

## New species and records of lichens from the Cook Islands, South Pacific Ocean

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### Abstract

*Lecanographa solicola* P.M.McCarthy & Elix (Roccellaceae) and *Pseudocyphellaria louwhoffiae* Elix (Lobariaceae) are described as new from Rarotonga, Cook Islands, South Pacific Ocean. Twenty-eight other taxa are reported for the first time from the Cook Islands. An updated, national lichen checklist is also provided.

The Cook Islands comprises 15 small islands and atolls in 2 million square kilometres of the South Pacific Ocean, flanked by Samoa and Tonga to the west and by French Polynesia to the east. Rarotonga, the largest island, is situated at latitude 21°12–15'S and longitude 159°44–50'W. Fringed by a coral reef, it is 11 km from east to west, 8 km from north to south, and has an area of 67 square kilometres. Volcanic in origin, eruptions, compaction and erosion have formed today's steeply rugged and fertile interior with breccia pinnacles and cliffs, as well as outcrops and boulders of rather porous basalt.

In 1998, the authors, with Dr Simone Louwhoff, visited Rarotonga, primarily to investigate Parmeliaceae and pyrenolichens. Based on specimens collected at that time, 11 new taxa of the genera *Buellia*, *Canoparmelia*, *Pertusaria*, *Porina*, *Pyrenula*, *Strigula* and *Verrucaria* have been described, and numerous other species reported from the Cook Islands for the first time (McCarthy 2000; Louwhoff & Elix 2000; Archer & Elix 2015; Elix 2016). In this contribution, new species of *Lecanographa* Egea & Torrente (Roccellaceae) and *Pseudocyphellaria* Vain. (Lobariaceae) are described from material collected in 1998, and 28 other species are reported for the first time from these islands. The checklist of Cook Islands lichens is brought up-to-date and now includes 113 taxa. However, given the considerable habitat diversity, particularly in Rarotonga, and the sporadic nature of previous lichenological investigations, this figure probably represents no more than 30–40% of the actual lichen diversity.

### Methods

Observations and measurements of photobiont cells, thalline and apothecial anatomy, asci, ascospores, pycnidial anatomy and conidia were made on hand-cut sections mounted in water; apothecial were also treated with 10% potassium hydroxide (K) and 50% nitric acid (N). Asci were also observed in Lugol's Iodine (I), with and without pretreatment in K and N. Thallus samples were analysed for chemical constituents by thin-layer chromatography (Elix 2014).

### New species

***Lecanographa solicola*** P.M.McCarthy & Elix, sp. nov.

Mycobank No. **MB 822282**

Figs 1, 2

Characterized by the terricolous, pale brownish grey or pale brown to pale yellow-brown, crustose thallus containing a trentepohlioid photobiont and lacking lichen substances; rather large, brown to black, apothecioid ascomata, (0.48–)0.90(–1.52) mm diam., with a red-brown, basally thick, cupulate proper excipulum; *Grumulosa*-type asci enclosed by sparingly branched and anastomosing paraphysoids with non-swollen and unpigmented apices; fusiform ascospores that are 3(–4)-septate, 16–30 × 5–8 µm, with or without a thin episporium; and usually clustered pycnidia with distinctive, obampulliform conidia with a short to long 'neck', 3–5(–6) × 1–1.5 µm.

*Type:* Cook Islands: Rarotonga, Raemaru Track, 21°14'S, 159°49'W, alt. c. 100 m, on consolidated, siliceous soil on fern-dominated slopes with scattered *Albizia*, *J.A. Elix* 42873, 8.vi.1998 (holotype – CANB).

*Thallus* crustose, epibiotic, determinate, continuous, forming colonies to several centimetres wide, pale brownish grey or pale brown to pale yellow-brown, dull, granulose to verruculose, (40–)80–150(–250) µm thick, the surface patchily farinose, ecorticate, or the thallus with an epinecral layer 5–8 µm thick. *Algae* trentepohlioid, occupying a discrete layer up to 50 µm deep, or more diffuse and penetrating 100 µm into the thallus-soil interface; cells broadly ellipsoid to subglobose, 6–10(–13) × 6–8(–10) µm, mostly solitary, or in very short filaments. *Medulla* whitish and discrete or partly or largely obscured by soil particles, c. 50–150 µm thick, H<sub>2</sub>SO<sub>4</sub>–, I–; hyphae 1.5–2.5(–3) µm wide, appearing to penetrate the soil to a depth of 250 µm or more. *Prothallus* not apparent. *Ascomata* numerous, apothecioid, somewhat innate to adnate or sessile, mostly solitary and rounded in outline, the largest ascomata often with a shallowly or more deeply scalloped edge, (0.48–)0.90(–1.52) mm diam. [*n* = 50]; disc red-brown to dull black, initially plane and then occasionally paler greyish brown, later moderately to strongly convex, smooth, epruinose or lightly grey-pruinose; proper margin initially glossy brown-black to black, to 80 µm thick, not or only moderately prominent and entire to flexuose (i.e. when the disc is plane to low-convex and less than c. 0.6 mm wide), epruinose or lightly grey-pruinose, becoming ± excluded, but remaining visible as a dark ring contrasting with the paler disc when the ascoma is wetted. *Thalline margin* lacking. *Proper excipulum* cupulate, deep red-brown, 40– 60(–80) µm thick laterally, 80–150 µm thick at the base, with an external, yellow-brown necral layer 5–8 µm thick; excipulum paraplectenchymatous internally above the ascomatal base, the cells 5–7 µm wide, these becoming elongate and radiating downwards and laterally to the edge of the excipulum, 7–10(–12) × 3–5(–7) µm, K+ yellow-brown laterally and K+ deep orange-red basally, N+ yellow-orange laterally and N+ deep orange-red at the base. *Hypothecium* pale yellow to pale yellowish brown, 50–80 µm thick, with oily inclusions, K+ yellow-orange, N–, merging with the base of the proper excipulum. *Hymenium* 80–100 µm thick, hyaline to very pale yellowish, not interspersed with granules or oil globules, I+ persistently dark blue, K–, N–; hymenial gel KI+ lilac-blue and diffusing into the mounting medium. *Epihymenium* diffuse red-brown, c. 20 µm thick, K+ pale orange, the colour rapidly dissipating, N+ pale orange, KI+ lilac blue; K-soluble granules present or absent. *Paraphysoids* tightly conglutinate in water, separating ± instantaneously in K, sparingly branched and anastomosing above, simple or sparingly branched below, long-celled, 1–1.5 µm thick; apices neither swollen nor pigmented. *Asci* *Grumulosa*-type (*sensu* Egea & Torrente 1994), 8-spored, narrowly clavate or narrowly cylindroclavate, 69–87 × 10–17 µm [*n* = 20]; ascus wall KI–, I+ uniformly pale blue; apex rounded, with a 2–4 µm thick tholus at maturity, without or occasionally with a minute ocular chamber. *Ascospores* colourless, 3(–4)-septate, irregularly biseriolate in the ascus, or overlapping-uniseriate below and clustered above, mostly narrowly to broadly fusiform, straight or slightly curved, faintly constricted at the septa or not, (16–)22(–30) × (5–)6.5(–8) µm [*n* = 77]; end cells smaller or all locules of ± equal size throughout spore ontogeny; apices subacute or acute, occasionally the distal end more rounded; endospore thin; spore wall 1–1.5 µm thick; epispore thin or not apparent; contents clear or granular-guttulate. *Pycnidia* moderately numerous, semi-immersed, solitary and 80–120(–150) µm wide or forming irregular, convex clusters of 8–12(–15), 0.5–0.8 mm in maximum extent, perithecioid, plane to convex and glossy brown-black or, finally, with a gaping, concave to urceolate, epruinose 'disc'; apex 15–20 µm thick; internal wall 8–12 µm thick, medium to dark red-brown (K+ pale yellow-brown to red-brown), with a simple conidiogenous layer; conidiophores 10–15 × 1–1.5 µm. *Conidia* budding off from the apices of conidiophores, simple, straight, obampulliform and with a short to long 'neck', 3–5(–6) × 1–1.5 µm. *Chemistry:* No substances detected by TLC.

