The cosmopolitan *Collema fasciculare* is common in New Zealand and Australia in shady mixed rainforest and *Nothofagus* forest from sealevel to subalpine elevations. In colour, it varies from a light or olive-brown when hydrated to nearly black when dry. 1 mm
The 26th John Child Bryophyte and Lichen Workshop will be held in Matawai, New Zealand, 70 km north of Gisborne on the East Cape of the North Island. Attendees should arrive on the evening of 1 December, and depart on the morning of 6 December.

The John Child workshops aim to foster interest in mosses, liverworts, hornworts, and lichens, and are open to anybody from beginners to professionals. The regular attendees are very friendly—they welcome newcomers, and freely offer guidance to beginners.

Group accommodation will be mostly in backpacker accommodation in Matawai or in nearby cottages or shearers’ quarters. Breakfast and lunch-making will be in Matawai Hall, as will the microscope work and evening talks.

Each of the four workshop days will consist of a morning-to-mid-afternoon field trip, a return to Matawai for afternoon microscope work, then a catered dinner in the evening followed by illustrated talks and further microscope work.

The best student presentation will receive a cash prize that covers most of the cost of the workshop.

Overall workshop costs are estimated to be at most NZD380 per person, which includes field trip transport, accommodation, and all meals.

To register or obtain further information, e-mail one of the workshop’s organizers:

Anne Redpath
**e-mail:** wairataforestfarm@farmside.co.nz

Leon Perrie
**e-mail:** leonp@tepapa.govt.nz

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**ANNOUNCEMENTS**

**Lichen website of the Australian National Botanic Gardens**

The lichen website of the Australian National Botanic Gardens is now open and can be reached at http://www.anbg.gov.au/lichen/ The excellent and well-illustrated text was written by Heino Lepp.

**26th John Child Bryophyte and Lichen Workshop—1–6 December, 2011**

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New records of *Ramalina* (Ramalinaceae, Ascomycota) from the Cook Islands, South Pacific Ocean

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Abstract:  
*Ramalina australiensis* Nyl., *R. microspora* Kremp., and *R. peruviana* Ach. are reported for the first time from the Cook Islands, South Pacific Ocean.

Introduction  
Until relatively recently, the lichens of the Cook Islands were not well-known, the only significant attempt at documenting species being that of Sbarbaro (1939). Elix & McCarthy (1998) summarized current knowledge of the lichens from a number of Pacific Islands, including the Cook Islands, although they warned that not all the species identifications were reliable. Subsequently, reviews of the Parmeliaceae (Louvohifo & Elix 2000) and pyrenocarpous taxa (McCarthy 2000) were published. Sbarbaro (1939) reported six species of *Ramalina* (*R. canaliculata* (Fr.) Taylor, *R. complanata* Nyl., *R. gracilenta Ach.*, *R. subcomplanata* Nyl., *R. subfraxinea* Nyl. and *R. taitensis* Nyl.). Elix & McCarthy (1998) listed seven (*R. canaliculata*, *R. leiolea* (Nyl., *R. luciae Molho*, *Brodo*, *W.L.Culb.* & *C.F.Culb.*, *R. pacifica var. pacifica Asah.*, *R. subcomplanata*, *R. subfraxinea* and *R. tayloriana* Zahlbr.). The records of *R. leiolea*, *R. luciae* and *R. pacifica* had already been documented by Stevens (1982, 1983a), who also cited voucher specimens. Stevens (1983b) referred specimens of *R. canaliculata* with usnic acid to *R. leiolea*, and she noted that the name *R. canaliculata* (Fr.) Taylor is illegitimate, and neither it nor the correct name *R. tayloriana* is applicable to Pacific material. Therefore, it seems likely to us that the names *R. canaliculata* and *R. tayloriana* for the Cook Islands both refer to *R. leiolea*, although we have not seen the relevant specimens.

This paper confirms five species of *Ramalina* from Rarotonga and one from Mangaia; three species are added to the lichen flora of the Cook Islands.

Materials and methods  
Twelve specimens were collected during two trips to Rarotonga (13–18 April, 2003, and 7–25 July, 2010) and one to Mangaia (13–18 April, 2003) (Fig. 1). Chemical constituents were identified using standardized techniques of thin-layer chromatography (Culberson 1972, White & James 1985). Voucher specimens were deposited in the herbarium of Unitec Institute of Technology, Auckland, and Auckland War Memorial Museum herbarium (AK). Descriptions are based on Rarotongan material.

New reports  

Remarks  
*Ramalina australiensis* is distinguished by the subterete to terete primary branches with dense secondary branching towards the apices, linear pseudocyphellae, and no medullary acids. The species is morphologically similar to *R. peruviana*, but lacks soralia and does not have sekikaic acid aggregate metabolites. Sparsely branched forms resemble the Australian species *R. rideoutis*, but the latter does not usually have the proliferation of secondary branches near the apices. Saxicolous specimens of *R. australiensis* can approach the morphology of *R. meridionalis*, but that species lacks secondary branches and its medulla contains norstictic acid (K+ red).

*Ramalina australiensis* is known also from Australia (Stevens 1987, McCarthy 2011), New Zealand (Blanchon et al. 1996a, Galloway 2007), the Kermadec Islands (Bannister & Blanchon 2003), Guam, the Hawaiian Islands and the Galapagos Islands (Elix & McCarthy 1998). On Rarotonga, it seems to be genuinely scarce—it was seen only once during a 10-day survey of the mountain ranges and valley systems.

**SPECIMEN EXAMINED**  
Cook Islands: Rarotonga: • Muri Lagoon, Motu Oneroa, 21°14′S, 159°44′W, 1 m, on exposed basalt rock outcrops within dense Tuanu’e (*Dicranopetris linearis*) fernland, P.J. de Lange CK73 & T.J. Martin, 7.vii.2010 (AK 323275).


**SPECIMEN EXAMINED**  
Cook Islands: Rarotonga: • Maungatea Bluff, 21°13′17.59″S, 159°46′51.78″W, 246 m, on exposed basalt rock outcrops within dense Tuanu’e (*Dicranopetris linearis*) fernland, P.J. de Lange CK73 & T.J. Martin, 7.vii.2010 (AK 323275).
Thallus corticolous, grey-green, tufted, up to 5 cm long; branching subdichotomous, intricate; branches 0.2–1.1 mm wide, suberete, slightly twisted and tangled, apices sharp; surface shiny, smooth, pseudocyphellae present; holdfast delimited; soralia punctiform, numerous, laminal, marginal and apical, small fibrils occasionally forming in soralia. Apothecia not seen.

**Chemistry:** cortex: usnic acid; medulla: homosekikaic acid (major), sekikaic acid (major), and minor traces of two other acids.

**Remarks**

*Ramalina peruviana* is characterized by its thallus with dense suberete branches, numerous punctiform soralia, and the presence of the sekikaic acid aggregate in the medulla (including homosekikaic acid as a major component). Morphologically, it could be mistaken for several other species; however, *R. australiensis* lacks medullary acids and soralia, both *R. luciae* and *R. pacifica* have dichotomous branching and round or elliptoidal soralia, with *R. luciae* further lacking homosekikaic acid in any significant quantity, and *R. pacifica* possessing salazinic acid instead of the sekikaic acid aggregate. *Ramalina peruviana* is also found in New Zealand, the Kermadec Islands, Norfolk Island, Lord Howe Island, and the Chatham Islands (Bannister & Blanchon 2003, Galloway 2007), Africa, Australia and South America (Stevens 1987), and Hawaii, Tahiti, New Caledonia, the Galapagos Islands and the Bonin Islands (Elix & McCarthy 1998). On Rarotonga it was frequently observed during a 10-day survey of the central mountain ranges and valleys, where it commonly grew with *R. leiodea* and *R. luciae* on the canopy branches of wind-shorn trees on steep ridgelines and valley heads.

