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New species and records of *Rhodocybe* (Entolomataceae, Agaricales) from Tasmania

Timothy J. Baroni[A,C] *and Genevieve M. Gates*[B]

[A]Department of Biological Sciences, State University of New York—College at Cortland, PO Box 2000, Cortland, NY 13045, USA.
[B]School of Plant Science, University of Tasmania, Private Bag 55, Hobart, Tas. 7001, Australia.
[C]Corresponding author. Email: baronitj@cortland.edu

Abstract. Five new and two previously unrecorded species of *Rhodocybe* (Agaricales, fungi) are described from the Australian state of Tasmania with a key provided to species known from Australia and New Zealand. This is the first report of *Rhodocybe* taxa for Tasmania, and increases the known number of species of this genus for the Australia / New Zealand region from 13 to 18. The newly described species of *Rhodocybe* are *R. pseudopiperita*, *R. lateritia*, *R. pallidogrisea*, *R. tasmanica* and *R. amara.*

Introduction

Records of Entolomataceae reported for Australia date back to the 19th century with publications by Berkeley (1859), McAlpine (1895), Cooke (1892*a*, 1892*b*) and Massee (1898, 1899). However, the genus *Rhodocybe* was not recognised until 1924 [1926] by Maire (1924). The 20th century brought forth works by Cleland (1927, 1931, 1933) and Pegler (1965) in which members of the Entolomataceae were dealt with, but only one species of *Rhodocybe* was recognised by Pegler (1965). Horak (1979) described nine species of *Rhodocybe* from New Zealand, with five of those taxa reported as new. Grgurinovic (1997) revised the previously reported species of *Rhodocybe* from South Australia, but listed only two species that had previously been recognised by Horak (1978 / 1979); no new taxa were described in that work. A compilation of macrofungi in Australia by May and Wood (1997) listed five species of *Rhodocybe* for Australia, but no new species were presented. If the work of Horak (1979) for New Zealand, based on his personal collecting and previous work by Stevenson (1964), is included in this census and corrected for species that do not belong in *Rhodocybe* (see Baroni 1981), then there are 13 species of *Rhodocybe* known from the Australia / New Zealand region. Species of *Rhodocybe* have not been previously reported for Tasmania, and this paper is the first to document the genus from this Australian state.

Tasmania is an island, lying between 40° and 43°40′ south of the equator, separated from the mainland of Australia by Bass Strait. The island has an area of 68 200 km^2, making it approximately the same size as Sri Lanka and a little smaller than Ireland. If Tasmania were in the northern hemisphere, it would be in a similar latitude to north-west Spain and the extreme north of California and be described as having a modified marine Mediterranean climate. The geology and marked spatial patterns in precipitation of this mountainous island and the effects of the Southern Ocean, the Indian Ocean and the Tasman Sea have resulted in diverse habitats with interesting and varied vegetation.

This vegetation falls into three broad formations: austral montane, temperate rainforest and sclerophyll forest (wet and dry). Generally, fungi are sparse in the austral montane and dry sclerophyll forest unless conditions are conducive for fruit body production. In contrast, the cool temperate rainforests dominated by *Nothofagus* and the wet eucalypt forests dominated by *Eucalyptus* (see Jackson 1999 for a detailed description), support a rich mycota, the majority of species of which appear to be undescribed and unnamed.

Tasmania, being geographically delimited with its natural boundaries imposed by water on all sides, presents a unique opportunity to conduct a taxonomic study of the Family Entolomataceae. This paper is the first in a series of presentations on the genera *Rhodocybe*, *Clitopilus*, and *Entoloma* s.l., and is confined to the genus *Rhodocybe*.

Materials and methods

Intensive collecting was undertaken over the period 1998–2005, predominantly in the south-east and south-west of the island with some sojourns to the north-east and north-west and rarely at an altitude exceeding 750 m. The south-east and south-west regions of Tasmania

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contain many wet forests rich in fungi and which are within reasonable driving distance of Hobart.

Fresh collections were photographed and described with colour notations made according to Kornerup and Wanscher (1978). Mounts for microscopic analysis were made from dried material and examined in water, 10% NH_4OH, 3% KOH, or ammoniacal Congo Red. All measurements were made in 10% NH_4OH or 3% KOH. For basidiospore measurements, the hilar appendix was excluded. In those measurements Q refers to the length divided by the width of an individual spore. The notation $n/5 = 78$, means that 78 individual basidiospores were measured from five different collections, while $n = 48$ means that 48 individual spores were measured from a single sample. $Mean_L$ is the mean length, $mean_W$ is mean width, and $mean_Q$ is the mean of the length divided by the width of all basidiospores measured. Drawings of basidiospores, cystidia and other microscopic structures were made with the aid of a drawing tube attached to a light microscope. Holotype specimens are deposited in the Tasmanian Herbarium (HO); isotypes are deposited at the State University of New York—College at Cortland Herbarium (CORT). All other specimens examined are deposited in both (HO) and (CORT) unless indicated otherwise.

Key to species of *Rhodocybe* from Australia (including Tasmania) and New Zealand

*Species described in this work.

1. Hymenial pseudocystidia with brightly coloured contents (ochre, orange, reddish brown) present in mounts of 3% KOH, 10% NH_4OH or water; repository hyphae with brightly coloured contents in lamella trama also present. 2
   Hymenial pseudocystidia and repository hyphae with brightly coloured contents absent. 8
2. Stipe lateral or absent; pileus to 15 mm broad, white to pale brown; on rotting trunks of tree fern and *Nothofagus*. Known only from New Zealand . . . . . *R. conchata* E. Horak
   Stipe central, well developed. 3
3. Pileus to 20 mm broad, pale buff-brown with pinkish hues, convex or truncate-campanulate; stipe buff; taste very bitter. . . . . *R. amara* (*)
   Pileus larger and / or more darkly coloured ochraceous or brownish or fuliginous; taste bitter or not bitter. 4
4. Basidiospores distinctively amygdaliform and often with a projecting 'snout' forming on the apex of the spores, 7–12.5 × 4–5.6 µm; pileus conical-convex or convex, dark teak brown but fading to yellows with age; taste bitter; vesiculose cells present in stipe trama. . . . . *R. tasmanica* (*)
   Basidiospores ellipsoid and shorter; pileus typically depressed or umbilicate or infundibuliform with age; taste mild; lacking vesiculose elements in stipe trama. 5
5. Lignicolous; pileus to 25 mm broad, ochraceous, infundibuliform; lamellae long decurrent; basidiospores ellipsoid, 6.5–9(−10) × 4–5(–5.5) µm (vide Baroni 1981). . . . . *R. gracilenta* (Cooke & Massee) Pegler
   Not truly lignicolous on woody substrates, may be on trunks of tree ferns; pileus greyish or brownish or fuscous or fuliginous, if ochraceous then pileus much larger and basidiospores less than 6 µm long. 6
6. Pileus to 25 mm broad, convex becoming umbilicate, fuscous greyish; stipe paler than pileus, radicating in soil; basidiospores 5.5–7 × 4.5–5 µm (vide Horak 1978 / 1979). . . . . *R. radicata* (Cleland) E. Horak
   Pileus smaller (to 20 mm broad) or larger (to 45 mm broad), depressed with age; stipe either concolorous with pileus or darker, not radicating. 7
7. Pileus umbilicate or subinfundibuliform; basidiospores 4.5–5.5 × 3.5–4 µm; pseudocystidia hyaline and lacking inclusions, narrowly fusoid with undulate walls; on soil (vide Horak 1979). Known only from New Zealand. . . . . *R. dingleyi* E. Horak
   Pileus convex with shallow depression, more broadly depressed with age, dark brown to fuliginous; stipe concolorous; basidiospores 5.6–8.8 × 4.5–6.4 µm; pseudocystidia with obvious ochre-reddish granular content, ventricose, ventricose-rostrate or broadly fusoid with non-undulating walls; on soil or decaying plant litter. . . . . *R. fuliginea* E. Horak (1979) (*)
8. Pileus pallid or pinkish, pinkish buff, reddish brown, burnt sienna (with some pink or reddish hues). 9
   Pileus brown or greyish brown. 14
9. Stipe eccentric or lateral; pileus pinkish buff or pink, to 80 mm broad; basidiospores 5.5–7 × 4–5 µm; on rotting wood (vide Horak, 1979). Known only from New Zealand. . . . . *R. albovelutina* (G. Stev.) E. Horak
   Stipe central; pileus pallid or pinkish buff or pink or darker cinnamon pinkish brown; on soil or decaying plant debris. 10
10. Pileus and stipe pallid (whitish), pileus 20–40 mm broad, umbilicate then infundibuliform; lamellae white, crowded (Cooke 1892*b*; but see Horak 1978 / 1979); basidiospores ellipsoid 4.5–6.5 × 3–4 µm (vide Horak 1978 / 1979). . . . . *R. cyathoidea* (Cooke & Massee) E. Horak
    Pileus and stipe coloured with pinkish hues or darker. 11
11. Pileus argillaceous-pink (pinkish clay colour or pinkish ochraceous-cinnamon-brown, Snell and Dick 1957), to 15 mm broad, convex or campanulate; hyphae of pileus brown encrusted (vide Horak 1979). Known only from New Zealand. . . . . *R. iti* E. Horak
    Pileus and stipe pinkish buff or pink or burnt sienna or reddish brown, much larger. 12
12. Pileus burnt sienna or reddish brown. . . . . *R. lateritia* (*)
    Pileus much paler coloured, pink or pinkish buff. 13
13. Pileus to 47 mm; stipe 4 × 30 mm, slender; odour and taste of fresh mown green grass or not distinctive; basidiospores 5.6–8 × 4–5.6 µm; hyphae of pileus surface finely yellow brown encrusted, with scattered cystidioid end cells in pileus surface hyphae. . . . . *R. pseudopiperita* (*)
    Pileus to 80(−130) mm broad; stipe 10–15 × 30–40 mm, robust; odour and taste peppery when fresh or when drying; basidiospores 6.5–10.5 × 5–7(−8.5) µm; hyphae of pileus surface not encrusted, end cells of pileus surface hyphae not cystidioid (vide Baroni 1981). Known from New Zealand and Hawaii (D. Desjardin, personal comm. and collection examined by us). . . . . *R. piperita* (G. Stev.) E. Horak
14. Pileus surface with concentric dark greyish-brown reticulate cracks or lines. . . . . *R. reticulata* (Cleland) E. Horak (*)
    Pileus not concentrically reticulate or reticulate-rimose. 15
15. Pileus uniformly grey or greyish brown, 16–35(−75) mm broad, surface glabrous, entire, suede-like or felted under a lens; lamellae creamy buff or greyish buff, subdecurrent or decurrent; pileipellis two-layered with a hyaline suprapellis and a brown encrusted subpellis. . . . . *R. pallidogrisea* (*)
    Pileus brown or dark brown; pileipellis composed of a single layer. 16
16. Pileus to 40 mm, brown, robust; lamellae adnate or emarginate; basidiospores 6–7.5 × 3.5–4 µm (vide Horak 1979). Known only from New Zealand. . . . . *R. muritai* (G. Stev.) E. Horak
    Pileus to 45 mm or smaller; but lamellae subdecurrent or decurrent. 17

