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Verrucaria pluviosilvestris sp. nov., a common lichen of rainforest in north-eastern Queensland

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Abstract: *Verrucaria pluviosilvestris* P.M.McCarthy (Verrucariaceae) is described as new. This lichen is common on sheltered, non-aquatic siliceous rocks of various types in lowland and montane rainforest in north-eastern Queensland.

In July and August, 2006, a collecting trip to rainforest and associated habitats between Townsville and Cape Tribulation, north-eastern Queensland, confirmed the significance of pyrenocarpous lichens in the saxicolous communities of creeks and creek-banks, cliffs, gorges and sheltered outcrops. While Porinaceae are especially diverse in the region, species of *Anisomeridium*, *Strigula* and Verrucariaceae are also prominent. One previously undocumented *Verrucaria* is particularly common on non-aquatic rocks, and is described here.

Verrucaria pluviosilvestris P.M.McCarthy, sp. nov. Fig. 1
Thallus epilithicus, laevigatus, rimosus vel areolatus, 30–60 μm crassus, albidus vel pallidogriseus, sine strato basali, madefactus pallidoviridis. Perithecia numerosa, fere omnino immersa, (0.2–)0.38(–0.55) mm diametro, apicibus nigris, (0.08–)0.15–0.22(–0.35) mm diametris. Involucrellum ad basim excipuli descendens, deinde late expansum. Centrum 0.15–0.28 mm diametro. Periphyses 15–30(–40) x (1.5–)2–2.5 μm. Asci 65–115 x 24–40 μm. Ascosporae plerumque elongatae-ellipsoideae, (22–)31(–39) x (9–)12(–15) μm.

Type: Australia, Queensland, Tully Gorge Natl Park, Tully Gorge, banks of Tully R. below Kareeyah Power Station, 55 km NW of Tully, 17°46′03″S, 145°34′48″E, on shaded siliceous rocks in rainforest gorge, alt. 220 m, *P.M.McCarthy 2577*, 28.vii.2006 (holotype CANB; isotype BRI).

Thallus crustose, epilithic, sometimes coalescing to form colonies to 5(–10) cm wide, usually off-white to pale grey when dry, occasionally darker, richly rimose to areolate (less rimose in deep shade), with a smooth to rugulose or irregularly and minutely uneven surface, matt, 30–60 μm thick in the absence of ascomata, to 100(–120) μm thick between ascomata in richly fertile thalli; moist thalli pale greenish (when ascomata are sparse) to medium greenish grey (when ascomata are numerous and densely aggregated); areolae angular to irregular, separated by thin cracks. True cortex lacking, but the uppermost 10–20 μm of the thallus without algae; cells rounded to angular and vertically elongate, 3–8 x 3–5 μm, hyaline, thin-walled. Algae chlorococcoid, dominating the rest of the thallus (vertical section), bright green, globose, subglobose or ellipsoidal, 5–10(–12) x 4–8(–10) μm; interstitial cells similar to those of the alga-free layer. Prothallus not apparent. Basal layer absent; however, overlapping involucrellum bases in abundantly fertile thalli can give the misleading impression of a thick continuous layer of blackish basal hyphae. Perithecia usually very numerous, almost entirely immersed in the thallus, with only the upper part of the involucrellum exposed; wetting the thallus often shows the full extent of the immersed involucrellum; perithecia less commonly semi-immersed in the thallus. Involucrellum black, (0.2–)0.38(–0.55) mm diam. [25 measured], usually exposed only towards the apex, *c.* 40–60 μm thick, contiguous with the excipulum but also spreading laterally into the thallus and towards the substratum. Perithecial apex usually plane to convex, (0.08–)0.15–0.22(–0.35) mm diam. [50 measured], with a central, hyaline to grey-brown plane shallowly depressed or, occasionally, crateriform ostiole (40–)80(–100) μm diam. Excipulum hyaline to greyish brown in thin section, 20–25(–30) μm thick. Centrum

