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The corticolous *Pertusaria thwaitesii* was described in 1884 by Müller Argoviensis from a Queensland collection. Primarily coastal, it occurs also in New South Wales and Victoria to an elevation of 1200 m, and outside Australia in Papua New Guinea and Sri Lanka. Woody hosts in Australia include species of *Acacia*, *Albizzia*, *Rhizophora*, *Casuarina*, *Eucalyptus*, and *Schefflera*.

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CONTENTS

| | |
|---|----|
| 17TH MEETING OF AUSTRALASIAN LICHENOLOGISTS | 2 |
| RECENT LITERATURE ON AUSTRALASIAN LICHENS | 3 |
| ADDITIONAL LICHEN RECORDS FROM AUSTRALIA | |
| Elix, JA—(56) | 4 |
| ADDITIONAL LICHEN RECORDS FROM NEW ZEALAND | |
| Galloway, DJ; Ledingham, J (43) <i>Umbilicaria deusta</i> (L.) Baumg. | 14 |
| Galloway, DJ; Kooperberg, R (44)— <i>Roccellinastrum flavescens</i> Kantvilas | 17 |
| ARTICLES | |
| Elix, JA—A new species of <i>Lepraria</i> (lichenized Ascomycota) from Australia | 20 |
| Elix, JA—The chemical diversity of <i>Lepraria coriensis</i> and <i>L. usnica</i> (lichenized Ascomycota) in Australia | 24 |
| Elix, JA; Kalb, K—Two new species of <i>Tephromela</i> (Lecanoraceae, lichenized Ascomycota) from Australia | 27 |
| Kantvilas, G—On the identity of <i>Opegrapha flavescens</i> , with new Australian records of <i>Cresponea</i> | 32 |
| Galloway, DJ—Notes on <i>Placopsis albida</i> (Kremp.) I.M.Lamb (Ascomycota: Agyriaceae) from Java and New Ireland, Papua New Guinea | 37 |
| BOOK REVIEW | |
| Galloway, DJ—A <i>World Monograph of the Genus Plectocarpon</i> (Roccellaceae, Arthoniales) by D. Ertz, C. Christnach, M. Wedin, & P. Diederich | 40 |

17th MEETING OF AUSTRALASIAN LICHENOLOGISTS—2006

The 17th meeting of Australasian Lichenologists will be held at Manjimup, Western Australia, and surrounding selected bushland sites on Saturday and Sunday, 8–9 April, 2006.

Lichen forays to several habitat types around Manjimup (within about 70 km) will be undertaken on both Saturday and Sunday. The habitats visited will include Lake Muir and surrounds and a section of the Warren (Rooney's Bridge), an area of jarrah forest NE of Manjimup that includes an extensive granite rock outcrop. A group dinner is planned for Saturday evening and, if desired, will be followed by an informal discussion session.

The assembly point: 9:30 a.m. on Saturday, April 8, in the front carpark of the Department of Conservation and Land Management at the corner of Brain Street and SW Highway, Manjimup.

A list of accommodation is provided covering a range of options and prices. There are many B&Bs in the surrounding area, especially towards Pemberton 30 km S of Manjimup, and plenty of wineries to sample a drop or two.

To assist with dinner logistics, you should register in advance with Ray Cranfield. If you are having problems obtaining accommodation, or if you need answers to other enquiries, please contact Ray by post at: Department of Conservation and Land Management, Science Division, Brain Street, Manjimup, WA 6258, by phone: (08)–9771–7976 (work), or e-mail: rayc@calm.wa.gov.au

Please note that a licence is required to collect flora in WA, and applications should be made prior to attending the meeting. An application form and requirements for a permit are available from CALM Wildlife Licensing Section, 17 Dick Perry Avenue, Technology Park, Western Precinct, Kensington, WA 6151. Phone Graeme Zekulich on (08)–9334–0441, or by fax: (08)–9334–0242.

accommodation in Manjimup and surrounds (up to 30 km)

Manjimup:

Kingsley Motel, phone (08)–9771–1177

Kingston House (CALM) phone (08)–9771–7995 (cheap, self-catering)

Pemberton:

Pemberton Hotel, phone (08)–9776–1017

Karri Valley Resort, phone (08)–9776–2012

Other:

Wilgarup Lodge (B&B), phone (08)–9771–1991

Perup (CALM), phone (08)–9771–7988 (self-catering, lab area available)

Assorted other B&Bs in the area, plus caravan parks, and two other hotels/motels in Manjimup.

RECENT LITERATURE ON AUSTRALASIAN LICHENS

- Bjerke, JW (2004): A new sorediate, fumarprotocetraric acid-producing lichen species of *Menegazzia* (Parmeliaceae, Ascomycota). *Systematics and Biodiversity* 2, 45–47.
- Blanco, O; Crespo, A; Elix, JA; Hawksworth, DL; Lumbsch, HT (2004): A molecular phylogeny and a new classification of parmelioid lichens containing *Xanthoparmelia*-type lichenan (Ascomycota: Lecanorales). *Taxon* 53, 959–975.
- Calvelo, S; Stocker-Wörgötter, E; Liberatore, S; Elix, JA (2005): *Protousnea* (Parmeliaceae, Ascomycota), a genus endemic to southern South America. *Bryologist* 108, 1–15.
- Czeczuga, B; Rogers, RW (1999): Carotenoids in some lichen species from Queensland (Australia). *Feddes Repertorium* 110, 447–453.
- Divakar, PK; Blanco, O; Hawksworth, DL; Crespo, A (2005): Molecular phylogenetic studies on the *Parmotrema reticulatum* (syn. *Rimelia reticulata*) complex, including the confirmation of *P. pseudoreticulatum*. *Lichenologist* 37, 55–65.
- Elix, JA (2004): Two new species of *Imshaugia* (Ascomycota: Parmeliaceae) from South America. *Mycotaxon* 90, 337–341.
- Elix, JA; Wardlaw, JH (2004): Pigmentosin A, a new naphthopyrone from the lichen *Hypotrachyna immaculata*. *Australian Journal of Chemistry* 57, 681–683.
- Elix, JA (2006): Additional lichen records from Australia 56. *Australasian Lichenology* 58, 4–13.
- Elix, JA (2006): A new species of *Lepraria* (lichenized Ascomycota) from Australia. *Australasian Lichenology* 58, 20–23.
- Elix, JA (2006): The chemical diversity of *Lepraria coriensis* and *L. usnica* (lichenized Ascomycota) in Australia. *Australasian Lichenology* 58, 24–26.
- Elix, JA; Kalb, K (2006): Two new species of *Tephromela* (Lecanoraceae, lichenized Ascomycota) from Australia. *Australasian Lichenology* 58, 27–31.
- Elvebakk, A; Bjerke, JW (2005): *Pannaria isabellina* (Vain.) comb. nov., a remarkable lichen species from Chile. *Lichenologist* 37, 47–54.
- Galloway, DJ; Lewis-Smith, RI; Quilhot, W (2005): A new species of *Placopsis* (Agyriaceae: Ascomycota) from Antarctica. *Lichenologist* 37, 321–327.
- Galloway, DJ; Ledingham, J (2006): Additional lichen records from New Zealand 43. *Umbilicaria deusta* (L.) Baumg. *Australasian Lichenology* 58, 14–16.
- Galloway, DJ; Kooperberg, R (2006): Additional lichen records from New Zealand 44. *Roccellinastrum flavescens* Kantvilas. *Australasian Lichenology* 58, 17–19.
- Galloway, DJ (2006): Notes on *Placopsis albida* (Kremp.) I.M. Lamb (Ascomycota: Agyriaceae) from Java and New Ireland, Papua New Guinea. *Australasian Lichenology* 58, 37–39.
- Galloway, DJ (2006): BOOK REVIEW. *A World Monograph of the Genus Plectocarpon* (Roccellaceae, Arthoniales), by D. Ertz, C. Christnach, M. Wedin, and P. Diederich, *Bibliotheca Lichenologica* 91. *Australasian Lichenology* 58, 40–42.
- Harris, RC (2005): Some name changes in *Porina* s. lat. *Opuscula Philolichenum* 2, 15–16.
- Jørgensen, PM (2005): Notes on some recently discovered specimens of the lichen genus *Leioderma* from Peninsular Malaysia. *Lichenologist* 37, 369.
- Kantvilas, G (2006): On the identity of *Opegrapha inallescens*, with new Australian records of *Cresponea*. *Australasian Lichenology* 58, 32–36.
- Lewis-Smith, RI (2005): Extensive colonization of volcanic ash by an unusual form of *Peltigera didactyla* at Deception Island, maritime Antarctica. *Lichenologist* 37, 367–368.
- McCarthy, PM; Mallett, K (eds) (2004): *Flora of Australia*. Volume 56A, Lichens 4. ABRS/CSIRO, Melbourne.

Additional lichen records from Australia 56

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Lepraria atlantica, *L. atrotomentosa*, *L. eburnea*, *L. obtusatica*, *Parmotrema upretii*, *Phyllopsora albicans*, *Ph. rappiana*, *Ph. santensis*, *Ph. swinscowii*, and *Squamacidia janeirensis* are reported as new to Australia. In addition, new state or territory records are listed for 30 other species. The new name *Phyllopsora foliatella* Elix is proposed, and the new combination *Phyllopsora rappiana* (Brako) Elix is made.

NEW RECORDS FOR AUSTRALIA

1. *Lepraria atlantica* Orange, *Lichenologist* **33**, 462 (2001).

The leprose thallus of this species is pale bluish grey to greyish cream and composed of fine powdery granular soredia. It lacks lobes, a medulla and projecting hyphae, but contains atranorin, porphyritic acid (major), rangiformic or jackinic acid (major), norrangiformic or norjackinic acid (minor or absent). *Lepraria cacuminum* (A.Massal.) Kummerl. & Leuckert has similar chemistry, but is distinguished by the coarsely granular thallus which grows in montane, rain-exposed habitats. This species was previously known only from northern Europe (Orange 2001). A detailed description was given in this reference.

SPECIMENS EXAMINED

New South Wales. •Shingle Ridge, 5 km N of Molong along road to Yeoval, 33°04'22"S, 148°49'45"E, 595 m, over moss and soil in sheltered ledge at base of large rock in remnant *Eucalyptus* woodland, *J.A. Elix 36007*, 13.x.2005 (CANB).

Australian Capital Territory. •Shepherds Lookout, 13 km WNW of Canberra, 35°14'S, 148°58'E, 550 m, on porphyry rocks on dry hillside with scattered *Callitris endlicheri*, *J.A. Elix 26706*, 10.iv.1992 (CANB).

Western Australia. •Boyagin Rock, Boyagin Nature Reserve, 20 km NW of Pingelly, 32°28'S, 116°53'E, 350 m, on sheltered rock ledge on exposed granite outcrop, *J.A. Elix 41036*, *H.T. Lumbsch & H. Streimann*, 11.ix.1994 (CANB).

2. *Lepraria atrotomentosa* Orange & Wolseley, *Biblioth. Lichenol.* **78**, 328 (2001).

The leprose thallus of this species is pale blue-grey to grey-white, comprising mostly a finely sorediate-granulose crust, but with occasional short, fragile, poorly defined lobes up to 1.4 mm wide with a ±upturned margin. It is characterized by the dark bluish grey to dark brown hypothallus or tomentum on the lower surface of the lobes, which often projects slightly beyond the lobes and is visible from above, and the presence of atranorin, zeorin and lecanoric acid. It was known previously from Sri Lanka and Japan, and a detailed description is given by Orange & Wolseley (2001).

SPECIMENS EXAMINED

New South Wales. •Bobbin Head, Ku-ring-gai Chase National Park, 33°39'S, 151°09'E, 15 m, on mosses over sandstone rock in *Eucalyptus* forest, *J.A. Elix 770*, 28.iv.1974 (CANB); •Hanging Mountain, Hanging Mountain Forest Reserve, 24 km SW of Moruya, 36°01'S, 149°52'E, 550 m, on rocks in *Eucalyptus* forest with *Xanthorrhoea* on steep rocky slope, *J.A. Elix 25483*, 20.vi.1990 (B, CANB).

3. *Lepraria eburnea* Laundon, *Lichenologist* **24**, 332 (1992).

The leprose thallus of this species is grey-white to yellow grey, and can be diffuse or delimited with an obscurely lobed margin. The species is characterized by a medulla and projecting hyphae, and contains alectorialic acid (major), barbatolic acid (minor), and protocetraric acid (minor). *Lepraria eburnea* was previously known from Europe and North America (Orange 1997). A detailed description is given in Laundon (1992) and complemented by Orange (1997).

SPECIMEN EXAMINED

Victoria. •Result Creek, Bendoc-Orbost Road, 13 km SW of Bendoc, 37°14'S, 148°49'E, 900 m, on mosses in *Atherosperma moschatum*-*Acacia*-dominated forest beside creek, *J.A. Elix 24152*, 13.ii.1990 (CANB).

4. *Lepraria obtusatica* Tønsberg, *Sommerfeltia* **14**, 204 (1992).

The thallus of *L. obtusatica* is leprose throughout or composed of very fine soredia mixed with some colourless medullary hyphae, pale greenish white with a greyish yellow tinge, diffuse, unlobed, with or without an indistinct white medulla. Chemically it is characterized by the presence of obtusatic acid (major), norobtusatic acid (minor), placodiolic acid (trace), and barbatic acid (minor or trace). It was previously known only from Europe. A detailed description is given in Tønsberg (1992).

SPECIMEN EXAMINED

Victoria. •Bendoc-Orbost Road (Gap Road), 5.5 km SW of Bendoc, 37°10'S, 148°51'E, 900 m, on dead wood in wet sclerophyll forest with *Bedfordia*, *J.A. Elix 24121*, 13.ii.1990 (CANB).

5. *Parmotrema upretii* Divakar, *Lichenologist* **35**, 23 (2003).

Parmotrema upretii is characterized by the large, loosely adnate thallus, the broad eciliate lobes, the lobulate-isidiate upper surface and the presence of lecanoric acid in the medulla. It resembles *P. tinctorum* (Despr. ex Nyl.) Hale, but differs in having a lobulate rather than isidiate upper surface. Divakar & Upreti (2003) reported this species to contain gyrophoric rather than lecanoric acid, but an examination of the type specimen showed this was incorrect. This species was known previously from India (Divakar & Upreti 2003), and a detailed description is given in that reference.

SPECIMEN EXAMINED

New South Wales. •Jervis Bay Botanic Gardens, Lake McKenzie, 30 km SSE of Nowra, 35°09'S, 150°40'E, 50 m, on sandstone rocks in dry *Eucalyptus* woodland, *J.A. Elix 26404*, 8.xi.1990 (CANB).

6. *Phyllopsora albicans* Müll. Arg., *Bull. Soc. Roy. Bot. Belg.* **32**, 132 (1893).

