Australasian Lichenology
Number 54, January 2004

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Haematomma eremaeum, endemic to dry inland parts of Western Australia, where it grows on the bark of *Acacia acuminata*, *Melaleuca hamulosa*, and other species in open woodland. The warty, cream-coloured thallus and sessile apothecia with pink to cinnabar-red discs are charactistic of the species.

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16th MEETING OF AUSTRALASIAN LICHENOLOGISTS 2004

The 16th meeting of Australasian lichenologists will be held at Jindabyne, NSW, and adjacent Kosciuszko National Park on Saturday and Sunday, 17–18 April, 2004.

The format of the gathering will differ from that of recent years. Instead of formal talks, on both days lichen forays will be made to several localities in Kosciuszko National Park, including areas above the tree line and at lower elevations in *Eucalyptus pauciflora* (snow gum) woodland. A group dinner is planned for Saturday evening, and will be followed by informal discussions on regional lichenological topics and progress with the lichen volumes of the *Flora of Australia*.

Assembly will be at 9:15 a.m. on Saturday, 17 April, in the carpark immediately in front of the Snowy Region Visitors' Centre, Kosciuszko Road, Jindabyne.

Jindabyne has a wide range of accommodation, including pubs, cabins, ski lodges, hotels, motels, and resorts. However, even in the off (non-ski) season, it's a popular destination for school excursions, so don't leave your booking too late. Information on accommodation is available at http://www.walkabout.com.au/fairfax/locations/NSWJindabyne.shtml

To assist with field-trip and dinner logistics, you should register in advance with Jack Elix. If you have any questions on accommodation or other details, you can contact him by **post** at the Department of Chemistry, Faculty of Science, Australian National University, Canberra, ACT 0200, **phone** at +61–(0)2–6125–2937, **fax** at +61–(0)2–6125–0760, or **e-mail** at John.Elix@anu.edu.au

2'-*O*-Methyllecanoric acid and 2-*O*-methyllecanoric acid, two new depsides from *Hypotrachyna everniiformis*

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Abstract: The first natural occurrence of the depsides 2'-*O*-methyllecanoric acid and 2-*O*-methyllecanoric acid is reported from extracts of the lichen *Hypotrachyna everniiformis*. The new combination *Hypotrachyna everniiformis* (Zahlbr.) Elix, T. Nash & Sipman is made.

Lecanoric acid (1) is a very common orcinol depside, widely distributed in many lichen genera (Huneck & Yoshimura 1996). A number of lecanoric acid derivatives show a much more restricted taxonomic distribution, and are sometimes genus- or species-specific. Diploschistesic acid (4) is one such compound, known only from lichens of the genus *Diploschistes* Norman (Fig. 1). Similarly, 2'-*O*-methylevernic acid (5) has only been found in *Evernia prunastri* (L.) Ach. (Nicollier *et al.* 1979), 5-chlorolecanoric acid (6) is restricted to some species of *Punctelia* (Elix & Wardlaw 2002) while 5-methoxylecanoric acid (7) has only been reported from *Melanelia glabratula* (Lamy) Essl. (Elix & Jayanthi 2003). In this paper we confirm the first natural occurrence of the depsides 2'-*O*-methyllecanoric acid (2) and 2-*O*-methyllecanoric acid (3) in extracts of *Hypotrachyna everniiformis* (Zahlbr.) Elix, T. Nash & Sipman. The depsides (2) and (3) have been synthesized previously (Elix *et al.* 1995, 1998).

Materials and Methods

Chromatography

The lichen fragments were freed as far as possible from obvious organic substrate and extracted with warm acetone for thin layer chromatography (TLC) or with warm methanol for high performance liquid chromatography (HPLC). Compounds were identified by TLC by using the methods standardized for lichen products (Culberson 1972, Culberson & Ammann 1979, Culberson & Johnson 1982, Elix & Ernst-Russell 1993) and by HPLC with retention index values (R_I) calculated from benzoic acid and solorinic acid controls (Elix & Jayanthi 2003, Feige *et al.* 1993).

