blue-grey, centre darker yellow-brown, sometimes with an orange tinge; margin long involute, sometimes slightly striate.

Gills deep violet; edge paler.

Stipe cylindrical to clavate, often with a rounded bulb or ± fusoid; glutinous, white, often sky-blue on upper part, below ± peronate grey-violet, ending in a collar; later paling to grey, turning ochraceous from base.

Veil thick, elastic, white to grey-violet, copious; cortina white to violaceous grey.

Flesh pale violet, marbled darker violet, ochraceous to grey in cap and stipe base; odour faint, raphanoid; taste nil.

Reactions: NaOH nil; lugol trivial to dark red.

Micro: spores obtusely amygdaloid to elliptic, 10–14 × 6.5–8.5 µm, moderately verrucose, rather dark.

Ecology: in *Nothofagus* forest, common.

Ref.: Horak & Wood 1990.

A robust fungus that resembles the European species *C. salor* Fr. but produces different spores. Like the latter, fruitbodies are sometimes pale with diluted, greyish blue tints. [Molecular markers place *C. taylorianus* in sect. *Archeriani* M.M. Moser & E. Horak.]

Cortinarius ixomolynus Soop — Plate 28

Cap 17–40 mm, glutinous, weakly hygrophanous; amber yellow when young, later greyish yellow, disk orange-red to red-brown, maculated by dark-red to umber, irregular spots, glabrous; margin pale tan, weakly or not striate.

Gills white to pale grey.

Stipe viscid, cylindrical, tough; white, somewhat flavescent with sparse brownish fibrils on lower part.

Veil hyaline with a brownish tinge, rather copious; cortina white or absent.

Flesh white to pale yellow, often marbled golden yellow; odour none or faint, like "lubricant"; taste distinctly bitter.

Reactions: NaOH red on cutis, elsewhere trivial.

Micro: spores elliptical to subamygdaloid, 5.7–7 × 3.5–4.5 µm, moderately to weakly verrucose.

Ecology: in *Nothofagus* forest, uncommon. Murray Creek, Bridle Track, Cameron Creek, Te Iringa Track.

Ref.: Soop 2013.

Resembles *C. vitreofulvus* (above), but can be separated by the brown-stained cap, bitter taste, and exceptionally small spores. [This taxon is not part of the section.] Cf. *C. pectochelis* (below).

22. Section *Vibratiles* & allies

The bihemispherical section *Vibratiles* Melot consists of viscid taxa of a modest size and with the predominant combination yellow cap and white stipe. Some of the species have a bitter or acerbic taste. See further Soop et al. (2022, in prep.).

Cortinarius melleomitis M.M. Moser & E. Horak Plate 32

Cap 20–40 mm, viscid to glutinous, hygrophanous; handsomely amber yellow with a darker, shallow umbo; margin with a white rim, not or weakly striate.

Gills white.

Stipe clavate to fusoid, viscid; white, finely fibrillose-downy under gluten.

Veil hyaline, white, sparse; cortina rudimentary.

Flesh white to pale yellow, soft; odour nil, taste nil or slightly bitter.

Reactions: NaOH, guayac trivial.

Micro: spores obtusely elliptic, 7.5–9.5 × 4.5–5.7 µm, moderately to rather weakly verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak & Wood 1990, Moser & Horak 1975.

A rather decorative *Myxacium* with a distinct coloration: yellow on the cap and white on the stipe, which is typically thickest in the middle. *C. melleomitis* was originally described from Patagonia. It evokes the boreal *C. pluvius* (Fr.) Fr. in the same section, which, however, is strongly bitter. Cf. *C. melimyxa* (below).

The rare ***C. psilomorphus*** Soop (Plate 32) is similar, but the stipe is not pure white and the gills are somewhat decurrent. It displays an orange alkaline reaction on the cap, and the spores are smaller (5.5–7 × 4.5 µm) [see Soop 2016; Wangateka Valley]. — ***C. electridius*** ined. (Plate 32) is a sticky fungus resembling *C. melleomitis* (including the spores), but is smaller with a strongly bitter context. It is found occasionally in the same habitat [Tawhai]. [Molecular analyses have shown that the species is a sister to sect. *Vibratiles*.]

Cortinarius melimyxa E. Horak Plate 32

Cap 10–25 mm, viscid, hygrophanous; pale brownish yellow with a darker disk that may be slightly more red-brown; glabrous; margin concolorous, strongly striate.

Gills pale grey-brown to greyish yellow, sometimes with a distinct but fugacious violet tone.

Stipe cylindrical, tenacious, viscid; greyish yellow to dirty white, young with a white coating, apex white.

Veil white, sparse; cortina ± white.

Flesh dirty yellowish to pale grey-brown, sometimes marbled faintly blue; odour nil; taste sometimes bitter or acerbic.

Reactions: NaOH inconsistently reddish to red-brown or trivial; guayac trivial.

Micro: spores amygdaloid to subelliptic, 7–9 × 4.5–5.2 µm, moderately to weakly verrucose; marginal elements crowded, clavate to lageniform, differentiated.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak & Wood 1990.

A small, yellow-brown and sticky fungus with an unusually elastic structure. Young gills occasionally display a faint violet tinge. Cf. *C. viscilætus*. [This and the following taxa do not belong to sect. *Vibratiles*.]

C. gemmeus E. Horak, described from myrtaceous forest, differs by significantly smaller spores (see Horak & Wood 1990).

Cortinarius ignotus E. Horak Plate 33

Cap 25–45 mm, viscid, not hygrophanous; brown-yellow with an orange tinge on disk, darker yellow-brown when young, fading with age, innate fibrillose; margin paler, not striate.

Gills dark yellow, fairly crowded.

Stipe viscid, cylindrical to clavate, sometimes with a slightly tapering base; covered by a yellow gluten, apex yellowish white.

Veil gelatinous, thick, brownish yellow, rather copious; cortina rudimentary.

Flesh golden yellow; odour faint, sweetish; taste nil.

Reactions: NaOH cherry red everywhere.

Micro: spores ± obtusely elliptic, 5.7–6.8 × 3.8-4.5 µm, moderately verrucose.

Ecology: in myrtaceous forest, rare. Donald Mclean Track.

Ref.: Horak & Wood 1990.

A spectacularly golden, but rare species in myrtaceous woods. The thick gluten colours the stipe brilliantly yellow. The strong alkaline reaction indicates the presence of anthraquinonic pigments. [This taxon is closely related to the Australian *C. sinapicolor* Cleland, with which it has often been confused. Both are part of sect. *Sinapicolores* (Gasparini) Soop.] Cf. certain forms of *C. viscoviridis* (below), which grows with *Nothofagus*.

Cortinarius viscoviridis E. Horak Plate 33

Cap 25–55 mm, glutinous, weakly or not hygrophanous; warmly yellow-brown to orange, sometimes with an olive tinge, disk darker red-brown, glabrous; margin yellow to greenish yellow, not striate, but ± sulcate when old.

Gills pale grey to pale yellow-green, rather thick.

Stipe cylindrical to narrowly clavate, viscid; white to pale yellow or greyish green, covered largely by a yellow gluten; apex white to yellow-green.

Veil yellow, gelatinous, fairly copious to sparse; cortina yellow-white**.**

Flesh greyish yellow to saturated yellow, sometimes with a green tinge; odour and taste raphanoid.

Reactions: NaOH weakly red to trivial.

Micro: spores elliptic, 7.5–9.5 × 4.5–5.7 µm, weakly verrucose.

Ecology: In *Nothofagus* forest, uncommon. Mackay Creek, Kepler Track, Lake Gunn Track, Boyd Creek, Borland Lodge.

Ref.: Horak & Wood 1990.

A rather spectacular species with bright yellow colours on the cap margin and stipe. The form with green or olive hues is less common (see Soop 2008). Cf. *C. alienatus* and *C. ignotus* (above), which both react strongly with alkaline solutions. [The spores reported here are slightly wider than stated in the protologue].

Cortinarius pectochelis Soop Plate 28

Cap 15–40 mm, viscid to glutinous, not or weakly hygrophanous; saturated dark yellow-brown to mahogany, disk almost blackish brown, rather coarsely innate fibrillose; margin paler, greyish yellow, weakly striate.

Gills greyish to pale brown.

