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

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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 (1892a, 1892b) 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 (1978) 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...
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 Körnrep and Wanscher (1978). Mounts for microscopic analysis were made from dried material and examined in water, 10% NH₄OH, 3% KOH, or ammonical Congo Red. All measurements were made in 10% NH₄OH 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, is the mean length, meanW, is mean width, and meanQ 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% NH₄OH or water; repository hyphae with brightly coloured contents in lamella trama also present. .......................... 2
2. Hymenial pseudocystidia and repository hyphae with brightly coloured contents absent. .......................................................... 8

3. Stipe eccentric or lateral; pileus pinkish buff or pink, to 80 mm broad; basidiospores 5.5–7

4. Basidiospores distinctly amygdaliform and often with a projecting 'nose' forming on the apex of the spores; 3.12.5 x 4.5–6.5 µm; pileal cortical convex or convex, dark teak brown but fading to yellos with age; taste very bitter; vescicolous cells present in stipe trama; ........................................... R. amoena (*). Basidiospores ellipsoid and shorter; pileus typically depressed or umbilicate or infundibuliform with age; taste mild; lacking vescicolous elements in stipe trama. .......................................................... 1

5. Ligicoculic, pileus to 25 mm broad, ochreous, infundibuliform; lamella long deciduous; basidiospores ellipsoid, 6.5–9 (–10) x 4–5; 5.5–7 µm (vide Baroni 1981). Not truly ligicoculic on woody substrates, may be on trunks of tree ferns; pileus greyish or brownish or fuscous, or fuscous, 3.15.6 × 4.5–6.4 µm; hyphae of pileus surface not encrusted, end cells of pileus surface hyphae not cystidioid (vide Baroni 1981). Known only from New Zealand. ........................................... R. cyathoidea (*). Basidiospores shorter; pileus much paler coloured, pink or pinkish buff. ...................................................... 6

6. Pileus and stipe pallid (whitish), pileus 20–40 mm broad, umbilicate then infundibuliform; lamellae white, crowded (Cooke & Massee) E. Horak (1979). Known only from New Zealand. ........................................... R. abellolomangeni (G. Stev.) E. Horak 

7. 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-echaloid granular content, ventricose, ventricose-ostiolate or broadly furred with non-undulating walls; on soil or decaying plant litter. ................................. R. radicata E. Horak (1979) (*). 

8. Pileus pallid or pinkish, pinkish buff, reddish brown, bunted (some with pink or reddish hues). ............................................................ 9

9. Stipe eccentric or lateral; pileus pinkish buff or pink, to 80 mm broad; basidiospores 5.5–7 × 4.5–5 µm, on rotting wood (vide Horak, 1979). Known only from New Zealand. ........................................... R. dingleyi Baroni (1981) (*). 

10. Pileus and stipe pallid (whitish), pileus 25–40 mm broad, umbilicate then infundibuliform; lamella white, crowded (Cooke 1982); but see Horak 1979/1979. Basidiospores ellipsoid, 4.5–6.5 x 3–4 µm (vide Horak 1979/1979). Basidiospores shorter; pileus much paler coloured pink or pinkish ochraceous-cinnamon-brown; on soil or decaying plant debris. .......................................................... 11

11. Pileus argyrophyllum-pink (pinkish clay colour or pinkish ochraceous-cinnamon-brown; Steel & Dick 1975), to 15 mm broad, convex or campanulate; hyphae of pileus brown encrusted (vide Horak 1979). Known only from New Zealand. ........................................... R. cyanathus (Cooke & Massee) E. Horak 

12. Pileus much paler coloured, pink or pinkish buff. .............................................................. 13

13. Pileus to 47 mm, stipe 4 × 30 mm, slender; odour and taste of fresh brown mumm grass or 30 distinctive; basidiospores 5.6–8 × 4.5–6.8 µm, hyphae of pileus surface finely yellow brown encrusted, with scattered cystidied end cells in pileus surface hyphae; ........................................... R. pseudolyppe (*). Pileus to 80–130 mm broad; stipe 10–15 × 30–40 mm, robust, robust and taste peppery when fresh or when drying; basidiospores 6.5–10.5 × 4.5–6.5 (–7) × 5–8.1 µm, hyphae of pileus surface not encrusted, end cells of pileus surface hyphae not cystidioid (vide Balansin 1981). Known from New Zealand and Hawaii (D. Deojardin, personal comm. and collection examined by us) ........................................... R. porporina (G. Stev.) E. Horak 

14. Pileus surface with concentric dark grey-brown reticulate cracks or lines; ........................................... R. reticulata (Cleland) E. Horak (*) 

