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The striking rust-red colour of the surface of *Porpidia macrocarpa* is thought to result from a high "luxury" accumulation of iron. The species is known from New Zealand and Australia in the Southern Hemisphere and from North America, Europe, and Asia in the Northern Hemisphere.

1 mm 

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Australasian Lichenology is the official publication of the Australasian Lichen Society, and formerly was named the *Australasian Lichenological Newsletter*. Its Editorial Board is W.M. Malcolm, J.A. Elix, G. Kantvilas, S.H.J.J. Louwhoff, and P.M. McCarthy.

Abstract: *Coccotrema corallinum* and *C. pocillarium* are reported as new to the New Zealand mycobiota from collections made by Henry Imshaug on the Auckland Islands in 1972. Both species are also new to Australasia, *C. corallinum* being known previously from only southern South America, and *C. pocillarium* from only southern South America and the Pacific Northwest of North America.

Introduction

The genus *Coccotrema* Müll.Arg. was erected for the single species *C. antarcticum* Müll.Arg. by Müller (1888), although the following year he included his new species in the synonymy of *Pertusaria cucurbitula* Mont. (Müller 1889), and made the new combination *C. cucurbitula* (Mont.) Müll.Arg. The earliest name for this species is actually *Porina granulata* Hook.f. & Taylor (Hooker & Taylor 1844), but that name is illegitimate because it is a later homonym of *P. granulata* Ach. (Acharius 1814), a very different species. A full account of the nomenclature of the genus is given by Brodo (1973) and Messuti (1996).

More recently the genus has been expanded by the inclusion of three species transferred from *Pertusaria*: *C. colobinum* (Tuck.) Messuti from South America (Messuti 2003), *C. pocillarium* (C.E.Cumm.) Brodo from NW North America and southern South America, and *C. porinopsis* (Nyl.) Imshaug ex Yoshim. from southern South America, Australasia and Japan. In addition, several new species have been described: *C. citrinescens* P.James & Coppins from NW Europe, *C. corallinum* Messuti, *C. fernandezianum* Messuti and *C. magellanicum* Messuti from southern South America, and *C. maritimum* Brodo from NW North America. The monotypic genus *Lepolichen* Trevis. from southern South America has also been shown to be congeneric with *Coccotrema* (Schmitt *et al.* 2001), resulting in the new combination *C. coccophorum* (Mont.) I.Schmitt, Messuti & Lumbsch.

The genus is concentrated in the southern cool-temperate zone, and is especially well represented in southern South America; of the 10 currently accepted species, seven are known from southern South America. Two species of *Coccotrema* are currently included in the mycobiota of Australasia: *C. cucurbitula* and *C. porinopsis* (Malcolm & Galloway 1997). However, investigation of the extensive collections made from the Auckland Islands during the austral summer of 1972–1973 by Henry Imshaug and housed in the herbarium of Michigan State University (MSC) (Fryday & Prather 2001) has revealed the presence of two additional species of *Coccotrema* that are here reported for the first time from New Zealand and Australasia.

Coccotrema corallinum Messuti, *Mycotaxon* **82**, 430 (2002).

Type: Argentina, Tierra del Fuego, Dept. Ushuaia, Bahía Buen Suceso, alpine region at the summit of mountain behind bay, 600 m, 13.ix.1971, Imshaug 49994 & Ohlsson (holotype—MSC).

Illustrations: Messuti (2002: 434, as *C. corallina*); Messuti & Vobis (2002: 19).

Coccotrema corallinum is a terricolous species that grows over bryophytes and is characterized by having a thallus completely covered by thick coralloid isidia (0.3–0.4 mm wide by 2–4 mm tall). The Auckland Islands collections lack ascomata, but when present these have a non-isidiate thalline margin and ascospores 48–60 × 24–30 µm. There are two other isidiate species of *Coccotrema*: *C. magellanicum* and *C. porinopsis*,

but in both those species the isidia are simple or branched and much finer (less than 0.2 mm wide by 1.0 mm tall), and the ascomata have an isidiate thalline margin. In addition, *C. magellanicum* occasionally has soralia. *Coccotrema porinopsis* is known from Australasia (including New Zealand) and southern South America, but *C. magellanicum* is known from only southern South America (Galloway 1985, Messuti 2002). The thalli of all three species contain stictic acid and accessory compounds. The single collection from the Auckland Islands is from terricolous bryophytes on the summit of the Hooker Hills in the north of Auckland Island (50°32.5'S, 166°09'E).

NEW ZEALAND SPECIMEN EXAMINED

Auckland Islands. Auckland Island: • on summit of Hooker Hills, tussock and rock outcrops, 1972, *Imshaug 56673* (MSC).

ADDITIONAL SPECIMENS EXAMINED (all MSC)

Argentina. Tierra del Fuego: • Dept. Ushuaia, Isla Grande, Bahia Buen Suceso, 54°48'S, 65°17'W, 600 m, at summit of mountain behind bay, alpine region, 1971, *Imshaug 49983 & Ohlsson* (topotype); • *ibid.*, Bahia Valentin, 54°53'S, 65°32'W, 500 m, krummholz area at summit of mountain behind bay, 1971, *Imshaug 50288 & Ohlsson*. **Falkland Islands.** West Falklands: • Mt. Adam, cliffs on E side of summit ridge, UTM 2IF TC 8781, 2200–2297 ft, 1968, *Imshaug 41083, 41087 & Harris*; • Port Howard, on summit ridge of Mt. Maria, UTM 2IF UC 2078–2079, 2000–2150 ft, feldmark & outcrops, 1968, *Imshaug 41366 & Harris*; East Falklands: • Mt. Usborne, on ridge between Mr. Usbornes 1 & 2, UTM 2IF UC 7371, 2250 ft, sheltered cliffs with seepage, 1968, *Imshaug 39996 & Harris*.

Coccotrema pocillarium (C.E.Cumm.) Brodo, *Bryologist* 76, 267 (1973).

Basionym: *Pertusaria pocillaria* C.E.Cumm., in Cardot *et al.*, Harriman Alaska Expedition 5, 101. Pl. IX. 1904.

Type: U.S.A., Alaska, Farragut Bay, on *Alnus*, 5.vi.1899, *Trelease 806A* (holotype—US*). = *Pertusaria carnea* G.Merr., *Macoun Can. Lich.*, ser. 11, no. 131, ca. 1901–1912 (nom.nud.).

Type: Canada, British Columbia, Ucluclet [sic]. West coast of Vancouver Island, on bark of willows, 5.vii.1909, *Macoun* (holotype—CANL).

= *Pertusaria minuta* Degel., *Meddel. Göteborgs Botaniska Trädgård* 12, 122 (1937).

Type: U.S.A., Alaska, Ad Kodiak in insula Kodiak in cortice Piceae, 1932, *E. Hultén 503b* (holotype—UPS).

= *Ochrolechia pacifica* H.Magn., *Meddel. Göteborgs Botaniska Trädgård* 13, 249 (1939).

Type: U.S.A., Oregon, Siltcoos, 1924, *F.P. Sipe 849* (holotype—UPS).

Illustrations: Brodo (1990: 261, 267); Messuti & Vobis (2002: 19).

Coccotrema pocillarium is a corticolous sorediate species. Whereas most other corticolous species of the genus grow over bryophytes, *C. pocillarium* occurs on bark. Two other species of *Coccotrema* are known with soredia: the saxicolous *C. citrinescens* from NW Europe and the corticolous *C. magellanicum* from southern South America, which is primarily isidiate with only occasional soralia.

The three collections from the Auckland Islands are all from the same small area, one from southern Auckland Island, and two from the north shore of Adams Island, which is immediately south of Auckland Island and separated from it by Carnley Harbour, a narrow strait about 1 km wide.

NEW ZEALAND SPECIMENS EXAMINED

Auckland Islands. • Auckland Island: Carnley Harbour, Camp Cove, 50°50'S, 166°0.5'E, *Metrosideros* forest mixed with scrub & moor, 1972, *Imshaug 56913*; • *ibid.*, Adams Island, Carnley Harbour, SW of Camp Cove, Magnetic Station, 50°52'S, 166°0.5'E, *Metrosideros* forest on slope, 1973, *Imshaug 57444-A, 57452*.

SELECTED ADDITIONAL SPECIMENS EXAMINED (all MSC)

Argentina. Tierra del Fuego: • Dept. Ushuaia, Strait of Magellan, B[ahia] Fortescue, 53°42'S, 72°01'W, climax forest, on *Nothofagus betuloides*, 1969, *Imshaug 44908 & Ohlsson*; • *ibid.*, NE side of Pto Gallant, 53°47'S, 72°00'W, thin woods, on *Drimys*, 1969, *Imshaug 45121-B & Ohlsson*; • *ibid.*, Isla de los Estados, Puerto Parry, E side of inner bay, 54°47'S, 64°22'W, sea level, mature *Nothofagus* forest, 1971, *Imshaug 53967 & Ohlsson*.

Canada. British Columbia: • Queen Charlotte Islands, Graham Island: 6.6 miles SE of Port Clements, alongside Gold Creek, 53°38'N, 132°03'W, in open swamp, dominant tree *Pinus contorta*, on *Pinus contorta*, 1967, *Brodo 9797 & Shchepanek*; • *ibid.*, Gudal Bay, 53°14'N, 132°34'W, shoreline trees on north side, in glades of protected cave, on *Alnus rubra*, 1967, *Brodo 10171, Shchepanek & Schofield* (Lichenes Canadensis Exsiccati #108); • Frank Island, Chesterman beach (Cox Bay) 6 miles S of Tofino, 49°06'N, 125°53'W, sea level, few wind-swept trees, 1969, *Ohlsson 1009, 1024, 1027*.

USA. Oregon: • Lane Co., S of Cleawox Lake, in alder grove, on *Alnus rubra*, 1968, *Pike L-514*.

Acknowledgements

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References

- Acharius, E (1814): *Synopsis Methodica Lichenum*. Svanborg et Soc., Lund.
Brodo, IM (1973): The lichen genus *Coccotrema* in North America. *Bryologist* 76, 260–270.
Fryday, AM; Prather, LA (2001): The lichen collection of Henry Imshaug at Michigan State University Herbarium (MSC). *Bryologist* 104, 464–467.
Galloway, DJ (1985): *Flora of New Zealand Lichens*. P.D. Hasselberg, Government Printer, Wellington.
Hooker, JD; Taylor, T (1844): Lichenes antarctici. *London Journal of Botany* 3, 634–658.
Malcolm, WM; Galloway, DJ (1997): *New Zealand Lichens: Checklist, Key, and Glossary*. Museum of New Zealand Te Papa Tongarewa, Wellington.
Messuti, MI (1996): Notes on the lichen genus *Coccotrema* in southern South America. *New Zealand Journal of Botany* 34, 57–64.
Messuti, MI (2002): New species of the lichen genus *Coccotrema* from southern South America. *Mycotaxon* 82, 429–435.
Messuti, MI; Vobis, G (2002): *Flora Criptogámica de Tierra del Fuego. Vol. 13, Fasc. 13. Lichenes Pertusariales: Coccotremataceae, Megasporaceae, Pertusariaceae*. Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires. 106 pp.
Messuti, MI (2003): Notes on *Coccotrema colobinum* (lichenized Ascomycotina). In: Jensen, M. (ed.): *Lichenological Contributions in Honour of G.B. Feige. Bibliotheca Lichenologica* 86, J. Cramer, Berlin, Stuttgart, pp. 129–132.
Müller, J (1888): Lichens. pp. 141–172. In: *Mission scientifique du Cap Horn. 1882–1883. T. 5. Botanique*. Gauthier-Villars et fils, Paris.
Müller, J (1889): Lichenes Spegazziniani in Staten Island, Fuegia et in regione freti Magellanici lecti. *Nuovo Giornale Botanico Italiano* 21, 35–54.
Schmitt, I; Messuti, MI; Feige, GB; Lumbsch, HT (2001): Molecular data support rejection of the generic concept in the Coccotremataceae (Ascomycota). *Lichenologist* 33, 315–321.