Stipe cylindrical, viscid; pale yellow with numerous gelatinous, thick, yellowish to orange-brown tufts or stair-like girdles, sometimes terminating in an adpressed collar with grey-brown pustules above.

Veil orange-brown to pale orange-yellow, gelatinous, copious; cortina greyish yellow, gelatinous.

Flesh yellow-grey to pale yellow; odour weak, possibly like "lubricant"; taste nil.

Reactions: NaOH red to orange-red or brownish red everywhere; guayac green.

Micro: spores amygdaloid, 8–10 × 4.5–5.5 µm, moderately to rather weakly verrucose; marginal elements crowded 15–30 µm, clavate, many filled with a yellowish pigment.

Ecology: In *Nothofagus* forest, uncommon.

Ref.: Gasparini & Soop 2008.

A yellow-brown, sticky fungus with a remarkable veil, not really glutinous as with most *Myxacia* but thick, jelly-like (cf. fruitbodies of the genus *Tremella*). The stipe often presents stair-like girdles (like *C. indolicus*) and a small, gelatinous collar. *C. pectochelis* recalls *C. phæomyxa*, which usually has the cap covered with veil remnants.

The uncommon ***C. castaneiceps*** E. Horak differs by a dark red-brown cap, a white stipe, and small, elliptic spores [Rimutaka; see Horak & Wood 1990]. — ***C. porphyrophæus*** E. Horak is similarly coloured but the gills are bluish and the spores subglobose (see Horak & Wood 1990). [Despite the coloration, the latter is a member of section *Sinapicolores* (see above).] Both species grow under myrtaceous hosts.

23. Section *Defibulati* and allies

Like sect. *Marmorati,* sect. *Defibulati* M.M. Moser comprises rather robust taxa with large spores, but differs by the lack of clamp connections in the hyphæ, a virtually unique feature in the genus. Mainly encountered in the Northern Hemisphere, a few *Defibulati* are also known from New Zealand and Australia. But in contrast to the boreal taxa, their cortina is rudimentary or missing, making them resemble taxa in the *Cuphocybe* group (Ch. 10).

Cortinarius gymnocephalus Soop Plate 30

Cap 30–50 mm, glutinous, not or weakly hygrophanous towards margin; grey-brown to yellow-brown, glabrous; margin greyish with a violet tinge when young.

Gills saturated violet or pale reddish violet with a marked violet edge, crowded.

Stipe cylindrical, occasionally with a small piston-like bulb, viscid; pale violet with whitish squamules over the whole length.

Veil white to pale violaceous, rather sparse; cortina absent.

Flesh greyish white to pale tan, marbled violet; odour faintly sweetish; taste faint, ± unpleasant.

Reactions: NaOH trivial.

Microscopy: spores elliptic to amygdaloid, 10.5–14 × 6.8-8 µm, coarsely verrucose. Cheilocystidia crowded, clavate to vesiculose, 30–40 µm; clamp connections absent.

Ecology: In *Nothofagus* forest, rare. Borland Lodge, Te Iringa Track.

Ref.: Gasparini & Soop 2008, possibly Horak 197x as *Phlegmacium defibulatum* ined.

Lacking a cortina, this fungus recalls *C. dulciolens* but displays different veil and gill colours and possesses a viscid stipe. Its gills (sometimes only their edges) are beautifully violet-blue. The stipe is typically covered by white veil tufts over the whole length.

The very rare ***C. cuphocyboides*** Soop (Plate 30) differs by more greyish colours, including the gills [Te Anau Downs; see Soop 2014].

Cortinarius cuphomorphus Soop Plate 30

Cap 35–55 mm, viscid, weakly or not hygrophanous, pale grey-brown with dense fibrils and squamules, pallescent on disk and glabrous when older, coarsely innate fibrillose.

Gills grey-blue.

Stipe cylindrical, sometimes with a small, piston-like bulb, dry, white, with grey to yellowish squamules over the whole length.

Veil pale yellow to ochraceous grey, fairly copious; cortina white, rudimentary.

Flesh white to pale violet, marbled grey-blue; odour sweetish, sometimes strong; taste nil.

Reactions: NaOH weakly red-brown on cutis, else nil.

Micro: spores elliptic, 11–12.5 × 7–8 µm, rather strongly verrucose; clamp connections absent.

Ecology: in *Nothofagus* forest, rare. Clement Rd, Te Iringa Track, Kiko Rd.

Ref.: Soop 2014.

A largely greyish fungus, resembling *C. canovestius*, but without the hairy aspect of the cap and with violet colours in gills and context. It is the only member of the group with a dry stipe. *C. cuphomorphus* is so far recorded only from the Kaimanawa mountains. Cf. *C. poliotrichus*.

The rare ***C. juglandaceus*** Soop (Plate 30) differs by a more modest habit and a darker, date-brown and more glabrous cap (Arthurs Pass; see Soop et al. 2018). [It forms, with *C. cuphomorphus* and the secotioid ***C. violaceocystidiatus*** Nilsen et al., sect. *Cuphomorphi* Soop; see Nilsen et at. 2020).]

24. Section *Delibuti*

The bihemispherical section *Delibuti* (Fr.) Sacc. is characterised by viscid and brightly coloured caps, rounded spores, and yellowish or ochraceous, viscid veils. In the South Pacific the caps tend to display a greenish coloration and are sensitive to alkaline reagents. [The section contains, apart from the species described, at least two undescribed taxa in the country, and five in New Caledonia.]

Cortinarius rotundisporus Cleland & Cheel Plate 17

Cap 20–50 mm, viscid, not hygrophanous; young dark blue-green, later paling to grey-blue, centre often more orange-brown; glabrous to finely innate fibrillose.

Gills grey-blue to steel-blue; rather thick; edge paler.

Stipe ± clavate, viscid; greyish white, young with greyish green to grey slime, zoned when drying.

Veil young greyish green, darkening to grey-brown or ochraceous, sparse; cortina greyish blue.

Flesh pale yellow to white, grey-blue in stipe apex; taste nil; odour faintly raphanoid.

Reactions: NaOH lilac-red on cutis, pink on gills, yellowish in context.

Micro: spores globose to subglobose, 7–9 × 7–8 µm, moderately to fairly coarsely verrucose.

Ecology: in myrtaceous forest, common.

Ref.: Cleland 1934–35, Horak & Wood 1990, Fuhrer 1975, Bougher & Syme 1998, and maybe "*Cortinarius sp.*" (#72) in Taylor 1973.

One of the most characteristic *Cortinarii* in myrtaceous copses, presenting generally blue-green hues when young, later to become paler and more greyish, sometimes with an ochraceous tinge. It is furthermore recognised by its round spores and by the alkaline reaction. *C. rotundisporus* is well-known under *Eucalyptus* in Australia.

C. viridipileatus X. Yue Wang, M. C. Te Tana, A. R. Nilsen & Orlovich. (Plate 17) is a similar but uncommon species with a dark-green cap, growing in *Nothofagus* forests [Kiko Track, Cascade Hut Track; see Nilsen et at. 2021].

Cortinarius tessiæ Soop Plate 17

Basionym: *C. rotundisporus* subsp. *nothofagi* Soop

Cap 20–50 mm, viscid, weakly or not hygrophanous; blue-green to aerugineous, staining orange or ochraceous from disk, sometimes egg-yellow with a green rim when young; finely innate fibrillose; margin greyish, long with a green tinge.

Gills bluish grey to lavender.

Stipe cylindrical to slightly clavate or tapering; viscid to almost dry; pale blue-green with ochraceous fibrils and hazy bands; apex white to silvery blue-green.

Veil ochraceous, very sparse; cortina white to bluish green.

Flesh white to diluted blue-green, staining ochraceous, sometimes entirely ochraceous-yellow, orange in stipe-base; tough; odour faint but distinct of "hospital"; taste nil.

Reactions: NaOH red on cutis, ± pink on gills, trivial in context; guayac trivial.

Micro: spores subglobose, 6.5–8.5 × 6–7 µm, moderately to rather coarsely verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Gasparini & Soop 2008, Soop 2001 as *C. rotundisporus* subsp. *nothofagi.*

This taxon may be considered a *Nothofagus* vicariant of *C. rotundisporus* (above), from which it differs by more pronounced yellow or yellow-green hues. The context in the stipe-base may be orange tinted. Cf. *C. calaisopus* (below).