15. Pileus not concentrically reticulate or reticulate-emost. .............................................................. 15

16. Pileus uniformly grey or greyish brown, 16–36–(–75) mm broad, surface glabrous, entire, urdle-like or felled under a lens, lamellae creamy buff or greyish buff, subdecurrent or decurrent; pileipellis two-layered with a hyaline hypodermis and a brown excrusted subpellis; ........................................... R. pachyphyllus (*). Pileus brown or dark brown; pileipellis composed of a single layer; ........................................... R. maritima (G. Stev.) E. Horak 

17. Pileus to 45 mm or smaller; but lamellae subdecurrent or decurrent. ........................................... 16
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17. Pileu 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.

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.

**Rhodocybe pseudopiperita**

TAXONOMY

**Description of new species**

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

Pileus bula-bulino-roseus colouribus ochraceis paululum tinctus, saepe supra centrum infuscatus brunnescente, in areolis primum hygrophanus deinde pallide subroseo-bubalino, (15–)24–47 mm latus, convexus, saepe leniter umbonatus, succinctus vel interdum in statu maado lucibus, ut videtur gaber sed sub lente ×10 implicatus vel pannosus, laevis, interdum in superficie leniter rugulosus, opacus. Lamellae bubalino-roseae, plerumque decurrentes sed nonnullae adnatae vel subdecurrentes, arctae vel coarctae luteo flavo in gradibus duobus dispositae. Stipes roseolo-novellae adnatae vel subdecurrentes, arctae vel coarctatae

**Lamellae**

bubalino-roseolae, plerumque decurrentes sed nonnullae adnatae vel subdecurrentes, arctae vel coarctae luteo flavo in gradibus duobus dispositae. Stipes roseolo-novellae adnatae vel subdecurrentes, arctae vel coarctatae

**Stipe**

bubalino-roseolae, plerumque decurrentes sed nonnullae adnatae vel subdecurrentes, arctae vel coarctae luteo flavo in gradibus duobus dispositae. Stipes roseolo-novellae adnatae vel subdecurrentes, arctae vel coarctatae

**Lamella Trama**

hyphae, 4–16 µm in diameter. Clamp connections absent. Clamps absent.

**Hymenial**

Lamellae, clavate, 4-sterigmate. Hymenial cystidia absent.

Lamella trama hyaline, parallel, cylindrical hyphae, 4–8 µm in diameter. Pileipellis hyaline or pale straw yellow, 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. Pileospore and taste unknown; basidiospores 4.5–5.5 × 3.5–4.4 µm; hymenial cystidia hyaline, narrowly fusoid with undulate walls (vide Horak 1979). Known only from New Zealand.

**Selected specimens**


**Habitat**

Wet sclerophyll gullies or wet sclerophyll forests.

**Selected specimens**


**Commentary**

**Rhodocybe pseudopiperita** is a slender pale pinkish buff taxon that differs from the similarly coloured **Rhodocybe piperita** and lack of peppery odour and taste. **Rhodocybe pseudopiperita** has several other characters that distinguish it from **Rhodocybe piperita**. The presence of finely

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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

yellowish brown encrusted narrow hyphae in the pileipellis of R. pseudopiperita (encrusted hyphae are not present in R. piperita) and the presence of scattered cystidiod end cells in the pileipellis for R. pseudopiperita (there are no cystidiod 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).
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profound depressive, siccus, in statu madido sublubricus vel gelatinosus, in superficie implicatus vel pannosus, epacus. Lamellae juveniles pallide roseolae, deinde carneo-roseolae vel brunneo-roseolae, decurrentes vel subdecurrentes, interdum primum adnatae, congregatae, lamellulitas in gradibus duobus dispositis. Stipes exalbescens subdecurrentes, interdum adnatae, congestae, carneo-roseolae vel brunneo-roseolae, decurrentes vel subdecurrentes, arcuate, 3–5 mm deep, crowded, with or brownish pink, decurrent or subdecurrent, occasionally pale pink when young, becoming buff-pink, fleshy pink spicy-musty or curry-like when dried, some fresh specimens wet, surface matt or felty, opaque, pellis rind-like.