*The holotype of *P. pocillaria* was stated to be in MO by Brodo (1973), but MO's lichen collection was transferred to US around that time, probably while the specimen was on loan to Brodo. The specimen certainly isn't in MO, and a recent search by Greg McKee failed to locate it in US.

Additional lichen records from Australia 63
***Graphis cleistoblephara* (Nyl.) and *Graphis plagiocarpa* Fée**

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Graphis cleistoblephara Nyl. and *Graphis plagiocarpa* Fée are reported as new to Australia.

Graphis hiascens (Fée) A.W.Archer (sic) and *G. lumbschii* var. *deficiens* (A.W.Archer) A.W.Archer were recently included in an account of the Australian Graphidaceae (Archer 2006), but those two taxa are now respectively identified as *Graphis cleistoblephara* Nyl. and *G. plagiocarpa* Fée. Both are members of a group of lichens characterized by short, sessile, simple lirellae, usually with a well-developed thalline margin. The members of the group, which contains *inter alia* *G. dussi* Vain., *Graphis lumbschii* (A.W.Archer) A.W.Archer, *G. ruiziana* (Fée) A.Massal., and *G. sorsogona* Vain., are differentiated by chemistry, degree of exciple carbonization, and ascospore size, number and septation.

***Graphis cleistoblephara* Nyl.**

in Triana, J. and Planchon, J.E., *Ann. Sci. Nat., Bot. sér.* **4**, 20: 265 (1863).

= *Graphis hiascens* (Fée) A.W.Archer, *Biblioth. Lichenol.* **94**: 69 (2006).

nom. inval. non Graphis hiascens (Fée) Nyl., *Ann. Sci. Nat., Bot., sér.* **4**, 11: 226 (1859)

Type: Hong Kong, ex Herb. Tuckerman; holotype: H-NYL 7589 (*vide* Staiger 2002)

SPECIMEN EXAMINED

Queensland: • O'Keefe Creek, Big Tableland, 26 km S of Cooktown, H. *Streimann* 30919 p.p., 4.vii.1984 (CANB).

The species is characterized by the short, simple lirellae, the almost completely carbonized exciple, the unispersed hymenium, the hyaline, muriform ascospores and the presence of norstictic acid. It is illustrated in Archer (*op. cit.*, p. 167, Fig. 48) as *Graphis hiascens*. The species also occurs in India (Patwardhan & Kulkarni 1976) and Japan (Kurokawa 2003).

***Graphis plagiocarpa* Fée**

Essai Crypt. Écorc. Offic.: 38 (1824).

Type: India, "India occidentali, ad corticem Lauri Cassiae"; holotype: G.

= *Graphina lumbschii* var. *deficiens* A.W.Archer, *Mycotaxon* **77**: 170 (2001).

= *Graphis lumbschii* var. *deficiens* (A.W.Archer) A.W.Archer, *Telopea* **11**: 73 (2005).

SPECIMEN EXAMINED

Queensland: • Track to Lugger Bay, 17 km E of Tully, H. *Streimann* 45427, 1.xii.1990, (CANB).

The species is characterized by the short, simple lirellae, the completely carbonized exciple, the non-inspersed hymenium, the hyaline, muriform ascospores, and the absence of lichen compounds. It resembles *Graphis cleistoblephara* in appearance, but is distinguished from that species by the absence of lichen compounds.

Acknowledgement

The author is grateful to Dr R. Lücking, Field Museum, Chicago, for indicating these synonymies and for providing an illustration of *Graphis plagiocarpa*.

References

Archer, AW (2006): The lichen family Graphidaceae in Australia. *Bibliotheca Lichenologica* **94**, 1–191.

Kurokawa, S (2003): *Checklist of Japanese Lichens*. National Science Museum, Tokyo. 1–128.

Patwardhan, PG; Kulkarni, CR (1976): Some additions to the lichen flora of India. IV: *Graphis* and *Graphina* (Family Graphidaceae). *Biovigyanam* **2**, 123–132.

Staiger, B (2002): Die Flechtenfamilie Graphidaceae. *Bibliotheca Lichenologica* **85**, 1–526.

Additional lichen records from Australia 64

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Amandinea diorista var. *hypopelidna*, *Cratiria aggreddiens*, *Gassicurtia subpulcella*, *Prototermelia isidiata* and *Vainionora americana* are reported as new to Australia. The genus *Gassicurtia* has not been reported from Australia previously. In addition, new state or territory records are listed for 30 other taxa.

NEW RECORDS FOR AUSTRALIA

1. *Amandinea diorista* var. *hypopelidna* Marbach & Kalb, in Marbach, *Biblioth. Lichenol.* **74**, 60 (2000).

This species is characterized by the thin, yellow to yellow-green thallus, the tiny, epruinose apothecia 0.3–0.4 μm wide, the 8-spored asci with 2-celled, olive or olive-brown to olive-grey ascospores, 10–14 \times 4.5–6.0 μm , with a moderately strongly sculptured outer surface and the presence of arthothelin (major), thuringione (major), 4,5-dichlorolichexanthone (trace) and 4,5-dichloro-3-O-methylnorlichexanthone (trace). Previously this species was known from the Pacific (New Caledonia) and Asia (Marbach 2000). A detailed description is given in Marbach (2000).

SPECIMENS EXAMINED

Northern Territory: • Howard Springs Road, 34.5 km SE of Darwin, 12°28'37"S, 131°01'59"E, 30 m, on *Callitris* in *Callitris* plantation, *J.A. Elix* 37111, 3.viii.2005 (CANB).
Queensland: • Jourama Falls, Paluma Range National Park, 23 km S of Ingham, 18°51'50"S, 146°07'40"E, 150 m, on *Eucalyptus* stump at margins of rainforest gully, *J.A. Elix* 37201, 24.vii.2006 (CANB).

2. *Cratiria aggreddiens* (Stirt.) Marbach, *Biblioth. Lichenol.* **74**, 165 (2000).

Cratiria aggreddiens is characterized by the yellow, cracked, moderately warty thallus, the white or yellow pruinose apothecia, the dark olive to dark olive-brown, 1-septate ascospores 17–28 \times 8–13 μm , where the apical region is often slightly elongated (*cf. Callispora*-type) and the outer surface markedly sculptured, and by the presence of arthothelin (major), thuringione (major), 4,5-dichloronorlichexanthone (minor) and 3-O-methylthiophanic acid (trace). The proper exciple of the apothecia reacts K+ red. This species was known previously from the Pacific (New Caledonia), South Africa, Asia, Central and South America (Marbach 2000). A detailed description is given in Marbach (2000).

SPECIMENS EXAMINED

Queensland: • Coochiemudlo Island, Moreton Bay, 27°34'S, 153°20'E, 1 m, on *Callitris columellaris* along foreshore, *J.A. Elix* 10230, 9.v.1982 (CANB); • 3 km S of Forrest Beach, 16 km SE of Ingham, 18°43'S, 146°18'E, 1 m, on tree at edge of mangrove and strand vegetation, *J.A. Elix* 15909 & *H. Streimann*, 22.vi.1984 (CANB); • Newell Beach, 5 km NE of Mossman, 16°26'S, 145°24'E, 1 m, on mangrove in tidal flats, *J.A. Elix* 17441 & *H. Streimann*, 6.vii.1984 (CANB).

3. *Gassicurtia subpulcella* Marbach, *Biblioth. Lichenol.* **74**, 244 (2000).

Gassicurtia subpulcella is characterized by the yellow or yellow-grey to grey-white, warty or subgranular thallus, the grey, pruinose apothecia, the 8-spored asci, the olive to olive-brown, to grey-olive, 1-septate ascospores 10–15 \times 4.0–5.5 μm , and by the presence of thiophanic acid (major), arthothelin (trace), 3-O-methylthiophanic acid (trace), atranorin (trace) and an unknown red pigment. The proper exciple of the apothecia reacts K+ yellow. This species was known previously from Asia, Africa,

and North and South America (Marbach 2000). A detailed description is given in Marbach (2000).

SPECIMEN EXAMINED

New South Wales: • Lord Howe Island, Intermediate Hill via track to North Hummock, 31°32'45"S, 159°04'55"E, 120 m, on base of palm in lowland forest with dense shrub cover, *J.A. Elix* 42035, 5.ii.1995 (CANB).

4. *Prototermelia isidiata* Diederich, Aptroot & Sérusiaux, *Biblioth. Lichenol.* **64**, 146 (1997).

This species is characterized by the whitish, pale brown to dark brown crustose thallus, the copious, subglobose to cylindrical isidia on the upper surface and by the presence of alectoronic acid (major) and dehydroalectoronic acid (minor). This species was known previously from Papua New Guinea (Aptroot *et al.* 1997), and a detailed description is given in that paper.

SPECIMEN EXAMINED

Northern Territory: • Melville Island, Takamprimili Creek, Pickertaramoor, 11°47'S, 130°53'E, 60 m, on dead part of *Erythrina* in disturbed *Callitris*-dominated vegetation, *H. Streimann* 42469, 26.iv.1989 (CANB).

5. *Vainionora americana* Kalb, Tønsberg & Elix, *Biblioth. Lichenol.* **88**, 326 (2004).

This species is characterized by the off-white to dull fawn or pale olive-green, crustose thallus with an areolate and cracked, smooth to subtubercular soresiate upper surface and the presence of atranorin, arthothelin and 6-O-methylarthothelin together with minor amounts of chloroatranorin and other xanthenes belonging to the arthothelin chemosyndrome. This species was known previously from North America (Kalb 2004), and a detailed description is given in that paper.

SPECIMENS EXAMINED

New South Wales: • Great Dividing Range, 2 km N of Parkers Gap, 6 km E of Captains Flat, 35°37'S, 149°30'E, 1260 m, on twigs of *Tasmania* in wet *Eucalyptus* woodland, *J.A. Elix* 33065, 12.vii.1992 (CANB); • Monga National Park, Penance Grove, 28 km SE of Braidwood, 35°35'58"S, 149°54'51"E, 655 m, on dead log in *Eucryphia*-dominated rainforest gully with *Dicksonia* understorey, *J.A. Elix* 36365, 1.iii.2005 (CANB); • Cottan-Bimbang National Park, 4.8 km from W end of Myrtle Gully Road, c. 70 km E of Walcha, 31°21'45"S, 152°00'38"E, 980 m, on fallen branch in rainforest with isolated *Eucalyptus*, *J.A. Elix* 36319, 28.iv.2005 (CANB); • Cottan-Bimbang National Park, Myrtle Gully Road, Cells River Picnic Ground, c. 75 km E of Walcha, 31°23'25"S, 152°01'58"E, 695 m, on fallen branch in wet *Eucalyptus* forest, *J.A. Elix* 36335, 36344, 28.iv.2005 (CANB); • Cottan-Bimbang National Park, junction of Oxley Highway and Tobins Road, c. 70 km E of Walcha, 31°22'22"S, 152°03'37"E, 1040 m, on dead *Acacia* in wet *Eucalyptus* forest with tree fern understorey, *J.A. Elix* 36365, 28.iv.2005 (CANB).

NEW STATE AND TERRITORY RECORDS

1. *Amandinea extenuata* (Müll.Arg.) Marbach, *Biblioth. Lichenol.* **74**, 71 (2000).