Cortinarius calaisopus Soop Plate 17

Cap 20–40 mm, dry to slightly viscid, not hygrophanous, brightly yellowish green or olive-green to olive-grey, disk darker with orange to ochraceous patches or strands, tomentose to finely granulose.

Gills greyish blue to greyish green, sometimes thick.

Stipe clavate to cylindrical, dry; greyish blue to turquoise blue, pale and shimmering on upper half, sometimes ± yellow-tinged below with ochraceous fibrils, apex pale blue.

Veil orange to ochraceous, sparse to fairly copious**;** cortina greyish white to pale blue-grey.

Flesh pale turquoise-blue, marbled yellowish to orange; odour faint, phlegmacioid; taste nil.

Reactions: NaOH orange-red on cutis, pinkish on stipital veil, ± red-brown in context; guayac nil.

Micro: spores subglobose, 6–7.5 × 5.5–6.5 µm, moderately verrucose.

Ecology: In myrtaceous forest, occasional. Waiora Scout Camp, Waipori Falls, Clements Rd.

Ref.: Soop 2010, and Sawyer & al 1999 as *C. sp.* RFLP II.

This species resembles *C. rotundisporus* (above), differing mainly by an almost dry fruitbody and slightly smaller spores. It also occurs in Australia.

Cortinarius subgen. *Telamonia*

Basically subgenus *Telamonia* (Fr.) Trog consists of dry, hygrophanous, medium-sized to small species. Colours are often drab brownish, sometimes with violet tones, including young gills. In New Zealand, however, there are many species with brighter colours, while others exhibit all the typical characters of *Telamonia* except that they are viscid. Cf. sect. *Carbonelli* and *Anomali* (Ch. 9, 12)..

[*Telamonia* in the strict sense had not been reported from the native forests of the South Pacific until one (see C. *xenophylon*) was recently discovered. Some species were originally reported from Patagonia (Horak & Moser 1975, Horak 1979), but have gradually been shown to belong to other groups. Genetically this core subgenus forms an isolated clade in the Northern Hemisphere, probably of a late evolution. New Zealand taxa that would morphologically rank as *Telamonia* tend to exhibit several deviating characters; a few were cited above. In addition one may note that they often react with alkaline solutions, a character more or less incompatible with the boreal circumscription, None (except C. *xenophylon*) has so far been shown to belong genetically to the northern core *Telamonia,* which is also characterised by a 50–70 base-pairs long indel in

the ITS1 region. Neither do several sections that were traditionally regarded as *Telamonia*. As detailed below, some of these (*Obtusi, Læti, Camphorati*, *Illumini*) are bihemispherical with a number of taxa growing in New Zealand (Soop et al. 2019).]

25. Group "Fulvi"

This group contains medium-sized species with vividly yellow-ochraceous or orange colours. Cf. sections *Limonii* and *Callistei* (Ch. 6, 7). Smaller yellowish species are described further on (Ch. 29). [Genetically, this group is polyphyletic.]

Cortinarius peraureus Soop — Plate 34

Cap 20–50 mm, dry, hygrophanous; evenly saturated yellow or yellow-brown to apricot-brown, later slightly darker on disk; matt, white frosty to finely micaceous when young; margin young with a white rim, not striate.

Gills pale grey to pale cinnamon; edge somewhat paler.

Stipe cylindrical to slightly tapering; white with thin, white girdles, vaguely staining yellow-brown.

Veil white, usually sparse, sometimes fairly copious; cortina white.

Flesh pale yellow to almost white; odour faint, pleasant; taste nil.

Reactions: NaOH, guayac trivial; fluorescence weakly yellow.

Micro: spores elliptic to subamygdaloid, 7.5–10 × 5.2–6.3 µm, weakly verrucose; marginal elements clavate, some lageniform, others vesiculose.

Ecology: in *Nothofagus* forest, very common.

Ref.: Soop 1998.

Being very common in virtually all southern-beech forests, this *Cortinarius* can hardly be overlooked with its strikingly golden cap and contrasting white stipe. Younger specimens are sometimes provided with a more persistent veil, which covers the cap with a fine white frost even into maturity, tending to mask the innate yellow colour. A rare form with a red-brown cap has also been observed.

C. chrysoconius Soop (Plate 34) is rather similar, but the cap is dotted by white squamules. and the spores are longer. It is rare, growing in the same habitat [see Soop 2016; Borland Lodge Track, Kepler Track].

Cortinarius lamproxanthus Soop — Plate 35

Cap 15–50 mm, dry, weakly hygrophanous; brilliantly saturated evenly yellow, sometimes with a faint lemon tinge, disk often slightly orange spotted, when old more yellow-brown; glabrous to finely innate fibrillose; margin citrinous when young with thin, yellow fibrils.

Gills saturated yellow, rather distant, thick.

Stipe cylindrical; brightly yellow when young, later greying, with yellow fibrils on lower part, apex pale citrinous, mycelial base white.

Veil brilliantly yellow, possibly with a faint citrinous shade, fairly copious; cortina pale yellow.

Flesh yellow with a white middle string, often with red spots in stipe-base; odour and taste nil.

Reactions: NaOH, formalin nil; guayac green; phenol red; fluorescence nil.

Micro: spores elliptic to amygdaloid, 8–10 × 5–6 µm, moderately to rather coarsely verrucose; cheilocystidia crowded, hyaline, 25–40 × 10–12 µm, clavate to pointed or subcapitate.

Ecology: in *Nothofagus* forest, rare. Kepler Track, Te Anau Downs.

Ref.: Soop 2005.

The handsome, saturated yellow of this fungus makes it almost unmistakable when young. *C. lamproxanthus* is moreover characterised microscopically by the polymorphic cheilocystidia. Yellow taxa in sect. *Chrysmata* and in the genus *Pholiota* are separated by their alkaline reactions. Other yellowish species, described further along, are smaller and tend to have a darker, more brownish cap.

Cortinarius vernicifer Soop Plate 35

Cap 20–55 mm, dry, hygrophanous; deeply orange to orange-brown, evenly coloured like varnish, glabrous to very finely innate fibrillose; margin young with thin yellow fibrils.

Gills yellowish grey.

Stipe cylindrical; young pale yellow, later darker with a pale-yellow coating towards base, apex almost white.

Veil pale yellow, sparse; cortina greyish yellow.

Flesh ± pale yellow, odour faint, agaricoid; taste nil.

Reactions: NaOH ± trivial, dark brown on cutis; guayac weakly green.

Micro: spores elliptic, 7.5–8.7 × 4.5–5.2 µm, rather weakly verrucose.

Ecology: in myrtaceous forest, rare. Te Anau Downs, Kowai Bush.

Ref.: Gasparini & Soop 2008.

The cap displays orange-brown tints with a remarkable varnished sheen, not seen in many *Cortinarii*. Cf. *C. verniciorum*, *C. collybianus,* and *C. caryotoides*. [Molecular markers place *C. vernicifer* in sect. *Carbonelli* (below).]

26. Section *Camphorati* & allies

Members of this group are medium-sized and dry with predominantly brown, white and violaceous colours, consistent with the boreal concept of a typical *Telamonia*. Smaller taxa are treated in subsequent chapters. Cf. section *Anomali* (Ch. 12).

Cortinarius dysodes Soop Plate 36

Cap 25–60 mm, dry, hygrophanous; red-brown with a purple tinge to chestnut-brown, sometimes more yellow-brown when older; glabrous to innate fibrillose; margin with a wide white rim, or with thin white patches.

Gills violet to reddish lilac.

Stipe cylindrical to slightly clavate; white, dirty whitish towards base, with hazy, white zones and bands.

Veil white with a violet tinge, sparse; cortina white with a faint violet tinge.

Flesh pale grey-brown, young with a violet tinge, later often marbled violaceous; odour very strong, unpleasant, ± gas-like (cooking-gas or acetylene) or of rotting vegetables; taste similar.

Reactions: NaOH trivial.

Micro: spores elliptic to subamygdaloid, 8.5–11 × 5–6.5 µm, weakly verrucose.

Ecology: in *Nothofagus* forest, often fasciculate, occasional.

Ref.: Soop 2001, and probably "*Cortinarius sp.*" (#71) in Taylor 1973.