Lichen material

Hypotrachyna everniiformis (Zahlbr.) Elix, T. Nash & Sipman, comb. nov.

Basionym: *Parmelia everniiformis* ('*everniaeformis*') Zahlbr., *Sitzungsberichte der kaiserlichen Akademie der Wissenschaft, Mathematisch-naturwissenschaftliche Klasse*, Abteilung 1, **111**: 416, 1902. Lectotype. Brazil. Rio de Janeiro: Petröpolis, Höhnel 163 (W).

Detection of the new depside by comparative chromatography

Comparative HPLC and TLC of the total methanol extract of *Hypotrachyna everniiformis* indicated the presence of ovoic acid (major), gyrophoric acid (minor), lecanoric acid (1) (trace), 2'-*O*-methyllecanoric acid (2) (minor) [standard TLC R_F values: R_F (A) 0.26; R_F (B') 0.24; R_F (C) 0.20; standard HPLC R_I 0.10; R_T 16.98 min] and 2-*O*-methyllecanoric acid (3) (minor) [standard TLC R_F values: R_F (A) 0.23; R_F (B') 0.30; R_F (C) 0.18; standard HPLC R_I 0.12; R_T 18.52 min] together with minor

quantities of cortical atranorin and chloroatranorin (Fig. 2). The HPLC was coupled to a photodiode array detector for ultraviolet spectroscopic comparisons. By this means the spectra of the components eluting from the chromatogram were recorded and computer matched against a library of ultraviolet spectra recorded for the authentic lichen metabolites under identical conditions. For the above substances the correlation of the ultraviolet spectra was greater than 99.9%.

Discussion and Results

The natural occurrence of 2'-*O*-methyllecanoric acid (2) and 2-*O*-methyllecanoric acid (3) in the extracts of *Hypotrachyna everniiformis* has now been confirmed. Comparisons were conducted between the synthetic depsides (2) (Elix *et al.* 1995) and (3) (Elix *et al.* 1998), and the total acetone extracts of the *Hypotrachyna* species by TLC in three independent solvent systems and by HPLC coupled to a photodiode array detector for ultraviolet spectroscopic comparisons. The HPLC of this extract is shown in Fig. 2. By these means *Hypotrachyna everniiformis* was shown to contain ovoic acid (major), gyrophoric acid (minor), lecanoric acid (1) (trace), 2'-*O*-methyllecanoric acid (2) (minor), 2-*O*-methyllecanoric acid (3) (minor), atranorin (minor) and chloroatranorin (trace).

Acknowledgment

We thank Dr Uwe Passauer (W) for organizing the loan of the type of *Hypotrachyna everniiformis*.

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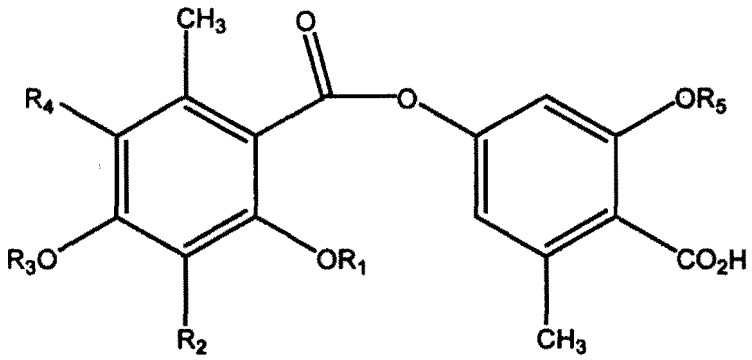

Ri	R2	R3	R4	R5
(1) H	H	H	H	H
(2) H	H	H	H	Me
(3) Me	H	H	H	H
(4) H	OH	H	H	H
(5) H	H	Me	H	M
(6) H	H	H	Cl	H
(7) H	H	H	OMe	H

Fig. 1. Structure of depsides.