**SPECIMEN EXAMINED**


**Other species collected**


Previously reported from Rarotonga by Stevens (1982, 1983a), *Ramalina luciae* is characterized by its dichotomously branched thallus with widely spaced branches, soralia both laminal and marginal, round or elliptoidal, and the presence of the sekikaic acid aggregate in the medulla.

One of the most abundant *Ramalina* species on Rarotonga, it is common from the coast to the summit of the main range, Tē Mānga (663 m a.s.l.). Along with *R. leiodea* it is common in village gardens and associated wasteland, and is especially prominent on the trunk and branches of *Polypsia scutellaria*, a shrub used widely by islanders for hedging to mark garden plots and land boundaries. Other common garden plant hosts include *Hibiscus schizopetalus* and *H. rosa-sinensis*. In wasteland and along the coastline it is frequently found with *R. leiodea* on the trunks of coconut (*Cocos nucifera*) palms. It is also known from Australia, Sri Lanka, Indonesia (Sulawesi), Kenya, Vanuatu, Fiji, Tahiti (Stevens 1983a, 1987), the Kermadec Islands (Blanchon et al. 1996a), and Niue (Blanchon et al. 1996b).

**SPECIMENS EXAMINED**

Cook Islands: Rarotonga: • Titikaveka, Nana’s House, 21°16’S, 159°46’W, c. 2 m, common on the bark of *Polypysia scutellaria* used for hedging, P.J. de Lange & T.J. Martin, 28.vii.2008 (AK 318416); • Maungatea Bluffs, “The Pinnacle”, 21°13’23.5”S, 159°46’49.5”W, 362 m, common on dead, exposed branches of mato (*Homalium acuminatum*) on steep rocky slope leading to a small pinnacle of rock overlooking the eastern-most tributary to the Vaikapuangi Stream, P.J. de Lange CK50 & T.J. Martin, 6.vii.2010 (AK 317738); • Maungatea Bluff, Maungatea Ridgeline, 21°13’20.5”S, 159°46’49.68”W, 355 m, on *Homalium acuminatum* twigs in full sunlight, P.J. de Lange & T.J. Martin CK71, 7.vii.2010 (AK 323273). Mantanga: • Mantanga Lodge, 21°55’21.53”S, 157°57’16.9”W, 47 m, M. Galbraith, 14.iv.2003 (Unitec 004099); • Oneroa School, 21°55’23.64”S, 157°57’15.55”W, 15 m, M. Galbraith, 16.iv.2003 (Unitec 004098).

**Ramalina leiodea** (Nyl.) Nyl., Lich. Nov. Zel. 22 (1888)

Previously recorded for Rarotonga by Stevens (1982, 1983a), *Ramalina leiodea* is distinguished by the subdichotomous branching, common apothecia, the lack of soralia and the presence of bonnic acid in the medulla. It is one of the most abundant species of *Ramalina* on Rarotonga, although it is less widely distributed than its common associate *R. luciae*. *Ramalina leiodea* is most commonly seen in coastal area and along the island’s ring plain. However, it does extend up to at least 500 m a.s.l., where it grows mostly on wind-shorn trees such as mato (*Homalium acuminatum*), pua (*Fagraea berteronii*), and rata (*Metrosideros collina* agg.). It occurs in the same sites and on the same hosts as *R. luciae*. It is also known from the Bonin Islands, Marianas Islands, Mauritius, Reunion, Australia, Lord Howe Island, Norfolk Island, New Caledonia, Vanuatu and the Hawaiian Islands (Stevens 1987).

**SPECIMENS EXAMINED**

Cook Islands: Rarotonga: • Titikaveka, 21°16’S, 159°46’W, 1 m, local. Corticolous on *Cocos nucifera*. Associated also with *Hibiscus tiliaceus*, and *Barringtonia asiatica*, P.J. de Lange 4433, 3.3x.2000 (AK 281602); • Avarua, 21°12’18.77”S, 159°46’11.75”W, 7 m, on south face of coconut 4 m back from the high water mark, K.M. Simon, 18.iv.2003 (Unitec 004097); • Avarua, 21°12’23.07”S, 159°46’33.18”W, on iron bark, K.M. Simon, 18.iv.2003 (Unitec 004096); • Maungatea Bluff, Maungatea, 21°13’20.5”S, 159°46’49.68”W, 355 m, common on *Homalium acuminatum* branches. Associated with *Ramalina luciae*, P.J. de Lange & T.J. Martin CK70, 7.vii.2010 (AK 323272).

**Acknowledgements**

We thank Katrina Simon and Mel Galbraith for collections, and Ewen Cameron (AK) and the curators of MIN and MSC for loans of specimens, W for photographing the type specimen of *Ramalina microspera*, and Jennifer Bannister for her description of the type. PdL thanks Gerald McCormack (Director, Cook Islands Biodiversity and Natural Heritage) and Tim Martin (Wildlands New Zealand Ltd) for company in the field, Jeremy Rolfe kindly prepared the map for Figure 1. We are grateful to Gerald McCormack, David Galloway and Jennifer Bannister for their comments on an earlier version of the manuscript.

**References**


Louwhoff, SHJJ; Elix, JA (2000): The lichens of Rarotonga, Cook Islands, South Pacific Ocean I: Pyrenomycous taxa. Lichenologist 32, 15–47.


Sbarbaro, C (1939): Aliquot lichenes oceanici in Cook insulis (Tonga, Raro Tonga, Tongatapu, Eua) collecti. Archivo Botanico per la Sistematica, Fitogeographica e Genetica 15, 100–104.


Fig. 1. Position of Rarotonga and Mangaia in the Cook Islands.

Fig. 2. Ramalina australiensis, AK 323275. 5 mm

Fig. 3. Ramalina microspora, AK 323276. 1 mm
The description of the genus *Austrographa* (Roccellaceae) by Sparrius et al. (2010) was not accompanied by the designation of the type species, thus making the genus name illegitimate. That situation is rectified here.


The authors thank Linda in Arcadia for reporting the omission.

Reference

Further new species and new records of *Heterodermia* (Physciaceae, Ascomycota) from Australia

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**Abstract**
*Heterodermia coralloidea* Elix, *H. isidiophorella* Elix, *H. koyanoides* Elix, *H. tubularis* Elix, *H. tasmatica* Elix and *H. violiostriata* Elix are described as new to science. The components of the *Japanica* chemosyndrome of triterpenes are documented, and *H. lepidula* (Swinscow & Krog, *H. stellata* (Vain.) W.A.Weber & D.D.Awasthi) are redescribed as new to Australia. The genus *Heterodermia* Trevis is, well represented in Australia (Elix 2010a,b; 2011; McCarthy 2011), and although more than 35 species have been recorded for the country (Kurokawa 1962, 1973; McCarthy 2011), further undescribed and previously unreported species continue to be discovered. The morphological and chemical characters used to segregate *Heterodermia* taxa have been discussed previously (Lücking et al. 2008; Elix 2010, 2011). Chemical identities were confirmed by thin-layer chromatography (Elix & Ernst-Russell 1993), high-performance liquid chromatography (Elix et al. 2003) and comparison with authentic samples.

**The New Species**

*Heterodermia coralloidea* Elix, sp. nov. 

Fig. 1

Sicut *Heterodermia isidiophora* sed phyllidiis erumpentibus et coralloidibus et acidum nor-sticticum continente differt.

**Type**: Australia. *Australian Commonwealth Territory*: Jervis Bay, Stoney Creek, 34 km SE of Nowra, 35°10'S, 150°45'E, 2 m, on sandstone beside creek in dry sclerophyll forest with numerous shrubs and *Livistona*, *J.A. Elix 26421*, 8.xi.1990 (holotype – CANB).