Basidiomata. Pileus: 5.6–11 × 4.5–7.2 mm (n = 8, mean = 7.5 ± 0.98, mean = 5.4 ± 0.57, Q = 1.24–1.62, mean = 1.29 ± 0.08). Holotype: 6.9–8.6 × 5–6.2 mm, n = 31

Basidiosporae 5.6–11 × 4.5–7.2 µm (n = 8, mean = 7.6 ± 0.49, mean = 5.5 ± 0.34, Q = 1.24–1.62, mean = 1.37 ± 0.08), elliptical or subamygdaliform in profile view, elliptical in face view, angular in polar view (8–11–13 facets), weakly or moderately undulate-pustulatum ornamented, walls evenly cyanophycid, walls inamyloid. Basidia 28–37 × (7–)8–9.7 µm, 4-sterigmatum, clavate. Cheliocystidia 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 × 3.2–6.5 µm. Pleurocystidia absent. Lamella trama hyaline, of parallel, cylindrical or slightly inflated hyphae, 4–10(–17)µm in diameter. Pleurocystidia a pale yellow brown layer of repent, but loosely interwoven, cylindrical or slightly inflated hyphae, 4–10.5µm in diameter, not encrusted but producing plasmatogenous 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 3–5 erect cells with sordid yellow plasmatogenous 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, 4–14µm in diameter. Clamp connections absent (Figs 4–6, 22).

Habitat

Watery and dry sclerophyll forests and wet sclerophyll gullies. Selected specimens


Pileus burnt sienna (7D6), reddish brown (8E1) or burnt sienna overlying terracotta (9D6) producing an ochreaceous pink hue, hygrophanous, becoming pale buff or buff pink, not infrequently with pallescent frosted-translucent watery spots (Wassleeflecken) 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 rollled at first, becoming decurved, straight or plane or uplifted with age, entire, dry but slightly lubricous or gelatinous when wet, surface matt or feltly, opaque, pelliis 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 lamellae, 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, tereete, 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.

Commentary

Rhodocybe lateritia is reminiscent of R. gemina (Fr) Kuyper & Noordel. [= R. truncata (Schaeff. ex Fr) Singer] because of its colours, stature and filamentous cheliocystidia. However, R. lateritia has larger and differently shaped basidiospores (in R. gemina they are 5–6.5 × 4–5 × 4–5.5 µm) and subglobose or short-broad-ellipsoid, 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...
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 grisius 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 cremes-bubalinae vel cinerascen-t bubalinae vel grisae,
acetate propert sporas subrosaeola, adnatae vel saepius subdecurrentes vel decurrentes, arctae vel coarctatae, lamellulsi in 2–3 gradibus dispositis. Stipes griseo-bubalinus vel acetate griseo-brunneus, omnino pruina alba obrectus tomentoqueto albo basali, ad apicem 4–5(–10) mm latus, ad basem 1.5–5(–9) mm latus, 14–46 mm longus, acuæs vel deorum vel serosum contractus, teres vel lateraler compressus, glaber, siccus, in contextu griseolo-bubalinus vel intus albenscens farutes. Odor plerumque valide farinaceus. Sapor plerumque valide farinaceus. Superficies pilei sicci in 3% KOH non reagens. Basidiospora

Hardly any of the above characteristics, except for the typicalH. pallidogrisea with its two-layered pileipellis, is found in Rhodocybe reticulata. However, the basidiospore form depicted by Horak and also the pileipellis (Horak 1978 / 1979; Grgurinovic 1997). In particular, the absence of pseudocystidia and clamp connections (Singer 1975, 1986; Rhodocybe 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,
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.

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 (1) 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 uniforniter pruinosis, tantum maturitate supra basem pruinosis. 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
Pileus Teak Brown (6F5) when young, becoming much paler with age (Wheat 4B5), 7–11 mm broad, dry, glabrous but matt or felted, margin paler with age (Wheat 4B5), 7–11 mm broad, convex 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 prunose at first, prunose only over base at maturity, stuffed inside, Champagne (4B4). Odour mushroomy. Taste very bitter.

**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 surrugapellis 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 umbicate or subumbiliciform species with ochreaceous umber colouration of the pileus, with a tomentose or minutely velvety pileus surface and very small spores (4.5–5.5 × 3.5–4.5 μm vide Horak 1979). *R. dingleyi* should not be confused with *R. tasmanica*. *Rhodocybe fuliginea* is also a taxon with a depressed or umbicate 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 × 4.5–6.5 μm vide Horak 1979) and ellipsoidal, not amygdaliform. One should not confuse *R. fuliginea* with *R. tasmanica*.