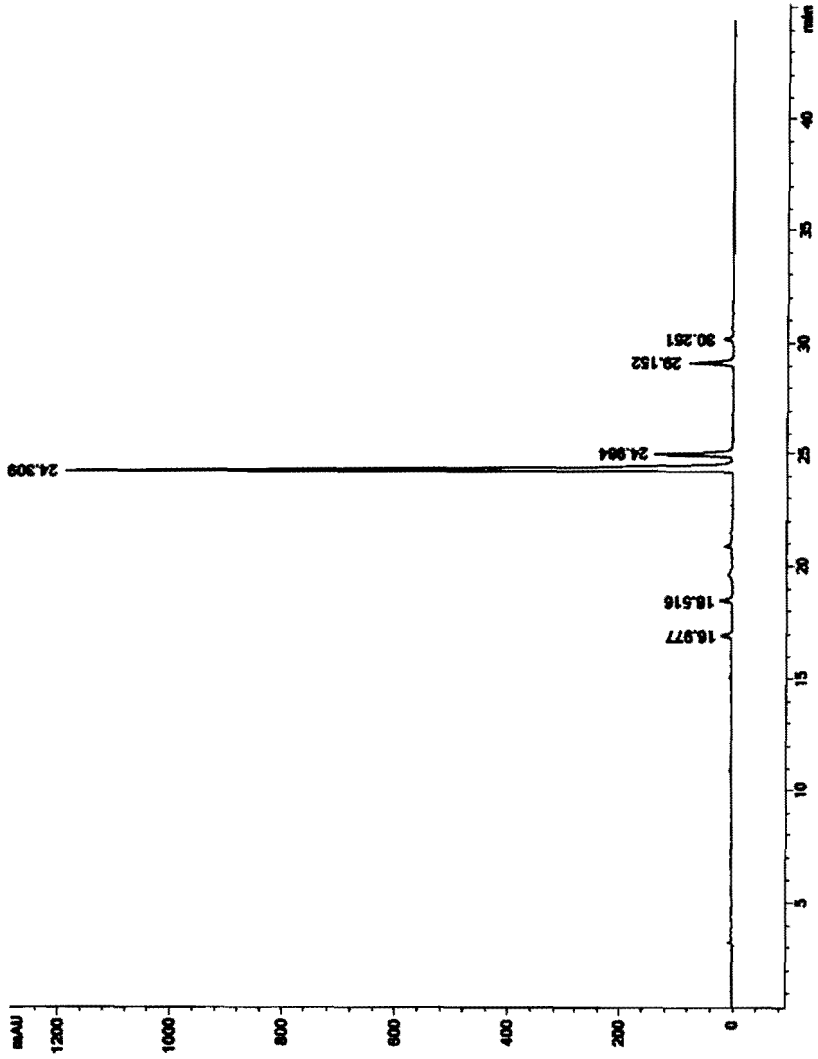

Fig. 2. HPLC of methanol extract of *Hypotrachyna everniiformis* (*Höhnel 163*). R_T 16.977 = 2'-*O*-methyllecanoric acid; R_T 18.516 = 2-*O*-methyllecanoric acid; R_T 20.874 = lecanoric acid (but not numbered); R_T 24.309 = ovoic acid; R_T 24.984 = gyrophoric acid; R_T 29.152 atranorin; R_T 30.251 = chloroatranorin.

Cladonia tasmanica—an extinct lichen

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Cladonia tasmanica Ahti is one of the least-known lichens in Tasmania. The species was first described by Ahti (1961), based on a collection now held in the Natural History Museum, London (BM). More than four decades later, this species is still known only from the type specimen, collected sometime in the early 19th century. On that basis, *Cladonia tasmanica* qualifies for listing as extinct on Schedule 3.2 of the *Tasmanian Threatened Species Protection Act 1995*. In preparation for the formal nomination of this species, the single specimen available has been critically re-examined.