Previously this species was known from the Pacific (Fiji), Africa, Asia, and South America, and in Australia from New South Wales and South Australia (Marbach 2000, McCarthy 2006).

SPECIMENS EXAMINED

Victoria: • Chiltern-Mt Pilot National Park, 2 km N of Chiltern, 36°07'47"S, 146°36'42"E, 200 m, on dead shrub in open *Eucalyptus* woodland, *J.A. Elix* 36936, 36937, 5.v.2006 (CANB).
Western Australia: • Charles Gardner Flora Reserve, central track, 20 km SW of Tammin, 31°47'24"S, 117°28'07"E, 305 m, on twigs of dead shrub in *Eucalyptus* woodland, *J.A. Elix* 31854, 22.iv.2004 (CANB).

2. *Cratiria lauricassiae* (Fée) Marbach, *Biblioth. Lichenol.* **74**, 160 (2000).
= *Buellia lauricassiae* (Fée) Müll.Arg., *Rev. Mycol. (Toulouse)* **9**, 85 (1887).
This species was previously known from Asia and in Australia from Queensland (Marbach 2000, McCarthy 2006).

SPECIMENS EXAMINED

Northern Territory: • Howard Springs National Park, 37.5 km SE of Darwin, 12°28'03"S, 131°02'54"E, 15 m, on dead branch in monsoon vine forest along stream, *J.A. Elix* 36734, 36735, 3.viii.2005 (CANB).

3. *Dirinaria subconfluens* (Fr.) D.D.Awasthi, *Biblioth. Lichenol.* **2**, 33 (1975).
Previously this species was known from India, Indonesia, Philippines, Vietnam, New Caledonia, Vanuatu and Hawaii. In Australia, it was previously known from Queensland (McCarthy 2006).

SPECIMEN EXAMINED

Northern Territory: • Charles Darwin National Park, Winnellie, 6 km E of Darwin, 12°26'37"S, 130°52'39"E, 5 m, on dead mangrove in mangrove swamp, *J.A. Elix* 36859, 3.viii.2005 (CANB).

4. *Hafellia bahiana* (Malme) Sheard, *Bryologist* **95**, 82 (1992).
Previously this species was known from the Pacific (Hawaii, Tahiti, New Caledonia), Africa, South, Central and North America, and in Australia from Queensland (Marbach 2000, McCarthy 2006).

SPECIMENS EXAMINED

Western Australia: • Nookaminne Picnic Area, 4 km W of Quairading, 32°01'19"S, 117°122'19"E, 250 m, on dead twigs of *Melaleuca* in *Casuarina-Eucalyptus* shrubland, *J.A. Elix* 31791, 22.iv.2004 (CANB).

Tasmania: • Moores Hill, 41°14'S, 146°52'E, 80 m, on *Acacia dealbata*, *G. Kantvilas* 222/80, 23.v.1980 (HO); • c. 7 km E of Lake Leake, undisturbed site E13, 42°01'30"S, 147°55'E, 400 m, on *Acacia dealbata* in *Eucalyptus tenuiramis-E. obliqua* dry forest, *G. Kantvilas s.n.*, 24.iv.1996 (HO); • Trevallyn State Recreation Area, 41°27'S, 147°06'E, 200 m, on bark, *A.V. Ratkovsky s.n.*, 22.viii.1992 (HO); • Hummocky Hills, 41°44'S, 147°14'E, 200–470 m, on bark, *A.V. Ratkovsky s.n.*, 20.ix.1992 (HO).

5. *Hafellia curatellae* (Malme) Marbach, *Biblioth. Lichenol.* **74**, 255 (2000).
Previously this species was known from the Pacific (New Caledonia, Papua New Guinea), Africa, and South America, and in Australia from Queensland and New South Wales (Marbach 2000, McCarthy 2006).

SPECIMEN EXAMINED

Western Australia: • Bullfinch-Evanston Road, 51.3 km N of Bullfinch, 30°37'19"S, 119°13'37"E, 360 m, on *Acacia* in scattered *Callitris-Eucalyptus* woodland with *Acacia* understorey, *J.A. Elix* 32503, 28.iv.2004 (CANB).

6. *Hafellia levieri* (Jatta) Pusswald & Kantvilas, in Pusswald *et al.*, *Muelleria* **8**, 138 (1994).
This endemic species was previously known from Victoria and Tasmania (Pusswald *et al.* 1994, Marbach 2000, McCarthy 2006).

SPECIMEN EXAMINED

Western Australia: • unnamed Nature Park, 20 km S of Moora along Gingin Road, 3 km E on Bullbarnet Road, 30°41'38"S, 116°12'19"E, 225 m, on base of dead *Acacia* in remnant *Acacia-Eucalyptus* woodland along seasonal creek, *J.A. Elix* 37169, 2.iv.2006 (CANB).

7. *Hafellia tetrapla* (Nyl.) Pusswald, in Marbach, *Biblioth. Lichenol.* **74**, 288 (2000).
This species was known previously from South America, southern Africa, and Réunion, and, in Australia, from New South Wales, the Australian Capital Territory, Western Australia and Queensland (Elix 2006a, McCarthy 2006).

SPECIMENS EXAMINED

South Australia: • Murray Park Flora and Fauna Reserve, Murray Bridge, 35°07'S, 139°15'E, 3 m, on dead wood in remnant mallee scrub, *J.A. Elix* 36802, 31.xii.2005 (CANB); • Mt Lofty Ranges, Corrynton Park Road, 8 km W of Eden Valley, 34°38'37"S, 139°00'33"E, 520 m, on base of dead *Eucalyptus* in remnant *Eucalyptus* woodland, *J.A. Elix* 37232, 5.ii.2006 (CANB).

8. *Lecanora dissoluta* Nyl., *Flora* **4**, 131 (1866).
This species was known previously from Java (Nylander 1866) and Norfolk Island (Elix 2006b).

SPECIMENS EXAMINED

Queensland: • Tully Gorge, 49 km NW of Tully, 17°45'20"S, 147°37'39"E, 145 m, on trunk of fallen tree, *J.A. Elix* 36964, 36975, 36999, 28.vii.2006 (BRI, CANB).

9. *Lecanora placodiolica* Lumbsch & Elix, *Mycotaxon* **67**, 399 (1998).
This Australian endemic was previously known from the Australian Capital Territory (Lumbsch & Elix 2004, McCarthy 2006).

SPECIMEN EXAMINED

South Australia: • Murray Park Flora and Fauna Reserve, Murray Bridge, 35°07'S, 139°15'E, 30 m, on dead wood in remnant mallee scrub, *J.A. Elix* 36799, 31.xii.2005 (CANB).

10. *Lecanora subimmersa* subsp. *ramboldii* Lumbsch & Elix, in Lumbsch *et al.*, *Pl. Syst. Evol.* **191**, 233 (1994).
This species occurs in Central and South America, Africa, Southeast Asia and Papua New Guinea. In Australia, it was previously known from Queensland (Lumbsch & Elix 2004, McCarthy 2006).

SPECIMEN EXAMINED

Northern Territory: • Howard Springs Road, 34.5 km SE of Darwin, 12°28'37"S, 131°01'59"E, 30 m, on laterite rocks in *Callitris* plantation, *J.A. Elix* 37117, 3.viii.2005 (CANB).

11. *Lepraria coriensis* (Hue) Sipman, *Herzogia* **17**, 28 (2004).
This species was reported previously from Korea, India and China (Hong Kong, Taiwan), and in Australia from the Northern Territory, New South Wales, South Australia, Tasmania and Western Australia (Elix 2007, Laundon 2003, Sipman 2004).

SPECIMENS EXAMINED

Queensland: • N face of Mt. French, Mt. French National Park near Boonah, 27°59'S, 152°37'E, 200 m, on rock face, *R.W. Rogers* 7861, 10.iv.1985 (BRI); • Simpsons Falls, Mt. Coot-tha, 27°28'30"S, 152°27'30"E, on soil on side of quarry, *R.W. Rogers* 10561, 3.vi.2003 (BRI).

12. *Lepraria lobificans* Nyl., *Flora* **56**, 196 (1873).
In Australia, this cosmopolitan species has previously been reported from New South Wales, the Australian Capital Territory, Victoria and Tasmania (McCarthy 2006).

SPECIMENS EXAMINED

Queensland: • Old Rockmount School, Stockyard-Preston Road, SW of Toowoomba, 27°40'30"S, 152°02'30"E, on bark of *Eucalyptus creba*, *M.E. Ballingall* 84, 6.ii.1983 (BRI);

• Noosa Hill, Noosa National Park, 26°23'S, 153°07'E, 100 m, on soil, *R.W. Rogers s.n.*, 28.ix.1985 (BRI); • Mt Glorious, 27°18'58"S, 152°44'50"E, on soil in roadside cutting in rainforest, *R.W. Rogers 1083*, 29.xi.2004 (BRI); • Mt Cordeaux, 28°04'S, 152°24'E, 900 m, on rock face in heath, *R.W. Rogers 8527 & J. Hafellner*, 17.ix.1986 (BRI).

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

This cosmopolitan species was previously reported from Asia, North America, and Europe, and in Australia from New South Wales, the Australian Capital Territory, Victoria and Western Australia (Elix 2006a).

SPECIMEN EXAMINED

Queensland: • Blackdown Tableland National Park, Mimosa Creek Camping Area, 23°50'S, 149°42'E, 900 m, on sandstone, *R.W. Rogers 7877*, 2.ix.1985 (BRI).

14. *Lepraria nigrocincta* Diederich, Sérusiaux & Aptroot in Aptroot *et al.*, *Biblioth. Lichenol.* **64**, 78 (1997).

This species was known previously from Papua New Guinea, Africa (Aptroot *et al.* 1997) and in Australia from New South Wales (Elix 2007).

SPECIMEN EXAMINED

Queensland: • Ironside Park, St. Lucia, Brisbane, 27°29'S, 153°00'E, on soil on shaded bank, *E.M. Ross s.n.*, 28.viii.1984 (BRI).

15. *Leptogium asiaticum* P.M.Jørg., *Herzogia* **2**, 466 (1973).

This species was known previously from India and Africa and, in Australia, from Queensland (McCarthy 2006, Verdon 1992).

SPECIMEN EXAMINED

New South Wales: • Mann River Nature Reserve, Diehard Creek, 50 km E of Glen Innes, 29°40'29"S, 152°05'19"E, 595 m, on *Allocasuarina* in *Allocasuarina-Eucalyptus* woodland along stream, *J.A. Elix 37062*, 1.v.2005 (CANB).

16. *Megalaria grossa* (Pers. ex Nyl.) Hafellner, *Beih. Nova Hedwigia* **79**, 302 (1984).

In Australia, this cosmopolitan species was previously known from Western Australia, Victoria, Tasmania and Norfolk Island (McCarthy 2006).

SPECIMENS EXAMINED

New South Wales: • Cottan-Bimbang National Park, Myrtle Gully Road, Cells River Picnic Ground, 75 km E of Walcha, 31°23'25"S, 152°01'58"E, 695 m, on fallen branch in wet *Eucalyptus* forest, *J.A. Elix 36345*, 28.iv.2005 (CANB); • Mt. Hyland Nature Reserve, 20 km N of Hernani, 30°10'44"S, 152°25'19"E, 1340 m, on *Acacia* and *Doryphora sassafras* temperate rainforest, *J.A. Elix 36553, 36640*, 30.iv.2005 (CANB); • Monga National Park, Penance Grove, 28 km SE of Braidwood, 35°35'58"S, 149°54'51"E, 655 m, on *Eucryphia* trunk in *Eucryphia*-dominated rainforest gully, *J.A. Elix 37011*, 1.iii.2005 (CANB).