17. Pileus 8–15 mm broad, convex becoming plano-convex with shallowly depressed disc, dark brown; odour and taste rancid farinaceous; basidiospores 7.5–10.5 × 5–6 µm; hymenial cystidia lacking (vide Horak 1979). Known only from New Zealand. . . . . *R. maleolens* E. Horak
Pileus to 45 mm broad; umbilicate or subinfundibuliform, dark brown or ochraceous; stipe argillaceous with distinct salmon pink hues; odour and taste unknown; basidiospores 4.5–5.5 × 3.5–4 µm; hymenial cystidia hyaline, narrowly fusoid with undulate walls (vide Horak 1979). Known only from New Zealand. . . . . *R. dingleyi* E. Horak

Taxonomy

Description of new species

1. *Rhodocybe pseudopiperita* T.J. Baroni & G. Gates, *sp. nov.*

Pileus bubalino-roseolus colouribus ochraceis paululum tinctus, saepe supra centrum infuscatus brunnescensque, in areolis primum hygrophanus deinde pallide subroseo-bubalinus, (15–)24–47 mm latus, convexus, saepe leniter umbonatus, siccus vel interdum in statu madido lubricus, ut videtur glaber sed sub lente ×10 implicatus vel pannosus, laevis, interdum in superficie leniter rugulosus, opacus. Lamellae bubalino-roseolae, plerumque decurrentes sed nonnullae adnatae vel subdecurrentes, arctae vel coarctatae lamellulis in gradibus duobus dispositis. Stipes roseolo-bubalinus, intus roseolo-bubalinus vel arctus farctus, tomento albo basali atque rhizomorphis albis praeditus, 20–30 mm longus, ad apicem 2.5–4 mm latus, ad basem 2–6 mm latus, plusminusve aequus, teres, siccus, glaber vel sub lente ×10 leniter pruinosus, laevis vel subasper. Odor graminum nuper sectorum vel non distinctus. Sapor graminum viventium vel non distinctus. Basidiosporae 5.6–8 × 4–5.6 µm, ellipticae vel subamygdaliformes vel amygdaliformes, ad polum visae angulares (faciebus 7–10), omnino distincte undulato-pustulatae vel obscure vel in sporis maioribus vel maturis sublaeves, parietibus aeque cyanophilicis. Basidia 4-sterigmata. Cystidia hymenialia nulla. Pileipellis hyalina vel pallide straminea, repens, plerumque cylindrica, interdum subinflata, 3.2–7.2(−10.5) µm diametro, hyphis angustissimis crustulis leniter pallide flavo-brunneis (obscuris, interdum difficiliter inventis), nonnullis cellulis ultimis anguste clavatis vel anguste ventricosis hyalinis vel pigmentis plasmaticis sublutescentibus, 24–38 × 4–9.7 µm. Fibulae nullae. Holotypus: G. Gates E1231 (HO).

Pileus buff pink, pale flesh pink or pale pinkish buff with some ochraceous hues, often darker and brownish over centre, hygrophanous in patches becoming pallid pinkish buff, (15−)24–47 mm broad, convex and often weakly umbonate with shallow depression around umbo, margin entire, incurved or decurved becoming plane, then uplifted with age, dry or occasionally lubricous in wet conditions, glabrous but matt or felted under ×10 lens, smooth but occasionally with finely rugulose surface, opaque. *Lamellae* buff pink or pinkish or flesh pink, mostly decurrent but some adnate or subdecurrent, arcuate or segmentiform, to 3–5 mm deep, close to crowded with 2 tiers of lamellulae, moderately thin. *Stipe* buff-pink or pinkish buff, stuffed pinkish buff or whitish inner, some white basal tomentum and white rhizomorphs, 20–30 mm long, 2.5–4 mm broad at apex, 2–6 mm broad at base, ±equal, terete, dry, glabrous or finely pruinose under a ×10 lens, smooth or slightly roughened, fistulose with age. *Odour* freshly mown green grass or not distinctive. *Taste* green grass or not distinctive.

Basidiospores 5.6–8 × 4–5.6 µm ($n/5 = 78$, $\text{mean}_L = 6.58 \pm 0.65$, $\text{mean}_W = 4.66 \pm 0.32$, $Q = 1.17$–2, $\text{mean}_Q = 1.42 \pm 0.15$; Holotype, 5.6–7.2 × 4.2–5.3 µm, $n = 38$, $\text{mean}_L = 6.36 \pm 0.37$, $\text{mean}_w = 4.64 \pm 0.29$, $Q = 1.23$–1.60, $\text{mean}_Q = 1.37 \pm 0.09$), elliptical or subamygdaliform or amygdaliform in profile view, elliptical in face view, angular in polar view (7–10 facets), distinctly undulate-pustulate in all views, but obscurely so or ± smooth on larger / older spores, walls evenly cyanophilic, inamyloid. *Basidia* 22–34 × 5–8 µm, clavate, 4-sterigmate. *Hymenial cystidia* absent. *Lamella trama* hyaline, parallel, cylindrical hyphae, 4–8 µm in diameter. *Pileipellis* hyaline or pale stramineous, repent, mostly cylindrical, some slightly inflated, 3.2–7.2(−10.5) µm in diameter, the narrowest hyphae with fine pale yellow brown encrustations (obscure and sometimes difficult to find), some end cells narrowly clavate, narrowly ventricose, hyaline or with pale yellowish plasmatic pigments, 24–38 × 4–9.7 µm. *Pileus context* hyaline, interwoven, cylindrical or slightly inflated hyphae, 4–16 µm in diameter. *Clamp connections* absent (Figs 1–3, 21).

Habitat

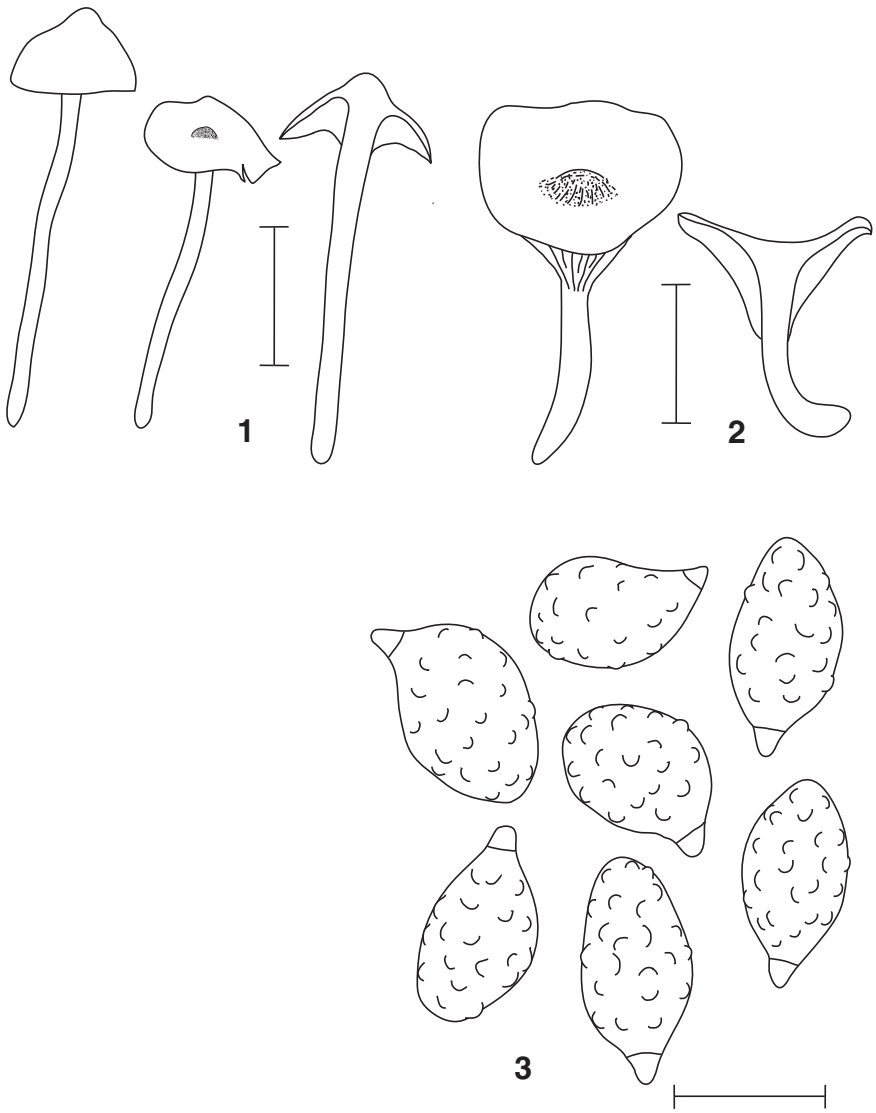
Wet sclerophyll gullies or wet sclerophyll forests.

Selected specimens

TASMANIA: Mt Wellington, Myrtle Gully, 42°54′S, 147°15′E, 13.iv.1999, *G. Gates E413 & D. Ratkowsky*; same location 3.v.2001, *G. Gates E1159 & D. Ratkowsky*; Wielangta, 42°42′S, 147°51′E, 22.vi.1999, *G. Gates E620 & D. Ratkowsky*; Mt Field, 42°41′S, 146°42′E, 29.vi.1999, *G. Gates E643 & D. Ratkowsky*; same location, 9.vi.2001, *G. Gates E1231 & D. Ratkowsky* (Holotype, HO; 536114 Isotype, CORT); Noel Jago Track, Oldina Forest Reserve, 41°00′S, 145°40′E, 1.v.2005, *G. Gates E2151 & D. Ratkowsky* (HO).