*Etymology:* The epithet *solicola* refers to the occurrence of the new species on soil.

## Remarks

As outlined in the foregoing diagnosis and elaborated upon in the description, *Lecanographa solicola* exhibits a distinctive suite of thalline, apothecial and pycnidial attributes. Its inclusion in the family Roccellaceae is based on the combination of the trentepohlioid photobiont, sparingly branched and anastomosing paraphysoids and the occurrence of *Grumulosa*-type asci with a KI– and I+ uniformly pale blue tholus.

The placement of the new species in *Lecanographa* Egea & Torrente is more tentative. This genus of 38 species is especially common on bark (less so on rock) in tropical to temperate regions. One terricolous species is known, viz. *L. azurea* Follmann from the Atacama Desert in Chile, which has a complex thallus chemistry, blue-pruinose apothecioid ascomata and long and narrow, 7-septate ascospores (Follmann 2008). The ascomata of *Lecanographa* are lirelliform or apothecioid, with a non-carbonized, dark brown proper excipulum, branched and anastomosing paraphysoids, *Grumulosa*-type asci and mostly fusiform or more elongate, transversely septate ascospores with a comparatively thin endospore (Egea & Torrente 1994; Grube 1998; Egea *et al.* 2004). However, some attributes of *Lecanographa* elsewhere in the world are not replicated in *L. solicola*, e.g. paraphysoids with swollen apices, ascospores being more obviously halonate and turning brown after maturity and, especially, solitary pycnidia with straight or curved, elongate-bacilliform to short-filiform conidia (Egea & Torrente 1994). The pycnidia of *L. solicola* are particularly noteworthy and anomalous, and they often clustered in discrete, convex groups of 8–12(–15), although not compound to the extent of occupying stroma-like structures. The conidia were similarly unexpected, having the shape of inverted flagons with elongate necks (obampulliform; Fig. 2) and closely resembling those seen in many species of *Byssoloma* Trevis. (Pilocarpaceae).

While our principal intention here is to provide a valid name for a highly distinctive species and to assign it to the most appropriate genus, it is hoped that further collections of this and unambiguously congeneric lichens will become available from the Pacific region and beyond. Once that occurs, subsequent chemical and morphological assessments, supplemented by molecular analyses, are likely to necessitate a revised generic placement.

*Lecanographa solicola* is known only from consolidated, siliceous soil at the type locality in the coastal lowlands of Rarotonga, Cook Islands.

***Pseudocyphellaria louwhoffiae* Elix, sp. nov.**  
Mycobank No. **MB 823490**

Figs 3, 4

Similar to *Pseudocyphellaria haywardiorum* D.J.Galloway, but differs in forming small rosettes 20–40 mm wide, in having a smooth, white-tomentose upper surface and lobes with pseudoisidiate margins, yellow pseudocyphellae and in containing calycin and pulvinic dilactone.

*Type:* Cook Islands: Rarotonga, Ara Metua Road, between Avana Drive and Pariki Road, 21°12'S, 159°44'W, alt. c. 100 m, on bark in roadside vegetation, *S.H.J.J. Louwhoff* 596, 7.vi.1998 (holotype – CANB).

*Thallus* foliose, forming small rosettes 20–40 mm wide, loosely attached, the margins often free. *Lobes* sublinear-elongate, 10–15(–20) mm long and 1–2.5 mm wide, ± regularly di- or trichotomously branched, contiguous to weakly imbricate; apices often suberect; lobe margins elevated, thickened above and below, sinuous or ragged, dentate-incised to densely pseudoisidiate, with sparse yellow pseudocyphellae. *Upper surface* pale grey or greyish brown when dry, dark blue-black when wet, smooth, slightly glossy in the thallus centre, white-silky-tomentose, especially towards the margins. *Pseudoisidia* common and conspicuous, mainly marginal, corticate, subglobose or often forming densely coralloid clusters to 0.7 mm high, yellow-green to orange-brown, rarely abraded and appearing granular-soresiate. *Medulla* yellow. *Photobiont* *Nostoc*. *Lower surface* yellow to yellow-brown; tomentum pale grey to grey-brown or yellow-brown, thick and tangled, most dense towards the margins. *Pseudocyphellae* yellow, sparse, scattered, minute, to 0.1 mm wide; decorticate area plane, immarginate. *Apothecia* and *pycnidia* not seen.

**Chemistry:** Thallus and medulla K–, C–, KC–, PD–, UV–; containing 2 $\alpha$ ,3 $\beta$ -diacetoxystictane (trace), 2 $\alpha$ ,3 $\beta$ -diacetoxystictane-22-ol (trace), pseudocyphellarin A (minor), pseudocyphellarin B (minor), 2'-O-methylpseudocyphellarin A (major), 2'-O-methylphenarctin (minor), calycin (minor), pulvinic dilactone (trace).

**Etymology:** The species is named in honour of our colleague and collector of the type specimen, Dr Simone Louwhoff.

#### Remarks

The new species is characterized by the thallus forming small rosettes, with a yellow medulla, a cyanobacterial photobiont, relatively narrow, sublinear-elongate lobes with a white-tomentose upper surface and conspicuous, pseudoisidiate margins, yellow pseudocyphellae on the lower surface and in containing the pigments calycin and pulvinic dilactone and depsides of the pseudocyphellarin A chemosyndrome. It is morphologically similar to *P. haywardiorum*, in that the two species have *Nostoc* as photobiont and develop similar pseudoisidia on the lobe margins, but *P. haywardiorum* has a punctate-impressed, non-tomentose upper surface, a white medulla and pseudocyphellae, a bullate lower surface, and it lacks medullary pigments (Galloway 1994). Chemically, *P. louwhoffiae* appears closely related to the Australasian *P. jamesii* D.J.Galloway and *P. nermula* D.J.Galloway, both of which have a yellow medulla and yellow pseudocyphellae on the lower surface. However, *P. jamesii* lacks vegetative propagules, while *P. nermula* has a densely phyllidiate upper surface (Galloway *et al.* 2001). The most similar species is *P. pilosellioides* (Räsänen) A.H.Magn., from southern South America (Galloway 1986). However, the latter has a larger thallus, 50–100 mm wide, with broader lobes, 5–40 mm wide, a reticulately ridged lower surface, a faveolate upper surface near the lobe margins, and it contains additional gyrophoric acid and methyl gyrophorate as well as an alternative suite of triterpenes (Galloway 1992).