17. *Megalospora subtuberculosa* (C.Knight) Sipman, *Biblioth. Lichenol.* **18**, 123 (1983).

This species was previously known from New Zealand, and, in Australia, from Tasmania and New South Wales (Kantvilas 1994, McCarthy 2006).

SPECIMEN EXAMINED

Queensland: • Mt. Glorious, c. 5 km W of Maiela picnic area, 27°18'S, 152°44'E, 800 m, on bark of *Tristania conferta* in *Eucalyptus* forest, *R.W. Rogers 2595*, 8.iv.1983 (BRI).

18. *Pertusaria doradorensis* Elix & A.W.Archer, in Elix *et al.*, *Mycotaxon* **64**, 20 (1997).

This Australian endemic was previously known only from New South Wales (Archer 2004, McCarthy 2006).

SPECIMENS EXAMINED

Victoria: • Reef Hills State Park, 7 km SSW of Benalla, 36°36'53"S, 145°56'03"E, 155 m, on dead *Eucalyptus* stump and base of *Eucalyptus* in open *Eucalyptus* woodland, *J.A. Elix 37180, 37191*, v.2006 (CANB, MEL).

19. *Pertusaria hermaka* A.W.Archer, *Mycotaxon* **41**, 227 (1991).

This largely Australian species was previously known only from Queensland, New South Wales and Papua New Guinea (Archer 2004, McCarthy 2006).

SPECIMENS EXAMINED

Northern Territory: • Charles Darwin National Park, Winnellie, 6 km E of Darwin, 12°26'37"S, 130°52'39"E, 5 m, on dead mangrove in mangrove swamp, *J.A. Elix 36850, 36856, 36857*, 3.viii.2005 (CANB).

20. *Pertusaria trimera* (Müll.Arg.) A.W.Archer, *Telopea* **4**, 179 (1991).

This Australia endemic was known previously from Western Australia, South Australia, Victoria and Tasmania (Archer 2004, McCarthy 2006).

SPECIMEN EXAMINED

New South Wales: • Goonoo State Forest, Modriguy Forest Road, 5 km E of Modriguy, 23 km NNE of Dubbo, 32°04'16"S, 148°42'53"E, 330 m, on *Melaleuca* in *Eucalyptus-Callitris* woodland with *Callitris* and *Westringia* understorey, *J.A. Elix 36773*, 11.x.2005 (CANB).

21. *Pertusaria subventosa* var. *hypothamnolica* A.W.Archer & Elix, *Mycotaxon* **49**, 146 (1993).

This taxon was known previously from Papua New Guinea and, in Australia, from Queensland (Archer 2004, McCarthy 2006).

SPECIMEN EXAMINED

New South Wales: • Mann River Nature Reserve, Diehard Creek, 50 km E of Glen Innes, 29°40'29"S, 152°05'19"E, 595 m, on granite rocks in *Allocasuarina-Eucalyptus* woodland along stream, *J.A. Elix 37093*, 1.v.2005 (CANB).

22. *Pertusaria verdonii* A.W.Archer, in Elix *et al.*, *Proc. Linn. Soc. New South Wales* **113**, 68 (1992).

This species was previously known only from Norfolk Island (Archer 2004, McCarthy 2006).

SPECIMEN EXAMINED

Queensland: • Tully Gorge, 49 km NW of Tully, 17°45'20"S, 147°37'39"E, 145 m, on trunk of fallen tree, *J.A. Elix 36988*, 28.vii.2006 (CANB).

23. *Phyllopsora chodatunica* Elix, *Australas. Lichenol.* **59**, 23 (2006).

This Australian endemic was previously known from Queensland (Elix 2006c).

SPECIMEN EXAMINED

New South Wales: • Mars Road, Mt Hyland Nature Reserve, 3 km NW of Dorrigo, 30°11'S, 152°26'E, 1250 m, on shaded *Sloanea* trunk in temperate forest, *H. Streimann 60620*, 20.iv.1998 (CANB).

24. *Phyllopsora neofoliata* Elix, *Australas. Lichenol.* **59**, 26 (2006).

This Australian endemic was previously known from New South Wales and Lord Howe Island (Elix 2006c).

SPECIMEN EXAMINED

Queensland: • Bloomfield River, 56 km N of Mossman, 15°57'S, 145°20'E, 5 m, on *Mangifera* trunk in *Mangifera*-dominated stony floodplain, *H. Streimann 45710 pr.p.min.*, 4.xii.1990 (CANB).

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

This species was known previously from East Africa, Central and South America, and in Australia, it is known from Western Australia, Queensland, Victoria, New South Wales, and Christmas Island (Moberg 2001, McCarthy 2006).

SPECIMEN EXAMINED

South Australia: • Murray Park Flora and Fauna Reserve, Murray Bridge, 35°07'S, 139°15'E, 30 m, on *Callitris* in remnant mallee scrub, *J.A. Elix* 36805, 31.xii.2005 (CANB).

26. *Physcia verrucosa* Moberg, *Nordic J. Bot.* **6**, 862 (1986).

This species was previously known from East Africa, and, in Australia, from Western Australia (McCarthy 2006, Moberg 2001).

SPECIMEN EXAMINED

Northern Territory: • Howard Springs National Park, 37.5 km SE of Darwin, 12°28'03"S, 131°02'54"E, 15 m, on dead branch in monsoon vine forest along stream, *J.A. Elix* 36733, 3.viii.2005 (CANB).

27. *Placidium squamulosum* (Ach.) Breuss, *Ann. Naturhist. Mus. Wien* **98**, 39 (1996).

In Australia, this cosmopolitan species was known previously from all states and the Northern Territory (McCarthy 2006).

SPECIMEN EXAMINED

Australian Capital Territory: • along the Molonglo River, 0.5 km W of Coppins Crossing, 8.5 km W of Canberra, 35°17'14"S, 149°01'58"E, 430 m, on soil over granitic rock outcrops in pasture, *J.A. Elix* 36638, 24.vi.2006 (CANB).

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

This species was known previously from Papua New Guinea, and, in Australia, from Western Australia and the Northern Territory (Elix 2006a, McCarthy 2006).

SPECIMENS EXAMINED

Queensland: • track to Rainbow Falls, Blackdown Tableland National Park, 36 km SE of Blackwater, 23°48'S, 149°05'E, 720 m, on dead wood in *Eucalyptus* woodland, *J.A. Elix* 34359, 22.viii.1995 (CANB); • Bamboo Range (Great Dividing Range), 79 km SSE of Coen, 15 km N of Musgrave, 14°38'S, 143°27'E, 270 m, on semi-shaded, dead, fallen tree trunk in disturbed monsoon forest with large *Acacia*, *H. Streimann* 56709, 16.x.1995 (CANB).

New South Wales: • Southern Tablelands, Morton National Park, 35°06'S, 150°08'E, 760 m, on dead twigs in open *Eucalyptus* woodland, *J.A. Elix* 33040, 12.vii.1992 (CANB).

29. *Xanthoparmelia crawfordensis* (Elix) Elix, *Mycotaxon* **87**, 398 (2003).

This Australian endemic was known previously from Western Australia, South Australia, New South Wales and Tasmania (Elix 2001 [as *Paraparmelia crawfordensis*], McCarthy 2006).

SPECIMEN EXAMINED

Victoria: • Chiltern–Mt Pilot National Park, 2 km N of Chiltern, 36°07'47"S, 146°36'42"E, 200 m, on sandstone in open *Eucalyptus* woodland, *J.A. Elix* 36950, 5.v.2006 (CANB).

30. *Xanthoparmelia remanella* Elix, *Lichenologist* **36**, 284 (2004).

This Australian endemic was known previously from Queensland (Elix 2004, McCarthy 2006).

SPECIMENS EXAMINED

Western Australia: • Burma Road, 29 km SE of junction with Walkaway–Nangetty Road, 29°04'07"S, 115°09'26"E, 240 m, on laterite rock in roadside heath with *Melaleuca* shrubs, *J.A. Elix* 33782, 33784, 4.v.2004 (CANB, PERTH).

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References

- Aptroot, A; Diederich, P; Sérusiaux, E; Sipman, HJM (1997): Lichens and lichenicolous fungi from New Guinea. *Bibliotheca Lichenologica* **64**, 1–220.
- Archer, AW (2004): *Pertusaria*. *Flora of Australia* **56A**, 116–172.
- Elix, JA (2001): A revision of the lichen genus *Paraparmelia* Elix & J.Johnst. *Bibliotheca Lichenologica* **80**, 1–224.
- Elix, JA (2004): New species and new records of *Xanthoparmelia* (lichenized Ascomycota, *Parmeliaceae*) from eastern Australia. *Lichenologist* **36**, 277–287.
- Elix, JA (2006a): Additional lichen records from Australia 56. *Australasian Lichenology* **58**, 4–13.
- Elix, JA (2006b): Additional lichen records from Australia 58. New records from Norfolk Island. *Australasian Lichenology* **59**, 12–15.
- Elix, JA (2006c): Five new species of *Phyllopsora* (lichenized Ascomycota) from Australia. *Australasian Lichenology* **59**, 23–29.
- Elix, JA (2007): Additional lichen records from Australia 62. *Australasian Lichenology* **60**, 6–12.
- Kantvilas, G (1994): Additions to the family Megalosporaceae in Tasmania and mainland Australia, *Lichenologist* **26**, 349–366.
- Laundon, JR (2003): Six lichens of the *Lecanora varia* group. *Nova Hedwigia* **76**, 83–111.
- Lumbsch, HT; Elix, JA (2004): *Lecanora*. *Flora of Australia* **56A**, 12–61.
- Marbach, B (2000): Corticole und lignicole Arten der Flechtengattung *Buellia* sensu lato in den Subtropen und Tropen. *Bibliotheca Lichenologica* **74**, 1–384.
- McCarthy, PM (2006): *Checklist of the Lichens of Australia and its Island Territories*. ABRIS, Canberra. <http://www.anbg.gov.au/abris/lichenlist/introduction.html> (last updated 13 April 2006).
- Moberg, R (2001): The lichen genus *Physcia* in Australia, *Bibliotheca Lichenologica* **78**, 289–311.
- Sipman, HJM (2004): Survey of *Lepraria* species with lobed thallus margins in the tropics. *Herzogia* **17**, 23–35.
- Verdon, D (1992): *Leptogium*. *Flora of Australia* **54**, 173–192.