Commentary

Rhodocybe pseudopiperita is a slender pale pinkish buff taxon that differs from the similarly coloured *R. piperita* (G. Stev.) E. Horak by its smaller basidiospores (i.e. 5.6–8 × 4–5.6 µm for *R. pseudopiperita* and 6.5–10.5 × 5–7 (−8.5) µm (Baroni 1981) or 7–10 × 5–6 µm (Horak 1979) for *R. piperita*) and lack of peppery odour and taste. *Rhodocybe pseudopiperita* has several other characters that distinguish it from *R. piperita*. The presence of finely



Figs 1–3. *Rhodocybe pseudopiperita*. **Fig. 1.** Basidiomata E1231 (TYPE), scale bar = 20 mm. **Fig. 2.** Basidiomata E620, scale bar = 20 mm. **Fig. 3.** Basidiospores E1231 (TYPE), scale bar = 5 µm.

yellowish brown encrusted narrow hyphae in the pileipellis of *R. pseudopiperita* (encrusted hyphae are not present in *R. piperita*) and the presence of scattered cystidioid end cells in the pileipellis for *R. pseudopiperita* (there are no cystidioid end cells present in the pileipellis of *R. piperita*) also separate these two taxa.

Rhodocybe antipoda (G. Stev.) E. Horak was considered similar to *R. piperita* and thus difficult to distinguish from *R. piperita* in the field (Horak 1979). However, *R. antipoda* is actually a species of *Lepista* based on the cyanophilic verrucae of the basidiospores and the rounded, not angular morphology of those spores in polar view (Baroni 1981). Thus the correct name is *Lepista antipoda* G. Stev. for that taxon or *Clitocybe antipoda* (G. Stev.) T. J. Baroni (Baroni 1981).

Rhodocybe pseudopiperita shows an interesting dimorphic basidiospore morphology with most of the spores being distinctly undulate-pustulate and smaller (5.6–6.4 × 4–4.8 µm) while ~30–45% of the basidiospores are almost smooth and distinctly larger (7.2–8.8 × 4.8–5.6 µm). *R. lateritia* also shows this odd dimorphism in spore form. Please refer to the commentary under *R. lateritia* for further comments.

2. *Rhodocybe lateritia* T.J. Baroni & G. Gates, *sp. nov.*

Pileus rubro-senatus vel rubello-brunneus, primum hygrophanus deinde pallido-bubalinus vel bubalino-roseus, saepe maculis pallescentibus pruinoso-pellucidis aquosis, 21–85 mm latus, primo convexus cito plano-convexus, deinde margine elevatus, interdum late atque non

profunde depressus, siccus, in statu madido sublubricus vel gelatinosus, in superficie implicatus vel pannosus, opacus. Lamellae juveniles pallide roseolae, deinde carneo-roseolae vel brunneolo-roseolae, decurrentes vel subdecurrentes, interdum primum adnatae, congestae, lamellulis in gradibus duobus dispositis. Stipes exalbescens vel subbubalinus, omnino pruina alba atque tomento albo basali, ad apicem 5–13 mm latus, ad basem 5–20 mm latus, 16–55 mm longus, aequus vel deorsum contractus vel ad basem protuberans subclavatusque, typice robustus sed interdum flexuosus, teres, siccus, glaber, intus albus farctus. Odor aromaticus, in statu sicco mucidus vel odore condimenti, interdum in statu naturali odore aromatico carens. Sapor non distinctus. Basidiosporae 5.6–11 × 4.5–7.2 µm, ellipticae vel subamygdaliformes, ad polum visae angulares (faciebus 8–11–13), leniter vel modice undulato-pustulatae, parietibus aeque cyanophilicis. Basidia 4-sterigmata. Cheilocystidia distanter sparsa, saepe paene procurrentia, nonnulla inclusa, maximum partem cylindrica, saepe ex base ramoso orientia, nonnulla interdum septata, flexuosa vel subcapitata vel angustate fusiformia, hyalinae, 36–66 × 3.2–6 µm. Pleurocystidia nulla. Pileipellis stratum pallide flavo-brunneum ex hyphis repentibus, laxe intertextis, cylindricis vel subinflatis, 4–10.5 µm diametro, crustulis carentibus, nonnullis hyphis atque cellulis ultimis pellicula tenui gelatinoidea, reagentibus quum in tinctura Congo Red dicta tinctis, cellulis ultimis (pileocystidiis) distinctis, sparsis, versiformibus praeditis, cellulis ultimis clavatis, fusiformibus, late lecythiformibus vel ventricoso-rostratis, nonnullis collo septato, 25–65 × 4–22.7 µm. Fibula nulla. Holotypus: G. Gates E1589 (HO).

Pileus burnt sienna (7D6), reddish brown (8E1) or burnt sienna overlying terracotta (9D6) producing an ochraceous pink hue, hygrophanous, becoming pale buff or buff pink, not infrequently with pallescent frosted-translucent watery spots (Wasserflecken) or patches of these translucent watery spots present on the darker pigmented surface before those colours are lost, to 21–85 mm broad, convex but soon plano-convex becoming plane and eventually uplifted, some broadly and shallowly depressed, margin incurved or inrolled at first, becoming decurved, straight or plane or uplifted with age, entire, dry but slightly lubricous or gelatinous when wet, surface matt or felty, opaque, pellis rind-like. *Lamellae* pale pink when young, becoming buff-pink, fleshy pink or brownish pink, decurrent or subdecurrent, occasionally slightly adnate at first, arcuate, 3–5 mm deep, crowded, with two tiers of lamellulae, moderately thin. *Stipe* off white or becoming buff, with white pruina overall and white basal tomentum, 5–13 mm broad at apex, 5–20 mm wide at base, 16–55 mm long, equal or tapered downwards or base swollen and subclavate, stout typically but some flexuous, terete, dry, glabrous, stuffed white inside. *Odour* spicy when fresh, more spicy-musty or curry-like when dried, some fresh specimens not always with distinctive spicy odour. *Taste* not distinctive.

Basidiospores 5.6–11 × 4.5–7.2 µm ($n/8 = 84$, $\text{mean}_L = 7.5 \pm 0.98$, $\text{mean}_W = 5.4 \pm 0.57$, $Q = 1.24–1.62$, $\text{mean}_Q = 1.29 \pm 0.08$: Holotype, 6.9–8.6 × 5–6.2 µm, $n = 31$ $\text{mean}_L = 7.6 \pm 0.49$, $\text{mean}_W = 5.5 \pm 0.34$, $Q = 1.24–1.62$, $\text{mean}_Q = 1.37 \pm 0.08$), elliptical or subamygdaliform in profile view, elliptical in face view, angular in polar view (8–11–13 facets), weakly or moderately undulate-pustulate ornamented, walls evenly cyanophilic, walls inamyloid. *Basidia* 28–37 × (7−)8–9.7 µm, 4-sterigmate, clavate. *Cheilocystidia* widely scattered, often barely projecting, some embedded and obscure, mostly cylindrical, often from a branched base and some occasionally septate, some also flexuous or subcapitate or narrowly fusiform, hyaline, 36–66 × 3.2–6 µm. *Pleurocystidia* absent. *Lamella trama* hyaline, of parallel, cylindrical or slightly inflated hyphae, 4–10(−17) µm in diameter. *Pileipellis* a pale yellow brown layer of repent, but loosely interwoven, cylindrical or slightly inflated hyphae, 4–10.5 µm in diameter, not encrusted but producing plasmatic or vacuolar pigment, some hyphae and end cells with thin gel-like pellicle when stained in Congo Red, with distinctive scattered versiform end cells (pileocystidia) that are embedded repent or often in clusters of typically ± erect cells with sordid yellow plasmatic pigments, clavate, fusiform, broadly lecythiform or ventricose-rostrate, some with septate necks, 25–65 × 4–22.7 µm. *Pileus context* hyaline, loosely interwoven, or cylindrical or inflated hyphae, 4–14 µm in diameter. *Clamp connections* absent (Figs 4–6, 22).

Habitat

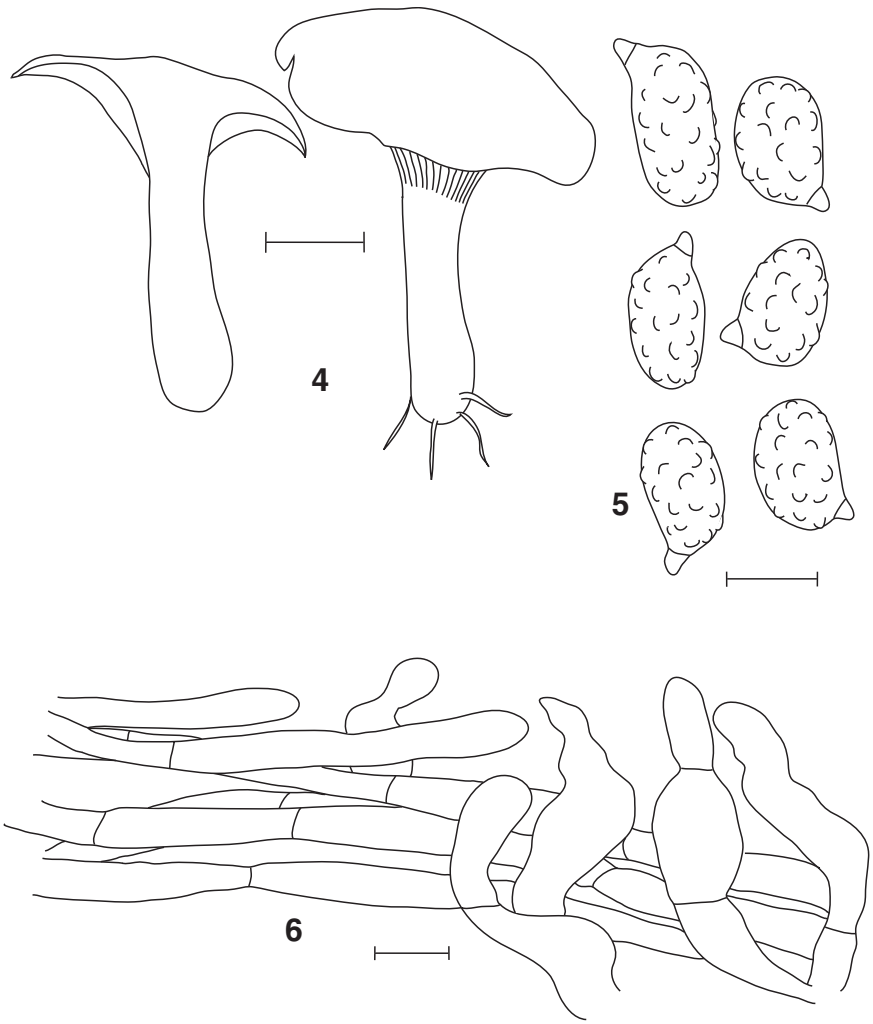
Wet and dry sclerophyll forests and wet sclerophyll gullies.