*Pseudocyphellaria louwhoffiae* was found on the bark of trees in open forest at altitudes of 100–360 m. Associated species include *Bulbothrix goebelii* (Zenker) Hale, *B. tabacina* (Mont. & Bosch) Hale, *Coccocarpia palmicola* (Spreng.) Arv. & D.J.Galloway and *Heterodermia propagulifera* (Vain.) Dey.

#### ADDITIONAL SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Raemaru Track, upper level, 21°14'S, 159°49'W, alt. 200 m, on *Allocasuarina* on fern-dominated slopes with scattered *Albizzia*, *J.A. Elix 42898, 42922*, 8.vi.1998 (CANB).

#### New records

##### 1. *Acarospora* aff. *veronensis* A.Massal., *Ric. Auton. Lich. Crost.* 29 (1852)

Thallus squamulose, growing on hard, compacted soil and on rock. Squamules solitary and scattered, or in small groups, rounded to shallowly lobate, 0.5–1.5(–1.8) mm wide, 100–250(–300)  $\mu$ m thick, pale brownish grey to medium or dark brown, mostly plane, occasionally slightly convex, smooth, epruinose, K–, C–, KC–; margin initially with a blackish rim up to 50  $\mu$ m thick, this disappearing at maturity, all squamules with a brown to blackish basal layer 20–40(–80)  $\mu$ m thick. Cortex with an upper, pale brown layer 7–12  $\mu$ m thick, subtended by a hyaline layer 15–30(–40)  $\mu$ m thick; algal layer with a jagged upper edge, 50–80(–100)  $\mu$ m thick, continuous or not and then broken by columns of thin-walled, vertically oriented hyphae; algal cells 7–15  $\mu$ m diam. Apothecia 1 or 2 per mature squamule, 0.3–0.5 mm wide, immersed in the thallus; disc concave or plane and flush with the thallus surface, smooth or sulcate, with a low, dark brown rim. Proper excipulum hyaline to pale brown at the sides and base, 25–50  $\mu$ m thick; epihymenium brown-black, 10–15  $\mu$ m thick; hymenium 150–230  $\mu$ m thick; hypothecium pale yellowish brown, 40–50(–70)  $\mu$ m thick. Asci producing at least 200 ascospores; ascospores narrowly ellipsoid to oblong, 2–2.5(–3)  $\times$  0.7–1  $\mu$ m. Pycnidia immersed, to 100  $\mu$ m wide, with a minute, pale to dark brown apex, hyaline below; conidia bacilliform, 3–5  $\times$  0.5  $\mu$ m.

The two collections from the Cook Islands are linked to the variable and almost cosmopolitan *A. veronensis* due to their small, scattered, mostly pale brownish grey to brown squamules; these are smooth, epruinose, K–, C– and KC–, and have a dark rim and lower surface. However, the relationship is highly tentative at best because *A. veronensis* has a continuous algal layer with a smooth upper edge, a much shallower hymenium and larger ascospores, (3–)3.8–5  $\times$  1–2.1  $\mu$ m (see Knudsen 2008; Fletcher *et al.* 2009).

#### SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Te Kou Track, lower level, 21°13'S, 159°46'W, alt. c. 80 m, on basalt in a forest clearing, *P.M. McCarthy 4665*, 7.vi.1998 (CANB); • Raemaru Track, lower level, 21°14'S, 159°49'W, alt. c. 50 m, on hard, very compacted soil beside track, *P.M. McCarthy 4662*, 8.vi.1998 (CANB).

**2. *Amandinea efflorescens* var. *pseudohypopelidna*** Marbach, *Biblioth. Lichenol.* 74, 64 (2000) Previously known from Australia, New Caledonia and South America (Marbach 2000; Elix 2016, 2018).

#### SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • Muri Lagoon, 21°15'S, 159°44'W, alt. 1 m, on dead coconut palm along foreshore, *J.A. Elix 42729 pr.p.*, 6.vi.1998 (CANB).

**3. *Calopadia vermiculifera*** (Vain.) Sérus., in Aptroot *et al.*, *Biblioth. Lichenol.* 64, 42 (1997) Known from the Philippines, Papua New Guinea and the Seychelles (Santesson 1952; Aptroot *et al.* 1997; Seaward & Aptroot 2009), specimens of this highly distinctive, corticolous species in the Cook Islands have a thin, pale greyish green thallus (no substances detected by TLC) with tangled, superficial cephalodia, orange-brown, lecidine apothecia with paler margins and muriform ascospores that are 74–95  $\times$  21–27  $\mu$ m and 1 per ascus, along with campylidia that become erect and produce filiform-acicular, 15–21-septate conidia 100–150  $\times$  2–2.5  $\mu$ m.

#### SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Papua Falls, Papua Stream, 21°14'S, 159°47'W, alt. 40 m, on *Cecropia peltata*, in open area in moist forest, *J.A. Elix 42932, 42933 p.p.*, 9.vi.1998 (CANB); • Te Kou Track, lower level, 21°13'S, 159°46'W, alt. 80 m, on *Cecropia* trunk and branches in scattered regrowth forest and taro gardens, *J.A. Elix 42845*, 7.vi.1998 (CANB).

##### 4. *Chrysothrix candelaris* (L.) J.R.Laundon, *Lichenologist* 13, 110 (1981)

The known distribution of this almost cosmopolitan lichen includes the Pacific islands of Guadalupe, Maui (Hawaiian Islands), Galapagos Islands and Pitcairn Islands (Elix & McCarthy 2008).

#### SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • c. 50 m S of mouth of Avana Stream along Ara Tapu Road, 21°14'S, 159°43'W, alt. 1 m, on bark of *Cocos nucifera* on the seashore, *S.H.J.J. Louwhoff 619 pr.p.*, 9.vi.1998 (CANB).

**5. *Coenogonium lutescens*** (Vězda & Malcolm) Malcolm, *Australas. Lichenol.* 54, 19 (2004) This lichen was first described from bark in New Zealand (Vězda & Malcolm 1997); it was subsequently reported from Tasmania (Kantvilas & Jarman 2012) and, most recently, from Florida (Seavey *et al.* 2014). The saxicolous thalli of the Cook Islands specimen are very thin and filmy, smooth, slightly glossy and pale green, and the pale yellow, sessile apothecia are 0.2–0.35 mm diam., with a plane to faintly concave disc, and a minutely uneven margin. The hymenium is 50–60  $\mu$ m thick, and each cylindrical ascus has 8 irregularly biseriate ascospores, 7–9  $\times$  1.5–2.5(–3)  $\mu$ m. Pycnidia were not seen.

