

Australian coralloid fungi III – *Ramaria watlingii* R.H.Petersen

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Abstract

Ramaria watlingii R.H.Petersen, previously known only from a single Victorian collection (Petersen & Watling, 1989), has been recently collected from Tasmania. An up-dated description based on this new material is provided together with the first colour images of this Australian species.

Key words: fungi, systematics, *Ramaria*, Australia

Introduction

Petersen & Watling (1989) provided descriptions of some well known Australian species of *Ramaria* (Fr.) Bonord. such as *Ramaria lorithamnus* (Berk.) R.H.Petersen and *R. capitata* (Lloyd) Corner. Their paper also described new varieties of previously well known species (e.g., *Ramaria stuntzii* Marr var. *gelatinosa* R.H.Petersen & Watling; *R. subtilis* (Coker) Schild var. *microspora* R.H.Petersen & Watling) as well as two new species: *R. pyriformis* R.H.Petersen & Watling and *R. watlingii* R.H.Petersen. The Petersen & Watling (*ibid.*) paper includes only text descriptions, drawings of spores and, in some cases, simple line drawings of basidiomata, sometimes augmented by line drawings showing the structure of the apices of basidiomata. No colour images are included.

The species *Ramaria watlingii* was described from a single collection made by Watling from Gembrook in Victoria in 1982. Since that time, there have been no additional published records for the species so that information on such aspects as the species' geographical range, basidioma variations or fruiting period is non-existent. Petersen & Watling (1989) provided two simple line drawings of the taxon which emphasised the basidioma's unusual apical structures and these drawings have proven of great diagnostic value.

Ramaria watlingii has recently been collected from north western Tasmania. As far as can be determined, the Tasmanian material represents the second known collection of this apparently rarely encountered Australian taxon. Because of this rarity, and because good photographs are now available for the first time, a full description of the Tasmanian collection is provided here so that the species can be more readily identified in the field. A brief comparison of the Tasmanian and Victorian collections is given in the discussion and it is hoped this new information will assist field workers in diagnosing further collections of the species.

Materials and Methods

Two collections form the basis of the work in this paper: the holotype material (E) and the Tasmanian collection of which most has been lodged in HO with a small portion in BRI. Specimen samples were examined under an Olympus CX40 research light microscope (with drawing tube) using both ammoniated congo red and cotton blue in lactic acid as the mountants. Congo red was the preferred initial stain for all tissues, while cotton blue (with the sample pre-heated for a few seconds in the mountant) was used to provide accurate observations of the spore wall and its structures. Spore measurements were based on a sample of 20 spores selected at random. Spore Q is defined as the quotient of spore length divided by spore width; mean Q is defined as the quotient of the spore mean length divided by the spore mean width. Basidial measurements are based on a random sample of 10 basidia. Length/width quotients are omitted for basidia because, like most species of *Ramaria* so far encountered, the basidial lengths appear to vary considerably with both basidioma maturity and even the sampling location on the basidioma. The mean basidial dimensions should therefore be accepted with caution. The distribution map was developed using DMAP (Morton, 2005). Colour chip references are not yet available for this taxon.

Results

Ramaria watlingii R.H.Petersen, *Notes Roy. Bot. Gdn Edinburgh* **46**: 154 (1989)
Holotype: Australia, Victoria, Gembrook, 11 May 1982, R.Watling 14844 (E00218187).

Description based on the Tasmanian collection.

Basidiomata –12 × –12 cm; overall shape sphaeropedunculate; apices a shade of yellow to pale ochraceous but becoming brownish with orange tints when old, and then concolorous with branches, bluntly rounded, frequently bifid with the two apical branchlets usually broadly diverging and often either at right angles to each other or even subtending an obtuse angle between them, occasionally broadly digitate and may become subcornute, dry; *major branches* dark straw-yellow to pale ochraceous, numerous, cylindrical but flattened near the axils, –1 cm diam.,



Fig. 1 *Ramaria watlingii*; whole basidioma in situ at Dip River Forest Reserve. P.E.F. Harrison.

Fig. 2 *Ramaria watlingii*; immature basidiomata at Dip River Forest Reserve showing digitate and subcornute apices. P.E.F. Harrison.

minor branches dark straw-yellow to pale ochraceous, smooth, sometimes a little flattened; *axils* broadly round; *stipe* -3×-1.5 cm, separate or fasciculate, white to yellowish but superiorly becoming concolorous with the branches, aborted branches present. *Flesh* near the base yellowish with brown tints, not gelatinous or slippery; no colour changes on bruising were recorded. *Odour* and taste not recorded. *Rhizomorphs* not recorded. Figs 1, 2.