Phyllopsora albicans is characterized by the squamulose thallus, with relatively large, ±ascending squamules, numerous lacinules developing from the lobe tips, the absence of isidia, and the presence of argopsin and norargopsin in the medulla. It could be confused with *P. buettneri* (Müll. Arg.) Zahlbr., but the latter species contains pannarin (or dechloropannarin) and zeorin, and differs morphologically in forming larger, pruinose squamules and ±circular thalli with radiating marginal squamules. *Phyllopsora albicans* was previously known from East Africa, Mauritius and Réunion (Timdal & Krog 2001). A detailed description is given in Timdal & Krog (2001).

SPECIMENS EXAMINED

Queensland. •Lannercrest State Forest, Blue Water Creek, Old Mill Road, 39 km WSW of Ingham, 18°45'S, 145°48'E, 600 m, on tree in rainforest, *J.A. Elix 15580 & H. Streimann*, 19.vi.1984 (CANB); •Coo-roo Logging Area, 16 km WNW of Innisfail, 17°31'S, 145°53'E, 100 m, on felled tree in rainforest, *J.A. Elix 16682, 16694 & H. Streimann*, 28.vi.1984 (CANB); •Kirrima State Forest, Cardwell Range, Dunn Creek, 23 km WNW of Cardwell, 18°12'S, 145°49'E, 730 m, on sapling along rainforest margin, *J.A. Elix 17627, 17640 & H. Streimann*, 8.vii.1984 (CANB); •Mt. Spec State Forest, Paluma Range, 6 km W of Paluma, 19°01'S, 146°09'E, 920 m, on sapling in Lauraceae-*Syzygium* dominated forest, *J.A. Elix 20240 & H. Streimann*, 18.vi.1986 (CANB); •Clarke Range, 46 km SSW of Proserpine, 20°21'S, 148°41'E, 600 m, on *Argyrodendron* in "dry" rainforest, *J.A. Elix 20850 & H. Streimann*, 29.vi.1986 (CANB); •Arthur Bailey Road, 9 km SSE of Ravenshoe, 17°41'S, 145°30'E, 900 m, on tree trunk in rainforest, *H. Streimann 46146*, 8.xii.1990 (CANB); •Big Tableland, 26 km S of Cooktown, 15°43'S, 145°16'E, 580 m, on treelet stem in remnant rainforest, *H. Streimann 46292*, 11.xii.1990 (CANB).

7. *Phyllopsora rappiana* (Brako) Elix, comb. nov.

Basionym: *Phyllopsora corallina* var. *rappiana* Brako, *Fl. Neotropica Monogr.* 55, 42 (1991). *Phyllopsora rappiana* is characterized by the squamulose thallus, with relatively small to medium-sized squamules, the presence of laminal or marginal, globose to cylindrical, simple to rarely branched isidia and the presence of atranorin and parvifoliellin in the medulla. It could be confused with *Ph. santensis* (Tuck.) Swinsc. & Krog, but the latter species contains atranorin, argopsin and norargopsin. The chemistry of *Ph. rappiana* has been confused since Brako (1991) reported it to contain phyllopsorin in the key but parvifoliin in the text rather than parvifoliellin (a phenolic metabolite related to vicinican and characteristic of *Phyllopsora parvifoliella* (Nyl.) Müll. Arg.). The species was known previously from North, Central and South America (Brako 1991). A detailed description is given in Brako (1991).

SPECIMENS EXAMINED

Queensland. • Conway State Forest, 18 km ENE of Proserpine, 20°21'S, 148°45'E, 180 m, on tree trunk in lowland rainforest, *J.A. Elix 20201* & *H. Streimann*, 28.vi.1986 (CANB), *H. Streimann 37394*, 28.vi.1986 (CANB).

Northern Territory. • Arnhem Land, 19 km ENE of Jabiru, 12°37'S, 133°03'E, 140 m, on *Buchanania* trunk in deep gorge, *H. Streimann 42219*, 18.iv.1989 (CANB).

8. *Phyllopsora santensis* (Tuck.) Swinsc. & Krog, *Lichenologist* 13, 236 (1981).

Phyllopsora santensis is characterized by the squamulose thallus, with medium-sized, adnate to ascending squamules, dense laminal or marginal, globose to cylindrical, simple to rarely branched isidia and the presence of argopsin (major) and norargopsin (minor/trace). Atranorin and zeorin are often present as accessory metabolites. *Phyllopsora ochroxantha* (Nyl.) Zahlbr. is similar, but contains phyllopsorin and \pm chlorophyllopsorin as major metabolites. This species was previously known from North America, Central America and Asia (Brako 1991). A detailed description is given in Brako (1991) as *Phyllopsora corallina* var. *santensis* (Tuck.) Brako.

SPECIMEN EXAMINED

Northern Territory. • Florence Falls, Litchfield National Park, 27 km WSW of Batchelor, 13°04'S, 130°48'E, 170 m, on tree trunk along narrow creekside with dense growth of shrubs, *Syzygium* and *Gordenia*, *J.A. Elix 27542*, *H.T. Lumbsch* & *H. Streimann*, 2.vii.1991 (CANB).

9. *Phyllopsora swinscowii* Timdal & Krog, *Mycotaxon* 77, 88 (2001).

Phyllopsora swinscowii is characterized by the squamulose thallus, with medium-sized squamules, the presence of long, cylindrical, simple to rarely branched isidia attached to the margin of the squamules, and the presence of methyl 2,7-dichloroporsomate and methyl 2,7-dichloronorporsomate in the medulla. It could be confused with *Ph. corallina* (Eschw.) Müll. Arg., but the latter species contains atranorin or lacks lichen substances. This species was known previously from East Africa, Mauritius and South America (Timdal & Krog 2001). A detailed description is given in Timdal & Krog (2001).

SPECIMENS EXAMINED

Queensland. • Christmas Pocket, 16 km NW of Kuranda, 16°44'S, 145°34'E, 400 m, rainforest margin, on sapling, *J.A. Elix 17574* & *H. Streimann*, 7.vii.1984 (CANB); • Rocky Creek, 4 km NE of Nambour, 26°36'S, 152°58'E, 40 m, subtropical rainforest along steep creek, on tree trunk, *J.A. Elix 35503*, 4.ix.1993 (CANB).

10. *Squamacidia janeirensis* (Müll.Arg.) Brako, *Mycotaxon* 35, 8 (1989).

The incised squamules of this species are 0.3–0.5 mm wide, and develop from a pale prothallus. They can be adnate and areolate, or overlap to form a \pm continuous crust which becomes densely isidiate, or the isidia can develop directly from the prothallus. The colourless ascospores are simple or irregularly 2–3-septate and acerose, and measure 25–45 \times 2–3 μ m. This species is characterized by the copious isidia and the presence of atranorin, lobaric acid and/or fumarprotocetraric acid, and a white medulla.

Squamacidia janeirensis was previously known from Central and South America and the Philippines (Brako 1989). The genus is new to Australia. A detailed description is given in Brako (1989).

SPECIMEN EXAMINED

New South Wales. • Track to Wrights Lookout, New England National Park, 72 km E of Armidale, 30°31'S, 152°24'E, 1000 m, on branches in crown of fallen tree in *Nothofagus-Elaeocarpus*-dominated forest, *H. Streimann 47847*, 5.iv.1991 (B, CANB).

NEW STATE AND TERRITORY RECORDS

1. *Buellia substellulans* Zahlbr., *Cat. Lich. Univ.* 7, 420 (1931).

This common and widespread saxicolous species shows quite significant variations in ascospore size (12–22 \times 7–10 μ m), but invariably contains norstictic and connorstictic acids, with or without accessory atranorin and chloroatranorin. It has previously been reported from New South Wales and Queensland (McCarthy 2005).

SELECTED SPECIMENS EXAMINED

Australian Capital Territory. • Mulligans Flat, near the ACT-NSW border, 35°10'S, 149°09'E, 670 m, on shale rocks in pasture, *J.A. Elix 1429*, 11.xii.1975 (CANB); • Canberra Nature Park, Aranda Bushland, 4 km W of Canberra, 35°16'03"S, 149°04'40"E, 680 m, on sandstone rocks in dry *Eucalyptus* woodland, *J.A. Elix 28732*, 29.xii.2004 (CANB).

Tasmania. • Esk Highway, c. 7.7 km E of railway bridge, near Llewellyn Siding, 41°49'S, 147°34'E, 230 m, on dolerite in open *Eucalyptus* woodland with *Bursaria spinosa* and scattered dolerite rocks, *J.A. Elix 28793* & *G. Kantvilas*, 9.xi.2004 (CANB).

Western Australia. • near summit of Mount Brown, 3 km SE of York, 31°53'16"S, 116°47'07"E, 295 m, on granite rocks in remnant *Acacia* woodland, *J.A. Elix 31693*, 21.iv.2004 (CANB); • near summit of Mt. Observation, Mt Observation National Park, 20 km W of York, 31°53'45"S, 116°33'26"E, 365 m, on laterite rocks in *Eucalyptus* woodland with scattered *Dryandra*, *Casuarina* and *Xanthorrhoea*, *J.A. Elix 31722*, 21.iv.2004 (PERTH); • Kalbarri National Park, Murchison River Gorge, Hawkshead Lookout, 42.5 km ENE of Kalbarri township, 27°47'20"S, 114°28'05"E, 150 m, on sandstone rocks above gorge in dwarf *Eucalyptus-Acacia* woodland, *J.A. Elix 33737*, 3.v.2004 (CANB). *Northern Territory*. • Lost City, Litchfield National Park, 37 km SW of Batchelor, 13°13'S, 130°44'E on large sandstone outcrops, *E. Stocker s.n.*, 1.v.2005 (CANB).

2. *Canoparmelia norsticticata* (G.N.Stevens) Elix & Hale, *Mycotaxon* 27, 278 (1986).

This endemic species was reported previously from New South Wales and Queensland (McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. • 3 km E of Catamouri Hill, Jurien, 30°16'17"S, 115°22'42"E, on bark of *Banksia prionotes*, *R.J. Cranfield 10752*, 18.vi.1996 (PERTH).

3. *Collema novozelandicum* Degel., *Symb. Bot. Upsal.* 20, 81 (1974).

This species was known previously from New South Wales and New Zealand (Galloway 1985, McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. • Kalbarri National Park, Meanarra Hill, 5 km E of Kalbarri township, 27°41'51"S, 114°13'02"E, 200 m, on limestone in *Melaleuca-Acacia* heath, *J.A. Elix 33660*, 2.v.2004 (PERTH).

4. *Diploschistes aeneus* (Müll.Arg.) Lumbsch, *J. Hattori Bot. Lab.* 66, 158 (1989).

This species was known previously from North and South America, southern Africa, southern Europe, New South Wales and Tasmania (Lumbsch & Elix 2003).

SPECIMEN EXAMINED

Western Australia. • Kalbarri National Park, Murchison River Gorge, Hawkshead Lookout, 42.5 km ENE of Kalbarri township, 27°47'20"S, 114°28'05"E, 150 m, on sandstone

rocks above gorge with dwarf *Eucalyptus* and *Acacia*, *J.A. Elix* 33738, 3.v.2004 (PERTH).

5. **Fuscopannaria decipiens** P.M.Jørg., *New Zealand J. Bot.* **37**, 261 (1999).

This Australian endemic was previously known from Queensland, New South Wales, Australian Capital Territory, Victoria and Tasmania (McCarthy 2005).

SPECIMEN EXAMINED

South Australia. • Flinders Ranges, Alligator Gorge, Mount Remarkable National Park, 9 km S of Wilmington, 32°44'49"S, 138°04'33"E, 600 m, on *Callitris* in *Eucalyptus-Callitris* woodland in ravine, *J.A. Elix* 17783 & *L.H. Elix*, 27.x.1984 (CANB) [Det. P.M. Jørgensen].

6. **Hafellia demutans** (Stirt.) Pusswald, in Marbach, *Biblioth. Lichenol.* **74**, 259 (2000).

This species was known previously from South America, southern Africa, the Pacific (Hawaii, New Caledonia), New South Wales and Queensland (Marbach 2000, McCarthy 2005).

SPECIMENS EXAMINED

Western Australia. • Kalbarri National Park, along the road to The Loop and Z-Bend, 24 km NE of Kalbarri township, 27°37'13"S, 114°23'13"E, 210 m, on *Melaleuca* in low heath with emergent *Melaleuca*, *Callitris*, *Eucalyptus* and *Acacia*, *J.A. Elix* 33652, 2.v.2004 (CANB, PERTH); • Western Flora camp area, 20 km N of Eneabba, 29°37'30"S, 115°13'30"E, 250 m, on *Melaleuca*, *E. McCrum WF254*, 4–6.vi.2005 (CANB, PERTH).

7. **Hafellia pseudotetrapla** Pusswald, in Marbach, *Biblioth. Lichenol.* **74**, 280 (2000).

This species was known previously from Central America, New South Wales and Tasmania (Marbach 2000, McCarthy 2005).

SPECIMENS EXAMINED

Western Australia. • Yellowdine Nature Reserve, 56 km E of Southern Cross along the Great Eastern Highway, 31°16'23"S, 119°53'43"E, 410 m, on *Melaleuca* in *Eucalyptus-Melaleuca* woodland with shrub understorey, *J.A. Elix* 32385, 27.iv.2004 (CANB, PERTH); • Kalbarri National Park, Murchison River Gorge, trail from Ross Graham Lookout to Murchison River, 39 km ENE of Kalbarri township, 27°48'41"S, 114°28'22"E, 155 m, on *Acacia* among scattered *Casuarina*, *Eucalyptus*, *Acacia* and sandstone outcrops, *J.A. Elix* 33695, 3.v.2004 (CANB).

8. **Hafellia tetrapla** (Nyl.) Pusswald, in Marbach, *Biblioth. Lichenol.* **74**, 288 (2000).

This species was known previously from South America, southern Africa, Réunion, New South Wales, Australian Capital Territory and Queensland (Marbach 2000, McCarthy 2005).

SELECTED SPECIMENS EXAMINED

Western Australia. • Gwambygine Nature Reserve, 11 km S of York, 31°58'24"S, 116°48'38"E, 245 m, on branches of *Acacia* and *Melaleuca* in *Acacia acuminata* woodland with scattered *Melaleuca*, *J.A. Elix* 31735, 31739, 31759, 22.iv.2004 (CANB, PERTH); • Bullfinch-Evanston road, 24.7 km N of Bullfinch, 30°47'14"S, 119°09'28"E, 345 m, on *Acacia* in *Eucalyptus* woodland with saltbush and shrub understorey, *J.A. Elix* 32482, 32487, 28.iv.2004 (CANB, PERTH); • Korda North West Road, 10 km W of Korda, 30°48'45"S, 117°24'14"E, 340 m, on shrubs in *Eucalyptus* and *Casuarina* woodland with scattered *Acacia* and *Melaleuca*, *J.A. Elix* 32635, 32636, 32642, 29.iv.2004 (CANB, PERTH).

9. **Hertelidea pseudobotryosa** R.C. Harris, Ladd & Printzen, *Biblioth. Lichenol.* **88**, 549 (2004).

This species was known previously from North America, Queensland, Victoria, Tasmania, South Australia and Western Australia (Printzen & Kantvilas 2004, Kantvilas & Elix 2005).