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • track from the north to Te Rua Manga (The Needle), 21°13'S, 159°46'W, alt. c. 250 m, on shaded basalt, *P.M. McCarthy 4664*, 9.vi.1998 (CANB).

**6. *Coenogonium queenslandicum*** (Kalb & Vězda) Lücking, in Lücking *et al.*, *Lichenologist* **33**, 201 (2001)

Known from the wet-tropics of Queensland and Thailand (Kalb & Vězda 1994; Rivas Plata *et al.* 2006; Kalb *et al.* 2016), several small thalli were observed on the margin and adjacent underside of an *Inocarpus fagifer* leaf. The thallus is very thin, smooth and dull pale green, and the apothecia are uniformly pale yellow, sessile and 0.3–0.6 mm diam., with a plane to convex disc and a smooth or very faintly denticulate margin. The hymenium is 45–55 µm thick and the cylindrical asci are 35–40 × 4–6 µm, each with 8 irregularly biseriate ascospores, 6–8 × 1.5–1.8 µm. Mature pycnidia were not seen.

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • track from the north to Te Rua Manga (The Needle), 21°13'S, 159°46'W, alt. 200 m, on leaves of *Inocarpus fagifer* in dense rainforest, *P.M. McCarthy 4663*, 9.vi.1998 (CANB).

**7. *Dirinaria aegialita*** (Ach.) B. Moore, *Bryologist* **71**, 248 (1968)

The Pacific distribution of this pantropical lichen includes the Bonin Islands, Easter Island, Fiji, Hawaiian Islands, Marquesas Islands, New Caledonia, Norfolk Island, northern Mariana Islands, Pitcairn Islands, Tahiti and Samoa (Elix & McCarthy 2008).

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Muri Lagoon, 21°15'S, 159°44'W, alt. 1 m, on dead coconut palm along foreshore, *J.A. Elix 42733*, 6.vi.1998 (CANB); • Avana Stream, 400 m E of Water Tanks, 21°14'S, 159°45'W, alt. 60 m, on bark of *Hibiscus tiliaceus* in moist lowland forest, *J.A. Elix 42792*, 6.vi.1998 (CANB).

**8. *Dirinaria applanata*** (Fée) D.D. Awasthi, *J. Indian Bot. Soc.* **49**, 135 (1970)

The known distribution of this pantropical lichen includes Lord Howe Island, Norfolk Island, New Caledonia, Pitcairn Islands, Tahiti, Tuamotu and Samoa (Elix & McCarthy 2008).

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • Te Kou Track, summit plateau, 21°14'S, 159°46'W, alt. 560–588 m, on tree (*Fitchia* or *Weinmannia*) among ferns, *S.H.J.J. Louwhoff 542*, 7.vi.1998 (CANB).

**9. *Diorygma pruinosum*** (Eschw.) Kalb, Staiger & Elix, *Symb. Bot. Upsal.* **34**(1), 166 (2004)

This pantropical species is already known in the South Pacific from New Caledonia and the Solomon Islands (Elix & McCarthy 2008).

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • track from the north to Te Rua Manga (The Needle), near crossing of Avatiu Stream, 21°13'S, 159°46'W, alt. c. 150 m, on tree among taro plots, *P.M. McCarthy 1250*, 9.vi.1998 (CANB).

**10. *Graphis furcata*** Fée, *Essai Crypt. Écorc.* **40** (1824)

This pantropical, corticolous species occurs in Central and South America, southern Africa, eastern Australia, Lord Howe Island and the Philippines (Archer 2009).

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Te Kou Track, summit plateau, 21°14'S, 159°46'W, alt. c. 550 m, on tree among ferns, *P.M. McCarthy 1244*, 7.vi.1998 (CANB); • track from the north to Te

Rua Manga (The Needle), 21°13'S, 159°46'W, alt. 200 m, on branch in dense rainforest, *P.M. McCarthy 1259*, 9.vi.1998 (CANB).

**11. *Heterodermia isidiophorella*** Elix, *Australas. Lichenol.* **69**, 13 (2011)

Previously known from Australia, the Azores, Malaysia, Thailand and Réunion (Elix 2011b; van den Boom *et al.* 2011; Mongkolsuk *et al.* 2015).

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • Te Kou Track, lower level, 21°13'S, 159°46'W, alt. c. 80 m, on basalt in regrowth forest and taro gardens, *J.A. Elix 42821*, 7.vi.1998 (CANB).

**12. *Heterodermia japonica*** (Sato) Swinscow & Krog, *Lichenologist* **8**, 122 (1976)

A pantropical to pantemperate species previously known, in the Pacific, from the Northern Mariana Islands (Elix & McCarthy 2008; Elix 2011b).

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • Taputarangi Track, 21°12'S, 159°48'W, alt. 40–100 m, on fallen tree in open forest, *S.H.J.J. Louwhoff 504E*, 6.vi.1998 (CANB).

**13. *Heterodermia obscurata*** (Nyl.) Trevis., *Nuovo Giorn. Bot. Ital.* **1**, 114 (1869)

Known from Europe, North, Central and South America, Africa, Asia, Australia and New Zealand, as well as Fiji, the Hawaiian Islands, Islas Juan Fernández and New Caledonia (Elix & McCarthy 2008; Elix 2011b; Mongkolsuk *et al.* 2015).

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Avana Stream, 400 m E of Water Tanks, 21°14'S, 159°45'W, alt. 60 m, on bark of *Hibiscus tiliaceus* in moist lowland forest, *J.A. Elix 42793*, 6.vi.1998 (CANB); • Raemaru Track, 21°14'S, 159°49'W, alt. 100 m, on *Albizia* on fern-dominated slopes, *J.A. Elix 42883*, 8.vi.1998 (CANB).

**14. *Heterodermia propagulifera*** (Vain.) Dey, in Parker & Roane, *Dist. Hist. Biota S. Appal.* **4**, 403 (1977)

*Heterodermia reagens* (Kurok.) Elix, *Australas. Lichenol.* **67**, 6 (2010).

Previously known from Australia, Central and South America, Africa, Asia, and in the Pacific from the Bonin Islands and the Hawaiian Islands (Elix & McCarthy 2008; Elix 2011b; Mongkolsuk *et al.* 2015).