Taxonomy and nomenclature

Cladonia tasmanica Ahti *Ann. Bot. Soc. Zool.-Bot. Fenn, 'Vanamo'* **32** (1): 30 (1961) *Cladina tasmanica* (Ahti) Ahti, *Beih. Nova Hedwigia* **79**: 40. Type: Tasmania (holo-BM!).

The species is characterized by the cushion-forming, pale grey thallus with isotomic (see below), predominantly dichotomous branching, and by the presence of atranorin and fumarprotocetraric acid. The branches are 30–50 mm tall, 0.4–0.6 mm thick, and form dense, distinctly rounded clumps (see Ahti 1961). There is no tendency to develop main branches (Figs. 1–2).

The status and rank of *Cladina*, also known as the 'reindeer lichens', has been controversial in recent decades [for example see Ahti (1984) and Ruoss & Ahti (1989)], but the most recent accounts, based on DNA sequence data (Ahti & Depriest 2001), suggest that it does not warrant generic rank. Consequently, in the latest checklist of Australian lichens (McCarthy 2003), this lichen is listed as a *Cladonia*.

Two main types of growth form are displayed by the reindeer lichens. The first is a cushion-forming type where the branches are repeatedly dichotomously branched and ± equal, with no obvious main axis. Ahti (1961) refers to this form as 'isotomic'. The apices of the branches tend to be irregularly oriented, and the thallus forms very distinct clumps. This growth form is exhibited by *Cladonia confusa* R. Sant., a very common Australasian lichen in heathland and open woodland; it contains usnic and perlatolic acids. *Cladonia tasmanica* belongs to this group.

In the second type of growth form, there tends to be a ± distinct main axis with di-, tri- or tetrachotomous branching of the laterals, called 'anisotomic' by Ahti (1961). The thallus is tree-like or straggling, often with the apices of the branches deflexed and oriented in one direction. This form is exhibited by *C. mitis* Sandst., a common lichen that forms decumbent or straggling swards over alpine microshrubbery; this species is widespread in the south-eastern Australia, New Zealand, and Tasmania. *Cladonia mitis* typically contains usnic acid, stictic acid and related compounds, but occasional Tasmanian populations contain usnic and fumarprotocetraric acids. Regardless of chemical differences, it differs from *C. tasmanica* by its growth form.

Cladonia tasmanica is thus well separated from the other two Australasian species of reindeer lichens by a combination of chemical and morphological characters. Indeed, its closest relatives, based on examination of herbarium material and literature [viz. Ahti 1961 and Ahti 2000] are all South American. Species of *Cladonia* subgenus *Cladina* with the same combination of growth form and chemical composition are: *C. rotundata* Ahti from the Amazonian region, *C. dendroides* (Abbayes) Ahti from coastal Brazil and Guyana, and *C. sandstedei* Abbayes from the West Indies. The last two species differ morphologically from *C. tasmanica* by

forming looser clumps and a tendency to some development of main axes, at least in the lower parts of the thallus. Differences between *C. tasmanica* and *C. rotundata* are less obvious, but the latter is rather more robust (Ahti 1961).

Notes on the type specimen

The protologue (Ahti 1961) cites the location of the type as Kew (K), but the lichens were relocated to the Natural History Museum (BM) in the 1960s (P.W. James pers. comm.). The collection comprises three large, lightly pressed clumps of thallus (Figs 1–2). The original annotation states 'V[an] D[iemans] Land (= Tasmania) in ink and 'VDL' in the same handwriting in pencil. Ahti (1961) misinterpreted this as the name of a collector, 'V.D. Laurel', who is subsequently mentioned in such bibliographic works as Wetmore (1963), but this was later corrected by A.W. Archer (*in litt.*, and 1992). Also in pencil is the name '*C. rangiferina*', a non-cushion-forming species with the same chemistry as *C. tasmanica* but differing in having anisotomic, tri- or tetrachotomous branching and deflexed apices.