**Thallus** foliis, orbicularibus, irregularibus, adnatis, 2–3 cm wide. Lobes 0.7–1.5 mm wide, ±flatt, sublinear-elongata, dichotomously or irregularly branched, ±discrete to contiguous at thallus margin, with short lateral lobes; apices not asclitis, sterile, but often with white marginal rhizines. *Upper surface* whitish grey, phyllidiate; phyllidia laminal and marginal, dissected and erumpent, forming dense, coralloid pseudoisidia that cover the periphery, with short lateral lobes; apices not ascending, eciliate, but often with white marginal rhizines. *Lower surface* whitish grey, isidiate or phyl- lidiate; isidia laminal and marginal, cylindrical to sublobulate or phyllidiate, simple to sparingly branched, at length becoming granular and sorediate. *Medulla* white. *Lower surface* corticate, white to pale tan or brown near centre, rhizinate; rhizines white, concolorous with the thallus or becoming pale to dark brown towards the apices, simple to irregularly branched, numerous, mainly marginal, 0.5–1.0 mm long, ±projecting beyond the lobe margin. *Apothecia* and *pymnidia* not seen.

**Chemistry**: Cortex and medulla *K*+ yellow, *C*–, *KC*–, *P*+ pale yellow; containing atranorin (major), zeorin (major), norstictic acid (trace). *16-C–, P+ pale orange; containing atranorin (major), zeorin (major), 6α-acetoxyhopane-16β,22-diol (trace), 6α-acetoxyhopane-16β,22-dihydroxyhopane-25-ocid (trace). *leucotylin* (minor or trace), 16β-acetoxy-hopane-16β,22-diol (trace or absent). **Etymology**: The specific epithet is derived from the Latin *coralloides* (coral-like) in reference to the dense pseudoidia.

**Notes**: *Heterodermia coralloidea* is distinguished by the loosely adnate, foliaceous thallus with sublinear-longate lobes with a corticate lower surface, pale marginal rhizines and marginal and laminal phyllidia that erupt to form dense marginal and pseudoidial isidia. The presence of atranorin, norstictic acid and 16α-acetoxyhopane-6α,22-diol in the medulla. Morphologically, it resembles *H. isidiophora* (Nyl.) D.D.Awasthi, but that species has simple coralloid isidia that can be dorsiventral at first and then cylindrical, but which do not become granular or erect at age. Furthermore, *H. isidiophora* lacks medullary norstictic acid. Some morphotypes of *H. disecta* (Kurok.) D.D.Awasthi resemble *H. coralloidea*, but the former contains dissectic acid as a major metabolite.


**Heterodermia isidiophorella** Elix, sp. nov.

Sicut *Heterodermia isidiophora* sed diminutus, lobis angustioribus et terpenum continente differt.


**Thallus** foliosus, orbicularius, irregularius, adnatis, 2–5 cm wide. Lobes 0.15–0.5(–1.0) mm wide, ±flatt, sublinear-elongata, dichotomously or irregularly branched, ±discrete to contiguous at the periphery, with short lateral lobes; apices not ascending, eciliate, but often with white marginal rhizines. *Upper surface* whitish grey, isidiate or phyl- lidiate; isidia laminal and marginal, cylindrical to sublobulate or phyllidiate, simple to sparingly branched, at length becoming granular and sorediate. *Medulla* white. *Lower surface* corticate, white to pale tan or brown near centre, rhizinate; rhizines white, concolorous with the thallus or becoming pale to dark brown towards the apices, simple to irregularly branched, numerous, mainly marginal, 0.5–1.0 mm long, ±projecting beyond the lobe margin. *Apothecia* and *pymnidia* not seen.

**Chemistry**: Cortex and medulla *K*+ yellow, *C*–, *KC*–, *P*+ pale yellow; containing atranorin (major), zeorin (major), 6α-acetoxyhopane-16β,22-diol (major), 6α-acetoxy-hopane-16β,22-dihydroxyhopane-25-ocid (trace), *leucotylin* (minor or trace), 16β-acetoxy-hopane-16β,22-diol (trace or absent). **Etymology**: The specific epithet is derived from the similarity of this species to *H. isidiophora* (Nyl.) D.D.Awasthi, combined with the Latin suffix -*ellus* (diminutive).

**Notes**: *Heterodermia isidiophorella* is distinguished by the small, adnate thallus with very narrow, sublinear-longate lobes with pale marginal rhizines and cylindrical to lobulate or phyllidiate isidia that become granular and sorediate with age. The med-ulla contains a preponderance of zeorin and 6α-acetoxyhopane-16β,22-diol. Morphologically, it closely resembles *H. isidiophora*, but that species has larger, loosely adnate thalli (7–20 cm wide versus 2–5 cm wide) with broader lobes (0.7–2.5 mm versus 0.15– 1.0 mm wide), simple to coralloid isidia that can be dorsiventral at first and then cyl-indrical and do not become granular with age. *Heterodermia isidiophorella* contains zeorin and 16β-acetoxyhopane-6α,22-diol as major triterpenes.


**SPECIMENS EXAMINED**

Queensland. • Kennedy North district, Ravenshoe State Forest, along the Tully Falls road, 23 km SE of Ravenshoe, 17°49'S, 145°33'E, 780 m, on sapling along the rainforest margin, *J.A. Elix 16024 & H. Streimann*, 23.vi.1984 (CANB). • type locality, on mossy...
trunk of Syzygium and Flindersia, J.A. Elix 16464, 16470 & H. Streimann, 26.vi.1984 (CANB); Cook district, Hugh Nelson Range, along Plath Road, 15 km S of Atherton, 17°25'S, 145°26'E, 1080 m, on base of Eucalyptus grandis in E. grandis woodland, J.A. Elix 16357 & H. Streimann, 25.vi.1984 (CANB); Kennedy North district, Walter Hill Range, 26 km SE of Ravenshock, 17°46'S, 145°41'E, 890 m, on canopy twigs of felled tree in rainforest, J.A. Elix 17060 & H. Streimann, 2.vii.1984 (CANB); Mount Lewis State Forest, 13 km WSW of Mossman, 16°29'S, 145°16'E, 1080 m, on fallen tree branch in rainforest, H. Streimann 46076, 7.xii.1990 (CANB).

New South Wales: Central Coast, Brisbane Water National Park, overlooking Woy Woy, 33°28'S, 151°21'E, 20 m, on moss over sandstone boulders, J.A. Elix 761, 27.iv.1975 (CANB).

Heterodermia koyanoides Elix, sp. nov.

Type: Australia. Queensland: Cook district, Great Dividing Range, Mt Baldy, 4 km SW of Atherton, 17°16'S, 145°23'E, 1080 m, on sapling along margin of regrowth rainforest, J.A. Elix 16308 & H. Streimann, 25.vi.1984 (holotype – CANB).

Thallus foliicolous, orbicular to irregularly spreading, loosely adnate, 5–10 cm wide. Lobes 0.7–2.0 mm wide, flat to weakly convex or weakly concave, sublinear-elongate, dichotomously to subdigitately branched, the lobe tips not ascending, ± discrete to contiguous at the periphery, with short lateral lobes, ecleitic. Upper surface whitish grey, sorediate; soralia marginal and at the apices of short lateral lobes, capitate, 0.5–1.2 mm wide, the soredia granular. Medulla white. Lower surface cortical, white to greenish white, sorediate at the centre; rhizines numerous, mainly marginal, concolorous with the thallus, ± irregularly branched, 0.3–1.0 mm long, ± projecting beyond the lobe margin. Apothecia and pycnidia not seen.