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Taputarangi Track, 21°12'S, 159°48'W, alt. 100 m, on fallen tree in open forest, *J.A. Elix 42747*, 6.vi.1998 (CANB); • Avana Stream, 400 m E of Water Tanks, 21°14'S, 159°45'W, alt. 60 m, on water pipeline in moist lowland forest, *J.A. Elix 42778*, 42779, 6.vi.1998 (CANB); • Te Kou Track, lower level, 21°13'S, 159°46'W, alt. 80 m, on basalt rocks in scattered regrowth forest and taro gardens, *J.A. Elix 42810*, 42814, 7.vi.1998 (CANB); • Raemaru Track, upper level, 21°14'S, 159°49'W, alt. 200–280 m, on *Allocauarina* in *Albizia-Allocauarina*-dominated forest, *J.A. Elix 42921*, 8.vi.1998 (CANB); *S.H.J.J. Louwhoff 586B*, 586D, 8.vi.1998 (CANB); • Papua Falls, Papua Stream, 21°14'S, 159°47'W, alt. 40 m, on *Cecropia peltata* in open area in moist forest, *J.A. Elix 42935*, 9.vi.1998 (CANB); • mouth of Avana Stream, 21°14'S, 159°43'W, alt. 1 m, on old coconut palm in strand vegetation, *J.A. Elix 42780*, 9.vi.1998 (CANB).

**15. *Lecanora tropica*** Zahlbr., *Cat. Lich. Univ.* **5**, 589 (1928)

In the Pacific this pantropical species was previously known from the Galapagos Islands and New Caledonia (Elix & McCarthy 2008).

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • Taputarangi Track, ridge below summit of Tereora Hill, 21°12'S, 159°48'W, alt. c. 220 m, on dead branch in open forest, *P.M. McCarthy 1298 pr.p.*, 6.vi.1998 (CANB).

**16. *Megalospora aff. austropacifica*** Lumbsch, Naikatini & Lücking, in Lumbsch *et al.*, *Phytotaxa* **18**, 83 (2011)

Recently described from Fiji (Lumbsch *et al.* 2011), *M. austropacifica* provides the closest match for the Cook Islands specimens. Thus, while other members of the *M. sulphurata* group share various diagnostic characters with them (Sipman 1983; Untari 2006), *M. austropacifica* differs only in having somewhat longer, narrower ascospores, i.e. 60–85 × 22–26 µm, with a smooth wall (Lumbsch *et al.* 2011), as opposed to 50–75 × 23–30 µm, with a smooth or warty wall in the Cook Islands material.

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Te Kou Track, summit plateau, 21°14'S, 159°46'W, alt. 560–588 m, on tree (*Fitchia* or *Weinmannia*) among ferns, *S.H.J.J. Louwhoff 557A*, 7.vi.1998 (CANB); • Raemaru Track, upper level, 21°14'S, 159°49'W, alt. 200 m, on treelet on fern-dominated slopes with scattered *Albizzia*, *J.A. Elix 42911, 42912*, 8.vi.1998 (CANB); • track from the north to Te Rua Manga (The Needle), 21°13'S, 159°46'W, alt. 200 m, on dead branch in dense rainforest, *J.A. Elix 42951*, 9.vi.1998 (CANB); • *loc. id.*, *S.H.J.J. Louwhoff 603*, 7.vi.1998 (CANB).

**17. *Megalospora sulphurata*** Meyen, in Meyen & Flotow, *Nov. Actorum Acad. Caes. Leop. Carol. Nat. Cur.* **19**, Suppl., 228 (1843) var. **sulphurata**

The known distribution of this mainly Palaeotropical and Pacific lichen already includes New Caledonia, the Hawaiian Islands, French Polynesia, Tonga and Samoa (Sipman 1983; Elix & McCarthy 2008).

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • Te Kou Track, summit plateau, 21°14'S, 159°46'W, alt. 560–588 m, on tree (*Fitchia* or *Weinmannia*) among ferns, *S.H.J.J. Louwhoff 557B*, 7.vi.1998 (CANB).

**18. *Physcia dactylifera*** Elix, *Australas. Lichenol.* **69**, 25 (2011)

Previously only known from Queensland, Australia (Elix 2011a).

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • Raemaru Track, 21°14'S, 159°49'W, alt. 100 m, on *Albizzia* on fern-dominated slopes, *J.A. Elix 42886*, 8.vi.1998 (CANB).

**19. *Physcia erumpens*** Moberg, *Nordic J. Bot.* **6**, 856 (1986)

This species was previously known from Africa, Australia, southern Europe, Macaronesia, North and South America and New Zealand (Moberg 1986; Elix 2011b).

## SPECIMEN EXAMINED

Cook Islands: *Rarotonga*. • Muri Lagoon, 21°15'S, 159°44'W, alt. 1 m, on *Hibiscus tiliaceus* along foreshore, *J.A. Elix 42719*, 6.vi.1998 (CANB).

**20. *Physcia integrata*** Nyl., *Syn. Meth. Lich.* **1**(2), 424 (1860)

Known from East Africa, Central and South America, Christmas Island (Indian Ocean) and islands of the Pacific including the Northern Marianas, Henderson Island, Tuamotu and Samoa (Elix & McCarthy 2008; Elix 2011b).

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Muri Lagoon, 21°15'S, 159°44'W, alt. 1 m, on *Hibiscus tiliaceus* along foreshore, *J.A. Elix 42716*, 6.vi.1998 (CANB); • c. 50 m S of mouth of Avana Stream along Ara Tapu Road, 21°14'S, 159°43'W, alt. 1 m, on bark of *Hibiscus tiliaceus* on the seashore, *S.H.J.J. Louwhoff 622*, 9.vi.1998 (CANB).

**21. *Physcia undulata*** Moberg, *Nordic J. Bot.* **6**, 861 (1986)

This species was previously known from East Africa, Australia, Christmas Island (Indian Ocean), Central and South America and New Zealand (Moberg 1986; Elix 2011b).

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Muri Lagoon, 21°15'S, 159°44'W, alt. 1 m, on *Hibiscus tiliaceus* along foreshore, *J.A. Elix 42714*, 6.vi.1998 (CANB); • Te Kou Track, lower level, 21°13'S, 159°46'W, alt. 80 m, on basalt rocks among scattered regrowth forest and taro gardens, *J.A. Elix 42817, 42826*, 7.vi.1998 (CANB); • Te Kou Track, lower level, 21°13'S, 159°46'W, alt. 80 m, on *Cecropia* trunk in scattered regrowth forest, *J.A. Elix 42862*, 7.vi.1998 (CANB).

**22. *Pseudocyphellaria argyracea*** (Delise) Vain., *Hedwigia* **37**, 35 (1898)

The known distribution of this mainly Palaeotropical and Pacific lichen already includes Fiji, Papua New Guinea, New Caledonia, the Hawaiian Islands, the Galapagos Islands, Tahiti and the Solomon Islands (Galloway 1994).