RECENT LITERATURE ON AUSTRALASIAN LICHENS

- Adams, BJ *et al.* (2006): Diversity and distribution of Victoria Land biota. *Soil Biology and Biochemistry* **38**, 3003–3018.
- Archer, AW (2006): The lichen family Graphidaceae in Australia. *Bibliotheca Lichenologica* **94**, 1–191.
- Archer, AW (2007): Additional lichen records from Australia (63). *Graphia cleistoblephara* Nyl. and *G. plagiocarpa* Fée. *Australasian Lichenology* **61**, 6–7.
- Archer, AW; Elix, JA (2007): Two new species in the Australian Graphidaceae (lichenized Ascomycota). *Australasian Lichenology* **61**, 18–20.
- Cannone, N; Evans, JCE; Strachan, R; Guglielmin, M (2006): Interactions between climate, vegetation and the active layer in soils at two maritime Antarctic sites. *Antarctic Science* **18**, 323–333.
- Elix, JA (2007): Additional lichen records from Australia (64). *Australasian Lichenology* **61**, 8–15.
- Elix, JA (2007): A new species of *Xanthoparmelia* (Parmeliaceae, lichenized Ascomycota) from Australia. *Australasian Lichenology* **61**, 30–31.
- Elix, JA (2007): Further new crustose lichens (Ascomycota) from Australia. *Australasian Lichenology* **61**, 21–25.
- Elix, JA; Archer, AW (2007): A new variety of *Pertusaria georgeana* (lichenized Ascomycota) containing a new depside. *Australasian Lichenology* **61**, 26–29.
- Fell, JW; Scorzett, G; Connell, L; Craig, S (2006): Biodiversity of micro-eukaryotes in Antarctic Dry Valley soils with <5% soil moisture. *Soil Biology and Biochemistry* **38**, 3107–3119.
- Fryday, AM (2007): Additional lichen records from New Zealand (47). *Coccotrema corallinum* Messuti and *C. pocillarium* (C.E.Cumm.) Brodo. *Australasian Lichenology* **61**, 3–5.
- Hager, A; Stocker-Wörgötter, E (2005): Secondary chemistry and DNA-analysis of the Australian lichen *Heterodea muelleri* (Hampe) Nyl. and culture of the symbionts. *Symbiosis* **39**, 13–19.
- Hogg, ID *et al.* (2006): Biotic interactions in Antarctic terrestrial ecosystems: are they a factor? *Soil Biology and Biochemistry* **38**, 3035–3040.
- Huiskes, AHL; Boschker, HTS; Lud, D; Moerdijk-Poorvliet, TCW (2006): Stable isotope ratios as a tool for assessing changes in carbon and nutrient sources in Antarctic terrestrial ecosystems. *Plant Ecology* **182**, 79–86.
- Jeong, GY (2006): Radiocarbon ages of sorted circles on King George Island, South Shetland Islands, West Antarctica. *Antarctic Science* **18**, 265–270.
- Kantvilas, G; Jarman, SJ (2006): Recovery of lichens after logging: preliminary results from Tasmania's wet forests. *Lichenologist* **38**, 383–394.
- Kantvilas, G; Elix, JA (2007): The genus *Ramboldia* (Lecanoraceae): a new species, key and notes. *Lichenologist* **38**, 135–141.
- Kaschik, M (2006): Taxonomic studies on saxicolous species of the genus *Rinodina* (lichenized Ascomycetes, Physciaceae) in the Southern Hemisphere with special emphasis in Australia and New Zealand. *Bibliotheca Lichenologica* **93**, 1–162.
- Kim, JH *et al.* (2006): Lichen flora around the Korean Antarctic Scientific Station, King George Island, Antarctica. *Journal of Microbiology (Korea)* **44**, 480–491.
- Kondratyuk, SY; Kärnefelt, EI; Thell, A (2006): New species of *Xanthoria* (Teloschistaceae) from Australia. *Nuytsia* **16**, 63–76.
- Louwhoff, SHJJ (2006): The lichen genus *Nephroma* in Australia. *Biologist* **31**, 12–13.
- Lücking, R; Sipman, HJM; Umaña, L; Chaves, JL; Lumbsch, HT (2007): *Aptrootia* (Dothideomycetes: Trypetheliaceae), a new genus of pyrenocarpous lichens for *Thelenella terricola*. *Lichenologist* **39**, 187–193.

ANNOUNCEMENT

18th MEETING OF AUSTRALASIAN LICHENOLOGISTS 2008

The 18th meeting of Australasian Lichenologists will be held in Gippsland, Victoria, on Saturday and Sunday, April 12–13, 2008. This is a preliminary announcement, and further details will be published in the January, 2008, issue of *Australasian Lichenology*.

The meeting will start at 9 a.m. on April 12 at the Regional Office of the Department of Sustainability and Environment (DSE) in Traralgon. It is intended that the morning will be devoted to talks and presentations. Topics will be confirmed closer to the date of the meeting. Following lunch, fieldwork will be undertaken in the local area, with an opportunity for informal discussions. A group dinner is planned for Saturday.

Additional fieldwork will take place on Sunday, April 13, to Baw Baw National Park. The departure place will be the DSE Regional Office, Traralgon. Mt Baw Baw lies approximately 50 km N of Traralgon, and we will visit sites accessible by two-wheel drive. Baw Baw National Park covers a substantial part of the Baw Baw Plateau plus sections of the Thomson and Aberfeldy River valleys. Elevations in the park range from 1565 m on the Baw Baw Plateau to 300 m in the river valleys, and the park has large areas of subalpine vegetation.

Traralgon is reached by the Princes Highway (M1), and lies approximately 170 km E of Melbourne. It is also readily accessible by train (V-line) from Melbourne. Traralgon has a range of accommodation, some within walking distance of the DSE office.

Some useful web-site information:

accommodation: <http://www.travelvictoria.com.au/traralgon/accommodation/>
Baw Baw NP: <http://www.australialps.deh.gov.au/parks/bawbaw/html>

For further information, contact Simone Louwhoff by post, phone, or e-mail.
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NEWS

RAY CRANFIELD AWARDED A SIR WINSTON CHURCHILL FELLOWSHIP

Ray Cranfield from the Department of Environment and Conservation in Manjimup has been awarded a Churchill Fellowship to study historical lichen collections and to investigate community involvement in lichen surveys in the United Kingdom and Sweden. He'll be there for seven weeks during June and July of 2008.

In the UK, Ray will access lichen collections held in the British Museum and those of the British Lichen Societies (BLS) in Dundee, Scotland. He hopes to bring back digital images of species that are recorded for Western Australia but only rarely recognized because no specimens of them are lodged in the Perth Herbarium. During the last weeks of his Fellowship, Ray will meet with co-ordinators of the BLS's Churchyard Project to discuss how best to maintain community involvement. He hopes to establish a similar community effort to document Western Australia's unique flora. A visit to Kew Herbarium is also on his must-do list, because he's interested in the taxonomy of WA's vascular flora. During his two weeks in Sweden, he'll travel to Lund and Uppsala to look at specimens and to catch up with Ingvar Kärnefelt.

Two new species in the Australian Graphidaceae (lichenized Ascomycotina)

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Abstract: *Acanthothecis borealis* A.W.Archer & Elix, with protocetraric acid, and *Graphis cycasicola* A.W.Archer & Elix, with norstictic acid, are described as new to science.

Recent studies on the Australian Graphidaceae have confirmed the presence of three species in the genus *Acanthothecis* and 67 species in the genus *Graphis* (Archer 2006, Archer & Elix 2007). An examination of recent collections from the Northern Territory has revealed the presence of two new species, one in each genus. The chemistry of the new species was analyzed by thin-layer chromatography (Elix & Ernst-Russell 1993) and confirmed by high-performance liquid chromatography (Elix *et al.* 2003).

Acanthothecis borealis A.W.Archer & Elix, sp. nov. Fig. 1
Sicut *Acanthothecis clavulifera* (Vain.) Staiger & Kalb sed ascosporis minoribus differt.

Etymology: from the Latin *borealis*, northern, a reference to the type locality in the north of Australia.

Type: Australia, Northern Territory, Berry Spring Nature Park, 47 km S of Darwin, 12°42'06"S, 130°59'57"E, alt. 35 m, on twigs of treelet, *J.A. Elix 37360*, 4.viii.2005 (Holotype—CANB).

Thallus off-white to pale grey, surface smooth to subtuberculate, corticolous. Apothecia lirelliform, inconspicuous, scattered, concolorous with the thallus, simple, straight, curved or sinuous, lips closed, with a conspicuous thalline margin, 1–2 mm long, 0.2–0.3 mm wide. Exciple not carbonized. Hymenium 120–140 µm tall, not interspersed, I-negative. Ascospores narrowly elongate-ellipsoid, hyaline, 4–8 per ascus, 40–56 µm long, 7–8 µm wide, 16–18-locular, I-negative, with a thin halo (epispore) 1–2 µm wide.

Chemistry: protocetraric acid.

Acanthothecis borealis is a rare, inconspicuous species known only from the type specimen from the Northern Territory. It is characterized by the inconspicuous lirellae, the long, narrow ascospores giving no colour with iodine, and the presence of protocetraric acid. It resembles the chemically similar *A. clavulifera* Staiger & Kalb (Staiger & Kalb 1999), but is distinguished from that species by shorter ascospores (40–56 µm compared with 85–117 µm) with fewer locules (16–18 compared with 36–47). Ascospores in the genus *Acanthothecis* range in length from 20 µm and 4-locular (Makhija & Adawadkar 2007) to 100 µm and multilocular or muriform (Staiger 2002), and are a useful taxonomic character. The new species is distinguished from other species of *Acanthothecis* containing protocetraric acid by the size and structure of its ascospores—the spores of *Acanthothecis abaphoides* (Nyl.) Staiger & Kalb and *A. hololeucoides* (Nyl.) Staiger & Kalb are muriform, whereas those of *A. subclavulifera* (Nyl.) Staiger & Kalb are locular and measure 75–110 µm in length.

Graphis cycasicola A.W.Archer & Elix, sp. nov. Fig. 2
Sicut *Graphis subserpentina* Nyl. sed excipulum integrum atratum ad basim planatum differt.

Etymology: from *Cycas*, the substratum of the holotype, plus the Latin *cola*, dweller or living on.

Type: Australia, Northern Territory, Berry Springs Nature Park, 47 km S of Darwin, 12°42'06"S, 130°59'57"E, alt. 35 m, on bark of *Cycas armstrongii*, *J.A. Elix 37306*, 4.viii.2005 (holotype—CANB).

Thallus pale olive-green to pale fawn, surface smooth and dull, corticolous. Apothecia lirelliform, conspicuous, scattered, simple, straight, curved or sinuous, rarely branched, semi-immersed, lips closed, with a thick, conspicuous thalline margin almost completely covering the exciple, 1–4(–5) mm long, 0.4–0.7 mm wide. Exciple completely carbonized. Hymenium 120–150 µm tall, I-negative, not interspersed. Ascospores 1 per ascus, ellipsoid, hyaline, muriform, 110–125 µm long, 25–32 µm wide, I+ blue.

Chemistry: norstictic acid.

Graphis cycasicola is a rare corticolous species known only from the type specimen from the Northern Territory. It is characterized by the semi-immersed lirellae, the completely carbonized exciple, the muriform ascospores, and the presence of norstictic acid. It resembles *G. subserpentina* Nyl. both chemically and morphologically, but differs in having a completely carbonized exciple. It also superficially resembles *G. polyclades* Kremp. and *G. streblocapa* (Bél.) Nyl. (*cf.* Archer 2006, Figs 59 and 60), but both those species contain stictic acid.

References

- Archer, AW (2006): The lichen family Graphidaceae in Australia. *Bibliotheca Lichenologica* **94**, 1–191.
- Archer, AW; Elix, JA (2007): New species and new reports in the Australian Graphidaceae. *Telopea* **11**, 451–462.
- Elix, JA; Ernst-Russell, KD (1993): *A Catalogue of Standardized Thin Layer Chromatographic Data and Biosynthetic Relationships for Lichen Substances*, 2nd Edn, Australian National University, Canberra.
- Elix, JA; Giralt, M; Wardlaw, JH (2003): New chloro-depsides from the lichen *Dimelaena radiata*. *Bibliotheca Lichenologica* **86**, 1–7.
- Makhija, U; Adawadkar, B (2007): Trans-septate species of *Acanthothecis* and *Fissurina* from India. *Lichenologist* **39**, 69–134.
- Staiger, B; Kalb, K (1999): *Acanthothecis* and other graphidioid lichens with warty periphysoids or paraphysis tips. *Mycotaxon* **73**, 69–134.
- Staiger, B (2002): Die Flechtenfamilie Graphidaceae. *Bibliotheca Lichenologica* **85**, 1–526.