SPECIMENS EXAMINED

New South Wales. • Shingle Ridge, 5 km N of Molong along road to Yeoval, 33°04'22"S, 148°49'45"E, 595 m, on base of *E. macrorhyncha* in remnant *Eucalyptus* woodland, *J.A.*

Elix 36003, 36004, 13.x.2005 (CANB).

Australian Capital Territory. • Canberra Nature Park, Aranda Bushland, 4 km W of Canberra, 35°16'14"S, 149°04'34"E, 580 m, on rotten log in moist gully in open *Eucalyptus* woodland, *J.A. Elix* 36008, 16.x.2005 (CANB), on base of *E. macrorhyncha*, *J.A. Elix* 36010, 16.x.2005 (CANB).

10. **Hypogymnia enteromorphoides** Elix, *Brunonia* **2**, 190 (1980).

This Australian species was known previously from Australian Capital Territory, Victoria, New South Wales and Tasmania (McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. • 5 km SE of Bannister, 33°43'30"S, 116°34'E, on twigs in open shrubland, *R.J. Cranfield* 10831, 4.xii.1996 (PERTH).

11. **Lecanora galactiniza** Nyl., in Crombie, *J. Linn. Soc., Bot.* **15**, 173 (1876).

This species was known previously from New Zealand, Central and South America, southern Africa, and in Australia from Australian Capital Territory, New South Wales, Victoria, South Australia and Tasmania (Lumbsch & Elix 2004, McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. • Kalbarri National Park, Murchison River Gorge, below Ross Graham Lookout to Murchison River, 39 km ENE of Kalbarri township, 27°48'41"S, 114°28'22"E, 155 m, on sandstone in gorge with scattered *Casuarina*, *Eucalyptus* and *Acacia* and sandstone outcrops, *J.A. Elix* 33719, 3.v.2004 (PERTH).

12. **Lecanora melanommata** C. Knight, in Bailey, *Syn. Qld. Fl. Supp.* **1**, 71 (1886).

This endemic Australian species was known previously from Queensland and New South Wales (Lumbsch & Elix 2004, McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. • West Kimberley, Gundarara Creek, 15°48'30"S, 125°42'06"E, on *Albizzia lebeck* along the river margin among rocks, *W. O'Sullivan WODD51A pr.p.*, 19.viii.2001 (PERTH).

13. **Lecanora symmicta** (Ach.) Ach., *Syn. Meth. Lich.* **340** (1814).

This species has a bipolar distribution, and in Australia was known previously from South Australia and New South Wales (Lumbsch & Elix 2004, McCarthy 2005).

SPECIMENS EXAMINED

Western Australia. • Drovers Cave National Park, Jurien Road, 6 km by road NE of Jurien Bay, 30°15'44"S, 115°06'43"E, 40 m, on dead *Banksia* in tall heath of mixed Proteaceae, *J.A. Elix* 28919, 6.v.2004 (CANB, PERTH); • Yardanogo Nature Reserve, 9.2 km E of Brand Highway along the Mt Adams Road, 29°24'20"S, 115°04'32"E, 40 m, on base of *Banksia* in *Banksia-Callitris* woodland, *J.A. Elix* 33818, 5.v.2004 (PERTH).

14. **Lecidea capensis** Zahlbr., *Cat. Lich. Univ.* **3**, 532 (1925).

This species was known previously from South Africa and New Zealand, and in Australia from New South Wales, Australian Capital Territory, South Australia and Western Australia (Rambold 1989).

SPECIMEN EXAMINED

Tasmania. • Esk Highway, c. 3 km E of railway bridge, 13.2 km NE of Campbell Town, 41°48'S, 147°32'E, 220 m, on dolerite in pasture with scattered dolerite rocks, *J.A. Elix* 28785 & *G. Kantvilas*, 9.xi.2004 (HO).

15. **Lecidea plana** (Lahm) Nyl., *Flora* **55**, 552 (1872).

This species was known previously from Europe, North America, South America, Japan, New Zealand and New South Wales (Rambold 1989).

SPECIMEN EXAMINED

Western Australia. • Kalbarri National Park, Rainbow Valley Walk, 6.5 km S of Kalbarri

township, 27°45'29"S, 114°08'19"E, 52 m, on sandstone in coastal heath with sandstone outcrops, *J.A. Elix 33690*, 3.v.2004 (CANB).

16. *Lecidella carpathica* Körb., *Parerga Lichenol.* 212 (1861).

This species was known previously from Europe, North America, South America, Asia, New Zealand and New South Wales (Knoph 1990, McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. •near summit of Mt Observation, Mt. Observation National Park, 20 km W of York, 31°53'45"S, 116°33'26"E, 365 m, on laterite rock in *Eucalyptus* woodland with scattered *Dryandra*, *Casuarina* and *Xanthorrhoea* and laterite outcrops, *J.A. Elix 31725*, 21.iv.2004 (CANB).

17. *Lecidella granulosa* (Nyl.) Knoph & Leuckert, in Knoph, *Herzogia* 14, 9 (2000). = *Lecidella chodatii* Knoph & Leuckert

This species was known previously from Europe, South Africa, North America, South America, New Zealand and New South Wales (Knoph 1990, McCarthy 2005).

SPECIMEN EXAMINED

Tasmania. •Lower Marshes Road, c. 1 km SW of Northumbria Hill, 42°23'S, 147°15'E, 450 m, on sandstone in pasture with scattered sandstone rocks, *J.A. Elix 28764 & G. Kantvilas*, 9.xi.2004 (HO).

18. *Lepraria jackii* Tønsberg, *Sommerfeltia* 14, 200 (1992).

Lepraria jackii is characterized by the leprose-soeridiate, whitish green to greenish or bluish grey thallus which lacks well-defined lobes, and by the presence of jackinic acid (major), norjackinic acid (minor), atranorin (major) and ursolic acid (minor). Zeorin, strepsilin, di-*O*-methylstrepsilin, fragilin and 7-chloroemodin are uncommon accessory substances. This species was previously reported from Asia, North America, Europe and Victoria (Kümmerling *et al.* 1995).

SPECIMENS EXAMINED

New South Wales. •Goonoo State Forest, Cashels Dam Road, 31 km SE of Gilgandra, 31°55'57"S, 148°52'17"E, 390 m, on sheltered sandstone ledge in *Eucalyptus-Callitris* woodland with sandstone outcrops, *J.A. Elix 36012*, 12.x.2005 (CANB); •Shingle Ridge, 5 km N of Molong along road to Yeoval, 33°04'22"S, 148°49'45"E, 595 m, remnant *Eucalyptus* woodland, on base of charred log, *J.A. Elix 36005*, 13.x.2005 (CANB).

Australian Capital Territory. •Canberra Nature Park, Aranda Bushland, 4 km W of Canberra, 35°16'14"S, 149°04'34"E, 580 m, on soil of uprooted tree in open *Eucalyptus* woodland, *J.A. Elix 28823*, 18.vi.2005 (CANB), on base of *Leptospermum* along ephemeral creek, *J.A. Elix 31542*, 22.ii.2004 (CANB).

Western Australia. •Slopes of Angwin Peak, Porongurups Range, Porongurups National Park, 19 km ESE of Mt. Barker, 34°40'S, 117°51'E, 360 m, on sheltered granite rocks in low sclerophyll forest with heath and numerous granite outcrops, *J.A. Elix 41327*, *H.T. Lumbsch & H. Streimann*, 16.ix.1994 (CANB); •Beedelup Falls National Park, 20 km W of Pemberton, 34°25'S, 115°52'E, on soil and detritus along walk track near falls, *N. Sammy 830705*, 11.iv.1982 (PERTH).

19. *Melanelia fuscosorediata* (Essl.) Essl., *Mycotaxon* 7, 47 (1978).

This endemic Australian species was known previously from South Australia and Victoria (Elix 1994a, McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. •17.5 km E of Watheroo along Merewana road, 29°19'S, 116°14'30"E, on bark in open scrub, *R.J. Cranfield 8047*, 18.ix.1991 (PERTH).

20. *Opegrapha herbarum* Mont., in Guillemin, *Arch. Bot.* 2, 302 (1833).

This species was known previously from North America, Europe, New South Wales and Victoria (McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. •Kalbarri National Park, Murchison River Gorge, trail from Ross Graham Lookout to Murchison River, 39 km ENE of Kalbarri township, 27°48'41"S, 114°28'22"E, 155 m, on *Acacia* among scattered *Casuarina*, *Eucalyptus* and *Acacia* and sandstone outcrops, *J.A. Elix 33700*, 3.v.2004 (CANB, PERTH).

21. *Pannaria elatior* Stirt., in Bailey, *Queensland Agric. J.* 5, 486 (1899).

This species was previously known from East Africa and the Pacific, and in Australia from Queensland (Jørgensen & Galloway 1992, McCarthy 2005).

SPECIMEN EXAMINED

New South Wales. •Lower Minyon Falls, 30 km SW of Mullumbimby, 28°37'S, 153°24'E, 150 m, on rocks in creek bed in dense subtropical rainforest, *J.A. Elix 21268*, 30.viii.1986 (CANB) [Det. P.M. Jørgensen].

22. *Pannaria lurida* (Mont.) Nyl., *Mém. Soc. Sci. Nat. Cherbourg* 5, 109 (1857).

In Australia this widespread tropical species was previously known from Queensland (Jørgensen & Galloway 1992, McCarthy 2005).

SPECIMEN EXAMINED

New South Wales. •17 km W of Dorrigo along the Armidale road, 30°22'S, 152°32'E, 1080 m, on bark in remnant rainforest, *J.A. Elix 2357*, 17.viii.1976 (CANB) [Det. P.M. Jørgensen].

23. *Parmelia tenuirima* Hook. f. & Taylor., *London J. Bot.* 3, 645 (1844).

This species was known previously from New Zealand, Australian Capital Territory, New South Wales, Victoria and Tasmania (Elix 1994b, McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. •8 km SSE of Manjimup on Muir Highway, 20 m in from road verge, 34°17'45"S, 116°13'38"E, on dead wood in open *Eucalyptus marginata-Corymbia calophylla* forest, *R.J. Cranfield 14056b*, 9.x.1999 (PERTH).

24. *Parmelinopsis cryptochlora* (Vain.) Elix & Hale, *Mycotaxon* 29, 242 (1987).

This species was known previously from the Caribbean, India, Papua New Guinea and Queensland (Elix 2002, McCarthy 2005).

SPECIMEN EXAMINED

New South Wales. •Hanging Mountain, Hanging Mountain Forest Reserve, 24 km SW of Moruya, 36°01'S, 149°52'E, on rocks in open *Eucalyptus* forest with *Xanthorrhoea* on steep rocky slope, *J.A. Elix 25483*, 20.vi.1990 (CANB).

25. *Parmotrema grayanum* (Hue) Hale, *Phytologia* 28, 336 (1974).

This species was known previously from New Zealand, Asia, Africa, North America, and Macaronesia, and in Australia from New South Wales and Queensland (Elix 1994c, McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. •near summit of Mount Brown, 3 km SE of York, 31°53'16"S, 116°47'07"E, 295 m, on granite rocks in remnant *Acacia* woodland with scattered *Eucalyptus* and rock outcrops, *J.A. Elix 31669*, 21.iv.2004 (CANB, PERTH).

26. *Phyllopsora foliatella* Elix, nom. nov.

Basionym: *Psora foliata* var. *subcorallina* Müll. Arg., *Flora* 65, 483 (1882).

= *Lecidea foliata* var. *subcorallina* (Müll. Arg.) Shirley, *Proc. Roy. Soc. Queensland* 6, 166 (1889).

= *Phyllopsora foliata* var. *subcorallina* (Müll. Arg.) Zahlbr., *Cat. Lich. Univ.* 4, 397 (1926).

In this species the thallus is formed partly from minute areolae, which often fuse and form a continuous crust, and partly by isidia developing directly from the prothallus, with the isidia often dominating. It is characterized by the copious isidia and the lack of lichen substances. Morphologically it closely resembles *Phyllopsora furfuracea* (Pers.)

Zahlbr., but can be distinguished by its lack of chemistry (*P. furfuracea* contains homophaein = furfuraceic acid) and somewhat longer ascospores (11–18 µm cf. 7–13 µm long). The species was originally described from Queensland, but also occurs in New South Wales.

SPECIMENS EXAMINED

New South Wales. • South Coast, Maxwells Road, Nadgee State Forest, 41 km SSW of Eden, 37°25'S, 149°49'E, 230 m, on semi-shaded tree trunk in *Acmena-Eucryphia-Dicksonia*-dominated valley, *H. Streimann* 61609, 27.v.1998 (CANB). • Jervis Bay, "Garden of Eden", 32 km SE of Nowra, 35°10'S, 150°44'E, 50 m, on sandstone in shaded rocky area near waterfall dominated by shrubs and *Pisonia*, *J.A. Elix* 26431, 8.xi.1990 (CANB).

27. **Protoparmelia pulchra** Diederich, Aptroot & Sérus., in Aptroot *et al.*, *Biblioth. Lichenol.* **64**, 147 (1997).

This species was known previously from Papua New Guinea and the Northern Territory (McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. • Korda North West Road, 10 km W of Korda, 30°48'45"S, 117°24'14"E, 340 m, *Eucalyptus* and *Casuarina* woodland with scattered *Acacia* and *Melaleuca*, on shrub, *J.A. Elix* 32641, 29.iv.2004 (CANB, PERTH).

28. **Pseudephebe pubescens** (L.) M. Choisy, *Icon. Lich. Univ.*, ser. 2(1), s.n. (1930).

In Australia this bipolar species was previously known from New South Wales, the Australian Capital Territory, Victoria and Tasmania (McCarthy 2005).

SPECIMENS EXAMINED

Queensland. • Mt Marley, 1 km NE of Stanthorpe, 28°39'S, 151°57'14"E, 900 m, on granite in *Eucalyptus-Callitris*-dominated woodland with large granite outcrops, *J.A. Elix* 35626, 5.ix.1993 (CANB).

Western Australia. • Sullivan Rock, Monadnocks Nature Reserve, 18 km ESE of Jarrahdale, 32°23'S, 116°15'E, 340 m, on exposed granite, *N. Sammy UWA* 1466, 10.viii.1975 (PERTH).

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

This species was previously known from Queensland, the Northern Territory and islands in the Pacific (Taiwan, Bonin Islands, Hawaii) (Kalb 2004, McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. • West Kimberley, Gundarara Creek, 15°48'30"S, 125°42'06"E, on *Albizzia lebeck* along the river margin among rocks, *W. O'Sullivan WODD51B pr.p.*, 19.viii.2001 (PERTH).

30. **Pyxine rugulosa** Stirt., *Trans. & Proc. New Zealand Inst.* **30**, 396 (1898).

This Australian endemic was previously known only from Queensland (McCarthy 2005).

SPECIMEN EXAMINED

Western Australia. • West Kimberley, Gundarara Creek, 15°48'30"S, 125°42'06"E, on *Albizzia lebeck* along the river margin among rocks, *W. O'Sullivan WODD51A*, 19.viii.2001 (PERTH).