Macrochemical reactions: unknown.

Basidiospores $7.9-11.9 \times 4.3-6.1$ μm , mean 9.7×5.1 μm , Q: 1.6–2.5, mean Q: 1.89, ellipsoid, narrowly ellipsoid or sub-cylindrical, inclusions absent or sometimes with a single large inclusion, hilar appendix prominent and often curved, ornamentation of randomly scattered flattened warts or ridges which may be occasionally arranged longitudinally, profile moderately rough; *basidia* $72-91 \times 8-10$ μm , mean 80.4×8.6 μm , 4-spored, clamped; *sterigmata* to 7 μm long, distinctly long-conical, straight; branch trama composed of thin-walled, clamped, hyaline hyphae 4–12 μm diam., neither ampulliform septa nor gleoerous hyphae observed; *stipe trama* composed of hyaline, thin-walled and slightly thick-walled, clamped, parallel to slightly interwoven hyphae 5–14 μm diam.; *ampulliform septa* present, -14 μm diam., thin-walled or slightly thick-walled and with abundant stalactitic ornamentation; *gleoerous hyphae* not seen. Fig. 3.

Habit: gregarious amongst litter directly on disturbed ground by the roadside. *Habitat*: wet eucalypt forest (dominant *Eucalyptus obliqua*) with scattered specimens of southern beech (*Nothofagus cunninghamii*) and an understory which includes *Pomaderris apetala*.

Known distribution: Vic, Tas. Fig. 4.

Material Examined

Victoria:

Gembrook, 37° 57' S, 145° 32' E, 11 May 1982, *R. Watling 14844* (holo: E00218187). **Tasmania:** Dip River Forest Reserve ('Big Tree' area), 41° 02' 44" S, 145° 22' 33" E, 21 Jul. 2007, *P.E.F. Harrison PH2007-11* (HO 552503; BRI).

Discussion

Petersen and Watling (1989) state that the diagnostic characters of *Ramaria watlingii* are 'the straw yellow colour of the basidiome; presence of clamped basidia; abortive branchlets on the stipe; and conspicuously roughened spores with [mean length] $> 11\mu\text{m}$ '. Macroscopically, the Tasmanian collection correlates with the original Victorian collection very well. Figure 1 shows the curious arrangement of the bifid apices of the branches of the basidioma which are either nearly at right angles to each other or sometimes subtend an obtuse angle. The subcornute structure can be seen in the small branch to the lower right of the basidioma, however other images taken of this collection (Fig. 2) show structures that are virtually identical to the apical sketch in Petersen & Watling (1989: fig. 2A, p.155). Both the deeply rounded axils and aborted branches of the Tasmanian collection are also present in the Victorian material. Petersen & Watling (1989) describe their material as being dark straw yellow to ochraceous. Given that only two collections of the taxon are so far known, it is reasonable to assume that some colour variations will be found to exist depending upon age and location of the basidiomata.

Some variation exists in spore size between the type and the Tasmanian collection, however this again probably results from an imperfectly known taxon originally based on a single collection. Petersen & Watling (1989) stated that the spore dimensions were: $9.7-12.2 \times 4.7-5.4$ μm , mean 11.2×5.0 μm , mean length: 11.2 μm ,

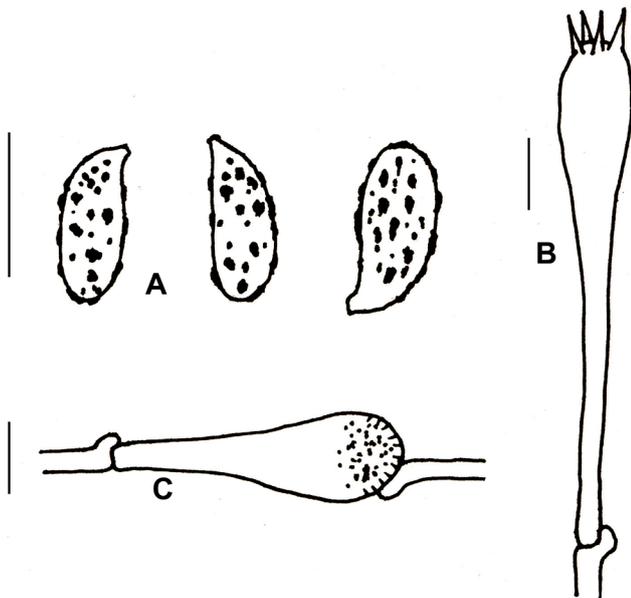


Fig. 3 *Ramaria watlingii*, micro-details taken from the Dip River Forest Reserve collection. A, basidiospores; B, basidium; C, ampulliform septum; all scale bars = 10 μ m.