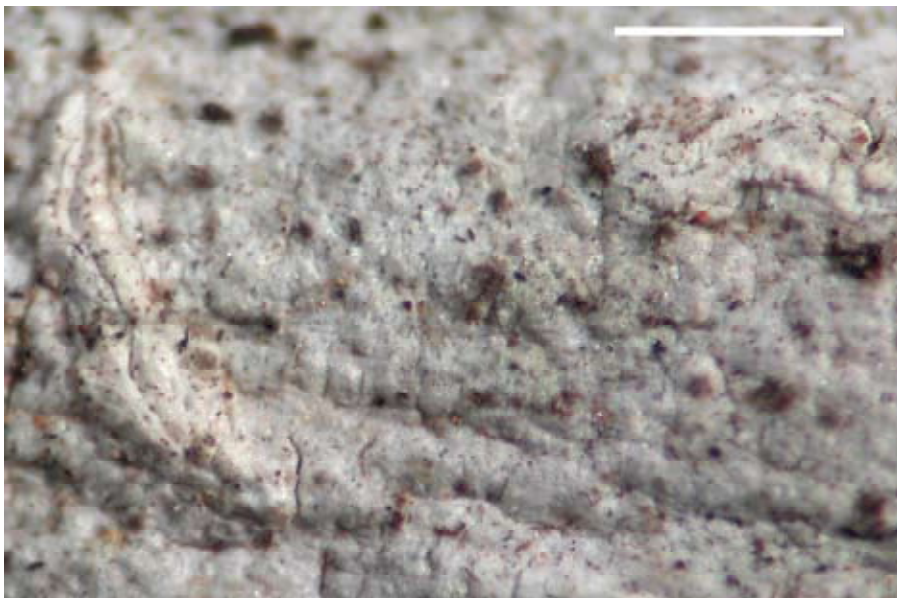


Figure 1. *Acanthothecis borealis* (J.A. Elix 37360, holotype CANB). Scale bar = 1 mm.



Figure 1. *Graphis cycasicola* (J.A. Elix 37306, holotype CANB). Scale bar = 1 mm.

Further new crustose lichens (Ascomycota) from Australia

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Abstract: *Hypocenomyce tinderryensis* Elix, *Ochrolechia neosidiata* Elix and *Rinodina leprosa* Elix are described as new to science. The new combination *Letrouitia sayeri* (Müll.Arg.) Elix is made.

The examination of various collections of crustose lichens in preparation for a further lichen volume of the *Flora of Australia* has led to the identification of several undescribed species. Three are described in the present paper: *Hypocenomyce tinderryensis* Elix, *Ochrolechia neosidiata* Elix and *Rinodina leprosa* Elix, and the new combination *Letrouitia sayeri* (Müll.Arg.) Elix is made. Chemical constituents were identified by thin-layer chromatography (Elix & Ernst-Russell 1993), high-performance liquid chromatography (Elix *et al.* 2003) and comparison with authentic samples.

The New Species

Hypocenomyce tinderryensis Elix sp. nov.

Fig. 1

Sicut *Hypocenomyce australis* sed superfice densis sorediatis differt.

Type: Australia. New South Wales, Tinderry Range, 10 km E of Michelago, 35°45'S, 149°16'E, 1200 m, on dead *Eucalyptus* trunk on exposed S slope surrounded by open *Eucalyptus dalrympleana*-dominated forest, 12.i.1993, H. Streimann 50968 (holotype CANB; isotypes B, KRAM, MSC, NY, TU).

Thallus squamulose, up to 10 cm wide; squamules 0.3–0.8 mm wide, adnate, not proliferating, flat to moderately convex, white, off-white, pale olive-green to yellow-brown. Isidia absent; soredia present. Soralia marginal, pustulate at first, then spreading along margins and ± over the upper surface, soredia copious, white to pale yellow-grey, granular, granules 40–75 µm wide. Upper cortex 25–40 µm thick, including an epinecral layer up to 15 µm thick. Apothecia common, 0.4–1.5 mm wide, attached to margins of squamules or directly to the substratum, ± flat; disc black, epruinose or faintly blue-white-pruinose, smooth; margin persistent, becoming somewhat flexuose, concolorous or in part paler than the disc, ± blue-white pruinose. Exciple colourless within, rim green; hypothecium pale to medium brown, 75–100 µm thick; epithecium brownish green, 10–15 µm thick; hymenium colourless, 35–50 µm high. Mature asci and ascospores very rare; asci clavate, 8-spored; ascospores simple, colourless, ellipsoid, 6–8 × 2.5–3.0 µm. Pycnidia not seen.

Chemistry: cortex and medulla K–, C+ red, KC+ red, P–; containing lecanoric acid (major), ± orsellinic acid (trace).

Etymology: The specific epithet is derived from the Tinderry Range in southern New South Wales, the type locality, plus the Latin *-ensis* (place of origin).

Remarks

The new species is characterized by the squamulose thallus, the narrow, adnate, congested squamules that develop copious soredia along the margins, and the presence of medullary lecanoric acid. *Hypocenomyce scalaris* (Ach.) M.Choisy has identical chemistry and similar morphology, in particular squamules with sorediate margins. However, the squamules of *H. scalaris* are broader (0.4–2.0 mm *cf.* 0.3–0.8 mm wide), ascending and geotropically oriented (rather than adnate and flat), and are

generally discrete and only very rarely become somewhat conglomerate. The apothecia of *H. scalaris* from the Northern Hemisphere are larger (1.5–2.5 mm cf. 0.4–1.5 mm wide) and the ascospores are longer (9–12 × 2.5–4.0 μm cf. 6–8 × 2.5–3.0 μm) (Schneider 1979). Fertile *H. scalaris* has not been reported from Australia, even though the species is very common.

At present the new species is known only from the type locality where it occurred on the base of a dead *Eucalyptus* in open *Eucalyptus* woodland. Commonly associated species include *Hypocenomyce australis* Timdal, *H. foveata* Timdal, *Hyogymnia pulverata* (Nyl.) Elix, *Parmelina conlabrosa* (Hale) Elix & J. Johnst., *P. pseudorelicina* (Jatta) Kantvilas & Elix, *Physcia jackii* Moberg, *Pyrrhospora arandensis* Elix, *Ramboldia stuartii* (Stirt.) Kantvilas & Elix and *Usnea inermis* Motyka.

Ochrolechia neoisidiata Elix, sp. nov. Fig. 2
Sicut *Ochrolechia isidiata* sed acidum 5-O-methylhiascicum continente differt.

Type: Australia. Northern Territory, Howard Springs Road, 34.5 km SE of Darwin, 12°28'37"S, 131°01'59"E, 30 m, on *Callitris* in *Callitris* plantation, 3.viii.2005, J.A. Elix 37106 (holotype CANB).

Thallus creamy white to pale fawn, thin to thick, cracked-areolate, corticolous; surface smooth to verrucose, dull to slightly shiny, lacking soredia, isidiolate. Isidia numerous, simple, subglobose to cylindrical, robust, concolorous with the thallus, 0.1–0.2 mm tall, 0.05–0.1 mm wide. Apothecia and pycnidia not seen.

Chemistry: Thallus K–, C+ red, KC+ red, P–; containing gyrophoric acid (minor), 5-O-methylhiascic acid (major), lecanoric acid (minor), 5-methoxylecanoric acid (minor).

Etymology: The specific epithet refers to the similarity of the new species to *Ochrolechia isidiata*, (Latin, *neo* = new, pertaining to *O. isidiata*).

Remarks

Ochrolechia neoisidiata is characterized by the sterile isidiolate thallus and the unique thalline chemistry. Morphologically it closely resembles the neotropical *O. isidiata* (Malme) Versegny, but the two taxa can be distinguished by their respective chemistries, *O. isidiata* containing gyrophoric acid, lecanoric acid and commonly accessory lichexanthone (Brodo 1991). Further, the isidia of *O. isidiata* are usually taller (0.1–0.5 mm cf. 0.1–0.2 mm) and sometimes become granulose.

At present the species is only known from the type locality, where it occurs on the bark of *Callitris* trees. Commonly associated species include *Coccocarpia palmicola* (Spreng.) Arv. & D.J. Galloway, *Dirinaria picta* (Sw.) Schaer. ex Clem., *Hafellia rechingeri* (Zahlbr.) Marbach and *Protoparmelia pulchra* Diederich, Aptroot & Sérus.

Rinodina leprosa Elix sp. nov. Fig. 3
Sicut *Rinodina furfuracea* sed atranorinum, chloroatranorinum et zeorinum continente differt.

Type: Australia. Victoria, Reef Hills State Park, 7 km SSW of Benalla, 36°36'53"S, 145°56'03"E, 155 m, on base of *Eucalyptus* in open *Eucalyptus* woodland, 5.v.2006, J.A. Elix 37188 (holotype MEL; isotypes CANB, HO).

Thallus crustose, superficial, thin and smooth, becoming ±entirely blastidiate to form a ±continuous, leprose-granulose crust, pale blue-grey to whitish grey, thin, spreading to 7 cm wide, not delimited, no prothallus observed; sorediate granules 30–50 μm diam., consoredia up to 125 μm wide. Photobiont a unicellular green alga; cells 10–14 μm diam. Apothecia uncommon, lecanorine, sessile, broadly attached, 0.4–1.2 mm wide; thalline margin concolorous with the thallus, thin, entire in young apothecia,

becoming flexuose, densely blastidiate-sorediate, finally completely excluded; disc dark brown to brown-black, ±flat but becoming strongly convex. Epithemium brown; hymenium colourless, 75–125 μm high; hypothecium pale yellow, 75–110 μm wide. Paraphyses 1.5–2.0 μm wide; apices 3–5 μm wide. Asci of the *Lecanora*-type, 60–90 × 10–20 μm. Ascospores 8 per ascus, *Physcia*-type, brown, ellipsoid, 15–20 × 10–13 μm with a well-developed torus. Pycnidia not seen.

Chemistry: Thallus K+ yellow, C–, P+ yellow; containing atranorin (major), chloroatranorin (major), zeorin (major).

Etymology: The specific epithet refers to the characteristic leprose-sorediate upper surface of the thallus.

Remarks

Morphologically *R. leprosa* closely resembles *R. furfuracea* H. Magn. in that both species are characterized by thin, entirely blastidiate thalli with small blastidia forming a more or less continuous leprose-granulose crust, and by *Physcia*-type ascospores (Giralto et al. 1995). However, *R. leprosa* can be distinguished by its broader ascospores (10–13 μm cf. 6.5–11 μm wide) and by its chemistry, that is, the presence of atranorin, chloroatranorin and zeorin. In *R. furfuracea*, all thallus reactions are negative, and no lichen substances can be detected. Chemically *R. leprosa* is identical with *R. degeliana* Coppins, but that species is characterized by its small, discrete areoles (up to 0.5 mm wide) which develop discrete soralia along the margins, soralia that remain scattered and rarely confluent, and by its longer ascospores, 19–25 × 10–14 μm (Coppins 1983).

At present, the new species is known only from the type locality where it is common on the base of trees in open *Eucalyptus* woodland. Commonly associated species include *Calicium robustellum* Nyl., *Candelariella xanthostigmoides* (Müll. Arg.) R.W. Rogers, *Fuscopannaria decipiens* (P.M. Jørg. & D.J. Galloway) P.M. Jørg., *Parmelina conlabrosa* (Hale) Elix & J. Johnst., *Pertusaria doradoraensis* A.W. Archer & Elix, *Physcia undulata* Moberg, *Pyrrhospora arandensis* Elix and *Ramboldia stuartii* (Stirt.) Kantvilas & Elix.