Chemistry: Cortex and medulla K+ yellow, C–, KC–, P+ pale yellow; containing atranorin (major), zeorin (major), 6β-acetoxyhopane-6α,22-diol (minor), leucotylin (major), 6β-acetoxy-16α,22-dihydroxyhopane-25-oic acid (trace), leucotylin (trace), norstic acid (major), connorstic acid (minor), testacein (minor).

Etymology: The specific epithet is derived from the Latin tabulatus (flattened horizontally) in reference to the type locality, Big Tableland, in north Queensland.

Notes: Both H. tabularis and H. trichophoroides (Kurok.) Kurok. are characterized by narrow lobes with marginal cilia, the lack of soredia and isidia, stipitate apothecia with ciliate margins, Polyblastidia-type ascospores and the presence of atranorin, zeorin and norstic acid. However, H. tabularis has subterminal, stipitate, 1–3.5 mm wide, situated subterminally on the lobe margin. H. trichophoroides is distinguished by the loosely adnate, foliose thallus with the apices of short lateral lobes, capitate, 0.5–1.2 mm wide, the soredia granular, so that the lobe margins appear to be sorediate (in part), but they do not develop capitate lobules marginal, more pronounced subapically, ± rounded to elongate, simple or sparingly branched, 0.05–0.3 mm wide. Medulla white. Lower surface ecoricate, arachnoid, soraliulicate, whitish, rhizinate; rhizines simple to dichotomously or irregularly branched, whitish, 0.5–3.2 mm long, ± projecting beyond the surface. Apothe- cia common, subterminal, stipitate, 1–3.5 mm wide, situated subterminally on ascending lobes; thalline exciple persistent, concolorous with the thallus, margin crenate or with well-developed lobules, ciliate; disc brown to dark brown, densely white-pruinose. Ascospores Polyblastidia-type, ellipsoid, containing numerous sporoblastidia, 30–40 × 15–20 µm. Pycnidia common, immersed, then becoming emergent, visible as black dots; conidia bacilliform, 4.5–5 x 1 µm.

Heterodermia koyane Elix, sp. nov.

Type: Australia. Queensland: Woy, 33°28'S, 151°21'E, 20 m, on moss over sandstone boulders, Elix, sp. nov. Fig. 3

Sicut Heterodermia koyana sed superfice sorediatis et soraliis capitatibus differt.

Thallus foliicolous, orbicular to irregularly spreading, loosely adnate, 5–10 cm wide. Lobes 0.5–2 mm wide, sublinear, convex to ± flat or weakly concave, irregularly to subdichotomously branched, suberect or ascending at apices, partially imbricate, discrete to adjacent, ciliate, with whitish cilia along margins; cilia scattered, simple, 0.5–1.3 mm long, not mat-forming. Upper surface greyish white to whitish in cream-coloured, pruinose, lobulate, soridial and isidial absent; lobules marginal, more pronounced subapically, ± rounded to elongate, simple or sparingly branched, 0.05–0.3 mm wide. Medulla white. Lower surface ecoricate, arachnoid, soraliulicate, whitish, rhizinate; rhizines simple to dichotomously or irregularly branched, whitish, 0.5–3.2 mm long, ± projecting beyond the surface. Apothe- cia common, subterminal, stipitate, 1–3.5 mm wide, situated subterminally on ascending lobes; thalline exciple persistent, concolorous with the thallus, margin crenate or with well-developed lobules, ciliate; disc brown to dark brown, densely white-pruinose. Ascospores Polyblastidia-type, ellipsoid, containing numerous sporoblastidia, 30–40 × 15–20 µm. Pycnidia common, immersed, then becoming emergent, visible as black dots; conidia bacilliform, 4.5–5 x 1 µm.

Chemistry: Cortex K+ yellow, C–, KC–, P+ pale yellow; medulla K+ yellow then red, C–, P+ dark yellow or yellow-orange; containing atranorin (major), zeorin (major), 6β-acetoxyhopane-6β,22-diol (minor), 6β-acetoxy-16α,22-dihydroxyhopane-25-oic acid (trace), leucotylin (trace), norstic acid (major), connorstic acid (minor), testacein (minor).

Etymology: The specific epithet is derived from the Latin tabulatus (flattened horizontally) in reference to the type locality, Big Tableland, in north Queensland.

Notes: Both H. tabularis and H. trichophoroides (Kurok.) Kurok. are characterized by narrow lobes with marginal cilia, the lack of soredia and isidia, stipitate apothecia with ciliate margins, Polyblastidia-type ascospores and the presence of atranorin, zeorin and norstic acid. However, H. tabularis has subterminal, stipitate, 1–3.5 mm wide, situated subterminally on the lobe margin. H. trichophoroides is distinguished by the loosely adnate, foliose thallus with the apices of short lateral lobes, capitate, 0.5–1.2 mm wide, the soredia granular, so that the lobe margins appear to be sorediate (in part), but they do not develop capitate lobules marginal, nor is the thallus ecoricate. Heterodermia koyanoides is known only from the type locality in north-eastern Queensland. Associated species include Dirinaria applanata (Fée) D.D.Awasthi, Heterodermia hypocaesia Yasuda, H. hypocaenica Elix, H. queenslandica Elix, Menegazzia fisscarpa P.James, Pseudocyphellaria desfontainii (Delise) Vain., P. intricata (Delise) Vain., Parmotrema reticulatum (Taylor) M.Choisy, P. tinctorum (Nyl.) Hale, Pertusaria velata (Turner) Nyl., Sticta suareti Müll.Arg. and Usnea pectinata Taylor.
Heterodermia violostriata is distinguished by narrow, sublinear-elongate lobes with an ecorticate, violet-striate lower surface, marginal lobules, ascosporae with sporo-libulastidia and the presence of triterpenes in the medulla. It was previously misidentified as H. microphylla (Kurok.) Swinscow & Krog or H. fragilissima (Kurok.) J.-C. Wei & J.-M. Jiang. Three species are characterized by densely lobulate lobe margins and an ecorticate lower surface. However, in H. microphylla the Pachysporaria-type ascosporae lack sporo-libulastidia, and the lower surface is predominantly white or pale, whereas the other two species have Polyblastidia-type ascosporae and a sordid brown to violet-striate lower surface. Heterodermia violostriata differs from H. fragilissima in having somewhat shorter lobulate lobe margins and in containing the leucotylin chemosyndrome of triterpenes rather than the japonica chemosyndrome. The American species H. squamulosa (Degel.) W.L.Cubl. is morphologically similar to H. violostriata and chemically identical. However, the former has smaller and much narrower ascosporae (26–37 × 11–16 µm versus 30–45 × 15–25 µm).

Heterodermia violostriata is common on trees in coastal and montane rainforests of eastern Australia. Associated species include Dirinaria annulata (Fée) D.D.Avasthi, Heterodermia hybocarponica Elix, Hypotrachyna ossea (Vain.) Y.S.Park & Hale, Leidneria sorediatae (D.J.Galloway & P.M.Jorg.), Lepraria cupressicola (Hue) J.R.Laundon, Megalaria grossa (Pers. ex Nyl.) Hafellner, Pannaria leproloma (Nyl.) P. M.Jorg., Peltigera (Nyl.) P.J.Morg., Parmelia erumpens Kurok., Parmelinopsis horrescens (Taylor) Elix & Hale, Parmotrema reticulatum (Taylor) M.Chaisy, Pertusaria erythrella Müll.Arg., and Usnea confusa Asahina.

**Etymology**

The specific epithet refers to the violet striations on the ecorticate lower surface.