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Additional lichen records from New Zealand 43.
***Umbilicaria deusta* (L.) Baumg.**

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Abstract: The bipolar lichen *Umbilicaria deusta* is reported from the Kakanui Mountains, in the first unequivocal record of the species from New Zealand and the Southern Hemisphere.

Introduction

The schist and greywacke mountain ranges east of the Main Divide in South Island, New Zealand, are areas of high species diversity for the lichen genus *Umbilicaria* (Frey 1936, 1949; Zahlbruckner 1941; Llano 1950; Allan 1951; Martin & Child 1972; Galloway 1985, 2006; Galloway & Sancho 2005). A recent visit to Mt Pisgah (1634 m), the highest point in the Kakanui Mountains, showed the genus to be both species-rich and particularly well-developed on schist outcrops in grassland and especially on the extensive screes and boulder fields that are noteworthy features of that upland landscape, from 980 m upwards in low- and high-alpine zones (Mason 1988, Comrie 1992). Among 10 species of *Umbilicaria* collected from the area [Mt Pisgah is the type locality for *U. durietzii* Frey (Frey 1949)], the circumboreal-montane, nitrophytic species *U. deusta* is recorded unequivocally for the first time from both New Zealand and the Southern Hemisphere.

***Umbilicaria deusta* (L.) Baumg., *Fl. Lips.*, 571 (1790).**
≡ *Lichen deustus* L., *Sp. Pl.* 1150 (1753) *nom. cons.* (see Wei 1993; Jorgensen *et al.* 1994a, 1994b; Gams 1996).

Illustrations: Llano (1950: 257, pl. 18, fig. 3); Yoshimura (1974: pl. 23, fig. 206); Jahns (1980: 219, fig. 526); Moberg & Holmäsén (1982: 154); Goward *et al.* (1994: 128, fig. 1a); Wirth (1995a: 933; 1995b: 600, pl. 60A, fig. C); McCune & Geiser (1997: 293); Brodo *et al.* (2001: 702, fig. 862).

Thallus monophyllous, occasionally appearing polyphyllous, central parts flat or obscured by squamiform isidia near the umbilicus, the lobes free or somewhat overlapping, 2–4 cm diam., rosette-forming and ±flat when young, becoming irregularly lacerate and contorted with age, margins slightly thickened, irregularly notched or incised, noticeably curled under, coarsely granular to isidiate, without rhizinomorphs, flabby and pliable when moist, rigid, cartilaginous, and brittle when dry. Upper surface deep olive-green suffused with brown when moist, dark greenish black to brown-black when dry, grey-white and granular-roughened above the umbilicus, when central parts are free of isidia, generally densely isidiate; sometimes with superficial, gall-like pustules of *Clypeococcum*. Isidia minute, granular, globular at first, soon becoming flattened-squamulose, squamules irregularly lobed, 0.1–1.5 mm diam., scattered to crowded-imbricate, margins irregularly incised, concolorous with upper surface or darker. Lower surface brown-black in patches, to pale fawnish, often piebald, smooth to irregularly pitted or minutely and irregularly cracked in places, or split in parallel, radiating lines from umbilicus to margins, rarely with broad fenestrations, to 2 mm

diam., and often with noticeable invaginations corresponding to *Clypeococcum* infections on the upper surface, but without wrinkles or ridges. Umbilicus compact, 2–3 mm diam., without radiating narrow ridges or lamellar structures. Rhizinomorphs absent. Apothecia and pycnidia not seen.

Chemistry: K–, KC+ red, C+ red, Pd–, containing gyrophoric acid.

Notes

Umbilicaria deusta is an alpine lichen characterized by the laminal and marginal minutely granular to flattened-squamulose isidia, a character unique to the genus. It is a further addition to New Zealand's bipolar lichen mycobiota (for recent discussions on bipolar lichens in alpine environments in New Zealand, see Galloway 2002a, 2003). A collection made by Jack Scott Thomson from Mt Torlesse in Canterbury (CHR 160089!) was earlier identified as *U. deusta* by Zahlbruckner (1941), but the collection referred to is mixed, consisting of two species, mainly *U. hyperborea* and a little *U. nylanderiana*, with no evidence at all of *U. deusta* s. str. That misidentification of *U. deusta* was subsequently perpetuated for New Zealand by Martin (1966) and Martin & Child (1972), with no specimens cited against which material could be checked. The Mt Pisgah material is the first unequivocal collection of *U. deusta* from New Zealand and also from the Southern Hemisphere.

On Mt Pisgah, *U. deusta* is a rather rare lichen which grows on horizontal to weakly sloping schist surfaces receiving periodic seepage or trickling water (it has that particular ecology in the Northern Hemisphere), or on the floors of shallow overhangs where it co-occurs with the more commonly encountered *U. grisea* (characterized by marginal parasoredia). It associates with the following lichens: *Bryoria austromontana*, *Lecanora bicincta*, *Rhizocarpon geographicum*, *R. grande*, *Sporastatia testudinea*, *Umbilicaria cylindrica*, *U. decussata*, *U. durietzii*, *U. grisea*, *U. hyperborea*, *U. nylanderiana*, *U. polyphylla*, *Usnea acromelana*, *U. ciliata*, *U. subcapillaris* and *U. torulosa*. The upper surface of all the thalli seen of *U. deusta* was infected with the characteristic, blister-like galls of the lichenicolous fungus *Clypeococcum grossum* (Galloway 2002b).

In the Northern Hemisphere, *U. deusta* is a circumboreal, mainly alpine species known from Great Britain, Europe, Scandinavia, Greenland, Svalbard, the Ukraine, Asia, Japan, and North America. It is not known from Africa, South America, New Guinea, Australia, or Antarctica.

SPECIMEN EXAMINED

Otago: • Kakanui Mountains, Mt Pisgah, Pisgah Spur, on horizontal or shallowly inclined surfaces of schist rock outcrop in grassland, with *U. grisea*, 1230 m, 31.xii.2005, D.J. Galloway 5654 (CHR 528204).

Acknowledgements

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Additional lichen records from New Zealand 44. *Roccellinastrum flavescens* Kantvilas

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Abstract: *Roccellinastrum flavescens*, formerly known from only the leafy shoots of the Tasmanian endemic conifers *Arthrotaxis cupressoides* and *Diselma archeri* (Cupressaceae), is reported for the first time from living leaves of the New Zealand endemic *Libocedrus bidwillii* (Cupressaceae).

Introduction

A recent collection of a greenish white byssoid lichen with pink marginal apothecia from the leaves of the endemic New Zealand conifer *Libocedrus bidwillii* (Cupressaceae) was made from high-altitude forest dominated by *Nothofagus* in the Tongariro National Park in North Island, and identified as *Roccellinastrum flavescens* Kantvilas. The species, formerly regarded as a Tasmanian endemic (Kantvilas 1990, 2004), was originally described from the endemic conifer *Arthrotaxis cupressoides* (Cupressaceae), and subsequently reported also from leaves of *Diselma archeri* (Cupressaceae). A description of New Zealand material is given below.

***Roccellinastrum flavescens* Kantvilas, *Lichenologist* **22**, 81 (1990).**

Illustrations: Kantvilas (1990), Kantvilas & Jarman (1999), Lumbsch *et al.* (2001), McCarthy & Mallett (2004).

Thallus distinctly byssoid, in small, swollen to flattened, cushion-like clumps, or spreading in irregular tube-like patches, 1–3 cm diam., investing leaf scales and attached by cottony threads. Upper surface pale greenish white when moist, whitish when dry, minutely granular-uneven to fibrous or sublobulate in parts, becoming cottony-eroded below. Apothecia scattered to crowded, marginal, protruding, attached to the thallus by a short stalk, pale pinkish when fresh, fading to whitish on storage, swollen, globular to shallowly indented, immarginate, 0.1–0.8(–1) mm diam., surface smooth or minutely pruinose. Epithecium pale yellowish brown, granular, 3–5 µm thick, decolourizing in K. Hymenium colourless, 20–25(–30) µm tall. Hypothecium opaque, pale yellowish brown, 15–25 µm thick, decolourizing in K. Asci clavate, 13–20 x 5–6.5 µm, 8-spored. Ascospores uniseriate to partially biseriata in ascus, globose, 3–3.5 µm diam. *Chemistry* (Australian material): Thallus K–, C–, KC–, Pd+ red; containing protocetraric acid (major), usnic acid (trace), and virensic acid (trace) (Kantvilas 1990).

Notes

Roccellinastrum flavescens is characterized by the pale green to green-white, cushion-like, byssoid thallus anchored to the substratum (living leaves of *Libocedrus bidwillii*) by cottony threads; marginal, protruding, pale-pink, globular apothecia that are attached to the thallus with short stalks; 8-spored asci containing globose ascospores, 3–3.5 µm diam.; and protocetraric acid (Pd+ red) as the major secondary metabolite. The yellowish colour (usnic acid) reported for Tasmanian populations (Kantvilas 1990, 2004) was not seen in the New Zealand specimens. *Roccellinastrum flavescens* is an addition to New Zealand's *Roccellinastrum* mycobiota, where formerly the widespread species *R. neglectum* Henssen & Vobis was the only species known (Henssen *et al.* 1982; Galloway 1985; Kantvilas 1990, 2004; Pennycook & Galloway 2004).

The occurrence of *R. flavescens* on leaves of *Libocedrus bidwillii* in New Zealand is noteworthy, because the tree is a New Zealand endemic in the family Cupressaceae. Of the five known species of *Libocedrus*, three occur in New Caledonia and two are endemic to New Zealand (Salmon 1980). *Libocedrus bidwillii* is found on both islands of New Zealand as an emergent canopy tree in montane and subalpine forests in humid and superhumid climates. High rainfall, frequent fogs, short, cool summers, and wet organic soils characterize the sites where it predominates, and it has an altitudinal range from 250 to 1200 m (Salmon 1980, Wardle 1991, Ogden & Stewart 1995). *Arthrotaxus cupressoides* and *Diselma archeri* grow in similar habitats in Tasmania.

Roccellinastrum neglectum, on the other hand, is a widespread species of more catholic habitat preference in New Zealand, being known from Tutamoe in Northland at lat. 38°14'S, to Port Pegasus at the south of Stewart Island at lat. 47°13'S (Galloway 2006). *Roccellinastrum neglectum* is characterized by the soft, terete, byssoid-spongiose, richly branched lobes that are greenish white when fresh, becoming yellowish white during storage; apothecia borne mainly at the lobe tips; the frequently long, stipitate fruiting bodies; simple, bacilliform ascospores, 5–7 x 1–1.5 µm; and the presence of protocetraric and squamatic acids (Pd+ red). It colonizes bark amongst mosses and ferns in deep shade in high-rainfall forested areas, where it is found on bark, tree fern brush, vines, mosses, liverworts, and ferns (especially dead filmy ferns), or on the leaves and stems of shrubs. It is also known from Tasmania (Henssen *et al.* 1982; Galloway 1985, 2006; Kantvilas 1990, 2004; McCarthy 2005).

The two species can be distinguished with the following key.

1. Thallus irregularly spreading, to 8 cm diam.; of densely entangled, tubular lobes; corticolous, muscicolous, or foliicolous (on leaves of filmy ferns); ascospores bacilliform, 5–7 x 1–1.5 µm; protocetraric and squamatic acids present **R. neglectum**
1. Thallus in distinct, cushion-like clumps, 1–3 cm diam.; foliicolous (on leaves of *Libocedrus bidwillii*); ascospores globose, 2.5–5 µm diam.; protocetraric and usnic acids present **R. flavescens**

SPECIMEN EXAMINED

Wellington: • Tongariro National Park, Ohakune Mountain Road, Waitonga Falls Track, on living leaves of *Libocedrus bidwillii*, 8.xii.2005, *Nick Martin s.n.* (CHR 528311, AK 294881).

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A new species of *Lepraria* (lichenized Ascomycota) from Australia

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Abstract: *Lepraria squamatica* Elix is described as new to science.

The lichen genus *Lepraria* Ach. is widely distributed in Australia, occurring on rocks, soil, bryophytes, bark and dead wood, and is frequently prominent in shaded habitats. Species are characterized by a powdery to granular sterile thallus for which ascomata are unknown. The margin can be diffuse or delimited, and the thallus composed of a mass of powdery or non-powdery spherical granules covered by entangled hyphae which often project outward (Laundon 1989, 1992a, b, c; Leuckert *et al.* 1995; Sipman 2004; Tønsberg 2004; Elix *et al.* 2005). Eight species have been recorded for Australia (McCarthy 2005), although two taxa were assigned to *Lepraria*, a genus now regarded as a synonym of *Lepraria* (Ekman & Tønsberg 2002). A further new species is described here. Chemical constituents were identified by thin-layer chromatography (Culberson 1972, Culberson & Johnson 1982, Elix & Ernst-Russell 1993), high-performance liquid chromatography (Elix *et al.* 2003) and comparison with authentic samples.

Lepraria squamatica Elix, sp. nov.

Fig. 1a–c

Thallus ut in *Lepraria multiacida* sed acidum squamaticum et acidum baeomycesicum continente differt.

Etymology: The specific epithet derives from the presence of squamatic acid in this species.

Type here designated: Australia, Northern Territory, Tabletop Range, Litchfield National Park, 25 km SW of Batchelor, 13°11'S, 130°50'E, 180 m, on charred wood in burnt *Eucalyptus* woodland with a dense understory of *Grevillea*, *Owenia* and *Acacia*, 2.vii.1991, J.A. Elix 27513, H.T. Lumbsch & H. Streimann (holotype–CANB).

Thallus leprose-soeridiate, powdery, creamy white, grey-white or pale yellow-grey, forming extensive, irregularly spreading patches to 10 cm wide, or in small, irregularly roundish colonies 0.5–2 cm wide that eventually coalesce; usually delimited, well-defined lobes present, 0.2–1.0 mm wide, raised at the margin; thin or thick (up to 250 µm); medulla present or not, white, distinct only in patches; hyphae 1.5–3 µm thick; soredia farinose, dispersed or forming a thick, continuous layer, ±roundish, 15–40 µm wide, commonly aggregated in roundish clumps (consoredia) 150–200 µm wide, with long projecting hyphae along the margins (up to 0.6 mm long), shorter projecting hyphae within (20–125 µm long); photobiont chlorococcoid, ±spherical, with individual cells 7–12 µm diam. Hypothallus thin and white or not apparent.

Chemistry: Thallus surface K⁺ yellow, C⁻, Pd⁺ yellow; containing squamatic acid (major), baeomycesic acid (major or minor), unknown fatty acid (major or minor), ±barbatic acid (trace), ±hypothamnolic acid (trace), ±subbaeomycesic acid (trace), ±subsquamatic acid (trace), ±protocetraric acid (trace).