subglobose to obpyriform, 0.15–0.28 mm diam. Periphyses 15–30(–40) x (1.5–)2–2.5 μm, simple to sparingly branched. Paraphyses absent at maturity. Hymenial gel IKI+ orange-brown. Asci fissitunicate, 8-spored, narrowly to broadly clavate to cylindro-clavate or obclavate, occasionally almost subglobose, 65–115 x 24–40 μm. Ascospores simple, hyaline, narrowly to broadly ellipsoidal, occasionally subcylindrical or broadly clavate, biseriate or irregularly massed in the asci, (22–)31(–39) x (9–)12(–15) μm [80 measured]; wall usually 0.7–1 μm thick, occasionally to 2 μm (due to environmental stress?); contents granulose and, frequently, large-guttulate.

Etymology: From the Latin *pluvius* (rainy) and *silvestris* (of the forest), in reference to the habitat of the species.

Remarks

The new species is characterized by a combination of very pale areolate thallus, very numerous and largely immersed perithecia, each with a spreading involucrellum, and comparatively large asci and ascospores. The aquatic and semi-aquatic *V. praetermissa* (Trevis.) Anzi occurs, among other places, in south-eastern and north-eastern Queensland (including the Atherton Tableland). However, while the thallus is outwardly and anatomically quite similar to that of *V. pluviosilvestris*, it is subtended by a thick brownish black basal layer. In addition, the ascospores are considerably smaller [15–24 x 6.5–9.5 μm; McCarthy (2001)]. The newly described lichen does not grow in creeks or on seasonally inundated rocks.

Verrucaria pluviosilvestris was collected from shaded, fine- and coarse-grained siliceous rock outcrops, boulders and cliff faces in rainforest at ten localities between Wallaman Falls (18°35′S) and Mossman Gorge (16°28′S) and at elevations of 55–980 m. It is likely to be as common in similar habitats further south in Queensland.

ADDITIONAL SPECIMENS EXAMINED

Queensland: • Girringun Natl Park, Wallaman Falls, 50 km W of Ingham, Jinda Track, 18°35′21″S, 145°48′20″E, on shaded siliceous rocks in deep gorge, alt. 300–500 m, *P.M. McCarthy 2549*, 25.vii.2006 (CANB); • Murray Falls State Forest Park, 19 km WSW of Bilyana, 18°09′14″S, 145°48′58″E, on deeply shaded rocks in rainforest, alt. 55 m, *P.M. McCarthy 2592*, *2596*, 27.vii.2006 (CANB); • Tully Gorge Natl Park, Tully Gorge, banks of Tully R., below Kareeyah Power Station, 55 km NW of Tully, 17°46′03″S, 145°34′48″E, on shaded siliceous rocks in rainforest gorge, alt. 220 m, *P.M. McCarthy 2578*, *2630*, 28.vii.2006 (CANB); • Atherton Tableland, Elinjaa Creek, below Elinjaa Falls, *c.* 5 km ENE of Millaa Millaa, 17°29′38″S, 145°39′20″E, on deeply shaded fine-grained siliceous rock in rainforest, alt. 705 m, *P.M. McCarthy 2514*, *2517*, 29.vii.2006 (CANB); • Wooroonooran National Park, tributary of North Johnstone River, track to Tchupala Falls, 34 km W of Innisfail, 17°36′25″S, 145°46′44″E, on deeply shaded siliceous rocks in rainforest, alt. 300–350 m, *P.M. McCarthy 2538*, 30.vii.2006 (CANB); • Mossman Gorge, 6 km W of Mossman, 16°28′21″S, 145°19′54″E, on deeply shaded siliceous rocks in rainforest, alt. 60 m, *P.M. McCarthy 2621*, 1.viii.2006 (CANB); • Atherton Tableland, Mount Hypipamee Natl Park, track to Dinner Falls, 25 km S of Atherton, 17°25′42″S, 145°29′10″E, on moderately shaded siliceous rocks, alt. 980 m, *P.M. McCarthy 2589*, 5.viii.2006 (CANB); • Atherton Tableland, Wongabel State Forest, 10 km S of Atherton, 17°19′56″S, 145°30′01″E, on shaded siliceous rocks in rainforest, alt. 775 m, *P.M. McCarthy 2574*, 5.viii.2006 (CANB); • Atherton Tableland, Danbulla State Forest, Danbulla Forest Drive, Kauri Creek, 24 km E of Tolga, 17°08′02″S, 145°35′55″E, on deeply shaded siliceous rocks in rainforest, alt. 660 m, *P.M. McCarthy 2565*, 6.viii.2006 (CANB); • Atherton Tableland, Tully Falls Natl Park, Charmillin Creek, 12.5 km S of Ravenshoe, 17°46′36″S, 145°33′51″E, deeply shaded siliceous rocks near a creek in rainforest, alt. 620 m, *P.M. McCarthy 2527*, 7.viii.2006 (CANB); • Wooroonooran National Park, tributary of North Johnstone River, above Wallicher Falls, 35 km W of Innisfail, 17°36′18″S, 145°46′21″E, on moderately shaded riverside siliceous rocks, alt. 300–350 m, *P.M. McCarthy 2614*, 10.viii.2006 (CANB).