Selected specimens

TASMANIA: Mt Field, 42°41′S, 146°43′E, 9.xii.1999, *G. Gates E775 & D. Ratkowsky*; same location, 8.viii.2002, *G. Gates E1622 & D. Ratkowsky*; Mt Wellington, Myrtle Gully, 42°54′S, 147°15′E, 9.iii.1999, *G. Gates E196 & D. Ratkowsky*; same location, 13.iv.1999, *G. Gates E414 & D. Ratkowsky*; same location, 17.i.2002, *G. Gates E1408 & D. Ratkowsky*; Waterworks Reserve, Hobart, 42°54′S, 147°17′E, 27.vi.2002, *G. Gates E1589 & D. Ratkowsky* (Holotype, HO 536113; Isotype CORT); Maydena, 42°46′S, 146°36′E, 11.vii.2002, *G. Gates E1596 & D. Ratkowsky*; University of Tasmania, 42°54′S, 147°19′E, 16.vi.1999, *G. Gates E613 & D. Ratkowsky*; Truganini Track, 42°56′S, 147°21′E, 8.vi.2005, *G. Gates E2180 & D. Ratkowsky* (HO).

Commentary

Rhodocybe lateritia is reminiscent of *R. gemina* (Fr.) Kuyper & Noordel. [= *R. truncata* (Schaeff. ex Fr.) Singer] because of its colours, stature and filamentous cheilocystidia. However, *R. lateritia* has larger and differently shaped basidiospores [in *R. gemina* they are 5–6.5(−7) × 4–5(−5.5) µm and subglobose or short-broad-ellipsoidal], distinctive versiform pileocystidia (these are lacking in *R. gemina*) and a strong spicy / curry odour when fresh and dry (the odours of *R. gemina* and its variants are



Figs 4–6. *Rhodocybe lateritia*. **Fig. 4.** Basidiomata E613, scale bar = 20 mm. **Fig. 5.** Basidiospores E1589 (TYPE), scale bar = 5 µm. **Fig. 6.** Pileipellis with pileocystidia E1589 (TYPE), scale bar = 10 µm.

farinaceous or rancid farinaceous or absent). Another taxon that has similar characters to *R. lateritia* is *R. roseiavellanea* (Murrill) Singer with its rosy avellaneous or sordid pinkish buff pileus that may become pale alutaceous, the broadly ellipsoidal or amygdaliform spores that are (6.5–)7–9(−10) × (4–)5–5.5(−7) µm, and the cylindrical cheilocystidia. *R. roseiavellanea* also produces some versiform end cells in the pileipellis, but these are considerably shorter and narrower than the ones found in *R. lateritia. R. roseiavellanea* also lacks a spicy / curry-like odour, is found under oak and pines on sandy soils, and produces a clavate-bulbous stipe that is concolorous with the pileus surface. These three taxa appear to be phenetically similar, even though they are widely spaced on the globe, i.e. *R. gemina* is European, *R. roseiavellanea* is found in eastern North America from Massachusetts to Florida, and also in Japan and recently a single collection in western Europe. *R. lateritia* is known to date only from Tasmania.

Rhodocybe piperita (G. Stev.) E. Horak of New Zealand is also similar by its sordid pink pileus and the size and shape of the basidiospores. However, *R. piperita* has a peppery odour and taste when fresh and a strongly peppery odour when dry. The stipe is concolorous with the pileus, cheilocystidia are absent as are any type of pileocystidia. *Rhodocybe lateritia* is easily recognised and quite common in Tasmania.

3. ***Rhodocybe pallidogrisea*** T.J. Baroni & G. Gates, *sp. nov.*

Pileus uniformiter griseus vel griseo-brunneus nitore micaceo ornatus, 16–35(−75) mm latus, convexus vel et convexus et non profunde depressus, deinde plano-convexus vel planus, ut videtur glaber sed sub lente ×10 leniter asper vel pannosus, siccus, opacus. Lamellae cremeo-bubalinae vel cinerascenter bubalinae vel griseae,

aetate propter sporas subroseolae, adnatae vel saepius subdecurrentes vel decurrentes, arctae vel coarctatae, lamellulis in 2–3 gradibus dispositis. Stipes griseolo-bubalinus vel aetate griseolo-brunneus, omnino pruina alba obtectus tomentoque albo basali, ad apicem 4–5(−10) mm latus, ad basem 1.5–5(−9) mm latus, 14–46 mm longus, aequus vel deorsum vel seorsum contractus, teres vel lateraliter compressus, glaber, siccus, in contextu griseolo-bubalinus vel intus albescens farctus. Odor plerumque valde farinaceus. Sapor plerumque valde farinaceus. Superficies pilei sicci in 3% KOH non reagens. Basidiosporae 4.7–7.5 × 3.8–5.6 µm, globosae vel subglobosae vel late ellipticae, ad polum visae angulares vel obscure angulares (faciebus minutis 8–10), omnino obscure vel distincte undulato-pustulatae, parietibus aeque cyanophilicis. Basidia 4-sterigmata. Cystidia hymenialia nulla. Pileipellis 2-stratosa, suprapelle ex hyphis hyalinis laxe implicatis, 3–5 µm diametro, subpelle ex hyphis atro-brunneis, repentibus, cylindricis, modice vel valde vel interdum leniter crustulis brunneis ornatis, 2.4–6.4(−14) µm diametro. Fibulae nullae. Holotypus: G. Gates E1321 (HO).

Pileus uniformly grey, or grey or greyish-brown with a micaceous sheen, 16–35(−75) mm broad, convex or convex and shallowly depressed, becoming plano-convex or plane or finally uplifted and centrally depressed with age, margin inrolled, becoming decurved then plane and eventually uplifted with age, entire, glabrous but suede-like or felted under a ×10 lens, dry, opaque. *Lamellae* creamy buff or becoming greyish buff or grey and eventually pinkish from spores, adnate or more often subdecurrent or decurrent, segmentiform or arcuate, narrow or moderately broad (2–6 mm deep), close to crowded with 2–3 tiers of lamellulae, thin or moderately thick in some specimens. *Stipe* greyish buff or greyish brown with age, with a white bloom or pruina overall and a white basal tomentum, 4–5(−10) mm broad at apex, 1.5–5(−9) mm broad at base, 14–46 mm long, equal or tapered downwards or upwards, terete or laterally compressed, glabrous, dry, firm or cartilaginous, greyish buff or whitish stuffed inside. *Odour* usually strongly farinaceous. *Taste* usually strongly farinaceous. *Macrochemical reactions* dried pileus surface not reacting in 3% KOH.

Basidiospores 4.7–7.5 × 3.8–5.6 µm ($n/8 = 108$, $\text{mean}_L = 5.6 \pm 0.55$, $\text{mean}_W = 4.7 \pm 0.39$, $Q = 1$–1.5, $\text{mean}_Q = 1.20 \pm 0.09$), globose or subglobose (or broadly elliptical in profile and face views), angular or obscurely angular by minute facets (8–10) in polar view, obscurely or clearly undulate-pustulate in all views, walls evenly cyanophilic, inamyloid. *Basidia* (24–)28–35(−39) × 6.4–8 µm, clavate, 4-sterigmate. *Hymenial cystidia* absent, but occasionally with long projecting contorted undulate hyphal ends scattered along lamellar edges. *Lamella trama* hyaline or pale brown, parallel, cylindrical or slightly inflated hyphae, 2.4–14(−24) µm in diameter. *Pileipellis* composed of two obvious layers, suprapellis a hyaline layer of loosely interwoven cylindrical hyphae, 3–5 µm in diameter, that can be up to 40 µm deep, but soon collapses over the dark brown subpellis layer that is 140–160 µm deep, and composed of repent, cylindrical, hyphae, 2.4–6.4(−14) µm in diameter, with moderate to heavy brown pigment encrustations or occasionally encrustations fine and obscure. *Pileus context* a hyaline layer of interwoven, cylindrical or inflated hyphae, 3.2–14 µm in diameter. *Stipitipellis* at the apex, pale yellow brown layer of repent, cylindrical hyphae 2.4–4 µm in diameter, producing hyaline scattered clusters of erect, cylindrical or cylindrical-contorted, entangled end cells. *Clamp connections* absent (Figs 7–9, 23, 24, 26).

Habitat

Wet sclerophyll gullies, wet sclerophyll and dry sclerophyll forests.