Remarks

Morphologically, the species resembles *Lepraria multiacida* Aptroot in having a relatively thick, creamy white thallus, often with distinct lobate margins and long protruding hyphae. However, the two species can be readily distinguished chemically—*L. multiacida* contains atranorin (major), stictic acid (minor/trace), constictic acid (major/minor), salazinic acid (trace), cryptostictic acid (trace), norstictic acid (trace), 3,7-

di-*O*-methylstrepisilin (minor), strepisilin (trace), 7-*O*-methylstrepisilin (trace), zeorin and unknown triterpenes (Elix & Tønsberg 2004), whereas *L. squamatica* contains squamatic acid and baeomycesic acid. This is the first reported occurrence in the genus *Lepraria* of the last two substances.

At present, the new species is known to occur on the trunks of trees and on dead wood and rocks in subtropical rainforest, tropical monsoon forest and open woodland from 60 m to 1400 m in eastern and northern Australia. Commonly associated species in eastern Australia include *Hypogymnia enteromorphoides* Elix, *H. pulverata* (Nyl.) Elix, *Leptogium biloculare* F. Wilson, *Nephroma cellulosum* (Sm. ex Ach.) Ach. and *Ramboldia brunneocarpa* Kantvilas & Elix, and in northern Australia, *Dirinaria applanata* (Fée), D.D. Awasthi, *Protoparmelia pulchra* Diederich, Aptroot & Sérus., *Pyrrhospora aurea* Kalb & Elix, *Pyxine coccifera* (Fée) Nyl. and *Pyxine cocoes* (Sw.) Nyl.

ADDITIONAL SPECIMENS EXAMINED

New South Wales: •Burruga Swamp, Mt Allyn Forest Park, 32°06'30"S, 151°25'30"E, 1000 m, rainforest, on *Acmena*, 29.vi.1988, G. Kantvilas 240/88 (HO, NSW); on *Nothofagus moorei*, G. Kantvilas 249/88 (HO, NSW); •Mt William, Barrington Tops National Park, 32°04'30"S, 151°28'E, 1400 m, rainforest, on old trunk of *Nothofagus moorei*, 30.vi.1988, G. Kantvilas 315/88 (HO, NSW).

Northern Territory: •Baroalba Creek, 19 km S of Jabiru, Kakadu National Park, 12°50'S, 132°53'E, 70 m, remnant monsoon forest beside creek in gorge, on dead wood, 25.v.1988, J.A. Elix 22549 & H. Streimann (CANB); •"Pethricks Rainforest", 39 km WSW of Batchelor, 13°08'S, 130°40'E, 60 m, disturbed lowland forest with palms and *Gmelina*, on charred base of tree, 3.vii.1991, J.A. Elix 27563, H.T. Lumbsch & H. Streimann (CANB).

Western Australia: •King Edward River, 54 km NNW of King Edward River Station (Doongan Station), 14°54'S, 126°22'E, 280 m, *Eucalyptus*-dominated grassland with *Terminalia* and *Calytrix* with large sandstone outcrops, on sheltered sandstone, 14.vii.1991, J.A. Elix 27966, H.T. Lumbsch & H. Streimann (CANB).

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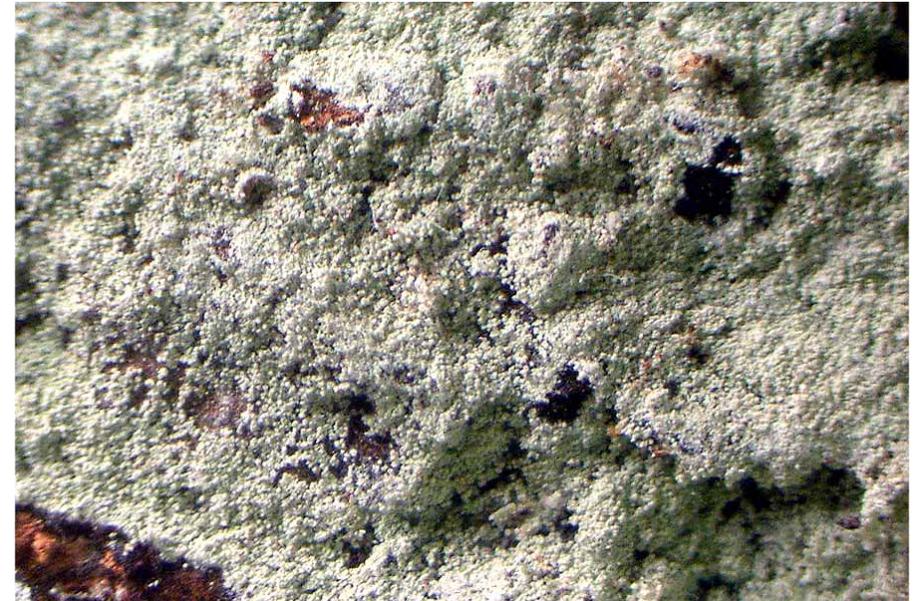


Figure 1b. *Lepraria squamatica*. ————— 2 mm.



Figure 1a. *Lepraria squamatica*, J.A. Elix 27563 H.T. Lumbsch & H. Streimann (CANB).
————— 1 mm.



Figure 1c. *Lepraria squamatica*. ————— 2 mm.

**The chemical diversity of *Lepraria coriensis* and
L. usnica (lichenized Ascomycota) in Australia**

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Abstract: In Australia both *Lepraria coriensis* and *L. usnica* have been shown to comprise three chemotypes, all of which contain usnic acid and zeorin as the major constituents. Chemically *L. usnica* can be distinguished from *L. coriensis* by the presence of minor amounts of the rare biphenyl contortin.

Introduction

The lichens *Lepraria coriensis* (Hue) Sipman and *L. usnica* Sipman are similar leprose-sorediate species that contain usnic acid and zeorin as major constituents. *Lepraria coriensis* is distinguished by having an ecorticate, crustose-leprose thallus that can form a thin to moderately thick non-areolate crust of powdery granules or, in part, to form irregular rosettes with lobed margins. The rounded "lobes", which resemble those of *Normandina pulchella* (Borrer) Nyl., are 0.5–2.0 mm wide and have a flat or more commonly raised rim (Laundon 2003, Sipman 2004). In some specimens a thin, black prothallus can be observed. *Lepraria usnica*, on the other hand, is distinguished morphologically by the presence of somewhat irregular (not rounded) sublobes or microsquamules that rarely exceed 0.2 mm in width and lack a marginal rim. *Lepraria coriensis* is quite common throughout Australia, occurring on sheltered rock surfaces, dead wood, the base of trees and shrubs, over mosses or directly on soil, whereas *L. usnica* has a more restricted distribution, being confined to shaded rock surfaces and the bases of trees in tropical areas. Previously *L. coriensis* has been reported from Korea, India, China (Hong Kong, Taiwan), and Australia (Northern Territory), whereas *L. usnica* was known from Singapore, Indonesia, Colombia, El Salvador, Namibia, Panama, Seychelles, South Africa, Sri Lanka and Australia (Northern Territory) (Laundon 2003; Sipman 2003, 2004).

In the present work, the Australian representatives of both species are shown to occur in three distinct chemical races, but there is no confluence between the two species. Chemical constituents were identified by thin-layer chromatography (Culberson 1972, Culberson & Johnson 1982, Elix & Ernst-Russell 1993), high-performance liquid chromatography (Elix *et al.* 2003) and comparison with authentic samples.

Lepraria coriensis (Hue) Sipman, *Herzogia* 17, 28 (2004)
= *Crocynia coriensis* Hue, *Bull. Soc. Bot. France* 71, 386 (1924)
= *Lecanora coriensis* (Hue) J.R. Laundon, *Nova Hedwigia* 76, 97 (2003).

Chemotype 1: contains usnic acid (major), zeorin (major), \pm isousnic acid (minor or trace), \pm atranorin (trace), protodehydroconstipatic acid (major or minor) and dehydroconstipatic acid (major or minor). This chemotype is most common in northern Australia.

Chemotype 2: contains usnic acid (major), zeorin (major), \pm isousnic acid (minor or trace), \pm atranorin (minor or trace), argopsin (minor), norargopsin (minor or trace), protodehydroconstipatic acid (minor or trace) and dehydroconstipatic acid (minor or trace). This chemotype is common in southern Australia.

Chemotype 3: contains usnic acid (major), zeorin (major), \pm isousnic acid (minor or trace), \pm atranorin (trace), caloploicin (minor) and fulgidin (minor or trace), protodehydroconstipatic acid (minor or trace) and dehydroconstipatic acid (minor or trace). This apparently rare chemotype has been found in New South Wales.

One specimen from Western Australia was found to contain a combination of two of the above chemotypes, i.e. it contained both argopsin and caloploicin. It is worth noting that dehydroconstipatic acid and isomuronic acid are synonymous.

SELECTED SPECIMENS EXAMINED

Chemotype 1

Northern Territory. • Umbrawarra Gorge, 22 km SW of Pine Creek, 13°59'S, 131°41'E, 220 m, *Melaleuca*-dominated creek side in gorge, on sandstone, 23.v.1988, J.A. Elix 22521, 22529 & H. Streimann (CANB); • Robin Falls, 15 km S of Adelaide River township, 13°21'08"S, 131°08'02"E, 140 m, remnant monsoon forest in gorge with *Melaleuca*, *Carallia* and numerous sandstone boulders, on shaded sandstone, 7.viii.2005, J.A. Elix 28834 (CANB).

South Australia. • Flinders Ranges, Mt Remarkable National Park, Alligator Gorge, 9 km S of Wilmington, 32°45'S, 138°03'E, 400 m, *Eucalyptus-Callitris* woodland in ravine, on *Callitris*, 27.x.1984, J.A. Elix 17782 & L.H. Elix (CANB).

Chemotype 2

New South Wales. • Shingle Ridge, 5 km N of Molong along road to Yeoval, 33°04'22"S, 148°49'45"E, 595 m, remnant *Eucalyptus* woodland, on soil bank in creek, 13.x.2005, J.A. Elix 36006 (CANB).

South Australia. • Sandy Creek National Park, 5 km W of Lyndoch, 34°36'S, 138°56'E, *Callitris* woodland, on *Callitris*, 27.xii.1977, J.A. Elix 4184 (CANB); • Mount Lofty Ranges, The Gap, 6 km W of Palmer, 34°49'S, 139°10'E, 300 m, pasture, on soil, 30.viii.1987, J.A. Elix 21782 & L.H. Elix (CANB); • South Mount Lofty Ranges, along Saunders Creek, 6.5 km E of Springton, 34°42'S, 139°10'E, 300 m, pasture and dry *Eucalyptus* woodland with numerous rock outcrops, on soil, 1.viii.1992, J.A. Elix 33190 (B, CANB).

Western Australia. • Boyagin Rock, Boyagin Nature Reserve, 20 km NW of Pingelly, 32°28'S, 116°53'E, 350 m, large exposed granite outcrop, on sheltered rock ledge, 11.ix.1994, J.A. Elix 40981, 40983, H.T. Lumbsch & H. Streimann (B, CANB); • Kalbarri National Park, Murchison River Gorge, trail from Ross Graham Lookout to Murchison River, 39 km ENE of Kalbarri township, 27°48'41"S, 114°28'22"E, 155 m, scattered *Casuarina*, *Eucalyptus* and *Acacia* with sandstone outcrops, on base of *Acacia*, 3.v.2004, J.A. Elix 33705 (CANB, PERTH).

Chemotype 3

New South Wales. • Goonoo State Forest, Cashels Dam Road, 31 km SE of Gilgandra, 31°55'57"S, 148°52'17"E, 390 m, *Eucalyptus-Callitris* woodland with sandstone outcrops, on sheltered sandstone ledge, 12.x.2005, J.A. Elix 36011 (CANB). Chemotype 2 + 3
Western Australia. • Depot Hill, 13 km along the Depot Hill road NW of Mingenew, 28°08'38"S, 115°21'02"E, 150 m, *Eucalyptus-Acacia* woodland with lateritic sandstone outcrops, on bryophytes over sandstone, 4.v.2004, J.A. Elix 33802 (CANB).

Lepraria usnica Sipman, *Biblioth. Lichenol.* 86, 179 (2003).

Chemotype 1: contains usnic acid (major), zeorin (major), isousnic acid (minor or trace), contortin (minor), placodiolic acid (trace), hopane-16 β ,22-diol (major or minor). The type specimen belongs to this chemotype. In Australia, this chemotype occurs in Queensland.

Chemotype 2: contains usnic acid (major), zeorin (major), \pm isousnic acid (trace), contortin (minor), placodiolic acid (trace), \pm roccellic acid (trace). This chemotype occurs in the Northern Territory and Western Australia.

Chemotype 3: contains usnic acid (major), zeorin (major), isousnic acid (minor or trace), contortin (minor), placodiolic acid (trace), atranorin (minor), chloroatranorin (minor). This chemotype occurs in the Northern Territory and Western Australia. The rare biphenyl contortin was found to be a constant, albeit minor, component of all three chemotypes of *L. usnica*. This compound, which is biosynthetically related to usnic

acid, was previously known only from the genus *Psoroma* Mich. (Elix *et al.* 1984). It exhibits standard TLC Rf values: Rf (A) 67; Rf (B') 41; Rf (C) 60.

SELECTED SPECIMENS EXAMINED

Chemotype 1

Queensland. • Brandy Creek Road, 12 km NE of Proserpine, 20°21'S, 148°41'E, 120 m, dry sclerophyll forest, on volcanic rocks, 28.vi.1986, J.A. Elix 20815 & H. Streimann (CANB); • between Breakneck and Quandong Creeks, 24 km WSW of Proserpine, 20°29'S, 148°22'E, 150 m, *Eucalyptus-Planchonia*-dominated woodland, on weathered basalt rocks, 2.vii.1986, J.A. Elix 21153 & H. Streimann (CANB).

Chemotype 2

Northern Territory. • Tabletop Range, Litchfield National Park, 25 km SW of Batchelor, 13°11'S, 130°50'E, 180 m, burnt *Eucalyptus* woodland with dense understorey of *Grevillea*, *Owenia* and *Acacia* and sandstone outcrops, on sheltered sandstone ledge, 2.vii.1991, J.A. Elix 27508, H.T. Lumbsch & H. Streimann (CANB).

Western Australia. • Kimberley Region, Donkey Escarpment, head of Donkey Creek, 27 km S of Drysdale River Station, 15°58'S, 126°22'E, 420 m, *Eucalyptus* woodland with *Dodonaea*, *Callitris* and *Terminalia* with sandstone outcrops, on sandstone, 15.vii.1991, J.A. Elix 28023, H.T. Lumbsch & H. Streimann (CANB).

Chemotype 3

Northern Territory. • Arnhem Land, 19 km WNW of Jabiru, 12°37'S, 133°03'E, 150 m, in *Calopyllum sil-* and *Buchanania arborescens*-dominated deep gorge, on shaded moss platform, 19.iv.1989, H. Streimann 42252 (B, CANB).

Western Australia. • Kimberley Region, King Edward River, 54 km NNW of King Edward River Station (Doongan Station), 14°54'S, 126°12'E, 280 m, *Eucalyptus*-dominated grasslands with *Calytrix* and *Terminalia*, with large sandstone outcrops, on sandstone, 14.vii.1991, J.A. Elix 27962, H.T. Lumbsch & H. Streimann (CANB).