This fungus is undoubtedly unique in the New Zealand mycoflora (or anywhere) on account of its unbelievable and insupportable stench, present already with young and fresh specimens, to the point that they can hardly be kept in-door. The smell recalls (but widely surpasses) that of the common European *C. camphoratus* Fr. Otherwise the species is rather anonymous with a brownish cap with a white rim and a white stipe. [*C. dysodes, C. camphoratus,* and a similar Tasmanian species, *C. tasmacamphoratus* Gasparini (see Gasparini & Soop 2008), belong to the bihemispherical section *Camphorati* (Liimat. et al.) Soop et al., well separated from *Telamonia* s. str.]

Cortinarius paraonui Soop Plate 36

Cap 20–70 mm, dry, hygrophanous; dark red-brown to umber; finely innate fibrillose, young minutely white frosty; margin long coated white.

Gills saturated red-brown to brick brown, rather thick and lean.

Stipe cylindrical, often tall, robust; coated white absorbing to brown.

Veil white, rather sparse to copious; cortina white.

Flesh pale brown; odour faint raphanoid or aromatic ("cocoa"?); taste nil; exsiccata darken.

Reactions: NaOH trivial; guayac weakly blue-green.

Micro: spores amygdaloid to elliptic, 8.5–10.5 × 5.5–6.5 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, often fasciculate, occasional. Te Anau Downs, Kepler Track, Lake Waikareiti Track.

Ref.: Soop 2005.

A typical medium-sized telamonioid species with a brown cap and a white stipe. *C. peraureus* usually has a more ochraceous cap, but is very variable, and *C. paraonui* can then be distinguished by its deep brick red gills and more verrucose spores.

Cortinarius carbonellus Soop Plate 36

Cap 15–45 mm, dry, hygrophanous; dark grey-brown to purple-brown, sometimes with a red-lilac tinge, later blackish brown to umber; finely innate fibrillose; margin with a greyish to red-brown rim when young, not striate.

Gills purple-brown to saturated violet, soon ± black; fairly crowded.

Stipe cylindrical to clavate; silvery grey with a violet tinge, soon darker grey-brown.

Veil violet to red-brown; very sparse; cortina greyish blue.

Flesh greyish to vinaceous brown, young marbled violet; odour and taste faintly raphanoid to nil.

Reactions: NaOH red to red-lilac in context, cherry red on gills, else trivial.

Micro: spores cylindrical to elliptic, 8–10 × 4.5–5.5 µm, moderately to rather weakly verrucose.

Ecology: in *Nothofagus* forest, often fasciculate, uncommon. Totara, Deer Flat, Waimakariri, Boyle River.

Ref.: Soop 2001.

A sombre-coloured fungus, soon darkening further to purplish black. Young gills are unusually dark, which, with the alkaline reaction, are good characters. [*C. carbonellus* is the type of sect. *Carbonelli* Soop, which consists of about 10 species from the South Pacific, several of which were earlier placed in section *Xenosmatæ* (Ch. 9).]

Cortinarius rattinus Soop Plate 36

Cap 10–30 mm, dry, hygrophanous; grey-brown to blue-grey, often staining yellow at centre, sometimes with a hint of olive; finely innate fibrillose, partly coated grey when young; margin with white to greyish pink fibrils when young, slightly striate.

Gills grey-blue to dark grey.

Stipe cylindrical to slightly clavate; greyish white to yellowish grey, sometimes with a faint olive-grey sheen and thin greyish girdles; apex shining pale grey or greyish blue.

Veil brownish red to pale grey-brown; sparse to fairly copious; cortina greyish with a blue tinge.

Flesh grey to olive-grey, faintly marbled blue, later yellow-brown in lower stipe; odour nil; taste nil to slightly bitter.

Reactions: NaOH orange to weakly red in context, red on gills, saturated brown on stipital veil.

Micro: spores elliptic to ± amygdaloid, 7–8.5 × 4–5 µm, rather weakly verrucose.

Ecology: in *Nothofagus* forest, rare. Kepler Track, Boyle River, St Arnaud Range, Clements Rd.

Ref.: Soop 2001.

This small, mouse-grey, telamonioid species evokes an *Inocybe* on account of its inconspicuous coloration, but may occasionally present pale blue and yellow tints. It is further characterised by the distinct alkaline reaction. [*C. rattinus* is a member of sect. *Carbonelli* (above).] Cf. *C. suecicolor*, which can be distinguished by its subglobose spores.

27. Group *Myxotelamonia*

Subsection *Myxotelamonia* was introduced by Moser & Horak (1975) for Patagonian species of *Telamonia* habit that exhibit a viscid cap (possibly also a viscid stipe). [The New Zealand species described here may be considered part of this entity, which appears to be polyphyletic.] They are all of a modest size. Cf. *C. viscilætus, C. melimyxa,* and *C. juglandaceus*.

Cortinarius laquellus Soop Plate 37

Cap 7–30 mm, viscid, weakly or not hygrophanous; matt with a white, velvety to almost pruinose layer that absorbs to violet on pressure; very finely innate fibrillose; margin thinly white fibrillose.

Gills pale violet to reddish lilac, sometimes more saturated violet, soon white with a grey-brown tinge.

Stipe tall, slender, cylindrical or slightly tapering at either end, dry or slightly viscid; silvery white with a faint, violaceous tint and thin, white bands near base.

Veil white, fairly copious; cortina white to pale lilac-grey.

Flesh white, young marbled violet or entirely bright violet-lilac; odour faint, pleasant like wax candles; taste nil to slightly bitter.

Reactions: NaOH, lugol, phenol nil; guayac greyish green.

Micro: spores elliptic to subamygdaloid, 6.5–8.5 × 4–5.2 µm, weakly to moderately verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2005.

This is a small, white fungus with rosy-lilac gills, a colour combination that is quite striking. Its stipe is normally tall and thin, and the cap is tacky on collection. A troupe of *C. laquellus*, forming a set of white dots against the dark-green moss, is a decorative sight in the forest. [Molecular markers place this taxon close to *C. urbiculus* (sect. *Laquelli* Soop). This clade is sister to the somewhat similar boreal species *C. leucophanes* P. Karst.]

Cortinarius periclymenus Soop Plate 37

Cap 10–35 mm, viscid soon drying, ± hygrophanous; white to greyish white, later with a yellow tone, disk blushing after collection, sometimes strongly red or with red, thin, diffuse spots and fibrils; margin with red fibrils.

Gills whitish to pale yellow-brown, sometimes entirely white when young; edge finely serrulate.

Stipe cylindrical to clavate, rarely ± fusoid and radicant; slightly viscid to dry, white to pale ochraceous, red-flushed and ± flavescent towards base; presenting sparse, cherry-red to lilac-red fibrils on lower part; apex pale yellow.

Veil red to lilac-red, sparse; cortina white or pink, blushing.

Flesh white to pale ochraceous, sometimes with a rosy to lilac tinge in stipe and near cutis; odour faint like wax candles or peppermint; taste unpleasant, somewhat acerbic; exsiccata reddish.

Reactions: NaOH turns red veil remnants yellow or white, otherwise nil; formalin nil to yellow-orange; guayac yellowish green; phenol red-orange; fluorescence nil.

Micro: spores elliptic to subglobose, 6.5–8.5 × 4.5–5.5 µm, weakly verrucose, rather pale; epicutis with ± gelified hyphæ × 2 µm.

Ecology: in *Nothofagus* forest, sometimes fasciculate, occasional.

Ref.: Soop 2001, possibly Horak 197x as *Hydrocybe lateraria* ined.

This small but spectacular cortinar is characterised by its red, often blood-red veil, clearly visible on the whitish cap and stipe. The reddish tint of newly dried material is an interesting feature; another is the ability of alkaline solutions to transform the red pigment of the veil into a butter-yellow shade. A rare form is strongly glutinous all-over in moist weather. [Molecular markers place *C. periclymenus* as a sister to sect. *Vibratiles*.] Cf. *C. rattinoides* and *C. indolicus*.

Cortinarius pansicolor Soop Plate 37

Cap 12–30 mm, viscid, weakly or not hygrophanous; orange-brown with a grey tinge, disk darker, more orange; glabrous; margin with thin brownish fibres, weakly striate.

Gills pale violet to grey-violet.

Stipe cylindrical with a small bulb, slightly viscid; pale grey-brown with brownish tufts and fibrils on lower part, apex pale grey-brown.