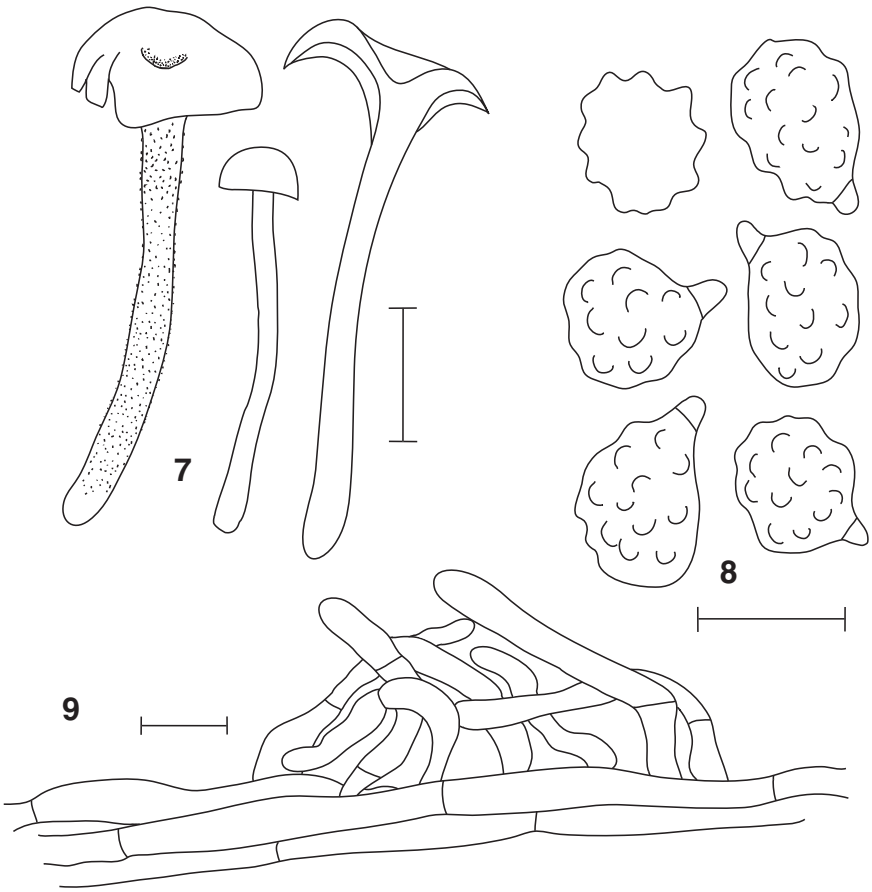
Selected specimens

TASMANIA: Myrtle Forest, 42°52′S, 147°09′E, 28.v.1999, *G. Gates E538 & D. Ratkowsky*; Mt Field, 42°41′S, 146°42′E, 6.vii.1999, *G. Gates E652 & D. Ratkowsky*; same location, 4.v.2000, *G. Gates E895 & D. Ratkowsky*; Marriotts Falls, 42°43′S, 146°39′E, 2.vi.2001, *G. Gates E1213 & D. Ratkowsky*; Chauncy Vale, 42°37′S, 147°16′E, 20.xi.2001, *G. Gates E1321 & D. Ratkowsky* (Holotype, HO 536111; Isotype, CORT); same location, 22.xi.2001, *G. Gates E1340 & D. Ratkowsky*; same location, 29.xi.2001, *G. Gates E1351 & D. Ratkowsky*; Ellendale, 42°37′S, 146°43′E, 5.iv.1999, *G. Gates E358 & D. Ratkowsky*; Bluff River State Forest, 42°31′S, 147°40′E, 14.vi.2003, *G. Gates E1867 & D. Ratkowsky* (HO).

Commentary

Rhodocybe pallidogrisea belongs in Section Decurrentes (Konrad & Maublanc) Singer because it is a greyish or greyish brown species, with decurrent or subdecurrent lamellae, is centrally stipitate and the basidiomata lack coloured pseudocystidia and clamp connections (Singer 1975, 1986; Baroni 1981). *R. pallidogrisea* is most phenetically similar to *Rhodocybe porcelanica* (Dennis) E. Horak of Venezuela because of its two-layered pileipellis with encrusted hyphae, and the subglobose or broadly ellipsoidal spores. However, *R. porcelanica* is a smaller species with pileus reaching only 20 mm broad, the pileus is coloured dark umber not greyish or greyish brown, and the basidiospores of *R. porcelanica* are also larger, i.e. (6.5–)7–9 × (5–)5.5–7 µm (Baroni 1981).

A taxon from South Australia, *Rhodocybe reticulata* (Cleland) E. Horak, is also somewhat similar morphologically due to its drab colouration, subdecurrent lamellae, lack of pseudocystidia in the hymenium and the presence of encrusting pigments on the hyphae of the pileipellis (Horak 1978/1979; Grgurinovic 1997). However, the basidiospore form depicted by Horak and also by Grgurinovic for *R. reticulata* shows distinctly angular morphology of the basidiospores in profile and face views, an important feature not found in *R. pallidogrisea.* In addition, the pileus surface of *R. reticulata* is described as reticulate with darker concentric cracks and depressions,



Figs 7–9. *Rhodocybe pallidogrisea*. **Fig. 7.** Basidiomata E1213, scale bar = 20 mm. **Fig. 8.** Basidiospores E358, scale bar = 5 µm. **Fig. 9.** Stipitipellis E358, scale bar = 10 µm.

giving it an unusual appearance and thus its specific epithet. A study of the Holotype (!) collection of *R. reticulata* revealed basidiospores that were not strongly angular in profile and face views as illustrated by Horak and then Grgurinovic. In fact the spore morphology of *R. reticulata* is similar to *R. pallidogrisea* (see illustrations in this paper from personal observations on the type collection of *R. reticulata* by TJB and of a newly discovered collection from Tasmania). However, *R. reticulata* lacks a two-layered pileipellis, a feature that is unusual and distinctive for only a small number of *Rhodocybe* species. Also, of the numerous collections of *R. pallidogrisea* we have examined, none have shown a cracked / reticulate pileus. It is not clear to us at the present time why two different authors have illustrated basidiospores for *R. reticulata* that are quite different from what we found during our studies, but the type collection consists of numerous basidiocarps and perhaps this is a mixed collection. We did not examine every specimen in the collection when we studied the type some years ago (TJ Baroni 1980). Therefore, because of these differences in macromorphology and micromorphology, we feel it is necessary to propose *R. pallidogrisea* as a new taxon for Tasmania. See further discussions under *R. reticulata* at the end of this paper.

4. *Rhodocybe tasmanica* T.J. Baroni & G. Gates, *sp. nov.*

Pileus juvenilis brunneo-senatus, aetate multo pallidiore flavescens, 7–11 mm latus, primum convexus vel conice convexus, siccus, ut videtur glaber sed implicatus vel pannosus. Lamellae griseolo-flavae, decurrentes, modice arctae, lamellulis in gradum unicum dispositis. Stipes plusminusve pileo concolor vel aetate griseolo-bubalinus, ad apicem 3 mm latus, ad basem 2 mm latus, 20–22 mm longus, versus basem contractus, teres, siccus, primum uniformiter pruinosus, tantum maturitate supra basem pruinosus. Odor pungens, speciebus Agarici commercialibus similis. Sapor amarissimus. Basidiosporae 4.7–7.5 × 3.8–5.6 µm, amygdaliformes vel fusiformes, ad polum visae angulares, multae rostro apicali elongato armatae, valde vel modice undulato-pustulatae. Basidia 4-sterigmata, clavata vel anguste clavata, 10–30% parietibus incrassatis praedita (0.8–1.6 µm). Cheilocystidia atque pleurocystidia

ut pote pseudocystidia, in forma, amplitudine, coloure similia, pigmentis atro-ochraceis aeque implena, fusiformia, ventricosa, ventricoso-rostrata, rostro saepe longo, contracto vel toruloso vel undulato-cylindrico, interdum ramoso, 36–80 × 4.8–8.8 µm. Pileipellis hyalina, repens, e hyphis cylindricis, 1.6–6.4 µm diametro, cellulas ultimas sparsas, inflatas, versiformes efformans, e contextu non bene distincta praeter prope pellem hyphis contextualis pallide brunneis atque in hyphis angustissimis pigmentas encrustantes leniter brunneas formantibus. Fibulae nullae. Holotypus: *G. Gates E666* (HO).

Pileus Teak Brown (6F5) when young, becoming much paler with age (Wheat 4B5), 7–11 mm broad, convex or conical convex at first, dry, glabrous but matt or felted, margin incurved, entire. *Lamellae* Champagne (4B4), decurrent, arcuate, narrow, to 2 mm deep, moderately thick, moderately close with 1-tier lamellulae. *Stipe* ± concolorous with pileus or becoming greyish buff with age, 3 mm broad at apex, 2 mm broad at base, 20–22 mm long, tapering towards base, terete, dry, uniformly pruinose at first, pruinose only over base at maturity, stuffed inside, Champagne (4B4). *Odour* pungent, mushroomy. *Taste* very bitter.

Basidiospores 7–12.5 × 4–5.6 µm ($n = 42$, $\text{mean}_L = 9.2 \pm 1.4$, $\text{mean}_W = 4.8 \pm 0.43$, $Q = 1.43$–2.42, $\text{mean}_Q = 1.93 \pm 0.22$), amygdaliform in profile view, fusiform in face view, angular in polar view, many spores with an elongated apical 'snout', strongly or moderately undulate pustulate. *Basidia* 25–36(−46) × 6–9 µm, (2–)4-sterigmate, clavate or narrrowly clavate, 10–30% with thickened walls (0.8–1.6 µm). *Cheilo- and pleurocystidia* as pseudocystidia, similar in shape, size and colour, filled evenly with dark ochre pigments, fusiform, ventricose, ventricose-rostrate, rostrum often long, tapered or torulose or undulate cylindrical, occasionally branched, 36–80 × 4.8–8.8 µm. *Lamella trama* pale orange or yellow brownish, parallel, cylindrical or inflated, 3.2–12.1 µm in diameter, with repository hyphae of similar diameters scattered through trama, filled with ochre or golden brown contents, connected to the pseudocystidia. *Pileipellis* hyaline, repent, cylindrical hyphae, 1.6–6.4 µm in diameter, producing scattered inflated, versiform end cells, not well differentiated from context except context hyphae pale brown near pellis and with fine brown encrusting pigments on narrowest hyphae. *Pileus context* pale brown layer of radially arranged or interwoven, cylindrical or inflated hyphae, 3.2–8 µm in diameter. *Stipitipellis* pale brownish or hyaline layer, repent, cylindrical hyphae, 3.2–7.2 µm in diameter, some encrusted with brown pigment, with distinctive vesiculose terminal or intercalary cells in trama. *Clamp connections* absent (Figs 10–14, 25).

Habitat

Wet sclerophyll forests.