**Notes:**

Heterodermia tasmanica is distinguished by the narrow, sublinear-elongate lobes with an ecorticate, orange-yellow to yellow towards the apices, the presence of marginal lobules that can become granular near the tips, and containing atranorin, zeorin, hybocarpone and the leucotylin chemosyndrome of triterpenes (see below). It is morphologically similar to H. flavosquamosa Aiptoot & Sipman, but that species lacks hybocarpone but contains the leucotylin chemosyndrome of triterpenes (16α-acetoxyxopane-6α,22-diol, 6α-acetoxyxopane-16β,22-diol, 6α,16β-diacetoxyxopane-22-ol or minor trace), chloroatranorin (minor or trace).

**Chemistry**

Ellipsoid, with 0–2 sporoblastidia, 30–45 µm long. Apothecia yellow, KC + yellow, C –, P + pale yellow; containing atranorin (major), zeorin (major), 16β-acetoxyxopane-6α,22-diol (major or minor), leucotylin (minor), 16β-acetoxyxopane-6α,22-diol (minor or major), 6α,16β-diacetoxyxopane-22-ol (minor or trace), chloroatranorin (minor or trace).
New South Wales: • Southern Tablelands, Clyde Mountain, above the road, 35°33’S, 149°57’E, 700 m, on base of large Eucalyptus in wet sclerophyll forest, J.A. Elix 1290, 29.x.1975 (CANB); J.A. Elix 1789, 1791, 29.i.1976 (CANB); • South Coast, along trail to Pigeon House Mountain, 15 km W of Ulladulla, 35°21’S, 150°16’E, 600 m, on mossy sandstone rocks in dry sclerophyll forest, J.A. Elix 3922, 29.ix.1977 (CANB); • Mount Hyland Nature Reserve, 20 km N of Hernani, 30°10’44”S, 152°25’19”E, 1340 m, on base of Eucalyptus nobilis in temperate rainforest, J.A. Elix 36630, 30.iv.2009 (CANB); • Gloucester Tops, Barrington Tops National Park, 36 km WSW of Gloucester, 32°04’S, 151°39’E, 1300 m, on treetop in open Nothofagus-dominated forest, H. Streimann 44036, 23.iv.1990 (CANB);

Victoria: • Gippsland region, Alfred National Park, 19 km E of Cann River, 37°32’S, 149°20’E, 350 m, on tree trunk in rainforest, J.A. Elix 5251, 21.xi.1978 (CANB);

Tasmania: • Sumac Road, spur 2, S of Arthur River, 41°08’S, 145°02’E, 170 m, on canopy branches of Eucryphia in rainforest, J.A. Elix 40179, 40181 & G. Kantvilas, 8.xii.1993 (CANB); 41°06’S, 145°08’E, 170 m, on Eucryphia in rainforest, G. Kantvilas 277/81, 20.v.1981 (CANB).

New Records

Heterodermia lepidota Swinscow & Krog, Lichenologist 8, 122 (1976)
This lichen is characterized by simple to dissected, marginal and ±laminal phyllidia, a corticate lower surface with pale to black rhizines, Pachyspora-type ascoshores lacking sporoblastidia, and the presence of atranorin and triterpenes (Swinscow & Krog 1976). It was previously known from East Africa.
Chemistry: Cortex K+ yellow, C–, KC–, P+ pale yellow; containing atranorin (major), zearin (major), 6β,16α-diacetoxyhopane-22-ol (minor or trace), leucotylin (minor), 6α,6β-diacetoxyhopane-22-ol (minor or trace).

SPECIMEN EXAMINED
New South Wales: • South Coast, Sugarloaf Creek, Misty Mountain Road, Currowan State Forest, 35°35’S, 150°03’E, 100 m, on dead log in wet sclerophyll forest beside creek, J.A. Elix 21564, 14.vii.1987 (CANB).

This species is characterized by lobes with white marginal cilia, a lack of vegetative propagules, the subterminal, substipitate or stipitate apothecia with an eciliate margin, the white, corticate lower surface, ascoshores with sporoblastidia and the presence of atranorin, zearin and triterpenes (Kurokawa 1962). It was previously known from Central and South America.
Chemistry: Cortex K+ yellow, C–, KC–, P+ yellow; medulla K+ yellow, C–, P+ pale yellow; containing atranorin (major), zearin (major), 6β,16α-diacetoxyhopane-6α,22-diol (major), 6α-acetoxyhopane-16β,22-diol (minor or trace), leucotylin (minor), 6α,16β-diacetoxyhopane-22-ol (minor or trace).

SPECIMEN EXAMINED
New South Wales: • Berrico Road, Chichester State Forest, 21 km SW of Gloucester, 32°06’E, 150°16’E, 900 m, on fallen twigs in cool-temperate rainforest on ridge, J.A. Elix 25015, 27.iv.1990 (CANB).

Heterodermia subsidiosa is characterized by marginal isidia, a white, eciliate lower surface, ascoshores with sporoblastidia (Kurokawa 1962) and the presence of atranorin and triterpenes. It was previously known from Mexico.
Chemistry: Cortex K+ yellow, C–, KC–, P+ yellow; medulla K+ yellow, C–, P+ pale yellow; containing atranorin (major), zearin (major), japonin (minor or trace), 6α-acetoxyhopane-16β,22-diol (trace), 6α-acetoxy-16β,22-dihydroxyhopane-25-oic acid (trace), anaptychin 1 (trace), ±16β-acetoxy-6α,22-dihydroxyhopane-25-oic acid (trace).

SPECIMEN EXAMINED
Queensland: • Mount Lewis State Forest, 13 km WSW of Mossman, 16°29’S, 145°16’E, 1080 m, on fallen tree branch in rainforest, H. Streimann 46078, 7.xii.1990 (CANB).

The japonica chemosyndrome of triterpenes
The first detailed chemotaxonomic survey of Heterodermia was undertaken by Kurokawa (1973), who utilized thin-layer chromatographic analysis using the solvent system hexane-diethyl ether-formic acid (10:8:1) and silica gel plates. More particularly, he distinguished the array of triterpenes present in many species, for example the common species H. obscurata (Nyl.) Trevis. (zearin, anaptychin-2 [= 16β-acetoxyhopane-6α,22-diol], N-5-[6β,16α-diacetoxyhopane-22-ol], leucotylin [trace], and anaptychin 1) and H. japonica (Nyl.) Swinscow & Krog (zearin, N-5, anaptychin-5, and traces of anaptychin-1, anaptychin-3 and anaptychin-4). More recently, Lendemer (2009) reported the TLC behavior of some North American species of Heterodermia using solvent C [toluene-acetic acid in ratio 85:15], but did not identify the minor triterpenes present. Some of Kurokawa’s results were equivocal because the single solvent system did not discriminate all the triterpenes present, in particular the substance he termed ‘N-5’ detected in H. japonica and other common species including H. diademata (Taylor) D.D.Awasthi, H. tremulans (Müll.Arg.) W.L.Culb. and H. speciosa (Wulfen) Trevis. Those terpenes are not identical, and while the ‘N-5’ of H. diademata, H. tremulans and H. speciosa is identical with 6α-acetoxyhopane-16β,22-diol, it differs from that present in H. japonica (a triterpene of unknown structure, here termed japonin). Those substances can be distinguished by TLC using silica plates and the solvent systems E’ [toluene-ethyl acetate (3:1)] in combination with solvent C (Tables 1, 2). The japonica chemosyndrome of triterpenes includes zeorin and japonin as major compounds.

References
Table 1. TLC Rf values (×100) of triterpenes of the leucotylin chemosyndrome in three solvent systems.