Veil red-brown to purple-brown, rather sparse; cortina white.

Flesh grey to yellow-brown, faintly marbled violaceous grey; odour nil; taste nil or slightly acerbic.

Reactions: NaOH red to red-brown on cutis, weakly red on gills, dark red on stipital veil.

Micro: spores elliptic to subamygdaloid, 7.5–8.7 × 5–6 µm, weakly verrucose.

Ecology: in *Nothofagus* forest, uncommon. Craigieburn, St Arnaud Range, Waimakariri Valley.

Ref.: Soop 2010.

A fairly anonymous, small fungus with a greyish orange cap and violaceous gills. It shares the reddish alkaline reaction with several other small, viscid species. Cf. *C. melimyxa*.

C. faucium ined. (Plate 39) is similar in the same habitat, but has brownish gills [Waimakariri Track]. [It belongs with *C. pansicolor* to the predominantly Patagoninan section *Rufoaurantii* ined.]

Cortinarius verniciorum Soop Plate 39

Cap 15–40 mm, viscid, weakly or not hygrophanous; warmly and evenly apricot to yellow-brown with a more orange disk; glabrous to finely innate fibrillose, often with a lacquered finish, young with thin, white fringes; margin with a white rim, weakly striate when old.

Gills white to pale grey-brown, rather crowded.

Stipe cylindrical to slightly clavate, dry; coated whitish, absorbing to pale grey-brown.

Veil white, very sparse; cortina rudimentary or absent.

Flesh pale tan, marbled yellow-brown; odour faintly raphanoid; taste faint with a distinctly acerbic after-taste.

Reactions: NaOH red to red-brown on cutis, else ± trivial.

Micro: spores oblong elliptic to subamygdaloid, 5.5–7 × 3–4 µm, weakly verrucose.

Ecology: in myrtaceous forest, uncommon. Te Anau Downs, St Arnaud Lodge.

Ref.: Soop 2013.

A small fungus with an evenly apricot-coloured cap, often shimmering as if varnished. The quite similar *C. vernicifer* in the same habitat, differs by a dry cap and wider spores. Also *C. thaumastus* is similar, but it produces larger spores and a stronger alkaline reaction, and grows with *Nothofagus*. Cf. *C. badiohepaticus.*

C. dulcamarus Soop (Plate 22) is larger with longer, fusoid spores. As the name indicates, it is characterised by a honey-sweet odour and a bitter taste. It is a rare taxon, growing in *Nothofagus* habitat (see Soop 2016; Craigieburn). [The two species are genetically close in sect. *Verniciori* Soop, which also includes about six species from other parts of the South Pacific.]

Cortinarius viscincisus Soop Plate 39

Cap 10–35 mm, viscid, hygrophanous, pastel yellow-brown to evenly pale red-brown, glabrous to very finely innate fibrillose; margin with a thin white frost, weakly or not striate.

Gills greyish to pale cinnamon.

Stipe cylindrical, dry; pale brown with a white, absorbing coating and thin bands.

Veil white, sparse; cortina white.

Flesh pale brown, sometimes with a grey to greenish blue tinge in stipe-base; odour nil or faintly like "lubricant"; taste nil.

Reactions: NaOH nil.

Micro: spores elliptic, 7.2–8.7 × 5–6, moderately to fairly coarsely verrucose.

Ecology: In *Nothofagus* forest, uncommon. Totara, Boyle River, Cascade Hut Track.

Ref.: Soop 2013.

A small brown and white fungus. It resembles *C. paraoniti* (below), but the cap is frankly viscid and the spores are larger. The species is almost indistinguishable from *C. faucium* (above), which has a reddish alkaline reaction.

C. pyrrhomarmarus ined. (Plate 39) is darker red-brown, including the gills. It is a rare taxon, growing in *Nothofagus* habitat (Arthurs Pass). [The two species are genetically close in sect. *Austroduracini* Soop & Dima, which consists mainly of Patagonian taxa.]

Cortinarius paraoniti Soop Plate 38

Cap 15–55 mm, slightly viscid soon dry, hygrophanous; evenly tan to greyish yellow-brown, young often with a sparse white frost; glabrous to finely innate fibrillose; margin paler, usually with a white rim, not striate.

Gills pale cinnamon.

Stipe cylindrical to slightly clavate, often sinuate, dry; white to pale brownish grey with white, absorbing girdles.

Veil white, sparse; cortina white.

Flesh pale cinnamon, marbled darker brown; odour weakly like "lubricant", taste nil.

Reactions: NaOH nil to weakly reddish; guayac nil.

Micro: spores elliptic, 6.8-8.2 × 4–5 µm, weakly verrucose.

Ecology: in *Nothofagus* forest, uncommon. Davis Flat, Te Anau Downs, Lake Gunn Track.

Ref.: Soop 2010.

A small, telamonioid fungus with an evenly-coloured, light tan cap and a dirty-white stipe, morphologically similar to the boreal *C. obtusus* (Fr.:Fr.) Fr. It may be difficult to separate *C. paraoniti* from *C. saturniorum*, which, however, is normally dry and often displays a violet tinge in the context. Cf. *C. viscincisus* (above). [*C. paraoniti* belongs, like the former, to sect. *Austroduracini*.]

Cortinarius opaculus Soop Plate 35

Cap 10–30 mm, viscid, hygrophanous; dark brown to warmly date brown, glabrous to finely innate fibrillose; margin paler, young with a thin white down, ± striate.

Gills pale brown-grey with a paler edge.

Stipe dry, cylindrical; white, absorbing to pale brown.

Veil white, very sparse; cortina white.

Flesh pale grey-brown; odour faint, ± raphanoid or like cocoa powder; taste nil.

Reactions: NaOH trivial.

Micro: spores elliptic, 8–10 × 5–6 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, sometimes fasciculate, rare. Hawdon.

Ref.: Soop 2013, Horak 197x as *Hydrocybe opaca* ined.

This is the darkest of the *Myxotelamoniæ* treated here, with a warm, saturated brown cap colour. It recalls a miniature *C. paraonui* (above), which is dry and presents brick-coloured gills.

28. Section *Obtusi* & allies

Cortinars in this group are small, dry, and brownish, exponents of the popular concept of "little brown mushroom", otherwise similar to those of the preceding group. [A few are members of the bihemispherical section *Obtusi* Melot.] See also *C. viscincisus* and *C. paraoniti* (above).

[Molecular studies have so far revealed about 42 *Obtusi* species in the South Pacific, most of them undescribed, and five of sequestrate habit. At least eight occur in New Zealand, one of which is the sequestrate ***C. leucocephalus*** (Massee) Peintner & M.M. Moser) (see Horak & Moser 1965 as *Thaxterogaster l.*).]

Cortinarius amblyonis Soop Plate 38

Cap 15–30 mm, dry, hygrophanous; dark red-brown to orange-brown, thinly white frosty when young, finely innate-fibrillose; margin striate.

Gills red-brown to cinnamon, distant.

Stipe cylindrical to somewhat tapering; thinly white coated, absorbing to pale brown.

Veil white, sparse; cortina white.

Flesh pale yellow-brown with a green-blue tinge when young; odour faintly raphanoid or of iodine; taste nil.

Reactions: NaOH ± trivial or dark red-brown on cutis and gills, else nil.

Micro: spores elliptic to subamygdaloid, 6.5–8.2 × 4.5–5.5 µm, moderately verrucose; marginal elements crowded, clavate, 25 µm long.

Ecology: in myrtaceous forest, uncommon. Waipori Falls.

Ref.: Soop 2016.

The species belongs to sect. *Obtusi*, where it is a typical member: small with a dry red-brown cap, a whitish stipe, and a faint odour of iodine (iodoform). The gills do not exhibit the cheilocystidia which are prominent on several other taxa in the section.

Cortinarius saturniorum Soop Plate 38

Cap 15–45 mm, dry, hygrophanous; pale red-brown to yellow-brown, sometimes with a faint, purple tinge; glabrous; young thinly white pruinose with a white rim, weakly or not striate

Gills pale grey-brown, sometimes with an evanescent purple tinge.

Stipe cylindrical to slightly clavate; silky white, zoned; base and sometimes apex with a violet tinge.

Veil white, sparse; cortina white, occasionally with a violet tinge.