Selected specimens

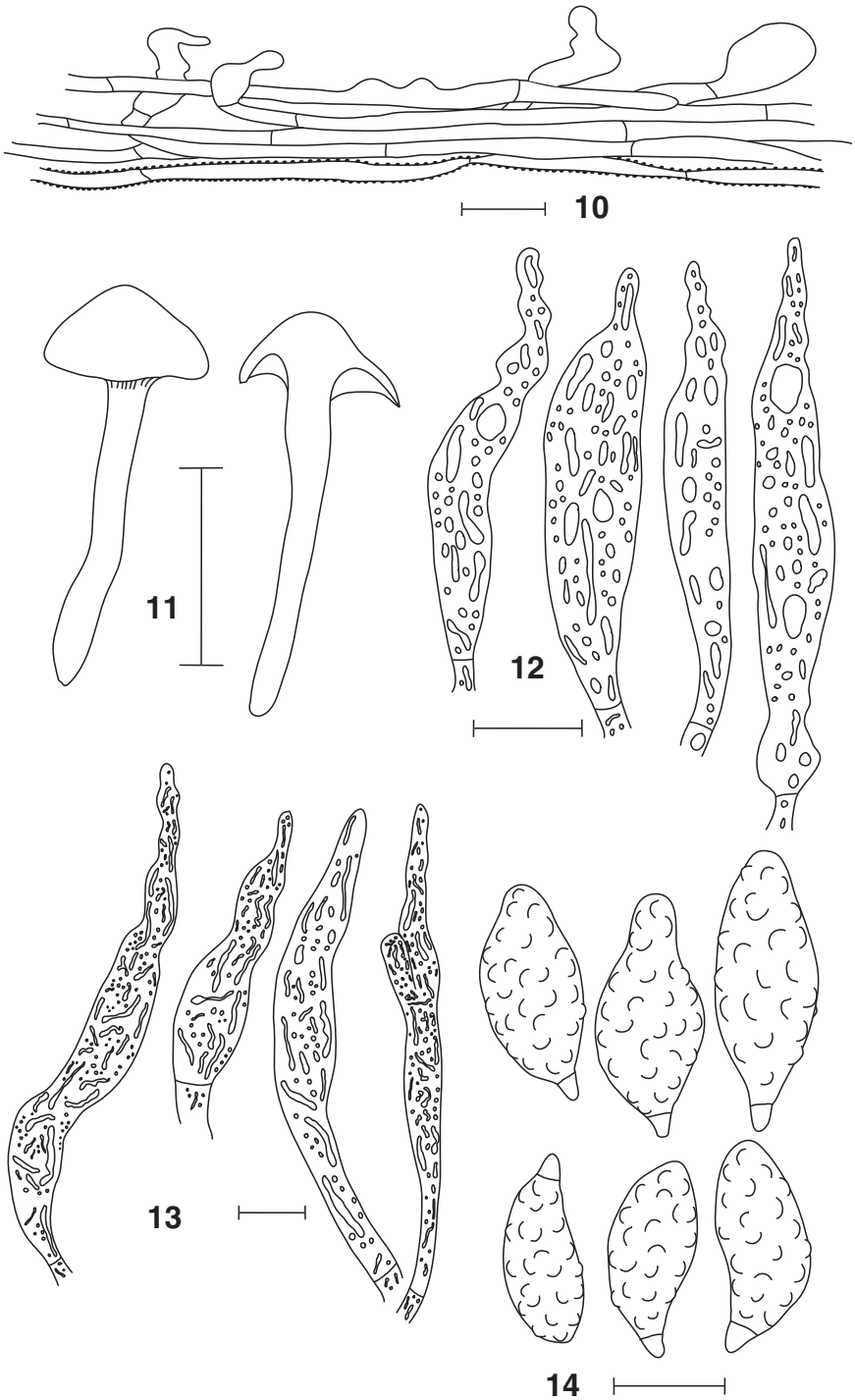
TASMANIA: Lilydale Falls, 41°14′S, 147°13′E, 25.vii.1999, *G. Gates E666 & D. Ratkowsky* (Holotype, HO 536115 ; Isotype, CORT); Mt Wellington, Lenah Valley Track, 42°55′S, 147°15′E, 30.iv.2001, *S. McMullan-Fisher SMF1088* (HO).

Commentary

Rhodocybe tasmanica is an unusual member of the Section Rhodocybe due to the sombre dark brown colours that change to very pale creamy yellow colours with age, the strongly amygdaliform basidiospores that often produce an obvious 'snout' apically, the inflated erect end cells for the pileipellis and the vesiculose cells in the stipe trama. The darkly pigmented pseudocystidia and central stipe ally this taxon with a few other members in Section Rhodocybe. One of these taxa that appears to be similar to *R. tasmanica* is *R. caelatoidea* because of the inflated pileocystidia. *R. caelatoidea* is a pinkish cinnamon species, with a cellular subhymenium, clusters of inflated and encrusted pileocystidia, and is currently only known from Venezuela. In addition, the basidiospores of *R. caelatoidea* are ellipsoidal not amygdaliform. Therefore, they may be only distantly related.

Rhodocybe caelata (Fr.) Maire is another similar species with its amygdaliform basidiospores, but the spores of *R. caelata* are shorter than those of *R. tasmanica*. The colour of the basidiomata for *R. caelata* is grey or greyish brown and not becoming paler as in *R. tasmanica*, and the pileus surface of *R. caelata* is often wrinkled, areolate or reticulate cracked with age. In addition, *R. caelata* has a two layered pileipellis with a hyaline layer overlying a heavily brownish encrusted subpellis. The hyaline suprapellis layer is due to the delicate pubescence of the young pileus surface of *R. caelata*, characters not found in *R. tasmanica.* However, the spore shapes of these two taxa do indicate there may be some relationship.

Horak (1979) reported two taxa of *Rhodocybe* from New Zealand in the Section Rhodocybe, *Rhodocybe dingleyi* E. Horak and *R. fuliginea* E. Horak that should be compared to *R. tasmanica. Rhodocybe dingleyi* is an umbilicate or subinfundibuliform species with ochraceous umber colouration of the pileus, with a tomentose or minutely velvety pileus surface and very small spores (4.5–5.5 × 3.5–4 µm vide Horak 1979). *R. dingleyi* should not be confused with *R. tasmanica*. *Rhodocybe fuliginea* is also a taxon with a depressed or umbilicate pileus with fuscous to black-brown colouration and a minutely velutinous or tomentose pileus surface. The stipe in this species can also be eccentric, a character not seen for *R. tasmanica.* Lastly, the basidiospores of *R. fuliginea* are also quite small (6–7.5 × 4.5–6 µm vide Horak 1979) and ellipsoidal, not amygdaliform. One should not confuse *R. fuliginea* with *R. tasmanica.*



Figs 10–14. *Rhodocybe tasmanica*, all E666 (TYPE). **Fig. 10.** Pileipellis, scale bar = 10 µm. **Fig. 11.** Basidiomata, scale bar = 10 mm. **Fig. 12.** Cheilocystidia, scale bar = 10 µm. **Fig. 13.** Pleurocystidia, scale bar = 10 µm. **Fig. 14.** Basidiospores, scale bar = 5 µm.

5. *Rhodocybe amara* T.J. Baroni & G. Gates, *sp. nov.*

Pileus bubalinus disco fusciore pallide brunneo, hygrophanus, aetate inter centrum usque ad marginem decolorate bubalinus, 19 mm latus, convexus loco centrali depresso vel paene truncato-campanulatus, siccus, glaber. Lamellae pallide subroseolae, decurrentes, arctae, lamellulis in gradum unicum dispositis. Stipes bubalinus, ad apicem 3.5 mm latus, ad basem 2.5 mm latus, 40 mm longus, plusminusve aequus vel deorsum subcontractae, teres, laeves,

siccus, elasticus vel flexiliter lentus, intus albus farctus. Odor non distinctus. Sapor amarissimus. Basidiosporae 6.3–8.8 (−11.3) × 4–5.6 µm, amygdaliformes vel ellipticae, ad polum visae angulares (faciebus 8–10), omnino undulato-pustulatae. Basidia 4-sterigmata, anguste clavata, interdum prope apicem constricta. Cheilocystidia atque pleurocystidia ut pote pseudocystidia, in amplitudine, forma, coloureque similia, pigmentis fuscis rufidulo-ochraceis implena, ventricosa, ventricoso-rostrata, saepe ad basem rostri septata, rostro saepe undulato, 36–70 × 4.8–8 µm, in praeparationibus 3% KOH crystallis rhomboideis sparsis supra basidia, basidiola et cystidia. Pileipellis 2-stratosa, stratis ambobus repentibus, suprapelle in strato hyalino tenuissisimo subpellem ex hyphis pallido-brunneis superimponente, in stratis ambabus hyphis cylindricis vel subinflatis, 2.4–7.2 µm diametro, in strato pallido-brunneo hyphis contextuque leniter tenuiterque incrustatis. Fibulae nullae. Holotypus: *G. Gates E875* (HO).

Pileus more or less buff with some flesh pink hues, but darker at centre and pale brownish, lighter buff-brown towards margin, hygrophanous and becoming a faded buff from centre to margin, 19 mm broad, convex with a central depression or somewhat truncate-campanulate, margin plane or slightly revolute with age, entire, dry, glabrous. *Lamellae* pale pinkish, decurrent, arcuate, to 2.5 mm deep, close, with one-tier lamellulae. *Stipe* buff, 3.5 mm broad at apex, 2.5 mm broad at base, 40 mm long, ± equal or tapered slightly downwards, terete, smooth, dry, rubbery or wiry tough, stuffed white inner. *Odour* not distinctive. *Taste* extremely bitter.

Basidiospores 6.3–8.8(−11.3) × 4–5.6 µm ($n = 45$, $\text{mean}_L = 7.6 \pm 0.99$, $\text{mean}_W = 4.6 \pm 0.28$, $Q = 1.36$–2.12 (−2.35), $\text{mean}_Q = 1.67 \pm 0.18$), amygdaliform or elliptical in profile and face views, angular in polar view (8–10 facets), undulate-pustulate in all views. *Basidia* 25–35 × (5–)7–8 µm, 4-sterigmate, narrowly clavate, some constricted near apex. *Cheilo- and pleurocystidia* as pseudocystidia, similar in size, shape and colour, filled with dark reddish ochre pigment, ventricose, ventricose-rostrate, often septate at base of rostrum, rostrum often undulate, 36–70 × 4.8–8 µm, with scattered rhomboidal crystals lying over basidia, basidioles and cystidia in 3% KOH mounts. *Lamella trama* hyaline or pale brownish, parallel, cylindrical or some inflated, 2.4–8.8 µm in diameter, with repository hyphae of similar diameters scattered through trama, filled with ochre or golden brown contents, connected to the pseudocystidia. *Pileipellis* two-layered and both layers repent, suprapellis a very thin hyaline layer overlying a subpellis of pale brown hyphae, hyphae in both layers cylindrical or slightly inflated, 2.4–7.2 µm in diameter, hyphae in pale brown layer and context finely and faintly encrusted. *Pileus context* hardly differentiated from subpellis, radially arranged, cylindrical or inflated, 2–10 µm in diameter, brownish encrusted. *Stipitipellis* a hyaline layer of repent, cylindrical hyphae, 2–4 µm in diameter, with some scattered encrustations present. *Clamp connections* absent. (Figs 15–18, 27).