<table>
<thead>
<tr>
<th>Triterpene name</th>
<th>Rf C</th>
<th>Rf G</th>
<th>Rf E'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeorin [Hopane-6α,22-diol]</td>
<td>43</td>
<td>50</td>
<td>19</td>
</tr>
<tr>
<td>Leucotylin [Hopane-6α, 16β,22-triol]</td>
<td>25</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>6α-Acetoxyhopane-16β,22-diol</td>
<td>34</td>
<td>38</td>
<td>6</td>
</tr>
<tr>
<td>16β-Acetoxyhopane-6α,22-diol</td>
<td>32</td>
<td>36</td>
<td>8</td>
</tr>
<tr>
<td>6α,16β-Diacetoxyhopane-22-ol</td>
<td>40</td>
<td>45</td>
<td>19</td>
</tr>
<tr>
<td>6α-Acetoxy-16β,22-dihydroxyhopane-25-oic acid</td>
<td>30</td>
<td>34</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2. TLC Rf values (×100) of triterpenes of the Japonica chemosyndrome in three solvent systems.

<table>
<thead>
<tr>
<th>Triterpene name</th>
<th>Rf C</th>
<th>Rf G</th>
<th>Rf E'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeorin [Hopane-6α,22-diol]</td>
<td>43</td>
<td>50</td>
<td>19</td>
</tr>
<tr>
<td>Japonin</td>
<td>32</td>
<td>36</td>
<td>5</td>
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<tr>
<td>Anaptychin-5</td>
<td>53</td>
<td>58</td>
<td>40</td>
</tr>
<tr>
<td>Anaptychin-1</td>
<td>22</td>
<td>27</td>
<td>4</td>
</tr>
<tr>
<td>6α-Acetoxy-16β,22-dihydroxyhopane-25-oic acid</td>
<td>30</td>
<td>34</td>
<td>4</td>
</tr>
</tbody>
</table>

Fig. 1. *Heterodermia coralloidea* (holotype in CANB). 1 mm

Fig. 2. *H. isidiophorella* (holotype in CANB). 1 mm

Fig. 3. *H. koyanoides* (holotype in CANB). 1 mm
Fig. 4. *H. tabularis* (apothecia - holotype in CANB). 1 mm

Fig. 5. *H. tabularis* (lobes - holotype in CANB). 1 mm

Fig. 6. *H. tasmanica* (holotype in CANB). 5 mm

Fig. 7. *H. violostrata* (J.A. Elix 36630 in CANB). 5 mm
Further new species and new records of Physcia (Physciaceae, Ascomycota) from Australia

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Abstract: Physcia dactylifera Elix and P. kantvilasi Elix are described as new to science. Physcia erumpens Moberg, P. krogiæ Moberg and P. rolfii Moberg are new to Australia. The genus Physcia (Schreb.) Michx. is well represented in Australia, and although 25 species have been recorded for the continent (Moberg 2001, Elix et al. 2009, Elix 2011, McCarthy 2011), undescribed and previously unreported species continue to be discovered.

Here, two new species are described and three taxa are reported from Australia for the first time. The morphological and chemical characters used to segregate Physcia taxa have been discussed previously (Moberg 2001, Elix et al. 2009, Elix 2011). Chemical constituents were identified by thin-layer chromatography (Elix & Ernst-Russell 1993), high-performance liquid chromatography (Elix et al. 2003), and comparison with authentic samples.

Physcia dactylifera Elix, sp. nov.
Sicut Physcia decorticata sed lobi latiore, superfice frigus-pruinosus et 16β-acetoxy-hopane-16α,22-diolium et 6α-acetoxyhopane-16β,22-diolium continenti differt.

Type: Australia. Queensland: Cook district, Cooktown road, 3 km NW of Mount Molloy, 16°40’S, 145°19’E, 450 m, on granite rocks in Eucalyptus-dominated grassland, J.A. Elix 17197 & H. Streimann, 3.vii.1984 (CANB – holotype).

Thallus orbicular or irregular, adnate throughout, to 8 cm wide. Lobes 0.8–1.5 mm wide, contiguous to imbricate in the centre, radiating at the periphery, irregularly branched, flat to weakly convex, the margins of the lobes entire; lobe tips truncate, weakly ascending, eciliate. Upper surface whitish grey to grey or dark grey, matt, emaculate, white-pruinose and appearing frosted especially near apices, dactylate isidia present; upper cortex pseudoparenchymatous. Dactyls laminal, 0.2–0.5 mm wide, becoming erumpent and developing into elevated pustules, stalked soralia or craters that sometimes coalesce to cover large parts of the upper surface; soredia coarsely granular, whitish or grey. Lower surface brown to dark brown or brown-black; rhizines sparse, concolorous with the lower surface, 0.4–0.6 mm long; lower cortex prosplectenchymatous. Apothecia juvenile, lacking ascospores. Pycnidia uncommon, immersed then emergent; visible as black dots; conidia subcylindrical, 4–6 x 1 µm.

Chemistry: Cortex K+ yellow; medulla K+ yellow; containing atranorin (major), zeorin (major), 16β-acetoxyhopane-6α,22-diol (major), 6α-acetoxyhopane-16β,22-diol (minor), leucocytin (minor), 6α,16β-diacetoxyhopane-22-ol (minor), 6α-acetoxy-16β,22-dihydroxyhopane-25-oic acid (minor), 16β-acetoxy-6α,22-dihydroxyhopane-25-oic acid (trace).

Etymology: The specific epithet derives from the characteristic dactylate isidia present on the upper surface.

Notes: Physcia dactylifera could be confused with P. decorticata Moberg (Moberg 2001) in that both have dactylate isidia that develop into pustules on the upper surface. However, the latter is distinguished by having narrower lobes (0.3–0.8 mm versus 0.8–1.5 mm), a fragile and cracked upper cortex that erodes in part, leaving the lobes decorticate (the upper cortex is frosted-pruinose and mainly intact in P. dactylifera).
and in containing a different cohort of triterpenes (the speciosa chemosyndrome). Chemically the new taxon is identical to *P. erumpens* Moberg, a species that has a dark brown to black-brown lower surface but lacks a frosted-pruinose upper surface. Furthermore, on its upper surface *P. erumpens* has crateriform soralia rather than dactyls. *Physcia krogiae* Moberg has a frosted-pruinose upper surface with erumpent pustules and a brown-black to black lower surface, but it lacks dactyls and contains the speciosa chemosyndrome of triterpenes. At present *Physcia dactylifera* is known only from coastal and hinterland areas of north Queensland, where it grows on rocks and bark. Commonly associated saxicolous species include *Australienna streimanni* Matzer, *H. Myrhofer & Eliss*, *Buella tivaxanthina* Eliss, *Caloplaca leptozona* (Nybl.) Zahlbr., *Diploclethidies actiniosomus* (Pers.) Zahlbr., *Lepraria usnica* Sipman, *Parmotrema praeerosulcosum* (Nybl.) Hale, *P. reticulatum* (Taylor) M. Choisy and *Ramboldia petraeoides* (Nybl. ex C. Bab. & Mitt.) Kantvilas & Eliss. Commonly associated corticolous species include *Dirinaria planata* (Fée) D. D. Awasthi, *Caloplaca bassae* (Willk. ex Ach.) Zahlbr., *Leptogium australianericanum* (Mmlne) C. W. Dodge, *L. azureus* (Sw. ex Ach.) Mont., *Physcia atrostriata* Moberg, *Parmotrema reticulatum* (Taylor) M. Choisy, *P. tinctorum* (Nybl.) Hale and *Paxine retigulella* Nybl.

**SPECIMENS EXAMINED**

**Queensland:** • track to Lugger Bay, 17 km E of Fully, 17°57'S, 140°05'E, 1 m, on dead tree trunk in strand vegetation dominated by *Calopodium myophyllum* and *Hibiscus tiliaceus*, H. Steimann 45436, 1.xi.1990 (CANB).