Flesh pale grey-brown, usually violet in stipe-base (also when mature), young marbled faintly violet; odour and taste raphanoid or of "raw potatoes".

Reactions: NaOH trivial; guayac greyish green.

Micro: spores elliptic, 6.5–8.2 × 4.5–5.5 µm, weakly verrucose.

Ecology: in *Nothofagus* forest, common.

Ref.: Soop 2001.

Characterised by a warmly brown cap and a silky-white stipe with a violet base, at least in the context. The glabrous cap with a thin, white rim recalls certain European *Telamonia* with a similar coloration (e.g. *C. leiocastaneus* Niskanen et al.).

The variety ***leiochrous*** Soop (Plate 38; see Soop 2013) exhibits a pale greyish yellow cap of a remarkably even pastel finish, reminding of plastic, often with a viscid surface. [This variety is almost impossible to separate from *C. paraoniti* without recourse to molecular markers, which place them in widely separate clades.]

Cortinarius mysoides Soop Plate 35

Cap 20–40 mm, dry, hygrophanous; red-brown to yellow-brown with a greyish smoky shade, rather coarsely radially innate-fibrillose with a glabrous disk; margin paler, ± striate.

Gills saturated brick red, distant to moderately crowded.

Stipe cylindrical, slender, tough; greyish yellow with red-brown to brown tufts and girdles.

Veil red-brown; fairly copious; cortina yellowish grey.

Flesh yellow-brown, marbled orange-brown; odour weakly raphanoid; taste nil.

Reactions: NaOH dark red to red-brown on cutis, gills, and stipital veil.

Micro: spores elliptic to subamygdaloid, 7.5–9.5 × 4.5–5.5 µm, moderately to rather strongly verrucose.

Ecology: in *Nothofagus* forest, uncommon. Cameron Creek, Bridle Track.

Ref.: Soop 2016.

A small grey fungus, which recalls both *C. rattinus* and *C. rattinoides*. It is characterised by the interesting smoky or cloudy appearance of the cap, especially when young, and by the reddish gills and veil remnants on the stipe.

Cortinarius urbiculus Soop Plate 37

Cap 20–35 mm, dry, weakly or not hygrophanous; young with a white, felty to pruinose coating, soon absorbing to grey-brown; margin paler with a silky white rim, not striate.

Gills violet to greyish with a violet tinge.

Stipe clavate, sometimes cylindrical; white with a thin, felty to pruinose coating, often with a violet tinge.

Veil white, sparse; cortina white to grey-white.

Flesh white, often marbled violet, later grey to greyish yellow, rather soft; odour nil to faintly agaricoid, taste ± bitter.

Reactions: NaOH nil to slowly red on context and cutis, else nil; guayac nil.

Micro: spores elliptic, 6.5–8.2 × 3.8–5 µm, moderately to weakly verrucose.

Ecology: In *Nothofagus* forest, rare. Kepler Track.

Ref.: Soop 2016.

A small, greyish species with a clavate stipe and a matt, slightly grainy coating, recalling members of sections *Malachii* and *Anomali*. Cf. *C. laquellus*, a closely related taxon, which is viscid and possesses a thin stipe.

29. Section *Læti* and allies

Fruitbodies in this group are of a modest size with a yellow to orange cap and often stipe. Some are members of the bihemispherical section *Læti* Melot.

Cortinarius waiporianus Soop Plate 41

Cap 10–20 mm, dry to slightly viscid, hygrophanous, orange-brown to yellow-brown with a darker disk, young saturated red-brown with a white frost; margin paler, striate.

Gills pale cinnamon to orange-brown or red-brown, rather distant, edge paler.

Stipe cylindrical; coated white with white tufts at base, absorbing to brownish.

Veil white, sparse; cortina white.

Flesh pale tan, marbled pale red-brown; odour and taste nil.

Reactions: NaOH inconsistently brown-red on cutis and context.

Micro: spores elliptic to subamygdaloid, 8.5–10 × 5–6 µm, moderately verrucose; cheilocystidia sparse, 30–40 × 10 µm.

Ecology: in myrtaceous forest, occasional.

Ref.: Soop 2013.

A small fungus with a vivid cap colour, found in myrtaceous woods. It recalls *C. paraoniti*, which is viscid and grows with *Nothofagus*. [As shown by genetic markers, the species belongs to sect. *Læti*.]

C. lanceolatus M. Wallace (Plate 41) in myrtaceous woods is similar, but often provided with a stipital collar that makes it resemble a *Descolea* [Northwood]. [Molecular studies have shown that also this taxon belongs to sect. *Læti* along with at least five undescribed species from New Zealand (see Soop et al. 2018).]

Cortinarius palissandrinus Soop — Plate 40

Cap 10–30 mm, dry, hygrophanous, intensely dark red-brown to mahogany red, later fading towards margin; innate fibrillose; margin striate with sparse yellow-white fibrils.

Gills saturated brick red to orange-red; distant; edge sometimes stronger yellow or red.

Stipe cylindrical; yellow to pale brownish orange with sparse yellowish fibrils and tufts towards base.

Veil pale yellow, darkening, sparse; cortina very sparse, possibly absent.

Flesh yellowish white, marbled darker when young; odour and taste raphanoid.

Reactions: NaOH red on cutis and gills, inconsistently red-brown in context.

Micro: spores obtusely elliptic, 6.5–8 × 4.5–5.5 µm, moderately to rather weakly verrucose.

Ecology: In *Nothofagus* forest, uncommon. Kepler Track, Cameron Track, Blue Pools, Klondyke Spur Track, St Arnaud, Floral Saddle.

Ref.: Soop 2010.

Another small telamonioid fungus characterised by its mahogany-coloured cap and intensely brick-red gills. Specimens whose colours have faded from age or draught recall *C. paraoniti* and allies. *C. palissandrinus* differs from *C. luteinus* (below) mainly by a darker cap colour.

Cortinarius luteinus Soop — Plate 40

Cap 15–30 mm; dry to slightly waxy, hygrophanous; dark yellow to brownish orange, later with a yellow-orange centre; finely innate fibrillose; margin striate, young with thin, yellow fibrils.

Gills dark yellow to orange.

Stipe cylindrical to slightly tapering; yellow to greyish yellow, sometimes ± citrinous, with thin, yellowish fibrils; mycelial felt white.

Veil yellow to pale yellow, later darkening with a reddish tone, sparse; cortina yellow.

Flesh greyish yellow, stronger yellow in stipe-base; odour faintly raphanoid or nil; taste nil.

Reactions: NaOH trivial; guayac blue-green; fluorescence nil.

Micro: spores obtusely elliptic, 6.5–8.5 × 4.5–6 µm, moderately verrucose; marginal cells vesiculose, 20–35 × 9–12 µm.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2002.

This species is typical of a group of small, yellow to orange, telamonioid fungi found in the country. It differs from *C. ignellus* by its yellow veil, lack of alkaline reaction, and leaner spores. [*C. luteinus* forms with *C. palissandrinus* (above) the small section *Luteini* Soop.]

C. lætiluteinus ined. (Plate 40), rare in the same habitat is similar but even smaller (cap <12 mm) [Murray Creek Track]. [This taxon belongs to sect. *Læti*.]

Cortinarius malosinæ Soop — Plate 40

Cap 10–40 mm, dry, hygrophanous, yellow-brown to orange, young coated with a yellow frost, finely innate fibrillose; margin orange, slightly or not striate, sulcate when older.

Gills tan to orange-brown, distant, thick but not veined.

Stipe cylindrical; strikingly orange to red-orange, especially at base, fibrillose, central part sometimes merely pale yellow.

Veil orange to red-orange, fairly copious; cortina dark yellow.

Flesh saturated orange to orange-yellow, red-orange in stipe-base; odour nil or raphanoid; taste nil.

Reactions: NaOH trivial; guayac weakly green.

Micro: spores elliptic to subamygdaloid, 8–10 × 4.5–5.5 µm, moderately to rather weakly verrucose; cheilocystidia crowded, clavate, 20–40 µm.

Ecology: In *Nothofagus* forest, occasional.

Ref.: Gasparini & Soop 2008.

A small telamonioid yet attractive fungus, easily recognised from its spectacular orange colours, at least at the stipe-base, while the cap is often duller. Specimens with a less saturated hue may be separated from *C. luteinus* (above) by spore size. Cf. *C. thaumastus* (below).