Habitat

Terrestrial in a rainforest with *Nothofagus cunninghamii* and *Eucalyptus delegatensis* as dominants, an understory of *Anopterus glandulosus, Atherosperma moschatum, Phyllocladus aspleniifolius, Leptospermum lanigerum,* as well as *Gaultheria hispida, Coprosma quadrifida* and *Dicksonia antarctica.*

Specimen examined

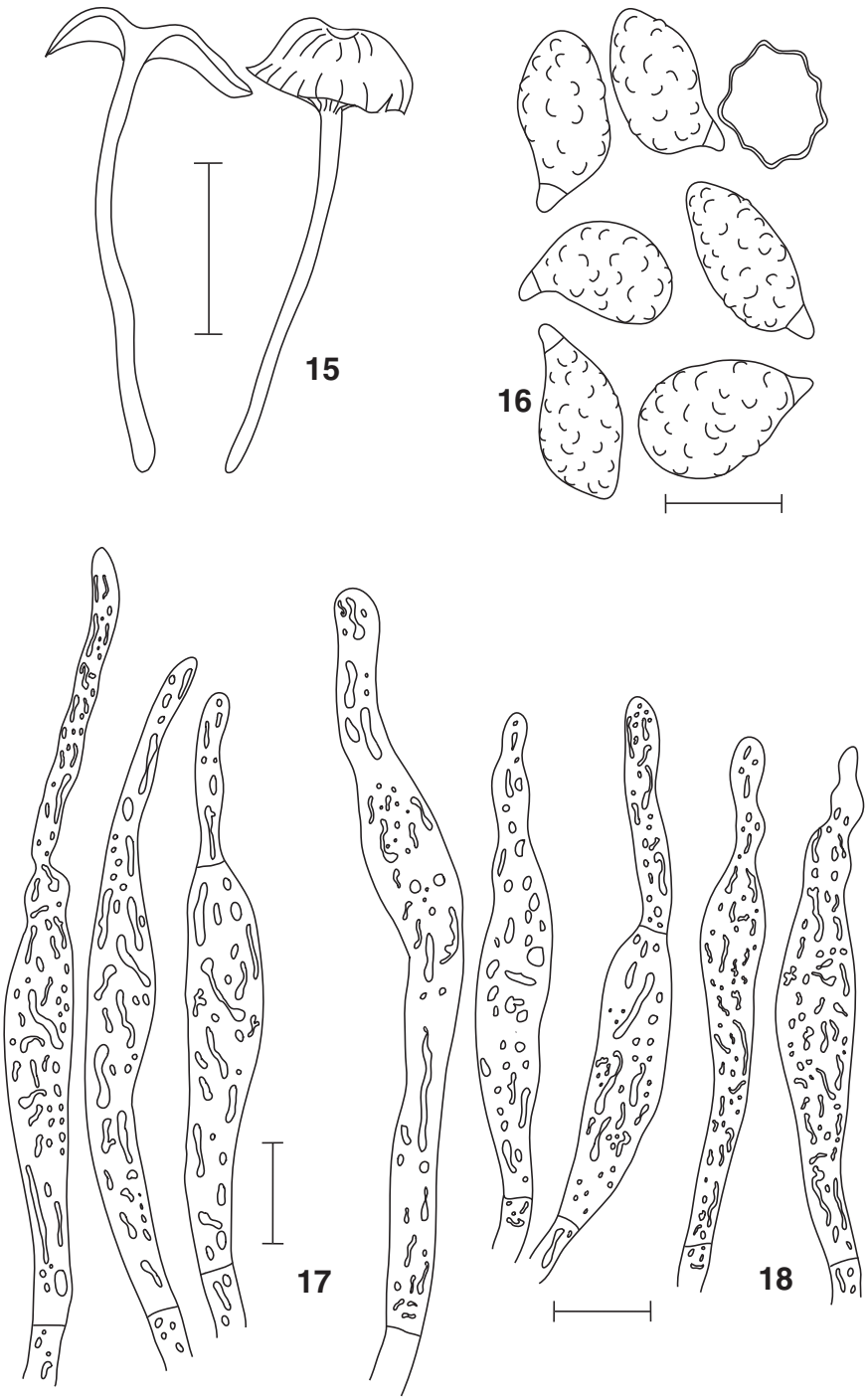
TASMANIA: Lake St Clair, 42°04′S, 146°09′E, 22.iv.2000, *G. Gates E875 & D. Ratkowsky* (Holotype, HO 536112; Isotype, CORT).

Commentary

Rhodocybe amara is yet another member of Section Rhodocybe due to the obvious and brightly coloured pseudocystidia, central stipe and distinctively undulate-pustulate basidiospores. *Rhodocybe amara* seems to be a rather rare taxon that is currently only known from the one locale in Tasmania. *R. amara* is most phenetically similar to *Rhodocybe naucoria* Singer and *R. caelata* because of the crystals in the hymenium and the pileipellis structure / basidiospore form, respectively.

Rhodocybe amara is readily separated from *R. naucoria* by several features. *R. naucoria* is a ferruginous coloured species with distant, pale ochraceous, sinuate or adnate lamellae. The basidiospores of *R. naucoria* are also subglobose or pip-shaped or obovoid and smaller [5.5–7(−8.5) × 4–5(−5.5) µm, vide Baroni 1981]. Finally, *R. naucoria* was collected in a xerophytic forest in Argentina (Baroni 1981). The presence of crystals in the hymenium for these two species seems to be incidental.

The similarity of *R. amara* with *R. caelata* due to the microscopic structures of the two layered pileipellis and similarly shaped basidiospores may show some true relatedness between these two species. However, there are numerous differences that mark these two species as distinct. *Rhodocybe caelata* is a greyish or grey brown species with broadly depressed, wrinkled, areolate or reticulate cracked pileus with age, and the pileus has a finely fibrillose pubescence at first, features not found in the pale buff coloured *R. amara.* Another feature that seems to distinguish these two taxa is the taste. *R. amara* is intensely bitter, while collections of *R. caelata* have typically an indistinct taste (Baroni 1981). However, Baroni (1981) did note that some collections of *R. caelata* from eastern North America did have a bitter taste, but this feature is not consistent. *Rhodocybe caelata* has been reported from the Southern Hemisphere in Chile and Argentina by Singer (1969), but not from Australia (May and Wood 1997; Grgurinovic 1997; Bougher and Syme 1998) or Australasia as yet.



Figs 15–18. *Rhodocybe amara*, all E875 (TYPE). **Fig. 15.** Basidiomata, scale bar = 20 mm. **Fig. 16.** Basidiospores, scale bar = 5 µm. **Fig. 17.** Cheilocystidia, scale bar = 10 µm. **Fig. 18.** Pleurocystidia, scale bar = 10 µm.

Horak (1978 / 1979) described a small pale brown *Rhodocybe* species, *Rhodocybe mustellina,* under *Castinopsis* and *Lithocarpus*, from Papua New Guinea that shows some similarities to *R. amara*. The pale brown pileus colours, the narrowly fusoid and pigment filled pseudocystidia, and repent pale yellow brown encrusted hyphae of the pileipellis are similar to the features displayed by *R. amara.* There are also just as many differences between these taxa as well, e.g. the basidiospores of *R. mustellina* are ovoid and much smaller (5–6 × 3.5–4.5 µm, vide Horak

1978 / 1979) than those of *R. amara,* the pileipellis of *R. mustellina* is composed of a single layer, the odour of *R. mustellina* is strongly acidulous ('like *Lepiota cristata*'), and the stipe has pruina over the apex.

Rhodocybe amara is a distinctive new taxon from rainforest habitat in Tasmania.

Documentation of species newly reported for Tasmania

We provide here our observations on fresh material of *Rhodocybe fuliginea* and *Rhodocybe reticulata* collected in Tasmania and reported here for the first time.

Rhodocybe fuliginea E. Horak, New Zealand J. Botany 17:280. 1979

Pileus pale grey, greyish brown with patches of greyish buff on some, greyish with ochraceous hues, becoming darker with age and very dark greyish brown or brownish black (fuliginous), some with dark golden brown hues mixed in as well, 4–40 mm broad, convex with a shallowly and broadly depressed disc, margin entire or crenulate or becoming lacerate, incurved at first becoming decurved or plane, dry, glabrous but suede-like or matted, opaque. Context pale greyish or very dark greyish brown, thick. *Lamellae* buff or greyish buff becoming light tan (5C6 Pompeian Yellow, brownish orange) with age, adnate with a decurrent tooth or subdecurrent or decurrent, arcuate, 1–2(−6) mm deep, close with a single layer of lamellulae, ± thick, edges occasionally darker than faces. *Stipe* concolorous with pileus, with white basal tomentum, 2–5 mm broad at apex, 1–4 mm broad at base, 15–30 mm long, equal or more often tapering to base, terete, white pruina overall at first, remaining more consistently pruinose over apex and base, dry, tough-pliant, buff or greyish buff or dark greyish and solid or narrowly hollow inside. *Odour and taste* none or farinaceous or bitter in some.