There are relatively few sources of Tasmanian lichen specimens from the early 19th century or earlier. Those of J.J. Labillardière (collected in 1792–93) and of Robert Brown (collected in 1804) are usually easily recognized in herbaria by the style of their annotations and labels. Other early Tasmanian lichen collectors include Robert William Lawrence, Ronald Campbell Gunn, and William Archer, all of whom corresponded with William Jackson Hooker and his son Joseph Dalton Hooker, and sent specimens to Kew (Burns & Skemp 1961, Kantvilas 1983). Gunn is known to have obtained collections from other sources as well, including collectors such as Charles Stuart. He also made journeys to mainland Australia and New Zealand himself. However, lichens were not a major focus for these collectors, hampered as they were by lack of knowledge and, at least in Gunn's case, lack of a microscope; Gunn even used lichens as packing material in a shipment of vascular plant specimens (Burns & Skemp 1961). The handwriting on the label of *C. tasmanica* has been examined by A.M. Buchanan at the Tasmanian Herbarium, who feels that it is not the script of any of those well-known collectors.

Discussion

There are several possible explanations as to why *C. tasmanica* has not been recorded in Tasmania since it was originally collected. Firstly, there is the possibility it is a rare or very restricted, localized species in Tasmania and has been overlooked in modern times. However, *C. tasmanica* is large and striking, and given the extent of lichenological activity undertaken in Tasmania since the 1960s, this possibility seems unlikely.

Alternatively, *C. tasmanica* might have always been very localized, and altered land use, habitat modification, and other events have caused it to become extinct. This might have been the fate of another lichen listed formally as extinct in Tasmania: *Punctelia subflava* (Taylor) Elix & J. Johnst. This species probably used to occur in the coastal *Melaleuca* swamp forests cleared extensively for dairy farming.

Of approximately two dozen lichens currently listed under the *Tasmanian Threatened Species Protection Act 1995*, many are from lowland grassland or grassy woodland, where the degradation or alteration of the natural landscape through land-clearing, conversion to improved pasture, cropping, or settlement has been severe. This is especially the case on basalt soils, where several endangered lichens, for example, *Xanthoparmelia amphixantha* (Müll. Arg.) Hale, *X. molliuscula* (Ach.) Hale and *X. willisii* (Kurok. & Filson) Elix & J. Johnst. occur, and are associated with other, highly restricted, uncommon, terricolous species (Kantvilas & Jarman 2000, Kantvilas *et al.* 2002). Several remnant grassland sites have been studied recently, but no *C. tasmanica* was recorded. Indeed, this habitat seems poorly suited

to the Cladoniaceae in general, which are most diverse in peaty heathlands and buttongrass moorlands. These *Cladonia*-rich vegetation formations have also been studied extensively from a lichenological perspective (Kantvilas & Jarman 1988, Kantvilas 1995), but no *C. tasmanica* located.

A third possibility is that the specimen of *Cladonia tasmanica* in BM is not from Tasmania, and that there has been a muddling of labels sometime in the distant past. This is not unusual in the history of botanical collecting and herbarium management. In Australian botanical history, such muddles have been documented concerning collections by Labillardière (Nelson 1974) and Brown (Paulson 1930, Kantvilas & Coppins 1997). The author (unpublished observations) has also seen liverwort material in BM that is from New Zealand but incorrectly annotated as being from Tasmania. At least one other lichen, *Platygrapha congerens* Nyl., is known only from the type specimen from Tasmania, housed in BM, but the bark on which it grows does not obviously look like that of a Tasmanian tree; like *C. tasmanica*, this species is not known from any recent collections.