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Two new species of *Tephromela* (Lecanoraceae, lichenized Ascomycota) from Australia

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Abstract: *Tephromela sorediata* Kalb & Elix and *T. stenosporonica* Elix & Kalb are described as new to science. *Skyttea tephromelarum*, found on *T. sorediata*, is a new addition to the Australian mycobiota.

The lichen genus *Tephromela* M.Choisy is widely distributed in Australia, occurring on rocks, bark and dead wood. Species are characterized by a crustose thallus, prominent black, lecanorine or aspicilioid apothecia with a poorly developed true exciple, *Bacidia*-type asci with simple, colourless ascospores and the occurrence of conidiogenous cells in chains (Hafeller & Türk 2001; Hertel & Rambold, 1985; Kalb 1991, 2004; Nash *et al.* 2004). Six species have been recorded for Australia (McCarthy 2005), and a further two new species are described here. Chemical constituents were identified by thin-layer chromatography (Culberson 1972, Culberson & Johnson 1982, Elix & Ernst-Russell 1993), high-performance liquid chromatography (Feige *et al.* 1993, Elix *et al.* 2003) and comparison with authentic samples.

Tephromela sorediata Kalb & Elix, sp. nov.

Fig. 1

Tephromelae pertusarioidis similis sed thallo corticola vel lignicola, tenui, acidum alectoronicum continenti et soraliis angustioribus differt.

Type here designated: Australia. Australian Capital Territory, trail to Mount Aggie, 43 km WSW of Canberra, 35°28'S, 148°46'E, 1400 m on *Acacia* trunk in open *Eucalyptus delegatensis* woodland, 17.iii.1994, J.A. Elix 40754; holo: CANB.

Thallus crustose, superficial, grey-white to pale creamy white or creamy grey, continuous, areolate to rimose, 0.05–0.15 mm thick or sometimes evanescent, up to 4 cm wide; areoles irregularly shaped to rounded, 0.2–0.8 mm wide, upper surface roughened, granular, lacking isidia; soredia present. Soralia laminal, capitate, 0.1–0.6 mm wide, ±spreading and coalescent; soredia white to cream or pale brown, farinose. Prothallus not apparent. Cortex 7–10 µm thick, lacking an epinecral layer; algal layer c. 25–35 µm thick; algal cells 6.5–8 µm wide; medulla poorly developed. Apothecia rare to common, dispersed, sessile, 0.3–1.5 mm wide; disc ±flat or weakly concave, round, black, shiny, epruinose; thalline exciple persistent, smooth or becoming sorediate; true exciple not apparent; epitecium violet-black, 10–15 µm thick; hymenium violet, 50–70 µm tall; hypothecium yellow to pale brown, 100–150 µm thick; paraphyses branched and anastomosing; apices not conspicuously swollen, 4–5 µm wide. Asci 8-spored, c. 40–50 x 16–20 µm, *Bacidia*-type. Ascospores ellipsoid, colourless, thick-walled, 11–14 x 6–8 µm. Pycnidia rare, black, immersed to slightly emergent. Conidia filiform, straight, 12–17 x 1 µm.

Chemistry: Thallus and soredia K+ yellow, C–, KC+ pink, P–, UV+ blue-white; containing atranorin (major), alectoronic acid (major).

Notes

This corticolous or lignicolous species is characterized by its grey-white to pale creamy white or creamy grey, sorediate thallus containing atranorin and aleatoronic acid, by its small, black, lecanorine apothecia, mostly c. 0.3–1.0 mm wide, and its ellipsoid ascospores, 11–14 x 6–8 µm. It resembles the saxicolous European species *T. pertusarioides* (Degel.) Hafellner & Roux, but *P. sorediata* is restricted to organic substrata, and is distinguished by its much thinner thallus (0.05–0.15 mm cf. 0.3–0.5 mm thick), the smaller soralia (0.1–0.6 mm cf. 0.4–2.0 mm wide) and in containing aleatoronic acid rather than α-collatolic acid. In addition, the apothecia are larger (1.0–2.5 mm cf. 0.5–1.5 mm wide) in *T. pertusarioides*.

The specimen *Kalb 35099* was infected by the parasitic fungus *Skyttea tephromelarum* Kalb & Hafellner, which is a new addition to the Australian mycobiota.

At present, this new species is known from scattered localities in south-eastern Australia, where it occurs on bark in montane *Eucalyptus* forests from 750 m to 1400 m. Commonly associated species include *Fuscidea australis* Kantvilas var. *australis*, *Hypogymnia pulverata* (Nyl.) Elix, *Maronea constans* (Nyl.) Hepp, *Pannaria leproloma* (Nyl.) P.M.Jörg., *Parmelia tenuirima* Hook.f & Taylor, *Parmelina pseudorelicina* (Jatta) Kantvilas & Elix, *Pertusaria gibberosa* Müll.Arg., and *Usnea inermis* Motyka.

ADDITIONAL SPECIMENS EXAMINED

New South Wales: • Big Badja Hill summit, 78 km S of Braidwood, 36°00'S, 149°34'E, 1360 m, on *Tasmannia* in wet *Eucalyptus* forest with exposed rock outcrops, *J.A. Elix 26299*, 3.viii.1991 (CANB); • near Tumanmang Mountain, Tallaganda State Forest, 24 km SSE of Captains Flat, 35°48'S, 149°35'E, 1200 m, on shrubs in *Eucalyptus pauciflora* woodland, *J.A. Elix 30010*, 17.iii.1993 (CANB); • Great Dividing Range, 6 km E of Captains Flat, 2 km N of Parkers Gap, 35°37'S, 149°30'E, 1260 m, on twigs of *Tasmannia* in wet *Eucalyptus* forest, *J.A. Elix 33065*, 12.vii.1992, (B, CANB); • along the road to Rocky Pie, c. 10 km E of Captains Flat, 1150 m, in a humid sclerophyll forest, *K.&A. Kalb 35094*, *35099* & *J. Elix*, 5.viii.1992 (Kalb); • Barrington Tops National Park, Gloucester River, 35 km WSW of Gloucester, 32°04'S, 151°39'E, 1280 m, on branches of *Acacia bartingtoniensis* in *Eucalyptus pauciflora* woodland, *D. Verdon 3729*, 10.x.1978 (CANB). **Tasmania:** • South Sister, lower slope near carpark, 4.2 km NNW of St. Marys, 41°32'S, 148°10'E, 750 m, on *Cyathodes glauca* among large dolerite boulders with *Pittosporum*, *Eucalyptus*, *Bedfordia* and *Tasmannia*, *J.A. Elix 28704* & *G. Kantvilas*, 10.xi.2004 (CANB).

Tephromela stenoporonica Elix & Kalb, sp. nov.

Fig. 2

Tephromelae atrae similis sed thallo crassiore, ascosporis elongatis latioribusque et acidum stenoporonicum, acidum colensoicum, et acidum divaronicum continenti differt.

Type here designated: Australia. Northern Territory, Tabletop Range, Litchfield National Park, 39 km SW of Batchelor, 13°12'S, 130°41'E, 120 m, on sandstone in rocky sandstone plateau with *Eucalyptus*, *Terminalia*, *Calytrix* and *Ficus*, 4.vii.1991, *J.A. Elix 27662*; holo: CANB, iso: DNA.

Thallus saxicolous, crustose, superficial, grey-white to yellow-grey, grey-brown or dark grey, continuous, areolate to rimose, 0.4–1.0 mm thick, up to 5 cm wide; areoles angular, irregularly shaped to rounded, 0.3–1.0 mm wide, upper surface flat and smooth to markedly convex and bullate, becoming ±white-pruinose along ridges and margins of the areolae, lacking isidia and soredia. Prothallus black, prominent between bullae and around the thallus margin or not apparent. Cortex 25–30 µm thick, algal layer c. 25–50 µm thick; algal cells 6–8 µm wide; medulla well-developed, c. 0.3–0.9 mm thick. Apothecia common, dispersed, sessile, 0.6–2.0 mm wide; disc ±flat, undulate or weakly convex, round, black, shiny, epruinose; thalline exciple prominent, persistent, smooth,

±folded in over disc; true exciple not apparent; epithecium violet-black, 10–20 µm thick; hymenium violet, 45–55 µm tall; hypothecium yellow to yellow-brown, 130–180 µm thick; paraphyses branched and anastomosing; apices not conspicuously swollen, 4–5 µm wide. Asci 8-spored, c. 50–60 x 10–15 µm, *Bacidia*-type. Ascospores broadly ellipsoid, colourless, thick-walled, 11–13 x 7–9 µm. Pycnidia common, black, immersed to slightly emergent. Conidia cylindrical to filiform, straight, 10–14 x 1 µm.

Chemistry: Cortex K+ yellow, C-, KC-, P-; medulla KC+ pink, P-, UV blue-white; containing atranorin (minor), stenoporonic acid (major), colensoic acid (minor), divaronic acid (minor), glomelliferonic acid (trace), loxodellonic acid (trace).

Notes

This saxicolous species is characterized by its grey-white to yellow-grey, grey-brown or dark grey, thick, areolate to bullate thallus containing atranorin and stenoporonic, colensoic and divaronic acids, by its large (0.6–2.0 mm wide), black apothecia with a very prominent thalline margin and its broadly ellipsoid ascospores, 11–13 x 7–9 µm. It resembles some well-developed saxicolous specimens of *T. atra* (Huds.) Hafellner ex Kalb, but can be distinguished by its thicker thallus (0.4–1.0 mm cf. 0.3–0.5 mm), its larger ascospores (11–13 x 7–9 µm cf. 9–11 x 5.5–7 µm) and in containing stenoporonic, colensoic and divaronic acids rather than aleatoronic and/or α-collatolic acids. In addition, the apothecia in *T. stenoporonica* have a particularly prominent thalline exciple which often encapsulates the disc in younger apothecia, whereas in *T. atra* the thalline exciple is thin and mostly persistent (but occasionally older apothecia are immarginate), and the disc is always exposed. Chemically *T. stenoporonica* resembles *T. bunyana* Kalb & Elix (Kalb 2004), but the latter species contains colensoic and norcolensoic acids as major substances and only minor quantities of stenoporonic acid. In addition, *T. bunyana* is restricted to corticolous and lignicolous substrata and has narrower ascospores (6.0–7.5 µm cf. 7–9 µm wide).

At present this new species is known from several localities in the north of the Northern Territory and the Kimberley region of Western Australia, where it occurs on sandstone in open *Eucalyptus-Terminalia* woodland from 120 m to 180 m. Commonly associated species include *Australiaena streimannii* Matzer, H.Mayrhofer & Elix, *Caloplaca leptozona* (Nyl.) Zahlbr., *Dimelaena elevata* Elix, Kalb & Wippel, *Diploschistes actinostomus* (Pers.) Zahlbr., *Dirinaria batavica* D.D. Awasthi, *Lecanora austrosorediosa* (Rambold) Lumbsch, *Parmotrema praesorediosum* (Nyl.) Hale, *Pertusaria remota* A.M. Archer and *Tephromela arafurensis* Rambold.

ADDITIONAL SPECIMENS EXAMINED

Northern Territory: • Table Top Range, Litchfield National Park, 25 km SW of Batchelor, 15°11'S, 130°50'E, 180 m, on sandstone rocks in burnt *Eucalyptus* woodland with dense understorey of *Grevillea*, *Acacia* and *Owenia*, *J.A. Elix 27505*, *H.T. Lumbsch* & *H. Streimann*, 2.vii.1991 (CANB, HO); • "Lost City", Litchfield National Park, 37 km SW of Batchelor, 13°13'S, 130°44'E, 150 m, on sandstone rocks among large sandstone outcrops with *Eucalyptus* and *Calophyllum*, *J.A. Elix 27670*, *H.T. Lumbsch* & *H. Streimann*, 4.vii.1991 (CANB); • Stuart Highway, 41 km NW of Pine Creek, 13°36'S, 131°32'E, 160 m, on sandstone rocks along escarpment dominated by *Eucalyptus*, *J.A. Elix 28126*, *H.T. Lumbsch* & *H. Streimann*, 18.vii.1991, (CANB); • 4 km N of Depot Creek past Hayes Creek, 205 km S of Darwin along the Stuart Highway, on sandstone, *N. Sammy 87/060A*, 24.vii.1987 (CANB, DNA); • Litchfield National Park, 39 km SW of Batchelor, 13°12'S, 130°41'E, 120 m, on semi-shaded sandstone outcrop on rocky sandstone plateau with *Eucalyptus*, *Terminalia*, *Calytrix* and *Ficus*, *H. Streimann 48251*, 14.vii.1991, (CANB); • Litchfield National Park, 100 km S of Darwin, 13°07'S, 130°45'E, 200 m, in a monsoon forest on huge sandstone rocks, *K.&A. Kalb 25590*, *25573*, 9.ix.1992 (Kalb); • Gregory National Park, c. 31 km S of Timber Creek, 16°03'S, 130°23'E, 110 m, *K.&A. Kalb 35093*, 10.ix.1995 (Kalb).

Western Australia: •Kununurra-Timber Creek Highway, 25 km SE of Kununurra, 15°54'S, 128°56'E, 100 m, on sandstone rocks in *Eucalyptus*-dominated grasslands with scattered *Calytrix*, *Ficus* and *Xanthostemon*, *J.A. Elix 27828*, H.T. Lumbsch & H. Streimann, 9.vii.1991 (CANB), *H. Streimann 48363*, 9.vii.1991 (CANB); •Gibb River Road, 45 km SSE of Wyndham, 15°53'S, 128°14'E, 140 m, on sandstone in *Eucalyptus*-dominated grassland with *Callitris* among rocky outcrops, *J.A. Elix 28066*, H.T. Lumbsch & H. Streimann, 16.vii.1991 (CANB).

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Figure 1. *Tephromela sorediata* (J.A.Elix 26299 in CANB).

1 mm



Figure 2. *Tephromela stenosporonica* (part of holotype in CANB).

1 mm

**On the identity of *Opegrapha flavescens*,
with new Australian records of *Cresponea***

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Abstract: *Opegrapha inallescens* (Stirt.) Müll. Arg., described from Queensland in the 19th Century, is a synonym of the widespread and common Australasian lichen *Cresponea plurilocularis* (Nyl.) Egea & Torrente. *Cresponea flava* (Vain.) Egea & Torrente is recorded from Australia (Queensland) for the first time, whereas *C. plurilocularis* and *C. lepriurii* (Mont.) Egea & Torrente are recorded from New South Wales. The occurrence of *C. proximata* (Nyl.) Egea & Torrente in Queensland, based on literature records, is recalled.

Introduction

The cosmopolitan, crustose lichen genus *Opegrapha* is poorly known but well-represented in Australasia. The most recent Australian checklist (McCarthy 2003) lists 36 names, but that does not reflect the true diversity of species present. Collections in herbaria and the author's field observations indicate that species of *Opegrapha* can be found in most habitats and vegetation types, and that many additional species are yet to be identified. As well, a review of names already listed for Australia is required, because many records are likely to be based on misidentifications, or have been affected by general advances in lichen taxonomy and nomenclature.