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Taputarangi Track, 21°12'S, 159°48'W, alt. 100 m, on basalt rocks and base of trees in open forest, *J.A. Elix 42752, 42758, 42765*, 6.vi.1998 (CANB); • 400 m E of Water Tanks, 21°14'S, 159°45'W, alt. 60 m, on water pipes and bark of *Hibiscus* in moist lowland tropical forest, *J.A. Elix 42783, 42788*, 6.vi.1998 (CANB); • Te Kou Track, lower level, 21°13'S, 159°46'W, alt. 80 m, on *Cecropia* trunk and branches in scattered regrowth forest and taro gardens, *J.A. Elix 42842*, 7.vi.1998 (CANB); • Raemaru Track, upper level, 21°14'S, 159°49'W, alt. 200 m, on dead wood on fern-dominated slopes with scattered *Albizzia*, *J.A. Elix 42899*, 8.vi.1998 (CANB); • Papua Falls, Papua Stream, 21°14'S, 159°47'W, alt. 40 m, on *Cecropia peltata*, in open area in moist forest, *J.A. Elix 42940, 42944*, 9.vi.1998 (CANB); • track from the north to Te Rua Manga (The Needle), 21°13'S, 159°46'W, alt. 200 m, on dead branch in dense rainforest, *J.A. Elix 42955*, 9.vi.1998 (CANB).

**23. *Pyxine cocoes*** (Sw.) Nyl., *Mem. Soc. Sci. Nat. Cherbourg* **5**, 108 (1858)

This pantropical species is known throughout the South Pacific, including Lord Howe Island, Norfolk Island, New Caledonia, Marquesas Islands, Pitcairn Islands, Tahiti and Tuamotu (Elix & McCarthy 2008).

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Papua Falls, Papua Stream, 21°14'S, 159°47'W, alt. 40 m, on *Cecropia peltata*, in open area in moist forest, *J.A. Elix 42933 p.p.*, 9.vi.1998 (CANB); • mouth of Avana Stream, 21°14'S, 159°43'W, alt. 1 m, on *Hibiscus* trunk in strand vegetation, *J.A. Elix 43006*, 9.vi.1998 (CANB).

**24. *Pyxine fallax*** (Zahlbr.) Kalb, *Biblioth. Lichenol.* **88**, 315 (2004)

This paleotropical species is known from South-east Asia, Australia and in the Pacific from the Hawaiian and Bonin Islands (Elix & McCarthy 2008; Elix 2011b).

## SPECIMENS EXAMINED

Cook Islands: *Rarotonga*. • Te Kou Track, lower level, 21°13'S, 159°46'W, alt. c. 80 m, on dead log in regrowth forest, *J.A. Elix 42832*, 7.vi.1998 (CANB); • Raemaru Track, lower level, 21°14'S, 159°49'W, alt. 100 m, on *Albizzia* on fern-dominated slope, *J.A. Elix 42877*,

8.vi.1998 (CANB); ● Papua Falls, Papua Stream, 21°14'S, 159°47'W, alt. 40 m, on *Cecropia peltata* in open area in moist forest, *J.A. Elix 42945*, 9.vi.1998 (CANB).

**25. *Pyxine farinosa*** Kashiw., *Bull. Natl. Sci. Mus. Tokyo*, B, **3**, 67 (1977)

This paleotropical species is known from South and East Asia, Australia and in the Pacific from Papua New Guinea and Micronesia (Yap Island) and Tahiti (Elix & McCarthy 2008; Elix 2011b).

**SPECIMEN EXAMINED**

Cook Islands: *Rarotonga*. ● Raemaru Track, upper level, 21°14'S, 159°49'W, alt. 200 m, on basalt rocks on fern-dominated slope with scattered *Albizzia*, *J.A. Elix 42927*, 8.vi.1998 (CANB).

**26. *Pyxine retrigella*** Nyl., *Ann. Sci. Nat., Bot.*, sér. 4, **11**, 240 (1859)

The known distribution of this mainly Palaeotropical and Pacific lichen already includes the Bonin Islands, New Caledonia, the Hawaiian Islands, Kiribati, Marquesas Islands, Pitcairn Islands and Tahiti (Elix & McCarthy 2008; Elix 2011b).

**SPECIMENS EXAMINED**

Cook Islands: *Rarotonga*. ● Taputarangi Track, 21°12'S, 159°48'W, alt. 40–100 m, on fallen tree in open forest, *J.A. Elix 42746*, 6.vi.1998 (CANB); ● Avana Stream, 400 m E of Water Tanks, 21°14'S, 159°45'W, alt. 60 m, on bark of *Hibiscus tiliaceus* in moist lowland forest, *J.A. Elix 42789, 42805*, 6.vi.1998 (CANB); ● Te Kou Track, lower level, 21°13'S, 159°46'W, alt. c. 80 m, on basalt in a forest clearing, *J.A. Elix 42811*, 7.vi.1998 (CANB); ● Raemaru Track, upper level, 21°14'S, 159°49'W, alt. 270 m, on treetop, slope near summit cliff, *J.A. Elix 42907*, 8.vi.1998 (CANB); ● track to Te Rua Manga (The Needle), 21°13'S, 159°46'W, alt. 200 m, on dead branch in dense rainforest, *J.A. Elix 42956*, 9.vi.1998 (CANB).

**27. *Sporopodium phyllocharis*** (Mont.) A.Massal., *Geneac. Lich.* 9 (1855)

This pantropical, foliicolous species is known throughout the Pacific region, its range including New Caledonia, Tonga, Samoa, American Samoa, French Polynesia and the Hawaiian Islands (Elix & McCarthy 2008).

**SPECIMEN EXAMINED**

Cook Islands: *Rarotonga*. ● track from the north to Te Rua Manga (The Needle), 21°13'S, 159°46'W, alt. 200 m, on leaves of *Inocarpus fagifer* in dense rainforest, *P.M. McCarthy 4656, 4659, 4660*, 9.vi.1998 (CANB).

**28. *Thelotrema diplotrema*** Nyl., *Ann. Sci. Nat., Bot.*, sér. 4, **11**, 258 (1859)

This pantropical species is already known in the South Pacific from New Caledonia (Mangold *et al.* 2008).

**SPECIMENS EXAMINED**

Cook Islands: *Rarotonga*. ● Raemaru Track, upper level, 21°14'S, 159°49'W, alt. 200 m, on branch, on fern-dominated slopes with scattered *Albizzia*, *P.M. McCarthy 4661*, 8.vi.1998 (CANB); ● track from the north to Te Rua Manga (The Needle), 21°13'S, 159°46'W, alt. 200 m, on branch in dense rainforest, *P.M. McCarthy 1255*, 9.vi.1998 (CANB).