Q: 1.93–2.54, mean Q: 2.26. Independent examination of the holotype produced the following dimensions: (9.0–)9.6–11.2(–11.5) \times 4.2–5.4 μ m, mean 10.3 \times 4.7 μ m, Q: 1.8–2.4(–2.5), mean Q: 2.19. Given that spores can vary so much from even the same basidioma, we do not consider these differences significant. It is of interest to note that occasional giant spores of up to 20.1 \times 6.0 μ m were encountered during examination of the holotype collection. The basidia of the holotype collection proved extremely difficult to rehydrate but their well developed basal clamps were clearly visible. The resulting basidial dimensions (60–63 \times 9–11 μ m) differ considerably from those given by Petersen & Watling (1989) (80–90 \times 9–11 μ m) but this variation is considered due to the location on the basidioma from which the basidial sample was made. The basidia of the Tasmanian collections also display well developed basal clamps and have basidial dimensions that agree well with the protologue.

Both the Tasmanian and Victorian collections display ampulliform septa and slightly thick-walled hyphae only in the stipe trama. Clamps are found throughout the trama of both the holotype and the Tasmanian collection. Gleoplerous hyphae with the same diameter as normal hyphae were also found in the stipe trama of the type collection, however they were not seen in the Tasmanian material. This variation is not yet considered of any significance since gleoplerous hyphae can occur in any quantity from absent to abundant among different collections of some species (e.g., *Ramaria anziana* R.H.Petersen and *R. capitata*; personal observations). More collections are needed to confirm this particular characteristic.

Some difference exists in the habitats for the two

collections. The Tasmanian collection was found in wet eucalypt forest (*Eucalyptus obliqua*) with scattered southern beech (*Nothofagus cunninghamii*) which shows some evidence of having been harvested in the early 1900's. However, the Victorian collection from Gembrook was made from 'dry sclerophyll forest with thorny under-story, and mainly *Eucalyptus obliqua* and *E. radiata*.' It is plausible that *Ramaria watlingii* requires a forest habitat with a *Eucalyptus* spp. component, however more collections will be required to confirm this. It should be noted that the distribution map is more a record of where collecting has occurred than a representation of the true range of the taxon.

Yellow colouration occurs in three other Australian taxa: *Ramaria capitata* var. *capitata*, *R. citrinocuspudata* A.M.Young & N.A.Fechner and *R. lorithamnus*. None of these taxa has clamp connections and none is closely related to *Ramaria watlingii*. *Ramaria capitata* var. *capitata* is readily separated by its apices, which are swollen, usually viscid and form 'shelf-like' surfaces on the basidioma. *Ramaria citrinocuspudata* differs by having closely packed and short apices on a compact, litter-immersed basidioma. *Ramaria lorithamnus* forms basidioma clusters that are far more slender and less branched than the compact and highly branched basidioma of *R. watlingii*. In addition, while the apices of *R. lorithamnus* do exhibit bifid branching, they tend to have the two short branchlets of the apex close together and not in the right angled or obtuse structure of the apices as in *R. watlingii*.

References

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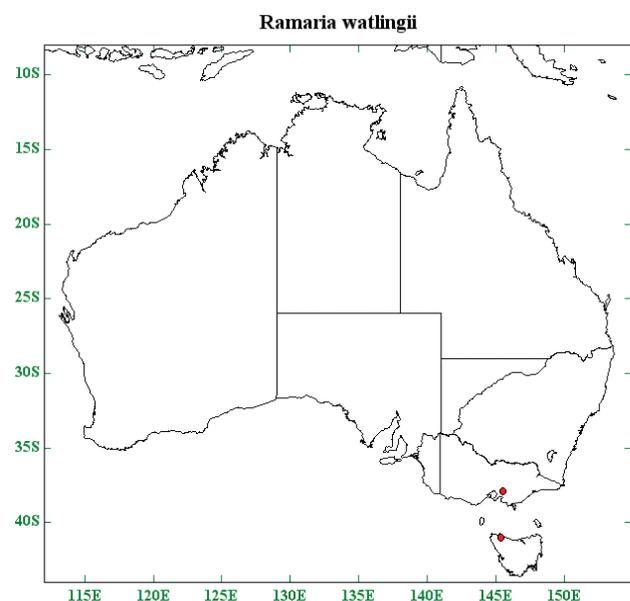


Fig. 4 *Ramaria watlingii*, distribution map.