One such name is *Opegrapha inallescens* (Stirt.) Müll. Arg., based on a collection from Queensland and originally described as a *Lecidea* by Stirton (1881). During an ongoing study of type specimens of Australian lichens held in various European herbaria, a portion of Stirton's type was located at the Natural History Museum, London (BM). Examination of the specimen revealed it to be the widespread species *Cresponea plurilocularis* (Nyl.) Egea & Torrente.

Taxonomy

Cresponea plurilocularis (Nyl.) Egea & Torrente

Mycotaxon 48: 322 (1993); *Lecidea premnea* var. *plurilocularis* Nyl., *Ann. Sci. Nat. Bot., sér. 4*, 15: 49 (1861).

=*Opegrapha inallescens* (Stirt.) Müll. Arg., *Nuovo Giorn. Bot. Ital.* 23: 397 (1891); *Lecidea inallescens* Stirt., *Trans. & Proc. Roy. Soc. Victoria* 17: 72 (1881). Type: [Australia: Queensland] Brisbane, on decorticated wood near Rosewood scrub, *F.M. Bailey* 258; lectotype (*vide* Rogers 1982) – GLAM; isolectotypes – BM!, BRI.

For additional synonyms, see Egea & Torrente (1993) and Kantvilas (2004).

This distinctive species is characterised by the following features: thallus crustose, lacking any substances detectable by t.l.c.; apothecia lecideine, black, to 1.7 mm diam., with proper margin persistent and disc concave, plane or undulate, occasionally yellowish-pruinose when young; excipulum cupulate, opaque dark brown to blackish, K+ olivaceous; paraphyses numerous, simple to sparingly branched, with apices colourless or pale yellow-brown to grey-brown; asci narrowly cylindrical, of the *abietina*-type (*sensu* Torrente & Egea 1989); ascospores fusiform, straight or occasionally curved, with rounded apices, 7–9(–10)-septate, (30–)34–42 x 4–6(–7.5) µm. For detailed descriptions see Egea & Torrente (1993) and Kantvilas (2004).

The correct taxonomic affinities of this taxon were hinted at by Rogers (1982), who noted that it was neither *Lecidea* nor *Opegrapha*, but that it might be close to *Lecanactis*. The genus *Cresponea*, which accommodates the '*Lecanactis premnea* group' was not segregated until much later (Egea & Torrente 1993). Species of *Cresponea* are not easy to distinguish from each other, and their taxonomy is based mainly on the size and de-

gree of septation of their ascospores. With respect to gross morphology, they are essentially inseparable.

James Stirton was an accomplished and prolific lichenologist who made major contributions to the lichenology of many regions of the world, including Australasia (New Zealand, Queensland, Victoria and Tasmania). He spent his working life in Scotland, and never visited the distant regions whose flora he studied, working instead on specimens provided to him by others. His Queensland material came mostly from Frederick Manson Bailey, Colonial Botanist from 1881 until 1915, whereas most of his Tasmanian and Victorian specimens were gathered by a travelling collector, Hugh Paton. His collection is housed mainly at the Glasgow Museum (GLAM), but large numbers of specimens, many of them duplicates, are lodged in the Natural History Museum in London (BM) (Rogers 1982). Stirton was a very accurate observer of lichen anatomy and morphology, as indicated by the copious notes that are found on his specimen labels (e.g. see Fig. 1) and in his papers.

The type specimen of *Opegrapha inallescens* is from a piece of wood, and has an unusually well-developed, thick, grey, rather verrucose thallus; otherwise, it accords well with the current concept of *Cresponea plurilocularis*. Young apothecia with pruinose discs (Fig. 2A) and older, epruinose apothecia are present (Fig. 2B), but relatively few ascospores in good condition could be observed. Due to the thick thallus and large, occasionally pruinose apothecia, the specimen superficially resembles a species of *Megalospora*.

Cresponea plurilocularis is a widespread lichen typically found in rainforest vegetation. It is known from Tasmania, New Zealand, Lord Howe Island, New Caledonia and the Malesian region (Egea & Torrente 1993, Kantvilas 2004). For mainland Australia, McCarthy (2003) records the species from Queensland and Victoria. It is here recorded from New South Wales for the first time.

SPECIMENS EXAMINED

New South Wales: •Mt Wilson, on *Ceratopetalum apetalum*, 8.v.1988, *G. Kantvilas s.n.* (HO); •trail to Cathedral Creek, Blue Mtns, 33°30'S 150°24'E, epiphytic in rainforest, 1030 m alt., 20.iv.2002, *G. Kantvilas 197/02* (HO); •Mt Wilson-Mt Irvine Road, 33°30'S 150°23'E, in cool temperate forest (Cunoniaceae-dominated), 750 m alt., 1.xi.1984, *H. Streimann 31641* (B, CANB); •Chaelundi State Forest, Stop-A-Bit Road, 29°58'S 152°22'E, on tree trunk in temperate forest, 820 m alt., 4.iv.1991, *H. Streimann 47525* (B, CANB).

Further new records of *Cresponea* species in Australia

1. *Cresponea flava* (Vain.) Egea & Torrente

This species is readily distinguished from other Australian species of the genus by its relatively short ascospores that are 15–22(–24) x (4–)4.5–5.5 µm and only 3–4-septate (see Egea & Torrente 1993 for description). It is widespread in the tropics, occurring in Florida (Harris 1995), tropical America, the Caribbean, Africa (Kalb 2004), south-east Asia, the Pacific and New Guinea (Egea & Torrente 1993). It has not been previously recorded for Australia. The single Australian specimen seen has somewhat shorter and broader ascospores, (14–)15.5–18 x 5–6 µm, but is best accommodated in this taxon pending the discovery of further material.

SPECIMEN EXAMINED

Queensland: •Bedarra Island, S of Dunk Island, 17°57'S 146°09'E, 16.vii.1075, *J.M. Gilbert 75/810* (HO).

2. *Cresponea lepriurii* (Mont.) Egea & Torrente

This species is recognized by having ascospores (34–)38–65 x 5–7 µm, with 8–14 septa, that is, generally longer and more septate than those of *C. plurilocularis* (see Egea & Torrente 1993 for description). However, at the lower end of their size range, the ascospores of the two species overlap, so identifications must be based on mul-

multiple observations. The species has been recorded from Hong Kong (Aptroot & Seaward 1999), New Guinea (Egea *et al.* 1996), the Americas, and Queensland (Egea & Torrente 1993). The records cited below are the first from New South Wales.

SPECIMENS EXAMINED

New South Wales: • Burruga Swamp, Mt Allyn Forest Park, 32°06'30"S 151°25'30"E, on *Acmena* in rainforest, 1000 m alt., 29.vi.1988, G. Kantvilas 186/88 (HO, NSW); • Duck Creek Road, 22 km WNW of Buladelah, 32°21'S 151°58'E, on tree trunk, 140 m alt., 22.iv.1990, H. Streimann 43992 (B, CANB).

3. *Cresponea proximata* (Nyl.) Egea & Torrente

This species is not included by McCarthy (2003), although a specimen from Queensland is cited by Egea & Torrente (1993). It has also been recorded from the Caribbean, South America, South-East Asia, the Pacific (Egea & Torrente 1993) and New Guinea (Egea *et al.* 1996). On the basis of published accounts (Egea & Torrente 1993, Messuti & Ferraro 2002) and the single specimen examined, the species is distinguished from the superficially similar *C. plurilocularis* by having slightly shorter ascospores, 25–38(–40) x 5–7(–7.5) µm with only 5–7(–8) septa.

SPECIMEN EXAMINED

Queensland: • Clarke Range, 46 km SSW of Proserpine, 20°49'S 148°29'E, on sapling in "dry" rainforest with *Argyrodendron* spp., 600 m alt., 29.vi.1986, J.A. Elix 20901 & H. Streimann (CANB).

Acknowledgments

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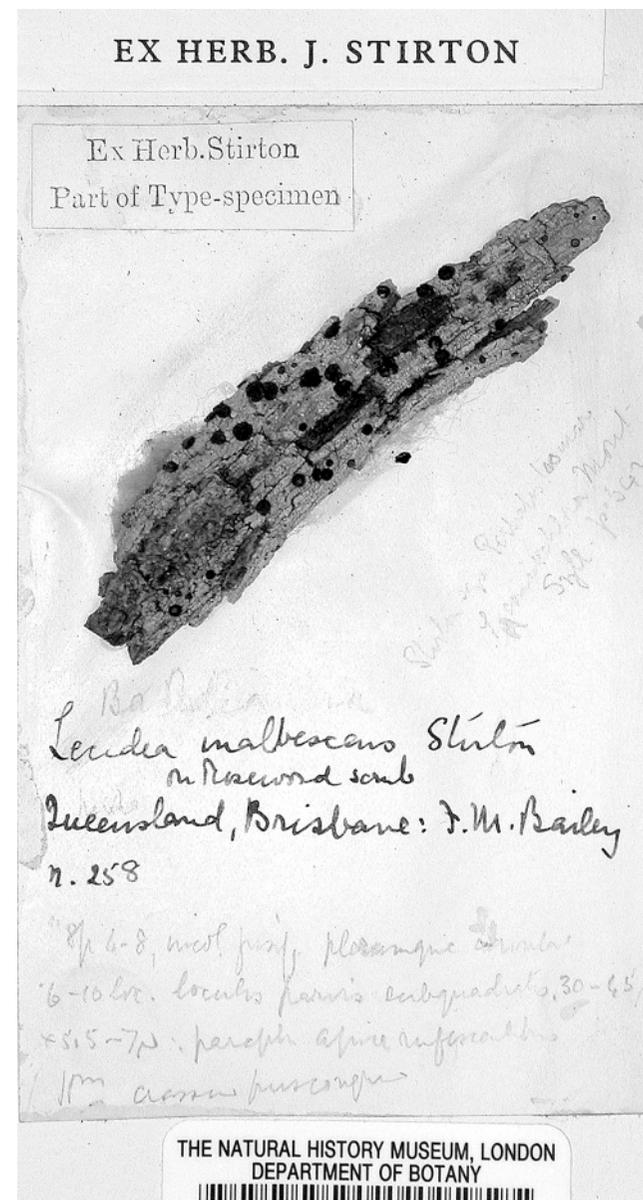


Fig. 1. Isolectotype of *Lecidea inalbescens* Stirt. BM specimen and label.

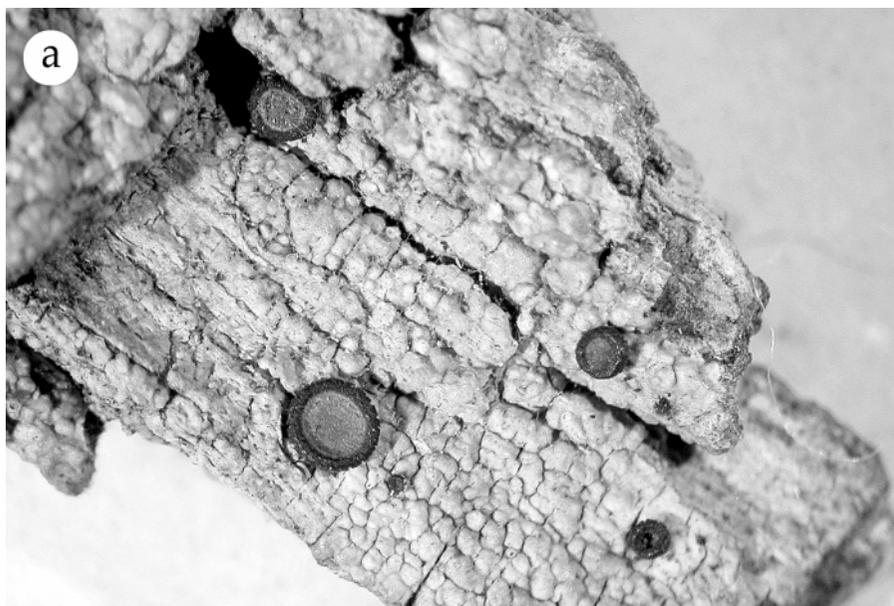


FIG. 2. Isolectotype of *Lecidea inallescens* Stirt. from BM. a: detail of young, pruinose apothecia and thick, verrucose thallus; b: older, epruinose apothecia.

Notes on *Placopsis albida* (Kremp.) I.M. Lamb (Ascomycota: Agryriaceae) from Java and New Ireland, Papua New Guinea.

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Abstract: *Placopsis albida* (Kremp.) I.M. Lamb, is a palaeotropical species first described from Java. It is here recorded also from New Ireland, Papua New Guinea.

The lichen genus *Placopsis* (Nyl.) Linds. is characteristic of highly oceanic, cool temperate biomes, with the Southern Hemisphere being the region of greatest species diversity (Lamb 1947; Galloway 2001a, 2001b, 2002, 2004a, 2004b, 2006; Galloway *et al.* 2005). During an ongoing study of *Placopsis* in New Zealand, and especially of the widespread and polymorphic species *P. ferrugosa* (Nyl.) Nyl., specimens of *P. albida* (Kremp.) I.M. Lamb from the Pacific tropics were investigated to check similarities and differences with *P. ferrugosa*. Specimens of *P. albida* from Java and New Ireland were obtained on loan from B, BM, M and UPS. Thin-layer chromatography of acetone extracts and HPLC of methanol extracts was performed according to standardized methods (Culbertson 1972, Feige *et al.* 1993). *Placopsis albida*, first described from Java by Krempelhuber (in Nylander 1863), was considered to be endemic there (Lamb 1947), but it is here reported from New Ireland in the Bismarck Archipelago, and could in fact be more widespread in alpine habitats in Papua New Guinea. A description is given below, based on the type specimen as well as on several more recent collections.

***Placopsis albida* (Kremp.) I.M. Lamb, *Lilloa* 13, 241 (1947).**

≡ *Squamaria albida* Kremp., in W. Nylander, *Ann. Sci. Nat. Bot. sér. 4*, 20, 277 (1863).

≡ *Lecanora albida* (Kremp.) Nyl., *Bot. J. Linn. Soc.* 9, 251 (1866).

Type: Java, *sine loco*. Jelinek 33, Exped. *Novara*, ex Hrb. Musei Palat. Vindob. (M! – holotype; W – isotype, not seen).

The holotype specimen consists of two small pieces of rock (each c. 3–4 cm diam.) glued to a piece of paper to which is attached Krempelhuber's diagnosis in pencil, plus a very neat and accurate pencil drawing of an 8-spored ascus, three paraphyses, and three photobiont cells. Krempelhuber's spore measurements are "0.0178–0.018 mm long., 0.0097–0.010 mm lat.". In the protologue, Nylander cites Krempelhuber's spore measurements as "0.018–0.025 mm x 0.010–0.012 mm" (Nylander 1863). On the outside of the packet, Krempelhuber has added the comment "potius *Psoroma*" to his name *Squamaria albida* Kremp., suggesting that he thought the lichen might be better accommodated in *Psoroma*.