Basidiospores 5.6–8.8 × 4.5–6.4 µm ($n/5 = 50$, $\text{mean}_L = 7.36 \pm 0.78$, $\text{mean}_W = 5.44 \pm 0.50$, $Q = 1.14$–1.67, $\text{mean}_Q = 1.36 \pm 0.12$; Holotype, 5.5–7 × 4.5–5 µm, $\text{mean}_L = 6.14 \pm 0.57$, $\text{mean}_W = 4.64 \pm 0.38$, $Q = 1.1$–1.5, $\text{mean}_Q = 1.33 \pm 0.14$), subglobose (or broadly elliptical in profile and face view), angular in polar view (8–10 facets), obviously undulate-pustulate, walls evenly cyanophilic, inamyloid. *Basidia* 20–30 × 6–8 µm, clavate, 4-sterigmate. *Cheilo- and pleurocystidia* as pseudocystidia, similar in size, shape and colour, filled with dark ochre-reddish granular pigments, ventricose or ventricose-rostrate or broadly fusoid, (27–)32–70 × 4.8–8 µm. *Lamella trama* pale brown, of parallel, cylindrical hyphae, 2.4–8 µm in diameter, with repository hyphae of similar diameters scattered throughout trama, filled with ochre-reddish or golden brown contents, connected to the pseudocystidia. *Pileipellis* a dark brown layer of compact, repent, cylindrical, heavily dark brown encrusted hyphae, 2–7 µm in diameter. *Pileus context* a hyaline or very pale brown layer of radially arranged or somewhat interwoven, cylindrical or slightly inflated hyphae, 2.4–8 µm in diameter. *Clamp connections* absent (Fig. 30).

Habitat

In Tasmania, on soil or decaying plant litter in dry sclerophyll and wet sclerophyll forests. The type from New Zealand was found on a rotten trunk of *Cyathea medullaris* (Forst.) Swartz (a tree fern).

Selected specimens

TASMANIA: Waverley Flora Park, Bellerive, 42°52′S, 147°23′E, 25.v.1999, *G. Gates E537 & D. Ratkowsky*; Pelverata Falls, 43°04′S, 147°08′E, 1.vii.1999, *G. Gates E645 & D. Ratkowsky*; Mt Field, 42°41′S, 146°42′E, 2.ix.1999, *G. Gates E688 & D. Ratkowsky*; Lake St Clair, 42°04′S, 146°09′E, 22.iv.2000, *G. Gates E863 & D. Ratkowsky*; N.W. Bay River, 42°57′S, 42°57′E, 14.ii.2002, *G. Gates E1428 & D. Ratkowsky*; Hospital Creek, 42°45′S, 147°49′E, 9.viii.2003, *G. Gates E1902 & D. Ratkowsky* (HO).

Commentary

Rhodocybe fuliginea is one of numerous dark greyish or greyish brown or dark brownish black species of Section Rhodocybe (e.g. *R. caelata*, *R. brunnescens*, *R. australis*) with its obvious brightly coloured hymenial pseudocystidia and central stipe [although Horak (1979) indicates that some of the basidiomata of the type collection had eccentric or even lateral stipes, we did not find this condition for any of our specimens, as they all had centrally attached stipes]. There is one species, *R. dingleyi* E. Horak, that *R. fuliginea* might be confused with in this region of the world because of their similar macromorphology. Even though these two are very similar macroscopically, Horak (1979) considered that they differed mainly by the size of the basidiospores, and the shapes and contents of the pseudocystidia (see the key provided).

An examination of the type of *R. dingleyi* by TJB revealed that the cystidioid cells in the hymenium were not true pseudocystidia, but simply hyaline leptocystidia. Knowing this fact, it should be easy to separate these two taxa under the microscope. We have constructed our key to allow for the identification of *R. dingleyi* regardless of whether one considers the hymenial cystidia as pseudocystidia or true cystidia.

Rhodocybe fuliginea is a rather common species in Tasmania and the basidiomata can be quite variable in colour. The pileus in very young specimens is a pale greyish colour, that soon becomes darker greyish brown, and often with some ochraceous hues developing as well. With age the colours become quite dark, fuliginous, and thus the character that prompted the specific epithet.

Rhodocybe reticulata (Cleland) E. Horak, Sydowia 31:58. 1979 (1978)

Pileus grey-brown (5D3–4 Nougat, Dark Blonde) but with a darker watery brown reticulate pattern of fine lines concentrically distributed over the surface, hygrophanous at margin becoming pallescent greyish, to 47 mm broad, plano-convex or applanate, surface undulate, margin incurved, lobed, dry, opaque, soft and suede-like, felted under lens. Context 6 mm thick. *Lamellae* pale yellowish grey with pinkish hues, decurrent or arcuate-decurrent, close, with 2 tiers lamellulae, moderately thick, moderately broad and 4 mm deep. *Stipe* greyish brown with a white pruina overall and white rhizomorphs and white pubescence at base, 8 mm broad at apex, 6 mm broad at middle and 3 mm broad at base, 35 mm long, centrally attached, tapered to base, slightly compressed, dry, cartilaginous, stuffed yellowish grey inside. *Odour and taste* cucumber or farinaceous-cucumber.

Basidiospores 4.8–7.2 × 4–6.5 µm ($n = 42$, $\text{mean}_L = 5.86 \pm 0.53$, $\text{mean}_W = 5.07 \pm 0.52$, $Q = 1–1.33$, $\text{mean}_Q = 1.16 \pm 0.09$; Holotype 5.5–7 × 4.5–5 µm, $n = 7$, $\text{mean}_L = 6.14 \pm 0.57$, $\text{mean}_W = 4.64 \pm 0.38$, $Q = 1.1–1.5$, $\text{mean}_Q = 1.33 \pm 0.14$), broadly elliptical or subglobose / ovate and strongly apiculate (to 1.6 µm long) in profile and face views, angular in polar view (8–10 facets), undulate-pustulate, walls evenly cyanophilic, inamyloid. *Basidia* 22–31 × 7.2–9.7 µm, clavate, 4-sterigmate, mostly filled with small lipoidal bodies, also occasional sclerobasidia present, walls 1.6–2.4 µm thick. *Hymenial cystidia* absent. *Lamella trama* hyaline, of parallel, cylindrical hyphae, 4–13 µm in diameter. *Pileipellis* a dark brown layer of repent, cylindrical, heavily dark brown encrusted hyphae also containing dark brown intracellular pigment, 4–10 µm in diameter. *Pileus context* a hyaline layer of loosely entangled, cylindrical or slightly inflated hyphae, 4–14 µm in diameter, occasionally with a distinctively inflated, clavate cell embedded in the context, to 22 µm in diameter. *Clamp connections* absent (Figs 19, 20, 28, 29).

Habitat

In Tasmania, solitary on soil and humus in wet sclerophyll forest.

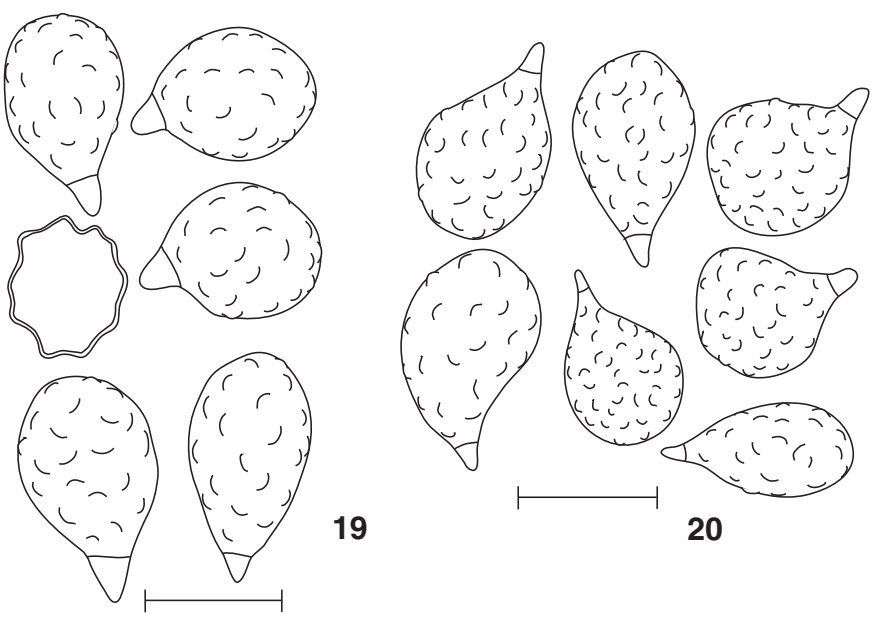
Selected specimens

TASMANIA: North West Bay River, 42°57′S, 147°12′E, 14.vi.2005, *G. Gates E2183*, leg. G. Gates & D. Ratkowsky. AUSTRALIA: South Australia, Mt Lofty, 25.iv.1924, Herb. AD 3950, J. B. Cleland No. 13938 (WAITE).

Commentary

This is the first report of *Rhodocybe reticulata* for Tasmania and only the second documented collection of this species, which was originally found in South Australia in 1924 by J. B. Cleland (Cleland 1933). *Rhodocybe reticulata* is a member of Section Decurrentes because of the greyish colours, decurrent lamellae, absence of clamps, and lack of hymenial cystidia. It is a very distinctive species due to the dark watery brown, concentrically distributed lines and cracks on the pileus, and the small globose basidiospores.

Rhodocybe reticulata tissues do not turn reddish in 3% KOH when mounted for examination under the microscope, so this species is not similar to *R. mundula*, *R. popinalis* and *R. obscura* of the northern temperate hemisphere,



Figs 19–20. *Rhodocybe reticulata*. **Fig. 19.** Basidiospores E2183, scale bar = 5 µm. **Fig. 20.** Basidiospores AD 3950 (TYPE), scale bar = 5 µm.

Figs 21–30. Colour images of *Rhodocybe* species. **Fig. 21.** *Rhodocybe pseudopiperita* E2151. **Fig. 22.** *R. lateritia* E2180. **Fig. 23.** *R. pallidogrisea* E1867. **Fig. 24.** *R. pallidogrisea* E1340. **Fig. 25.** *R. tasmanica* E666 (TYPE). **Fig. 26.** *R. pallidogrisea* E1213. **Fig. 27.** *R. amara* E875 (TYPE). **Figs 28–29.** *R. reticulata* E2183. **Fig. 30.** *R. fuliginea* E1902.

even though there are many macroscopic and microscopic similarities, e.g. the subglobose basidiospores, the encrusted hyphae of the pileipellis, and the large fleshy basidiomes. *R. reticulata* seems to be the southern hemisphere counterpart of *R. mundula* because of the concentrically reticulate pileus surface. However, the pale cream coloured *R. mundula* slowly turns black when bruised and produces dark cherry red discolorations on the pileus surface when spot tested with 3% KOH in the fresh and in the dried conditions. For further comparisons, see the discussion under *R. pallidogrisea* presented previously in this paper.

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