ADDITIONAL SPECIMENS EXAMINED

Victoria. • type locality, on base of *Eucalyptus* in open *Eucalyptus* woodland, 5.v.2006, J.A. Elix 37185, 37192 (CANB, GZU).

The new combination

Letrouitia sayeri (Müll. Arg.) Elix, comb. nov. Fig. 4
Basionym: *Heterothecium sayeri* Müll. Arg., *Flora* 70: 338 (1887). *Lecidea sayeri* (Müll. Arg.) Shirley, *Proc. Roy. Soc. Queensland* 6: 184 (1889). *Lopadium sayeri* (Müll. Arg.) Zahlbr., *Cat. Lich. Univ.* 4: 313 (1926).

Type: Australia, Queensland, Russell River, W.A. *Sayer s.n.*, holo: G; iso: G, S.

Thallus greenish to olive-grey or pale orange, K+ slowly turning purple, thin; soredia and isidia absent. Apothecia common and dispersed over the thallus, round to somewhat distorted, sessile, constricted at the base, 0.5–1.5 mm wide; disc dark rust-red to blackberry-red, ±flat; margin prominent, smooth, dark rust-red or sometimes slightly paler than the disc, disc and margin K+ blue-violet (appearing black under the microscope); exciple biatorine (in cross-section), composed of hyaline, radiating, agglutinated hyphae, the outer layer encrusted with red anthraquinone crystals that penetrate deep within the excipulum, the inner layer colourless and lacking anthraquinone crystals. Hymenium not interspersed, colourless, 80–100 μm high; hypothecium colourless to yellow. Epithemium encrusted with red anthraquinone crystals, K+ blue or blue-violet. Asci usually 2-spored, rarely 3–4-spored, 65–85 × 16–23 μm; ascospores broadly ellipsoid, densely muriform, 32–50 × 20–25 μm. Conidia not seen.

Chemistry: Thallus and apothecia K+ blue-violet; thallus containing \pm fragilin (minor), \pm parietin (minor), \pm 7-chloroemodin (trace), \pm 7-chloroemodin (trace), \pm 7-chloroparietinic acid (trace), fragilin bisanthrone (minor), \pm physcoicin bisanthrone (trace); apothecia containing \pm fragilin (minor), \pm parietin (minor), fragilin bisanthrone (minor), \pm physcoicin bisanthrone (trace), exuviatic acid B (minor), unknowns (major or minor).

Remarks

Hafellner (1981) considered *Heterothecium sayeri* to be synonymous with *Letrouitia subvulpina* (Nyl.) Hafellner, and morphologically the two taxa are very similar. Subsequently, Johansson *et al.* (2005) undertook a comprehensive investigation of the chemical variation in the genus *Letrouitia*, and found that *L. subvulpina sens. lat.* exhibited two chemotypes that had different geographical distributions. Those containing dibenzofurans originated from Africa and South America, while those lacking dibenzofurans were collected in Australasia and the Pacific region. The two groups are here distinguished as *L. subvulpina sens. str.* and *L. sayeri*, respectively. Not only do those two groups show substantive chemical differences, but the ascospores of *L. sayeri* were found to be broader than those of *L. subvulpina* (20–25 μ m cf. 16–20 μ m).

SPECIMENS EXAMINED

Australia. Queensland: • Between Airlie Beach and Shute Harbour, Whitsunday Coast, 25.ix.1981, H. Mayrhofer (GZU).

Papua New Guinea. Morobe Province: • Bulolo-Watut Divide, 8 km SW of Bulolo, 7°15'S, 146°36'E, 1550 m, on vine in *Castanopsis*-dominated forest, 18.vii.1982, H. Streimann 22392 (B, CANB); • Road #2, 3 km SW of Bulolo, 7°13'S, 146°37'E, 750 m, on *Dysoxylum* trunk in disturbed lowland forest, 5.v.1989, H. Streimann 41867 (B, CANB).

Acknowledgements

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References

- Brodo, IM (1991): Studies in the lichen genus *Ochrolechia*. 2. Corticolous species of North America. *Canadian Journal of Botany* **69**, 733–772.
- Coppins, BJ (1983): A new corticolous sorediate *Rinodina* from Swedish Lapland. *Lichenologist* **15**, 147–150.
- Elix, JA; Ernst-Russell, KD (1993): *A Catalogue of Standardized Thin-Layer Chromatographic Data and Biosynthetic Relationships for Lichen Substances*, 2nd Edn, Australian National University, Canberra.
- Elix, JA; Giralt, M; Wardlaw, JH (2003): New chloro-depsides from the lichen *Dimelaena radiata*. *Bibliotheca Lichenologica* **86**, 1–7.
- Giralt, M; Mayrhofer, H; Sheard, JW (1995): The corticolous and lignicolous sorediate, blastidiate and isidiate species of the genus *Rinodina* in southern Europe. *Lichenologist* **27**, 3–24.
- Hafellner, J (1983): Monographie der Flechtengattung *Letrouitia* (Lecanorales, Teloschistineae). *Nova Hedwigia* **35**, 645–729.
- Johansson, S; Søchting, U; Elix, JA; Wardlaw, JH (2005): Chemical variation in the lichen genus *Letrouitia* (Ascomycota, Letrouitiaceae). *Mycological Progress* **4**, 139–148.
- Schneider, G (1979): Die Flechtengattung *Psora* sensu Zahlbruckner. *Bibliotheca Lichenologica* **13**, 1–291.

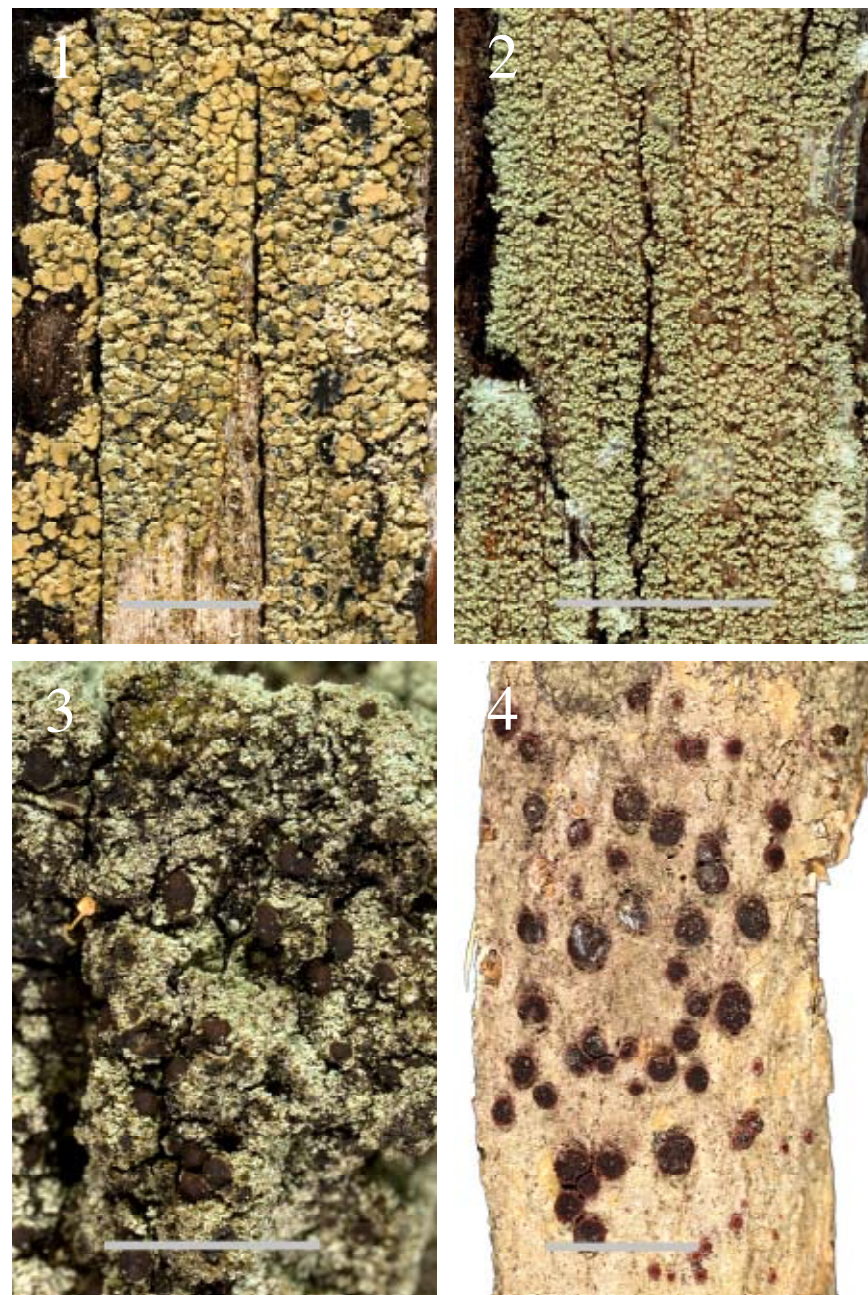
Captions for Figures

Figure 1. *Hypocenomycyces tinderryensis* (holotype in CANB). Bar = 5 mm.

Figure 2. *Ochrolechia neoisidiata* (holotype in CANB). Bar = 5 mm.

Figure 3. *Rinodina leprosa* (isotype in CANB). Bar = 5 mm.

Figure 4. *Letrouitia sayeri* (Streimann 41867 in CANB). Bar = 5 mm.



A new variety of *Pertusaria georgeana* (lichenized Ascomycota) containing a new depside

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ABSTRACT: *Pertusaria georgeana* var. *goonooensis* is described as new to science. This variety has been shown to contain the new depside 2,4-di-*O*-methylolivivetic acid as a major component.

The lichen *Pertusaria georgeana* A.W.Archer & Elix was first described from a single corticolous collection from near St George in inland, southern Queensland (Archer 1997). This species is typically sterile, but bears vegetative propagules (globose isidia). Although the isidia are usually globose at first, they proliferate or become blastidiate and coarsely sorediate with age. More recently, this species has been found to be relatively widespread in eastern Australia (Elix 2007).

In the present work, a new variety of *P. georgeana* is described that contains a new depside, 2,4-di-*O*-methylolivivetic acid, as the major component. 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.

***Pertusaria georgeana* var. *goonooensis* Elix & A.W.Archer, var. nov.** Fig. 1

Sicut *Pertusaria georgeana* A.W. Archer & Elix sed acidum 2,4-di-*O*-methyloliviveticum continente differt.

Type: Australia. New South Wales: Goonoo State Forest, Modriguy Forest Road, 5 km E of Modriguy, 23 km NNE of Dubbo, 32°04'16"S, 148°42'53"E, 330 m, *Callitris-Eucalyptus* woodland with *Calytrix* and *Westringia* understorey, on dead wood, J.A. Elix 36764, 11.x.2005 (CANB-holotype).

Thallus crustose, off-white to dull fawn or pale olive-green, corticolous or lignicolous, surface dull, smooth or subtuberculate, somewhat shiny, isidiate. Isidia inconspicuous, numerous, concolorous with the thallus, 0.1–0.2 µm tall, 0.05 mm diam, globose at first, proliferating or becoming blastidiate and coarsely sorediate with age. Apothecia and pycnidia not seen.

Chemistry. Thallus K–, C–, KC–, P–; containing 4,5-dichlorolichexanthone (minor), 2,4-di-*O*-methylolivivetic acid (major), 2-*O*-methylperlatolic acid (minor).

Etymology: The specific epithet is derived from the Latin *-ensis* (place of origin) and the type locality, Goonoo State Forest.