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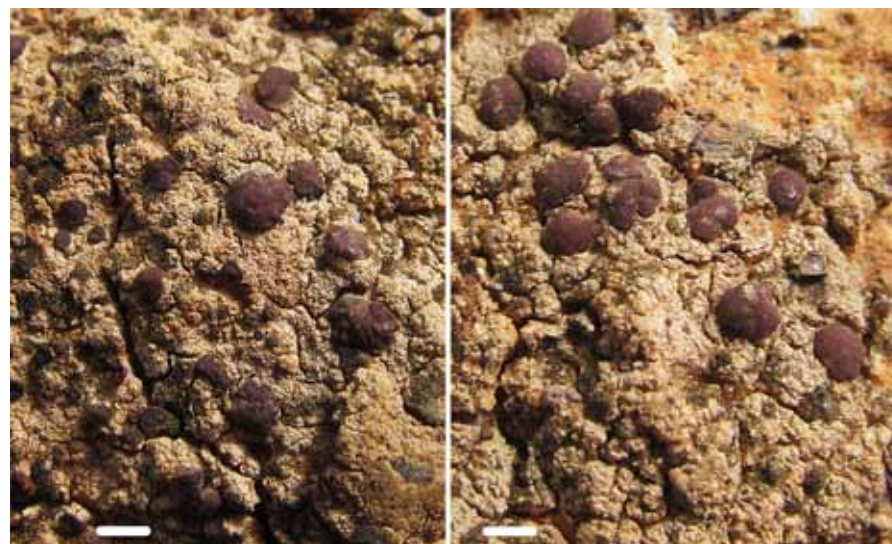


Figure 1. *Lecanographa solicola* (holotype). Scale bars: 1 mm.

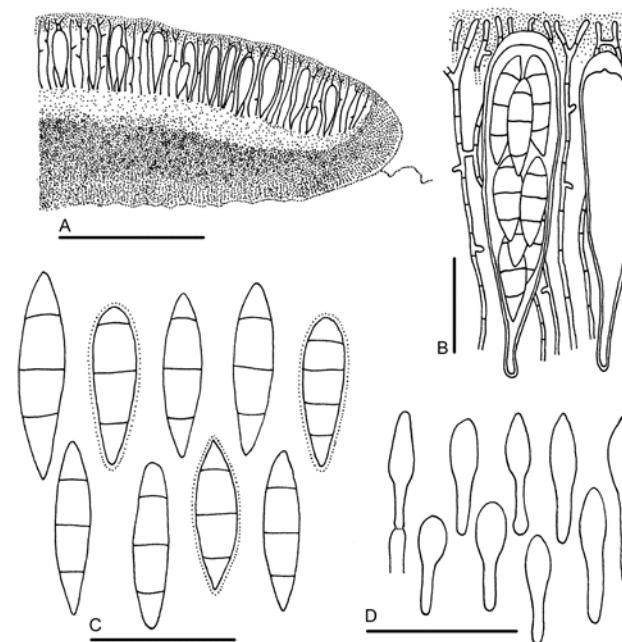


Figure 2. *Lecanographa solicola* (holotype). A, Part of a sectioned apothecium (semi-schematic); B, Immature and mature asci with paraphysoids (in water); C, Ascospores; D, Conidia. Scale bars: A = 0.2 mm; B, C = 20  $\mu$ m; D = 5  $\mu$ m.



Figure 3. *Pseudocyphellaria louwhoffiae* (holotype; dry thallus). Scale bar: 5 mm.



Figure 4. *Pseudocyphellaria louwhoffiae* (holotype; wet thallus). Scale bar: 5 mm.

### Updated Checklist of the Lichens of the Cook Islands

<i>Acarospora aff. veronensis</i> A.Massal. ....	.....	this paper
<i>Amandinea efflorescens</i> var. <i>pseudohypopelidna</i> Marbach .....	.....	this paper
<i>Anisomeridium anisobum</i> (Müll.Arg.) Aptroot .....	McCarthy (2000)	
<i>Anisomeridium carinthiacum</i> (J.Steiner) R.C.Harris .....	McCarthy (2000)	
<i>Anisomeridium consobrinum</i> (Nyl.) Aptroot .....	McCarthy (2000)	
<i>Buellia bahiana</i> Malme .....	Elix (2016)	
<i>Buellia rarotongensis</i> Elix .....	Elix (2016)	
<i>Bulbothrix goebelii</i> (Zenker) Hale .....	Louwhoff & Elix (2000)	
<i>Bulbothrix isidiza</i> (Nyl.) Hale .....	Louwhoff & Elix (2000)	
<i>Bulbothrix tabacina</i> (Mont. & Bosch) Hale .....	Louwhoff & Elix (2000)	
<i>Calopadia vermiculifera</i> (Vain.) Sérus. ....	.....	this paper
<i>Canoparmelia rarotongensis</i> Louwhoff & Elix .....	Louwhoff & Elix (2000)	
<i>Celothelium cinchonarum</i> (Müll.Arg.) Vain. ....	McCarthy (2000)	
<i>Chrysothrix candelaris</i> (L.) J.R.Laundon .....	.....	this paper
<i>Coccocarpia palmicola</i> (Spreng.) Arv. & D.J.Galloway .....	Arvidsson (1982)	
<i>Coenogonium lutescens</i> (Vězda & Malcolm) Malcolm .....	.....	this paper
<i>Coenogonium queenslandicum</i> (Kalb & Vězda) Lücking .....	.....	this paper
<i>Collema rugosum</i> Kremp.* .....	Degelius (1974)	
<i>Diorygma pruinosum</i> (Eschw.) Kalb, Staiger & Elix .....	.....	this paper
<i>Dirinaria aegialita</i> (Ach.) B.Moore .....	.....	this paper
<i>Dirinaria applanata</i> (Fée) D.D.Awasthi .....	.....	this paper
<i>Dirinaria picta</i> (Sw.) Schaer. ex Clem. ....	Vainio (1924) [?]	
<i>Gassicurtia subpulchella</i> (Vain.) Marbach .....	Elix (2016)	
<i>Glyphis cicatricosa</i> var. <i>simplicior</i> (Vain.) Zahlbr.....	Sbarbaro (1939)	
<i>Glyphis parksiana</i> Räsänen .....	Sbarbaro (1939)	
<i>Graphis furcata</i> Fée .....	.....	this paper
<i>Heterodermia isidiophorella</i> Elix .....	.....	this paper
<i>Heterodermia japonica</i> (Sato) Swinscow & Krog .....	.....	this paper
<i>Heterodermia obscurata</i> (Nyl.) Trevis. ....	.....	this paper
<i>Heterodermia propagulifera</i> (Vain.) Dey .....	.....	this paper
<i>Lecanographa solicola</i> P.M.McCarthy & Elix .....	.....	this paper
<i>Lecanora tropica</i> Zahlbr.....	.....	this paper
<i>Lecanora leprosa</i> Fée .....	Sbarbaro (1939)	
<i>Leptogium azureum</i> (Sw. ex Ach.) Mont. ....	Sbarbaro (1939)	
<i>Leptogium cyanescens</i> var. <i>trachynum</i> Vain. ....	Sbarbaro (1939)	
<i>Leptogium diaphanum</i> (Mont.) Nyl. ....	Jatta (1903)	
<i>Leptogium fallax</i> Müll.Arg. ....	Jatta (1903)	
<i>Leptogium moluccanum</i> var. <i>hypoleia</i> Vain. ....	Sbarbaro (1939)	
<i>Megalospora aff. austropacifica</i> Lumbsch, Naikatini & Lücking.....	.....	this paper
<i>Megalospora sulphurata</i> Meyen var. <i>sulphurata</i> .....	.....	this paper
<i>Parmotrema cristiferum</i> (Taylor) Hale .....	Louwhoff & Elix (2000)	
<i>Parmotrema endosulphureum</i> (Hillm.) Hale .....	Louwhoff & Elix (2000)	
<i>Parmotrema reticulatum</i> (Taylor) M.Choisy.....	Louwhoff & Elix (2000)	
<i>Parmotrema saccatilobum</i> (Taylor) Hale.....	Louwhoff & Elix (2000)	
<i>Parmotrema tinctorum</i> (Despr. ex Nyl.) Hale .....	Louwhoff & Elix (2000)	
<i>Pertusaria atroguttata</i> A.W.Archer & Elix .....	Archer & Elix (2015)	
<i>Pertusaria commutata</i> Müll.Arg. ....	Archer & Elix (2015)	
<i>Pertusaria homilocarpa</i> A.W.Archer & Elix .....	Archer & Elix (2015)	
<i>Pertusaria megacarpa</i> A.W.Archer & Elix.....	Archer & Elix (2015)	
<i>Pertusaria montpittensis</i> A.W.Archer .....	Archer & Elix (2015)	
<i>Pertusaria rarotongensis</i> A.W.Archer & Elix .....	Archer & Elix (2015)	
<i>Pertusaria rarotongensis</i> var. <i>stictica</i> A.W.Archer & Elix .....	Archer & Elix (2015)	
<i>Pertusaria thiospoda</i> C.Knight .....	Archer & Elix (2015)	