Cortinarius thaumastus Soop Plate 41

Cap 15–30 mm, dry to slightly viscid, hygrophanous; handsomely apricot-brown to saturated red-orange; finely granulose to innate fibrillose, often with thick, ochre tufts and stains; margin concolorous with similar tufts, not striate.

Gills pale greyish, rather crowded, edge ± serrulate.

Stipe cylindrical to clavate, dry; white to pale yellow or pale orange, ochraceous fibrillose to peronate with a volva of thick tufts near base, sometimes terminating in a membranous collar; apex white.

Veil yellow to ochraceous, fairly copious; cortina white.

Flesh greyish ochre to greyish yellow; odour and taste nil.

Reactions: NaOH strongly orange on stipital veil, orange-brown in context, red to red-brown on cutis, trivial on gills; guayac blue-green.

Micro: spores elliptic to subamygdaloid, 8–10 × 3.5–4.5 µm, finely punctuate.

Ecology: in *Nothofagus* forest, rare. Craigieburn, Eves Bush, Floral Saddle.

Ref.: Soop 2005.

This small and striking fungus is characterised by its bright orange hue, pale gills, and an often peronate veil that ends in a collar on the stipe. It may resemble *C. subgemmeus*, from which it differs by more orange hues, a positive alkaline reaction, and different micro-characters. [*C. thaumastus* is the type of sect. *Thaumasti* Soop, which in addition comprises at least nine species from Patagonia, many with a peronate stipe.]

Cortinarius cypripedii Soop Plate 41

Cap 20–35 mm, dry, hygrophanous; warmly brownish red to dark orange, disk blackish red, glabrous to very finely innate-fibrillose; margin paler with fine reddish fibrils, striate.

Gills brownish red to cinnamon, distant.

Stipe cylindrical with a slightly pointed base; pale brown-yellow with rather dense red-brown fibrils.

Veil orange brown to brick red; fairly copious; cortina white.

Flesh dark yellow-brown to saturated brown-red; odour raphanoid; taste nil.

Reactions: NaOH trivial.

Micro: spores subglobose, 6–7 × 5–6 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, rare. Cameron Creek.

Ref.: Soop 2016.

The interesting colour combination of the cap of this decorative fungus recalls certain flowers. Otherwise it is small and telamonioid with reddish gills and veil, and the only species in the group with subglobose

spores. [Molecular analysis has shown that *C. cypripedii* belongs to the northern sect. *Illumini* (Liimat. et al.) Soop et al.] Cf. *C. palissandrinus* (above).

Cortinarius paraxanthus Soop Plate 34

Cap 15–45 mm, dry to slightly viscid, hygrophanous; olive-brown to dark yellow-brown, often with an umber disk; finely innate fibrillose; margin greyish yellow to olive-yellow, fibrillose, weakly striate, sulcate when old.

Gills yellow-brown, sometimes with an orange tinge, rather distant.

Stipe cylindrical, tall, slender, often hollow and sinuate, dry; shining lemon-yellow, micaceous from yellow-brown, thin fibrils and zones; base with white rhizomorphs.

Veil brownish yellow, sparse; cortina yellow to greenish yellow.

Flesh brown-yellow, sometimes with an olive tinge, blackish brown in cap; odour faint, raphanoid or reminding of "raw potato"; taste nil to slightly acerbic.

Reactions: NaOH trivial; guayac dark blue-green; fluorescence nil.

Micro: spores elliptic to amygdaloid, 7–9 × 4–5.2 µm, moderately to weakly verrucose

Ecology: in *Nothofagus* forest, occasional.

Ref.: Soop 2005.

A thin-fleshed fungus, mostly merely brown and yellow, but sometimes with a distinct olive tinge. The smell is typical of many telamonioid taxa: it can be likened to radish, raw potatoes, seaweed, “hospital”, etc. *C. paraxanthus* resembles certain *Pauperæ* (cf. *C. elaiops*), but does not react with alkaline solutions.

Closely related is ***C. citribasalis*** Soop (Plate 34), rare in the same habitat. It is smaller with a citrinous stipe base [Waipori Falls, Klondyke Spur Track; see Soop et al. 2018]. [Both belong to sect. *Paraxanthi* Soop, which in addition comprises at least two species from New Caledonia.].

Sequestrate *Cortinarius*

The term designates forms where the gills are poorly developed (*gleba*) and more or less enclosed by the cap (*peridium*). One may distinguish two types in New Zealand (Bougher & Lebel 2001): *secotioid* with a distinct stipe and an epigeous fruiting; and *gastroid* or truffle-like with a rudimentary or absent stipe and a more or less hypogeous fruiting. The stipe, even when rudimentary, usually extends into the gleba (*columella*), where it may be dendrous (i.e. split into several thin branches).

The former genus *Thaxterogaster* Sing. is a secotioid or gastroid evolution of *Cortinarius* and possesses many characters of the latter, such as a veil (sometimes also a rudimentary cortina) and verrucose, rusty-brown spores. The gleba is chambered with walls that are often radially and vertically oriented, recalling the lamellar arrangement of undeveloped agaricoid fungi. [Molecular studies (Peintner et al. 2001a, 2001b) demonstrate that *Thaxterogaster,* along with several other sequestrate genera from the South Pacific, is included in *Cortinarius,* where it is polyphyletic.]

30. Group *Thaxterogaster*

Cortinarius violaceovolvatus* var. *viola (Soop) A.R. Nilsen & Orlovich Plate 42

Basionym: *Thaxterogaster viola* Soop

Cap 30–35 × 15–35 mm, viscid, not hygrophanous; blue-lilac to red-lilac or amethyst-blue; glabrous; peridium 1–2 mm thick.

Gleba pale brown to red-brown; finely loculate, labyrinthine; odour none to faint, pleasant, sweetish or perfumed (cf. *Inocybe pyriodora*).

Stipe 30–75 mm, cylindrical; slightly viscid, silky; white with a violaceous sheen, sometimes with violet spots; context concolorous; distinct veil remnants lacking; columella percurrent with a narrow neck where it often breaks.

Veil: white to violaceous, very sparse; cortina white, membranous.

Reactions: NaOH nil; guayac strongly green.

Micro: spores cylindrical to oblong elliptic, 11.5–15.5 × 6-8.5 µm, moderately to rather coarsely verrucose.

Ecology: in *Nothofagus* forest, common, often solitary.

Ref.: Nilsen et al. 2020; Soop 2001, 2003 as *Thaxterogaster viola*; Taylor 1973, Stevenson 1982, Horak 1973b, as *Th. porphyreum*.

This is the commonest *Thaxterogaster* in the area, found in most native-beech forests, but usually only in small numbers. It is characterised by a brilliantly violaceous cap and a whitish to violet cylindrical stipe with a sparse veil. The cap often falls off at maturity (which may be part of a strategy for spore dispersal). All all-white albino form has also been observed [Bridle Track].

The variety has traditionally been called ***C. porphyroideus*** (E. Horak) Peintner & M.M. Moser, which has been shown by molecular markers to be a very rare taxon in sect. *Dulciolentes*, so far known only from the Wellington area (Nilsen et al. 2020; see further Horak 1973b as *Thaxterogaster porphyreus* E. Horak.)

The type variety of ***C. violaceovolvatus*** (E. Horak) Peintner & M.M. Moser (Plate 42) is rare in the same habitat. It is smaller with the cap only partly violaceous, the disk being pale tan to red-brown [St Arnaud Range; see Horak 1973b as *Thaxterogaster v.*]. — Several additional species, sharing the morphology of *C. violaceovolvatus* var. *viola,* have been observed in the country (Nilsen et al. 2020). One is ***C. diaphorus*** Soop, A.R. Nilsen & Orlovich (Plate 42). ***C. purpureocapitatus*** X. Wang et al. is part of sect. *Marmorati* (Ch. 21), ***C. violaceocystidiatus*** A.R. Nilsen & Orlovich is part of sect. *Cuphomorphi* (Ch. 23), and ***C. minorisporus*** X. Wang et al. is a singleton.

Cortinarius epiphæus (E. Horak) Peintner & M.M. Moser — Plate 43

Basionym: *Thaxterogaster epiphæus* E. Horak
Synonym: *C. napivelatus* (E. Horak) Peintner & M.M. Moser

Cap 20–60 × 20–40 mm, viscid, hygrophanous; brownish yellow to tan, sometimes darker with a faint olive tinge; glabrous but often provided with scattered yellowish tufts that multiply near the margin; peridium thick (1–2 mm), pale yellow in section.