**Physcia kantvilasii** Eliss, sp. nov. Fig. 2

**Type:** Australia. Tasmania. Robbins Island Track, just N of Denium Hill, 25 km NW of Smithton, 40°44'S, 144°53'E, 2 m, on *Bursaria in Melaleuca swamp*, J.A. Elix 40291 & G. Kantvilas, 10.xii.1993 (CANB – holotype).

**Thallus** foliose, oblong, irregular to broadly rounded, adnate, 1–3 cm wide. Lobes 0.8–1.5 mm wide, broader at the tips, weakly to markedly convex, sublinear, irregularly branched, the lobe tips often ascending, with sparse, simple marginal cilia; cilia whitish, darkening at the tips or black, 0.2–0.7 mm long. **Upper surface** greenish white, whitish to cream-coloured, emaculate or rarely distinctly white-maculate, smooth, matt, rarely white-pruinose, sorediate; sorailia sparse, labriform on the underside of the lobe tips, soredia coarse, granular, white or greenish white; upper cortex pseudoparenchymatous. **Medulla** white. **Lower surface** corticate, white to pale brown, rhizinate; rhizines sparse to moderately dense subapically, simple to sparsely branched, whitish to brown or brown-black, 0.2–0.7 mm long; lower cortex prosoplectenchymatous to indistinctly pseudoparenchymatous. Apothecia and pycnidia not seen.

**Chemistry:** Cortex and medulla K+ yellow, C–, P+ pale yellow; containing atranorin (major), zeorin (major), 6β-acetoxyhopane-6α,22-diol (major), 6α-acetoxyhopane-16β,22-diol (minor), 6α,16β-diacetoxyhopane-22-ol (minor), leucotylin (minor).

**Physcia kantvilasii** is also characterized by having convex lobes.


**New records**

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

*Physcia erumpens* is characterized by convex lobes, laminal crateriform to capitate soralia, a brown-black to black lower surface (Moberg 1986) and the presence of atranorin, zeorin and the leucotylin chemosyndrome of triterpenes. It was previously known from East and South Africa, southern Europe, Macaronesia, North America, South America and New Zealand (Galloway & Moberg 2005; Moberg 1986, 1990, 1997, 2002).

**Chemistry:** Cortex and medulla K+ yellow, C–, P+ pale yellow; containing atranorin (major), zeorin (major), 16β-acetoxyhopane-6α,22-diol (major), 6α-acetoxyhopane-16β,22-diol (minor), 6α,16β-diacetoxyhopane-22-ol (minor), leucotylin (minor).

**SPECIMENS EXAMINED**

**New South Wales:** • South Coast, 1.5 km W of Surf Beach, Batehaven, 35°44'S, 150°13'E, 30 m, on *Acacia*, J.A. Elix 1803, 29.1.1976 (CANB); • North Coast, Park Beach, Coffs Harbour, 30°17'S, 153°07'E, 1 m, on trees in strand vegetation, J.A. Elix 1977, 20.vi.1977 (CANB); • North Coast, Old Macleay River estuary, Stuarts Point, 30°49'S, 153°00'E, 1 m, on *Aegericus caricifolium* in mangrove and strand vegetation, J.A. Elix 21368, 21377, 19.1.1987 (CANB); • Limeburners Creek Nature Reserve, Queens Head Area, 15 km S of Crescent Head, 31°19'09"S, 152°58'05"E, 5 m, on dead branch in coastal scrub with *Casuarina* and palms, J.A. Elix 43582, 43590, 7.viii.2008 (CANB).

**Physcia krogiae** Moberg, *Nordic J. Bot.* 6, 858 (1986)

*Physcia krogiae* is characterized by the frosted-pruinose upper surface, particularly near the lobe apices, the laminal pustulate soralia, the brown to brown-black lower surface (Moberg 1986) and the presence of atranorin, zeorin and the leucotylin chemosyndrome of triterpenes. It was previously known from East Africa and Central and South America (Moberg 1986, 1990).

**Chemistry:** Cortex and medulla K+ yellow, C–, P+ pale yellow; containing atranorin (major), zeorin (major), 6α-acetoxyhopane-16β,22-diol (major or minor), 6α-acetoxyhopane-16β,22-dihydroxyhopane-25-ol (minor), 6α-acetoxy-22-hydroxyhopane-25-ol (trace), leucotylin (minor), ±16β-acetoxy-6α,22-dihydroxyhopane-25-ol (trace).

**SPECIMENS EXAMINED**


**Queensland:** • Kennedy North district, Hervey Range, 45 km SW of Townsville, 19°26'S, 146°24'E, 350 m, on granite rocks in dry sclerophyll forest, J.A. Elix 20449 & H. Steimann, 20.vi.1986 (CANB), H. Steimann 37180, 20.vi.1986 (CANB); • Expedition National Park, Robinson Gorge, 73 km NW of Taroom, 25°17'S, 149°09'E, 400 m, on sandstone rock crevice in coastal scrub with *Casuarina* shrubs, J.A. Elix 35266, 1.ix.1993 (CANB); • Cabbage Tree Creek, 42 km ENE of Taroom, 25°29'S, 149°09'E, 400 m, on sandstone rocks in *Eucalyptus-Callicrion*-dominated woodland, J.A. Elix 33599, 2.ix.1993 (CANB).
New South Wales: • South Coast, Buckenbowra River Estuary, 7.5 km W of Batemans Bay, 34°42'S, 150°06'E, 1 m, on trunk of *Avicennia* in mangrove swamp, J. Johnston 2813, 29.xi.1989 (CANB).

**Australian Commonwealth Territory:** • South Coast, Jervis Bay, Australian National Botanic Gardens Annex, 39°09'S, 150°40'E, on base of *Pisonia* branch in moist, rocky gorge, D. Verdon 3102, 9.ix.1977 (CANB).

*Physcia rolfii* Moberg, Nordic J. Bot. 10, 337 (1990)

*Physcia rolfii* is characterized by narrow lobes with semicircular marginal soralia, the flat to convex, often distinctly white-maculate upper surface (Moberg 1990), and the presence of the *speciosa* chemosyndrome of triterpenes. It was previously known from Central and South America (Moberg 1990).

**Chemistry:** Cortex and medulla K+ yellow, C–, P+ pale yellow; containing atranorin (major), zeorin (major), 6α-acetoxhopane-16β,22-diol (minor or trace), 6α-acetoxy-22-hydroxyhopane-25-oic acid (trace), 6α-acetoxy-16β,22-dihydroxyhopane-25-oic acid (trace), leucotylin (minor), ±16β-acetoxy-6α,22-dihydroxyhopane-25-oic acid (trace).

**SPECIMENS EXAMINED**

**Queensland:** • Kennedy North district, Red Falls, Lolworth Creek, 58 km WNW of Charters Towers, 19°55’S, 145°44’E, 330 m, on tree trunk on great basalt wall with scattered trees and shrubs, J.A. Elix 20521 & H. Streimann, 21.vi.1986 (CANB); • Burke district, Whitecliff Gorge Creek, Hann (The Lynd) Highway, 56 km NNE of Hughenden, 20°20’S, 144°24’E, 550 m, on weathered rocks in *Eucalyptus*-dominated woodland, J.A. Elix 20745 & H. Streimann, 26.vi.1986 (CANB).

**Acknowledgments**

I thank the curators of UPS and O and Dr Klaus Kalb (Neumarkt) for the loan of types and other critical collections.

**References**


Elix, JA; Corush, J; Lumbsch, HT (2009): Triterpene chemosyndromes and subtle morphological characters characterize lineages in the *Physcia aipolia* group in Australia (Ascomycota). Systematics and Biodiversity 7, 479–487.