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Reference

McCarthy, PM (2001): *Verrucaria*. *Flora of Australia* **58A**, 176–196.

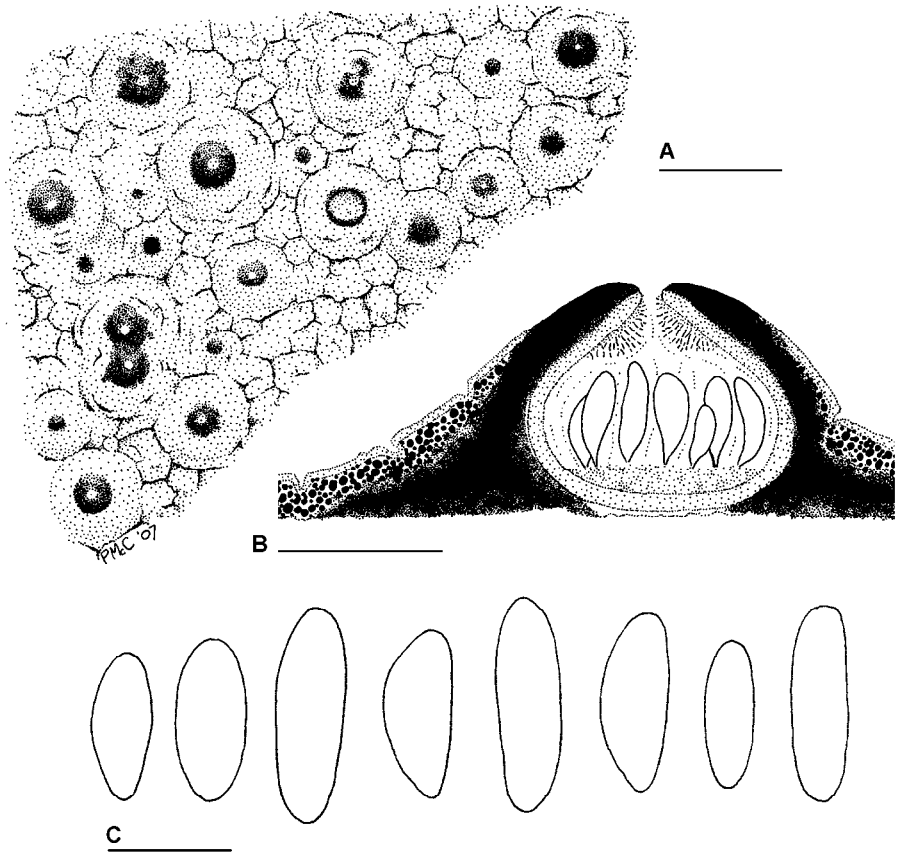

Figure 1. *Verrucaria pluviosilvestris* (holotype). A, Habit of thallus and perithecia. B, Sectioned perithecium and adjacent thallus (semi-schematic). C, Ascospores. Scales: A = 0.5 mm; B = 0.2 mm; C = 20 μm.