**Habitat**
Wet sclerophyll forests.

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**Selected specimens**

**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 pileipellis. *R. caelatoidea* is a pinkish cinnamon species, with a cellular subhyphalium, clusters of inflated and encrusted pileipellis, 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 surrugapellis 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 umbicate or subumbiliciform species with ochreaceous umber colouration of the pileus, with a tomentose or minutely velvety pileus surface and very small spores (4.5–5.5 × 3.5–4.5 μm vide Horak 1979). *R. dingleyi* should not be confused with *R. tasmanica*. *Rhodocybe fuliginea* is also a taxon with a depressed or umbicate 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 × 4.5–6.5 μm vide Horak 1979) and ellipsoidal, not amygdaliform. One should not confuse *R. fuliginea* with *R. tasmanica*.

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

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.
Rhodocybe from Tasmania

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siccus, elasticius vel flexiliter lentus, intus albus fœtus. Odor non distinctus. Sapor amarissimus. Basidiosporae 6.3–8.8 (–11.3) × 4–5.6 µm, amygaliformes vel ellipticae, ad pulum visae angulares (faciebus 8–10), omnino undulato-pustulatae. Basidia 4-sterigmata, angustae clavata, interdum prope apicem consticta. Chelioctydzia atque pleuroctydzia ut pote pseudocytdzia, in amplitudine, forma, coloreque similia, pigmentis fuscis rufido- ochraceis implenia, ventricosa, ventricoso-rostrata, saepe ad basem rostri septata, rostro saepe undulato, 36–70 × 4–8.8 µm, in praeparationibus 3% KOH crystallis rhomboideis in praeparationibus 3% KOH crystallis rhomboideis, in strato pallido-brunneo et colour et colourisque similis, pigmentis fuscis rufido- ochraceis supra basidia, basidioles et cystidia. 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Horak (1978/1979) described a small pale brown Rhodocybe species, *Rhodocybe mustellina*, under *Castanopsis* 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...
R. amara, Rhodocybe from Tasmania

We provide here our observations on fresh material of Documentation of species newly reported for Tasmania 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, incurred at first becoming decurved or plane, dry, glabrous but suede-like or matted, opaque. Context pale greyish or very dark greyish brown, thick. Lamellar buff or greyish buff becoming light tan (5C6 Pompeian Yellow, brownish orange) with age, adnate with a decurrent tooth or subdecurrent or decurrent, aruncate, 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 = 50, mean = 7.36 ± 0.78, meanw = 5.44 ± 0.50, Q = 1.14–1.67, meanw = 1.36 ± 0.12; Holotype, 5.5–7 × 4.5–5 µm, mean = 6.14 ± 0.57, meanw = 6.64 ± 0.38, Q = 1.1–1.5, meanw = 1.33 ± 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. Basidio- 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 × 4.8–8.9 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


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. brunneocerus, R. australis) with its obvious brightly coloured hymenial pseudocystidia and central stipe (although Horak (1979) considered that 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, 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.

**Basidiospores**

\[
4.8–7.2 \times 4–6.5 \, \mu m \quad (n = 42, \text{mean}_L = 5.86 \pm 0.53, \text{mean}_W = 5.07 \pm 0.52, Q = 1–1.33, \text{mean}_Q = 1.16 \pm 0.09; \text{Holotype} \ 5.5–7 \times 4.5–5 \, \mu m, \ n = 7, \text{mean}_L = 6.14 \pm 0.57, \text{mean}_W = 4.64 \pm 0.38, Q = 1.1–1.5, \text{mean}_Q = 1.33 \pm 0.14), \text{broadly elliptical or subglobose / ovate and strongly apiculate (to 1.6 \, \mu m long) in profile and face views, angular in polar view (8–10 facets), undulate-pustulate, walls evenly cyanophilic, inamyloid.}
\]

**Basidia**

\[
22–31 \times 7.2–9.7 \, \mu m, \text{clavate, 4-sterigmate, mostly filled with small lipidal bodies, also occasional sclerobasidia present, walls 1.6–2.4\mu m thick. Hymenial cystidia absent.}
\]

Lamella trama hyaline, of parallel, cylindrical hyphae, 4–13 \, \mu m in diameter. Pileipellis a dark brown layer of repent, cylindrical, heavily dark brown encrusted hyphae also containing dark brown intracellular pigment, 4–10\, \mu m in diameter. Pileus context a hyaline layer of loosely entangled, cylindrical or slightly inflated hyphae, 4–14 \, \mu m in diameter, occasionally with a distinctively inflated, clavate cell embedded in the context, to 22 \, \mu m in diameter. Clamp connections absent (Figs 19, 20, 28, 29).

**Habitat**

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

**Selected specimens**


**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 \, \mu m. Fig. 20. Basidiospores AD 3950 (TYPE), scale bar = 5 \, \mu m.
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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