Remarks

This taxon is characterized by the off-white to duff fawn or pale olive-green thallus, the isidiate-blastidiate upper surface and the presence of 4,5-dichlorolichexanthone, 2,4-di-*O*-methylolivivetic acid and trace amounts of 2-*O*-methylperlatolic acid. The new variety is morphologically identical to *P. georgeana* var. *georgeana*, but the latter differs

chemically in containing 4,5-dichlorolichexanthone (minor) and 2-*O*-methylperlatolic acid (major), and has a much broader distribution (Queensland, New South Wales and the Australian Capital Territory) (Archer 1997, Elix 2007).

The new variety occurs on dead wood or on the base of *Eucalyptus* trees in open *Eucalyptus*-*Callitris* woodland. It often resembles *Hertelidea aspera* (Müll.Arg.) Kantvilas & Elix or *H. pseudobotryosa* R.C.Harris, Ladd & Printzen, and can co-occur with the latter species. However, the *Hertelidea* species are chemically quite distinct, containing perlatolic acid as their major constituent, and they lack 4,5-dichlorolichexanthone. At present, the new variety is only known from the type locality where associated species included *Hypogymnia billardieri* (Kremp.) Filson, *Pannoparmelia wilsonii* (Räsänen) D.J.Galloway, *Parmelia pseudotenuirima* Gyeln., *Parmelina conlabrosa* (Hale) Elix & J.Johnst., *Punctelia subalbicans* (Stirt.) D.J.Galloway & Elix, *Pyrrhospora arandensis* Elix, *Ramboldia brunneocarpa* Kantvilas & Elix and *Tephromela atra* (Huds.) Hafellner.

SPECIMENS EXAMINED

New South Wales: • type locality, on base of *Eucalyptus*, J.A. Elix 36750, 36751, 36752, 36956, 11.x.2005 (CANB); on dead wood, J.A. Elix 36765, 11.x.2005 (CANB).

Structural confirmation of 2,4-di-*O*-methylolivivetic acid (1)

The structure of the new depside was established using the microhydrolysis methodology developed by Culberson (1972). A small portion of *P. georgeana* (100 mg, Elix 36956) was extracted with warm acetone. The residue obtained by evaporation of the acetone extract was dissolved in concentrated sulfuric acid (3–4 drops) at room temperature, and then the solution was cooled in an ice bath for 20 min. Crushed ice was then added, and the hydrolysis products were extracted with diethyl ether. The residue obtained on evaporation of the ether extract was analyzed by TLC and HPLC using the standard methods (Elix & Ernst-Russell 1993, Elix *et al.* 2003). The new depside (1) afforded two products in approximately equal proportions; di-*O*-methylolivivetonide (2) derived from the A-ring of (1) and 2,4-dihydroxy-6-pentylbenzoic acid (3) derived from the B-ring of (1). The identity of the hydrolysis products (2) and (3) followed TLC and HPLC comparisons with authentic, synthetic samples (Huneeck & Yoshimura 1996) as well as comparisons of their respective ultraviolet spectra. 2,4-di-*O*-methylolivivetic acid (1) exhibited standard TLC Rf values: Rf (A) 49; Rf (B') 57; Rf (C) 46 and standard HPLC Rt 28.68 min. It is interesting to note that the depsides present in *P. georgeana* var. *georgeana* and *P. georgeana* var. *goonooensis* are biosynthetically closely related. Thus 2,4-di-*O*-methylolivivetic acid can be considered a higher homologue of 2-*O*-methylperlatolic acid (with a seven-carbon rather than a five-carbon side chain in the A-ring).

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References

- Archer, AW (1997): The Lichen genus *Pertusaria* in Australia. *Bibliotheca Lichenologica* **69**, 1–249.
Culberson, CF (1972): Improved conditions and new data for the identification of lichen products by a standardized thin-layer chromatographic method. *Journal of Chromatography* **72**, 113–125.
Culberson, CF; Johnson, A (1982): Substitution of methyl *tert*-butyl ether for diethyl ether in the standardized thin-layer chromatographic method for lichen products. *Journal of Chromatography* **238**, 483–487.
Elix, JA (2007): Additional lichen records from Australia 62. *Australasian Lichenology* **60**, 6–12.

Elix, JA; Ernst-Russell, KD (1993): *A Catalogue of Standardized Thin-Layer Chromatographic Data and Biosynthetic Relationships for Lichen Substances*, 2nd Edn, Australian National University, Canberra.
 Elix, JA; Giral, M; Wardlaw, JH (2003): New chloro-depsides from the lichen *Dimelaena radiata*. *Bibliotheca Lichenologica* **86**, 1–7.
 Huneck, S; Yoshimura, I (1996): *Identification of Lichen Substances*. Springer-Verlag, Berlin, Heidelberg, New York.



Figure 1. *Pertusaria georgeana* var. *goonooensis* (holotype in CANB). Bar = 1 mm.

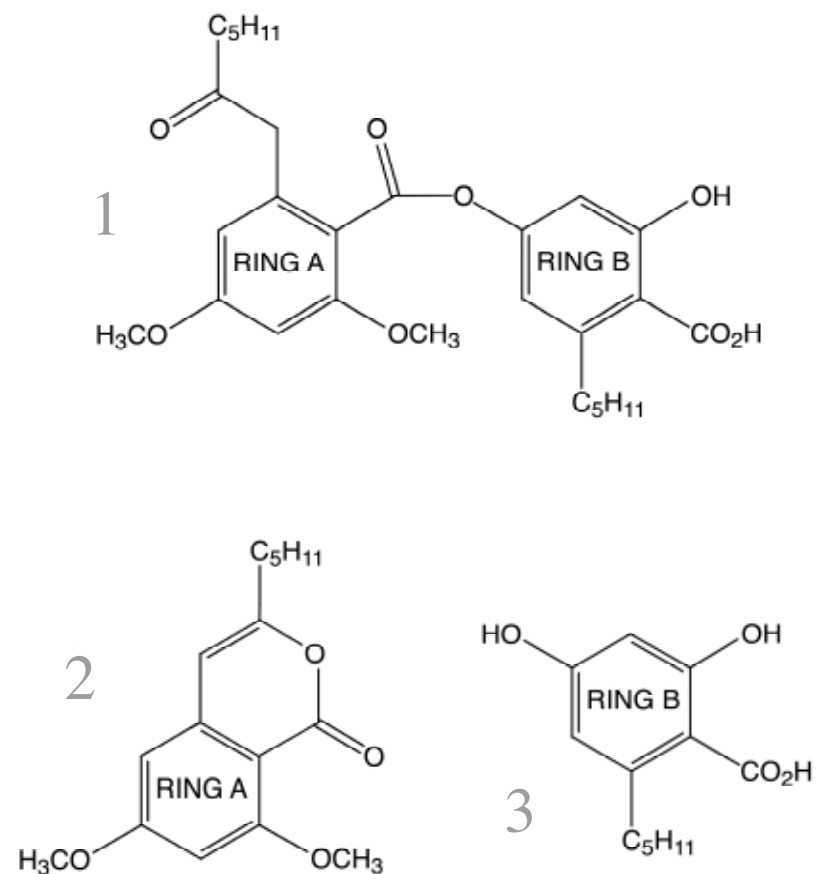


Figure 2. The structure of 2,4-di-O-methylolivetoric acid and its hydrolysis products.

A new species of *Xanthoparmelia* (Parmeliaceae, lichenized Ascomycota) from Australia

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Abstract: *Xanthoparmelia dapperensis* Elix from New South Wales is described as new to science.

The lichen family Parmeliaceae is particularly well represented in Australia, and has been investigated intensively over the past 25 years (see Orchard 1994). However, the lichens of some less-accessible regions as well as some difficult species complexes remain to be studied. A detailed survey of the family in Australia is currently in progress, and 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.

Xanthoparmelia dapperensis Elix, sp. nov.

Fig. 1

Thallus ut in *Xanthoparmelia elixii* sed superficie effiguratus maculatibus differt.

Type: Australia. New South Wales: Dapper Nature Reserve, 37 km NE of Wellington, 10 km N of Goma turnoff, 32°18'58"S, 149°11'58"E, 520 m, on soil and pebbles in mixed *Eucalyptus-Callitris* woodland, J.A. Elix 36103, 25.iv.2005; holo: CANB.

Thallus foliose, loosely adnate, saxicolous or terricolous, to 3–5 cm wide. Lobes separate, weakly imbricate, almost flat to weakly concave, sublinear-elongate, divaricate, subdichotomously branched, 1–2 mm wide, laciniate; laciniae sublinear-elongate, dichotomously branched, 0.2–0.5 mm wide. Upper surface pale yellow-green, shiny to dull, effigurate-maculate; maculae dense towards the apices, lacking isidia and soredia. Medulla white. Lower surface shiny, pale tan to brown, dark brown at the apices; rhizines dense, often projecting beyond the margins, simple or sparingly furcate, often tufted at apices, dark brown or black. Apothecia not seen. Pycnidia common, immersed. Conidia bifusiform, 7–9 × 1 µm.

Chemistry: Cortex K–, medulla K+ yellow then red, C–, P+ yellow-orange; containing usnic acid (minor), norstictic acid (major), connorstictic acid (minor/trace).

Etymology. The specific epithet is derived from the Latin *-ensis* (place of origin) and Dapper Nature Reserve, the type locality.

Notes. In many respects, *X. dapperensis* resembles *X. elixii* Filson, in that both species contain medullary norstictic acid and have moderately to loosely adnate foliose thalli which develop relatively narrow, subdichotomously to dichotomously branched laciniae and a pale brown lower surface, and lack soredia and isidia. However, those two species differ in a number of respects. Whereas *X. elixii* has contiguous to densely imbricate, irregular lobes with an emaculate upper surface and a sparsely rhizinate lower surface with simple rhizines, *X. dapperensis* has separate to weakly imbricate lobes with an effigurate-maculate upper surface and a densely rhizinate lower surface with simple to furcate rhizines that are often tufted at the apices.

At present, the new species is only known from the type collection. Common species on adjacent soil and pebbles included *Cladia corallaizon* F. Wilson *ex* Filson, *Heterodea muelleri* (Hampe) Nyl., *Parapropidia leptocarpa* (C.Bab. & Mitt.) Rambold & Hertel, *Xanthoparmelia lineola* (Berry) Hale, *X. mougeotina* (Nyl.) D.J.Galloway, *X. neotinctina* (Elix) Elix & J.Johnst., *X. reptans* (Kurok.) Hale, *X. substrigosa* (Hale) Hale, *X. ustulata* (Kurok. & Filson) Elix & J.Johnst. and *X. verisidiosa* (Essl.) Blanco *et al.*

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References

- Culberson, CF (1972): Improved conditions and new data for the identification of lichen products by a standardized thin-layer chromatographic method. *Journal of Chromatography* **72**, 113–125.
Culberson, CF; Johnson, A (1982): Substitution of methyl *tert*-butyl ether for diethyl ether in the standardized thin-layer chromatographic method for lichen products. *Journal of Chromatography* **238**, 483–487.
Elix, JA; Ernst-Russell, KD (1993): *A Catalogue of Standardized Thin Layer Chromatographic Data and Biosynthetic Relationships for Lichen Substances*, 2nd Edn, Australian National University, Canberra.
Elix, JA; Giralt, M; Wardlaw, JH (2003): New chloro-depsides from the lichen *Dimelaena radiata*. *Bibliotheca Lichenologica* **86**, 1–7.
Orchard, AE (ed.) (1994): *Flora of Australia* **55**, 1–360.



Figure 1. *Xanthoparmelia dapperensis* (holotype in CANB). Scale bar = 5 mm.