*Physcia dactylifera* Elix ..... this paper  
*Physcia erumpens* Moberg ..... this paper  
*Physcia integrata* Nyl. .... this paper  
*Physcia undulata* Moberg ..... this paper  
*Physma byrsinum* (Ach.) Tuck. .... Sbarbaro (1939)  
*Porina aff. cestrensis* (Mich.) Müll.Arg. .... McCarthy (2000)  
*Porina deminuta* P.M.McCarthy ..... McCarthy (2000)  
*Porina exocha* (Nyl.) P.M.McCarthy ..... McCarthy (2000)  
*Porina farinosa* C.Knight ..... McCarthy (2000)  
*Porina guentheri* (Flot.) Zahlbr. .... McCarthy (2000)  
*Porina mastoidea* (Ach.) Müll.Arg. .... McCarthy (2000)  
*Porina nucula* Ach. .... McCarthy (2000)  
*Porina perminuta* Vain. .... McCarthy (2000)  
*Porina subinterstes* (Nyl.) Müll.Arg. .... McCarthy (2000)  
*Porina tetracerae* (Ach.) Müll.Arg. .... McCarthy (2000)  
*Pseudocyphellaria argyracea* (Delise) Vain. .... this paper  
*Pseudocyphellaria desfontainii* (Delise) Vain. .... Sbarbaro (1939)  
*Pseudocyphellaria homalosticta* Vain. .... Galloway (1994)  
*Pseudocyphellaria louwhoffiae* Elix ..... this paper  
*Pseudocyphellaria intricata* (Delise) Vain. .... Sbarbaro (1939)  
*Pseudocyphellaria prolificans* (Nyl.) Vain. .... Galloway (1994)  
*Pyrenula astroidea* (Fée) R.C.Harris. .... McCarthy (2000)  
*Pyrenula aff. citrifomis* R.C.Harris ..... McCarthy (2000)  
*Pyrenula concatervans* (Nyl.) R.C.Harris. .... McCarthy (2000)  
*Pyrenula confinis* (Nyl.) R.C.Harris ..... McCarthy (2000)  
*Pyrenula leucostoma* Ach. .... McCarthy (2000)  
*Pyrenula macularis* (Zahlbr.) R.C.Harris ..... McCarthy (2000)  
*Pyrenula nitidula* (Bres.) R.C.Harris ..... McCarthy (2000)  
*Pyrenula ochraceoflava* (Nyl.) R.C.Harris var. **ochraceoflava** ..... McCarthy (2000)  
*Pyrenula ochraceoflava* var. **pacifica** P.M.McCarthy ..... McCarthy (2000)  
*Pyrenula philippina* var. **oceanica** Sbarbaro ..... Sbarbaro (1939)  
*Pyxine cocoes* (Sw.) Nyl. .... this paper  
*Pyxine fallax* (Zahlbr.) Kalb ..... this paper  
*Pyxine farinosa* Kashiw. .... this paper  
*Pyxine retirugella* Nyl. .... this paper  
*Ramalina australiensis* Nyl. .... Blanchon & de Lange (2011)  
*Ramalina microspora* Kremp. .... Blanchon & de Lange (2011)  
*Ramalina leiodea* (Nyl.) Nyl. .... Blanchon & de Lange (2011)  
*Ramalina luciae* Molho, Bodo, W.L.Culb. & C.F.Culb. \*\* ..... Blanchon & de Lange (2011)  
*Ramalina pacifica* Asah. var. **pacifica** ..... Stevens (1983)  
*Ramalina peruviana* Ach. .... Blanchon & de Lange (2011)  
*Ramalina subcomplanata* Nyl. .... Sbarbaro (1939)  
*Ramalina subfraxinea* Nyl. .... Sbarbaro (1939)  
*Sporopodium phyllocharis* (Mont.) A.Massal ..... this paper  
*Sticta sinuosa* Pers. .... Sbarbaro (1939)  
*Strigula decipiens* (Malme) P.M.McCarthy var. **decipiens** ..... McCarthy (2000)  
*Strigula decipiens* var. **divisa** P.M.McCarthy ..... McCarthy (2000)  
*Strigula smaragdula* Fr.:Fr. .... McCarthy (2000)  
*Strigula* "sp. A" ..... McCarthy (2000)  
*Thelotrema diplotrema* Nyl. .... this paper  
*Thelotrema monosporum* Nyl. .... Sbarbaro (1939)  
*Trichothelium assurgens* (Cooke) Aptroot & Lücking ..... McCarthy (2000)  
*Usnea fautaensis* Vain. .... Sbarbaro (1939)  
*Usnea nidifica* Taylor ..... Motyka (1936–38) [?]  
*Varicellaria velata* (Turner) Schmitt & Lumbsch ..... Archer & Elix (2015)

*Verrucaria fortuita* P.M.McCarthy ..... McCarthy (2000)  
*Verrucaria fuscella* (Turner) Winch ..... McCarthy (2000)  
*Verrucaria howensis* P.M.McCarthy ..... McCarthy (2000)  
*Verrucaria mundula* P.M.McCarthy ..... McCarthy (2000)  
*Xanthoparmelia subramigera* (Gyeln.) Hale ..... Louwhoff & Elix (2000)  
\* Aitutaki  
\*\* Rarotonga and Mangaia