Gleba pale red-brown to yellow-brown; densely loculate; odour nil to slightly sweetish.

Stipe 30–80 mm, cylindrical, robust, often abruptly truncated at base, tough, hard; dry to slightly viscid; white to pale yellow, later flushing brownish yellow, base with yellow-brown to orange-brown ± thick tufts; columella percurrent, tapering towards peridium; context white.

Veil ochre, darkening to orange-brown, copious around cap margin.

Reactions: NaOH yellow-brown to orange on stipital veil, else nil.

Micro: spores elliptic, 9.5–12.5 × 6–7 µm, moderately to fairly strongly verrucose.

Ecology: in *Nothofagus* forest, occasional.

Ref.: Horak 1973b (also as *C. napivelatus*), Taylor 1973, Stevenson 1982.

This ubiquitous secotioid species is characterised by a brownish cap and a whitish, rather robust stipe. It can exceptionally become very large. [*C. napivelatus* (E. Horak) Peintner & M.M. Moser is genetically identical, and may be regarded as a form with a shorter stipe provided with a marginate bulb (see Horak 1973b as *Thaxterogaster n.*; Craigieburn, Waimakariri).]

Cortinarius ohauensis (Soop) Peintner & M.M. Moser Plate 43

Basionym: *Thaxterogaster ohauensis* Soop
Synonym: *Austrogaster novæzelandiæ* Reid

Cap 30–45 × 15–30 mm; almost dry; warm but rather pale apricot-brown; young coated with a pale-ochre veil, darkening, breaking into patches and squames, especially at centre; margin fibrillose.

Gleba pale brown; ± vertically chambered, exposed around stipe; odour nil.

Stipe 20–45 mm, rather short; ± triangular without a bulb but often napiform; pale yellow; fibrillose with thick velar remnants at base; columella percurrent, attenuated near peridium; context white.

Veil ochre, rather copious; cortina yellowish grey, copious.

Reactions: fluorescence yellow in stipe context.

Micro: spores obtusely elliptic to subglobose, 9.5–11 × 6.5–7.5 µm, almost smooth.

Ecology: in *Nothofagus* forest, rare. Lake Ohau, Waimakariri.

Ref.: Soop 1998, Reid 1986 as *Austrogaster novæzelandiæ.*

Resembles *C. epiphæus* (above), but possesses a paler brown cap and a shorter, triangular stipe. The spores are almost smooth under a light-microscope but SEM examination reveals the presence of low, connected or oblong warts. [Molecular studies have shown that both species are part of sect. *Subcastanelli* (Ch. 19), where *C. ohauensis* is genetically almost identical to *C. trichocarpus*, possibly indicating a morphospecies. This relationship between secotoid and agaricoid *Cortinarii* has also been observed for a few Australian taxa.]

Cortinarius anisodorus (E. Horak) Peintner & M.M. Moser Plate 15

Basionym: *Thaxterogaster anisodorus* E. Horak

Cap 20–30 × 20 mm, dry, not hygrophanous; pale greyish yellow to greyish tan, with sparse yellowish ones; glabrous; peridium 1 mm thick, pale yellow in section.

Gleba brown; densely loculate; odour like aniseed or nil.

Stipe rudimentary but distinctly marginate-bulbous; columella short.

Veil very thin.

Reactions: not tested.

Micro: spores obtusely elliptic, 8.7–11.5 × 6.5–8 µm, moderately verrucose.

Ecology: in *Nothofagus* forest, rare. Nelson.

Ref.: Horak 1973b.

A small gastroid fungus, recalling a potato, also in colour which is rather pale tan. The short stipe, consisting almost entirely of a marginate bulb, is also characteristic. It is described with a strong aniseed odour, which was absent in the described collection.

Cortinarius beeverorum Orlovich, X. Y. Wang & T. Lebel Plate 15

Cap ± 25 mm, spherical, very viscid; dark, saturated orange, drying more yellow; glabrous; peridium ± 1 mm thick, concolorous in section with a paler hypoderm.

Gleba brown, finely labyrinthine-loculate; odour faint, aromatic.

Veil dark orange to reddish, gelatinous, fairly copious.

Stipe none, columella almost absent or thin, dendrous; basal part rudimentary with sparse ochraceous fibrils.

Reactions: NaOH trivial.

Micro: spores obtusely elliptic, 13.5–16.5 × 8.7–10.5 µm, coarsely verrucose.

Ecology: in *Nothofagus* forest, rare. Floral Saddle, Waimakariri.

Ref.: Orlovich et al. 2014.

This is a round, gastroid, sticky fungus with a beautiful dark orange colour.

C. beeverorum has long been confused with ***C. peraurantiacus*** Peintner & M.M. Moser (see Horak 1973b as *Thaxterogaster aurantiacus*), which is found under myrtaceous trees and possesses a more pronounced columella and shorter spores.— ***C. pisciodorus*** (E. Horak) Peintner & M.M. Moser. [= *Thaxterogaster p.;* see Horak 1973b] is more yellow-brown in colour, and has been reported to exhale a fishy odour. [Molecular studies show that these taxa all belong to sect. *Dulciolentes* (Ch. 10).]

List of Localities

Adams Track, Karamea
Albany Scenic Reserve, Auckland
Arthur's Pass, Canterbury
Awahu, NE of Stratford, Wanganui
Bealey Track, Arthurs Pass
Berlins, Westport
Black Hill Track, St Arnaud
Blue Pools Track, Haast Pass
Borland Lodge Track, Manapouri
Boyds Creek, Te Anau Downs
Boyle River Track, Lewis Pass
Bridle Track, Haast Pass
Cameron Creek Track, Haast Pass
Cameron Track, Haast Pass
Cascade Hut Track, Kaimanawas, Taupo
Clements Mill Rd, Kaimanawas, Taupo
Craigieburn, Canterbury
Davis Flat Track, Haast Pass
Denniston Walkway, Westport
Deer Flat rest area, Fiordlands
Evansdale Glen, Mosgiel
Eves Bush, Brightwater, Nelson
Floral Saddle Reserve, Nelson
Greyneys Shelter rest area, near Arthur's Pass
Hanmer Springs, Waterfall Track, Canterbury
Harwoods Hole, Abel Tasman, Nelson
Hawdon Valley Track, Cass, Canterbury
Horton Reserve, Albany, Auckland
Karamea River, Karamea
Kepler Track, Te Anau
Kiko Road Track, Taupo
Klondyke Corner rest areas, near Arthur's Pass
Klondyke Spur Track, Rahu, Springs Junction
Kowai Bush, Springfield, Canterbury
Lake Daniel Track, Lewis Pass
Lake Gunn Track, Fiordlands
Lake Hauroko Track, Tuatapere
Lake Mistletoe Track, Te Anau Downs
Lake Ohau, Mackenzie
Lake Waikareiti Track, Tuai, Urewera
Lee Valley Rest Area, Brightwater, Nelson
Lindemans Track, Katikati
Mackay Creek rest area, 26 km N of Te Anau Downs
Maclean Track, Huai, Auckland
Mangatangi Track, Hunua, Auckland
Matawai Conservation Area, Gisborne
Mistletoe Lake Track, Te Anau Downs
Mt Robert, St Arnaud, Nelson
Mt Egmont, Wanganui
Murray Creek Track, Reefton
Northwood Reserve, Albany
Palmer Road, Springs Junction
Rimutake Forest Park, Wellington
St Arnaud Range, Nelson
St Arnaud Camp Site, Nelson
St Arnaud West Bay Track, Nelson
Tawa Track, Tuai, Urewera
Tawanui, Owaka, Otago
Tawhai Rest Area, Reefton
Te Anau Downs, lake zone from Downs –12 km south
Te Iringa Track, Kaimanawas, Taupo
Totara rest area, 24 km N of Te Anau Downs
Towhai rest area, Reefton
Waimakariri Valley Track, near Arthur's Pass
Waiora Scout Camp, Dunedin
Waipori Falls, Mosgiel
Walker Creek Rest Area, near Te Anau Downs
Wangapeka Valley Reserve, Nelson
Woodside Glen, Dunedin

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