Notes on the typification and citation of Lobaria discolor (Delise) Hue

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Abstract: The currently accepted typification of the palaearctic lichen Lobaria discolor is shown to be incorrect, and should be typified on material collected by Bory de St-Vincent from Réunion in 1801. The correct citation of this taxon is Lobaria discolor (Delise) Hue, not L. discolor (Bory) Hue as is widely reported in the literature.

The palaearctic lichen Lobaria discolor (Delise) Hue has a distribution from Madagascar to northern Queensland and eastern New South Wales in Australia (Elix 2001, McCarthy 2011). It is one of the species that was recorded among the captures of the French soldier-botanist Jean Baptiste Sticta discolor, Yoshimura (1971: 263) cites a specimen (1825: Îsle de Bourbon [Réunion], “sur les troncs d’arbres dans les grands bois”, 1801, Bory, in herb. – PC-Thuret) as collector is in error, since Delise specifically mentions Bory de St-Vincent from Réunion in 1801. The correct citation of this taxon is Lobaria discolor (Delise) Hue, not L. discolor (Bory) Hue as is widely reported in the literature.

Delise's description from Bory de St-Vincent material collected in Réunion (Bory 1804), the description of Sticta discolor given by Delise (Delise 1825: 136) must be attributed to him as the publishing author, even though he uses thugs as synonyms the unpublished herbarium names “Sticta discolor Bory, in herb. – Lichen (pulmonarius) discolor Bory. Voy.” The correct citation of the lichen is thus Lobaria discolor (Delise) Hue, as given in Hue (1901), Swinscow & Krog (1988) and Krog (2000), not Lobaria discolor (Bory) Hue as given by Fée (1837). Zahlbruckner (1825), Yoshimura (1971), Elix (2001: 40), Wolseley et al. (2002) and McCarthy (2011). Further, the page number for Delise’s citation of Sticta discolor given in Elix (loc. cit.) and in McCarthy (2011) should be p. 136, not p. 91 (that refers to Delise’s description of Sticta argyracea Delise [= Pseudocyphellaria argyracea (Delise) Vain.], not to Sticta discolor).

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Endeavour 31(4), 145–151.

David J. Galloway

Notes on the typification and citation of Lobaria discolor (Delise) Hue

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AUSTRALASIAN LICHENOLOGY 69, July 2011
A new species of Pertusaria (lichenized Ascomycota, Pertusariaceae) from New Zealand

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Abstract: Pertusaria southlandica A.Knight, Elix & A.W.Archer sp. nov. is described from southern New Zealand.

Pertusaria is well-represented in the New Zealand lichen flora, with 53 species recorded (Galloway 2007), based on specimens collected from all parts of the country. In the course of a combined Wellington and Otago Botanical Society trip to western Fiordland (South Island), a new corticolous species was discovered and is described in this paper. The chemistry of the species was studied by thin-layer chromatography (Elix & Ernst-Russell 1993), high-performance liquid chromatography (Elix et al. 2003) and comparison with authentic samples.

Pertusaria southlandica A.Knight, Elix & A.W.Archer, sp. nov. Figs 1 and 2

Similis Pertusaria thwaitesii sed ostiolis pallidioribus et acidum conhypoprotocetraricum continens vice acidum protocetraricum.

Type: New Zealand, South Island: Southland: forest edge, Boyd Creek, 20 km W of Te Anau Downs, 45°08’S, 167°57’E, on fallen Nothofagus solandri twig, A. Knight, 6.1.2011 (OTA 60696 – holotype).

Thallus corticolous, pale grey-white, finely rimose-cracked, rough and thickish in fertile areas and against adjacent crusts, thinning towards margins. Surface dull to slightly shiny, lacking pruina, isidia and soredia. Faint black prothallus sometimes present. Apothecia verruciform, flattened-hemispherical, numerous, crowded, 2–3 mm diam., colorless with the thallus. Thalline margins thick, smooth and slightly glossy. Ostioles pale, conspicuous, 3–8 per verruca, slightly sunken. Ascospores ellipsoid, hyaline, 2 per ascus, rough-walled, 87–105 × 30–50 µm.

Chemistry: cortex K–, KC–, C–, P+ yellow-orange, UV+ dull brick red; medulla UV+ bright white; containing conhypoprotocetraric acid (major), 2-chlorolichexanthone (minor), hypoprotocetraric acid (minor) and protocetraric acid (trace).

Etymology: the epithet is derived from Southland, the district in the South Island of New Zealand where the new species was found.

Remarks
Pertusaria southlandica is characterized by conspicuous, multi-ostiolate verrucae, asci with two rough-walled ascospores, and the presence of 2-chlorolichexanthone and conhypoprotocetraric acid. It somewhat resembles the coastal Australian P. thwaitesii Müll.Arg., which is also known from Sri Lanka and New Guinea (Müller 1884), but that species has longer ascospores (110–160(–175) µm versus 87–105 µm) and black ostioles, and contains protocetraric acid. The New Zealand endemic P. vallicola Elix


& Malcolm (Elix et al. 1995), known from one location in Canterbury, is also similar to *P. southlandica*; both species have asci with two rough-walled ascospores and pale ostioles, but *P. vallicola* contains hypoprotocetraric acid as a major compound and has smaller verrucae (0.2–0.3 mm versus 2–3 mm diam.) and only one ostiole per verruca.

At present, the new species is known from only the type locality, where associated *Pertusaria* species include *P. psoromica* A.W.Archer & Elix, *P. thamnolica* A.W.Archer, *P. truncata* Kremp. and *P. velata* (Turner) Nyl.

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This book is the outcome of a symposium held in September, 2009, in Dunedin, New Zealand, celebrating the life and scientific achievements of Charles Darwin, held on the bicentennial of his birth and the sesquicentennial of the publication of his Origin of Species. The book is a collection of essays based on presentations by notable New Zealand scholars from a wide range of disciplines. The focus is broad, delving into Darwin as the traveller, the thinker and the scientist, for Darwin’s visit to New Zealand was very brief, spanning just the last few days of 1835.

The key chapter of interest to lichenologists is David Galloway’s, entitled “Darwin’s Beagle Lichens”. David’s penchant for weaving together history, natural history and systematics is well-known, and his past efforts in this regard have brought to life the contributions of many of the key historical figures in lichenology. This chapter is no exception. His account of his own early introduction to London’s Natural History Museum and its treasures: “...crazily stacked, disintegrating cardboard boxes on rusting shelving...” prompted nostalgic recollections of my own early visits there. The chapter then deals briefly with the state of South American lichenology at the time of Darwin’s visit, lists Darwin’s collecting localities and specimens, and recalls some of Darwin’s observations on the landscape and vegetation. Those include the first remarks about the fog-induced lichen oases in coastal Peru. David places Darwin firmly in the pantheon of South American lichenology, and sees him as the forerunner of one of the 19th century’s greatest thinkers, a man who perhaps more than any other altered our view of the world and our perception of our place in it.

I enjoyed all the contributions, but the late Eric Godley’s “Reminiscences of a Neo-Darwinian” was a particular favourite. The book also caused me to reflect on the evolution of ideas themselves. In science, as elsewhere, it is vital to understand the origin of the axioms we cling to or the tenets that are all too quickly discarded as ‘old hat’, and to reflect how over time we gradually inch our way towards what we believe to be ‘truth’.

Gintaras Kantvilas

Aspects of Darwin: A New Zealand Celebration, edited by David Galloway and John Timmins. Published by The Friends of the Knox College Library, Dunedin, 2010. 180 pp., hardback. ISBN 978-0-473-17692-1. NZ$34.95 plus postage. Available from The Hewitson Library, Knox College, Arden St, Opoho, Dunedin 9010, New Zealand. The e-mail contact for ordering is <John.Timmins@knoxcollege.ac.nz>

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