Thallus closely attached in small rosettes or irregular patches, (1–)2–5 cm diam., lobate-crustose centrally, or often with several discrete layers of small lobes or elongate squamules forming a loosely interlocking or interdigitating crust, or becoming confluent and ±continuous, marginal lobes when well developed projecting 8–15 mm beyond the main thallus. Prothallus ochraceous to dark brown, fibrous, between squamules centrally and sometimes visible at margins, especially when marginal lobes are abraded. Lobes 220–380 µm thick, marginal lobes flat to shallowly convex, 10–15(–25) mm long and 1–1.5 mm wide, discrete to contiguous, centrally much shorter, 1–3 mm long and 0.2–0.8 mm wide, appearing elongate-squamulose, complexly and often densely imbricate, sometimes minutely lobulate. Upper surface grey-green to pale olive-green and ±white-maculate (10x lens) when moist, grey-white to pale fawnish or creamish when dry, matt or slightly glossy in parts, smooth to minutely furrowed or wrinkled or plicate, occasionally minutely cracked, and often with small, flattened

lobules; isidia, pruina, pseudocyphellae, and soredia absent. Medulla white. Photobiont green, chlorococcoid, cells spherical, 6.5–8.5(–10) μm diam. Cephalodia dark purple-blue when moist, pale pinkish ochre when dry, widely scattered, sessile, conspicuously raised above the thallus surface, 0.5–3 mm diam., globose, discrete, smooth at first, becoming irregularly lobed, rosette-forming at maturity, strongly and deeply wrinkled or sometimes divided by deep cracks; cyanobiont *Scytonema*, in chains, cells laterally compressed, 3–5 μm diam. Apothecia sessile, constricted at base, laminal, mostly towards centre of the thallus, rounded, discrete, rarely 2–3 together and irregular through mutual pressure, 0.2–1(–2) mm diam. Thalline exciple prominent, entire, smooth to minutely papillate, obscuring disc at first, 0.1–0.2 mm thick at maturity, concolorous with thallus. Proper exciple very thin, persistent, entire, slightly raised above disc, paler than disc. Disc shallowly urceolate to plane, smooth to slightly wrinkled or roughened, pale pinkish brown, translucent when moist, pale to dark red-brown when dry, with or without a thin, ochraceous pruina. Epithecium olive-brown to pinkish brown, 15–25 μm thick, unchanged in K. Hymenium colourless (145–)160–210(–235) μm tall. Hypothecium opaque, pale yellow-brown, unchanged in K, 200–335 μm thick. Asci cylindrical, 8-spored, 135–150 \times 10–12 μm . Ascospores uniseriate in ascus, broadly ellipsoidal, apices rounded or pointed, 13.5–18(–23) \times (6.5–)8–10(–12) μm . Pycnidia widely scattered, immersed in thalline squamules or projecting as small, globose warts, 100–300 μm diam., concolorous with thallus, with a dark brown, apical, depressed ostiole. Conidia filiform, \pm straight to shallowly curved, 15–25(–30) \times 0.5–1 μm .
Chemistry. Thallus K–, C+ red, KC+ red, Pd–, containing gyrophoric acid (major), lecanoric acid (minor) and atranorin (trace).

Notes

Placopsis albida is characterized by an orbicular to irregularly spreading thallus having characteristic elongate-squamulose lobes (often minutely lobulate laminally and marginally) imbricately arranged centrally and with flattened, elongated marginal lobes extending for 8–15 mm beyond the main thallus. Thalli are commonly fertile, but lack isidia, pruina, pseudocyphellae and soredia. Cephalodia are sessile, conspicuously raised above the thallus surface, 0.5–3 mm diam., globose, discrete, smooth at first, becoming irregularly lobed, rosette-forming at maturity and then strongly and deeply wrinkled or sometimes divided by deep cracks. Apothecia are scattered, mainly solitary, central, with a prominent thalline exciple concolorous with the thallus, shallowly urceolate to plane discs that are pale to dark red-brown and with or without a thin, ochraceous pruina. The hymenium is colourless, 145–235 μm tall, and the ascospores broadly ellipsoidal, 13.5–18(–23) \times (6.5–)8–10(–12) μm . It has a secondary chemistry of gyrophoric acid (major), lecanoric acid (minor) and atranorin (trace).

Placopsis albida possibly is a palaeotropical species (Galloway 1996), known initially from Java (Lamb 1947) and now also from New Ireland. Very likely it is also present on high ground elsewhere in Papua New Guinea, although reports to date from that region record only *P. auriculata* (with campylidia-like soralia), *P. cribellans* (isidiate), *P. ferrugosa* and *P. rhodophthalma* (Aptroot & Sipman 1991, Lumbsch *et al.* 1993, Aptroot *et al.* 1997). It differs from *P. ferrugosa* (a widespread austral species) in both colour and morphology of the thallus (it lacks the snakeskin-like flattened surface of the latter species), and it has a distinctly taller hymenium. The two specimens from Java listed below were recorded by Lamb (1947) as *Placopsis parellina* var. *rhodocarpa* (Nyl.) I.M. Lamb. However, that determination is erroneous, because *Placopsis rhodocarpa* (a Pantropical or circum-Pacific species known from Bolivia, southern South America and New Zealand) is characterized by a pale greenish to whitish placodioid thallus of small, interlocking squamules that do not elongate at the thallus margins into discrete, narrow, branching lobes; small, capitate greenish white soralia; thick margined *Ochrolechia*-like apothecia, and ascospores 22–27 \times 8–10 μm (Nylander 1863; Galloway 2002, 2006).

SPECIMENS EXAMINED

Java: • *Preanger*: Mt Gede, c. 2600 m, 6.x.1927, *Van Leeuwen-Reijnvaan 11551* (UPS); • *Pasoeroean*, Mt Kawi, c. 2850 m, 15.iv.1929, *Van Leeuwen-Reijnvaan 12234* (UPS).
Papua New Guinea: Bismarck Archipelago, New Ireland: • *Namatani*, Hans Meyer Range, 2225 m, on scree, *M. Sands, G. Pattison & J. Wood 2367* (BM 8247).

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A World Monograph of the Genus Plectocarpon (Roccellaceae, Arthoniales), by Damien Ertz, Claude Christnach, Mats Wedin & Paul Diederich. 155 pp and 123 figures, including 11 distribution maps. *Bibliotheca Lichenologica* 91, J. Cramer, Berlin, Stuttgart. 2005. ISBN 3-443-58070-X. Price: Euro 58.00 (about \$NZ 100).

The genus *Plectocarpon* was established by the Strasbourg pteridologist, cryptogamist, Professor of Botany, and cleric Antoine Laurent Apollinaire Fée (1789–1874) in his celebrated *Essai sur les cryptogams des écorces exotiques officinales* (Fée 1825). However, Fée himself did not realize that it was a lichenicolous fungus, and another 159 years passed before its true identity was recognized and the generic name re-entered modern mycological systematics.

I still vividly remember my excitement in discovering Delise's splendidly preserved specimens of "*Sticta*" in the Lenormand Herbarium one golden October afternoon in 1982 in the Paris Herbarium (PC-LENORMAND) when sheet after sheet proved to be type material of names described by Delise in his monograph (Delise 1825a, 1825b), and long thought to be lost in World War II when the city of Caen, where they were originally lodged (see Degelius [1935]), was heavily bombed. One of those was the type of *Sticta delisea* (Delise 1825a), which is where the modern story of *Plectocarpon* begins. The type specimen (Hawksworth & Galloway 1984, Galloway & James 1986) is a collection of what is now known as *Pseudocyphellaria glabra* infected with a lichenicolous fungus forming apothecia-like galls on its upper surface. When the Delise specimens which I had requested on loan arrived at length in London at the BM, I showed that intriguing specimen of *P. glabra* to David Hawksworth, and we agreed to collaborate on material that had implications for *Plectocarpon* Fée, for the genus *Lichenomyces* Trevis. (Trevisan 1853), and also for the typification of Delise's *Sticta delisea* (Hawksworth & Galloway 1984). It is an interesting story.

Fée (1825) described the new genus *Delisea* (honouring his friend and fellow cryptogamist Dominic François Delise [1780–1814], a distinguished retired major of the French Army and Chevalier of the Legion d'Honneur), on lichen material collected from King Island in Bass Strait between Tasmania and Australia (the collection is discussed in detail in Galloway & James [1986]). It differed from any species of *Sticta* then known in the peculiar structure of what Fée considered to be its apothecia. For the specific epithet of his new genus, he chose *pseudosticta* (Fée 1825) and provided a colour illustration of it (Fée 1825). However, *Delisea* Fée is a later homonym of *Delisea* Lamouroux (Rhodophyta) published in 1819, so it had to be rejected. He realized that, and in the "Additions et Corrections" to the *Essai* (Fée 1825), he introduced *Plectocarpon* Fée as a replacement for *Delisea* Fée, again discussing in some detail the peculiar, apothecia-like structures. However, he did not combine the epithet *pseudosticta* with *Plectocarpon* until his account of *Plectocarpon* in the *Dictionnaire Classique d'Histoire Naturelle* (Fée 1828), an often overlooked compendium of cryptogamic information. David Hawksworth and I erred in attributing the taxon *Plectocarpon pseudosticta* (Fée) Fée to Fée's account in the *Supplement to the Essai* (Fée 1837), and furthermore, in our account the date of publication of the name *Delisea pseudosticta* Fée is erroneously given as 1925 instead of 1825! That error was subsequently rectified in Galloway & James (1986), but unfortunately the mistake is still perpetuated in the monograph reviewed here.

In the 20th century, the first accounts of a *Plectocarpon*-like fungus were as *Lecanora parasitica* (Keissler 1930) and Rolf Santesson's resurrection of Trevisan's genus *Lichenomyces* (Trevisan 1853) for a parasite on *Lobaria pulmonaria*, which he identified as *Lichenomyces lichenum* (Sommerf.) R. Sant. (Santesson 1960) in a paper which he wrote on lichenicolous fungi from northern Spain. Hawksworth and I realized that

Lichenomyces and *Plectocarpon* were conspecific, and mentioned that Santesson had earlier intimated that an undescribed species also occurred on *Nephroma antarcticum* from southern South America. That implicated *Plectocarpon* as a co-evolved parasite on *Pseudocyphellaria*, *Lobaria*, and *Nephroma*. Later, Galloway (1997) mentioned *Sticta caliginosa* as being "...commonly infected with *Plectocarpon* sp.", underlining the association of *Plectocarpon* with taxa in the Peltigerineae, families Lobariaceae and Nephromataceae (Eriksson 2005). Santesson (1993) synonymized *Epiphora* Nyl. with *Plectocarpon*, making two new combinations in the genus, bringing the known species to five, to which Diederich and Etayo (1994) added a further five species from Northern Hemisphere collections. Aptroot *et al.* (1997) described two new species from Papua New Guinea, Wedin & Hafellner (1998) transferred *Arthonia linitae* into *Plectocarpon*, and a new species was described from Canada and Russia (Ertz *et al.* 2003), one from North America (Hafellner *et al.* 2002), and one from Chile (Follmann & Werner 2003).

Today, 22 years after the modern resurrection of *Plectocarpon* as a name for a genus of lichenicolous fungi, we have a world monograph of the genus authored by Damien Ertz, Claude Christnach, Mats Wedin, and Paul Diederich, who bring together for the first time a view of the genus expanded both taxonomically and geographically, with the great riches of recent collections from the Southern Hemisphere (where the genus is most speciose) at last adequately researched and documented. The monograph accepts 32 species in *Plectocarpon*, 15 of them newly described. The genus is well-represented and speciose in the cool temperate Southern Hemisphere, with 10 species recorded from southern South America and seven from Australasia. Eight species are known from northern parts of the Northern Hemisphere, four are reported from Papua New Guinea, and three are recorded from Macaronesia, continental Africa, and Réunion. *Plectocarpon* is not known from Antarctica, Greenland, the Pacific Ocean, Mexico, or Central America, nor from the whole of Asia except for Russia and Turkey.

Seven taxa are currently accepted from Australasia, with *P. pseudosticta* (the genotype) being known from Tasmania, New Zealand, and Chile, *P. gallowayii* (an Australasian species transferred from *Melaspilea*), and five newly described species, namely *P. bunodophori* (on *Bunodophoron patagonicum* and known from New South Wales, Tasmania, and New Zealand), *P. concentricum* (on *Pseudocyphellaria homoeophylla* and apparently endemic to New Zealand), *P. opegraphoideum* (on *Pseudocyphellaria homoeophylla* and *P. multifida*, and apparently endemic to New Zealand); *P. sticticola* (on *Sticta caliginosa*, *S. filix*, *S. squamata*, and *S. subcaperata*, and apparently endemic to New Zealand, although some years ago the late Geoff Bratt discovered galls on a Tasmanian collection of "*Dendriscoaulon*", leading him to write to me that he had "found fertile *Dendriscoaulon*!"), and *P. tibellii* (on *Pseudocyphellaria rubella* and also apparently endemic to New Zealand).

Plectocarpon as discussed in the monograph comprises lichenicolous, stromatic Roccellaceae (Arthoniales) with more or less carbonized, multilocular stromata, many of which produce apothecia-like galls. The generic delimitation, especially with respect to *Opegrapha*-like taxa, is still unclear and needs resolution. Many species of *Plectocarpon* are restricted to Peltigeralean hosts. *Pseudocyphellaria* is the host genus richest in species of *Plectocarpon*, with at least 11 species known, adding substantially to data on lichenicolous fungi (and associated chemical patterns) from *Pseudocyphellaria* recorded earlier by Kondratyuk & Galloway (1995). To set *Plectocarpon* in perspective, a key is given to lichenicolous genera of Roccellaceae, including *Perigrapha* (a new species is described from New Zealand), *Opegrapha*, *Plectocarpon*, *Sigridea*, *Enterographa*, *Mazosia*, and *Lecanographa*. Several species formerly included in *Plectocarpon* are transferred to other genera, namely *Arthonia sampianae*, *Enterographa epiphylla*, *Sigridea labyrinthica*, and three *Plectocarpon*-like taxa. *Enterographa punctata* (from Sri Lanka), *Opegrapha phaeophysciae* (from Russia), and *Perigrapha nitida* (from New Zealand) are newly described. A key to all accepted species of *Plectocarpon* is given, together with an account of the pigments, crystals, and pruina found in the stromatic tissue, which are useful in species separation. Two species of *Celidium* (*C. bacidiosporum* from Kenya and *C. dubium* from New Zealand) are excluded from *Plectocarpon*.

Although the monograph is comprehensive in scope and detail, one gets the impression that it is far from the final word, and in several places the authors hint at areas deserving further study, with fascinating vistas of speciation and co-evolution in both *Plectocarpon* and the Lobariaceae to be explored in the future. I hope that this excellent and timely compilation will be both a guide and a stimulant to such studies in the near future. It is a fine addition to the growing literature of lichenicolous fungi, but more than that it offers some solid pointers to new research agendas, which I hope will be quickly taken up. From a Southern Hemisphere perspective, it is a solid achievement and a particularly welcome development. Congratulations to all concerned with its production.

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