Could *Cladonia tasmanica* be a mislabelled specimen, perhaps of *C. rotundata* from South America? Whilst anything is possible, this author is unaware of any muddling of herbarium specimens, documented or anecdotal, that has occurred between Tasmania and South America, despite numerous such cases for specimens from mainland Australia and New Zealand. There is one interesting twist to this conjecture. In colonial times, Rio de Janeiro was a common landfall on the voyage from Europe to Australasia, so there was an established route for the passage of items from Brazil to Tasmania. Secondly, on a recent visit to the Natural History Museum in London, the author examined a collection of unidentified, uncurated lichens labelled 'J. Lhotsky—Van Diemens Land'. Johann Lhotsky was a traveller and plant collector, and served briefly as a medical officer at the penal colony of Port Arthur, Tasmania, in the 1830s. He was poorly regarded by his colonial peers, being considered by Gunn in a letter to W.J. Hooker as 'a German adventurer... professing to know everything but really quite ignorant', and by Jørgen Jørgensen, another colonial Tasmanian naturalist–adventurer (also in a letter to Hooker) as 'an imposter and literary pirate' (Burns & Skemp 1961). Perhaps true to his reputation for unreliability, not one of his lichen specimens proved to be a known Tasmanian species; several, such as species of *Pyxine* and *Pertusaria*, were clearly of tropical–subtropical origin. Interestingly, before arriving in Tasmania in 1832, Lhotsky had travelled widely in Brazil!

The true origin of the type specimen of *Cladonia tasmanica* will be difficult if not impossible to resolve. Despite interesting speculation, there is no firm evidence that it is from any part of the world other than Tasmania, even though its absence there today is unusual. On that basis, it will soon be nominated for listing as extinct.

Acknowledgments

I thank Simone Louwhoff for securing the photographs of *Cladonia tasmanica* and Jean Jarman for preparing the figures. The support of the Natural History Museum's Botany Department that enabled much of this work to be undertaken is gratefully acknowledged.

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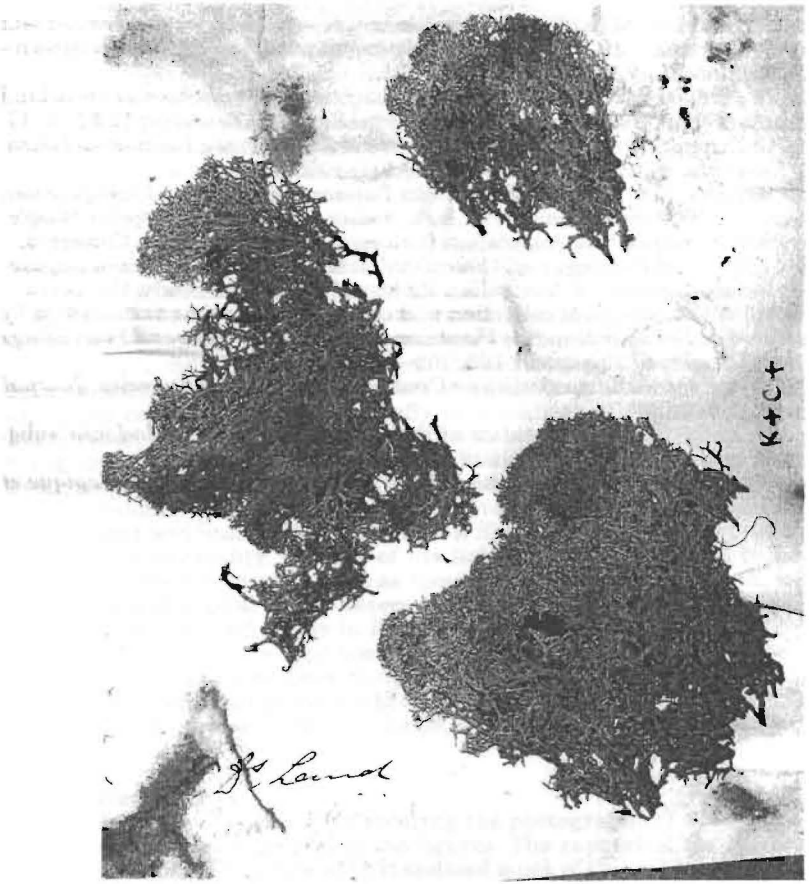

Fig. 1. Type specimen of *Cladonia tasmanica* (BM).

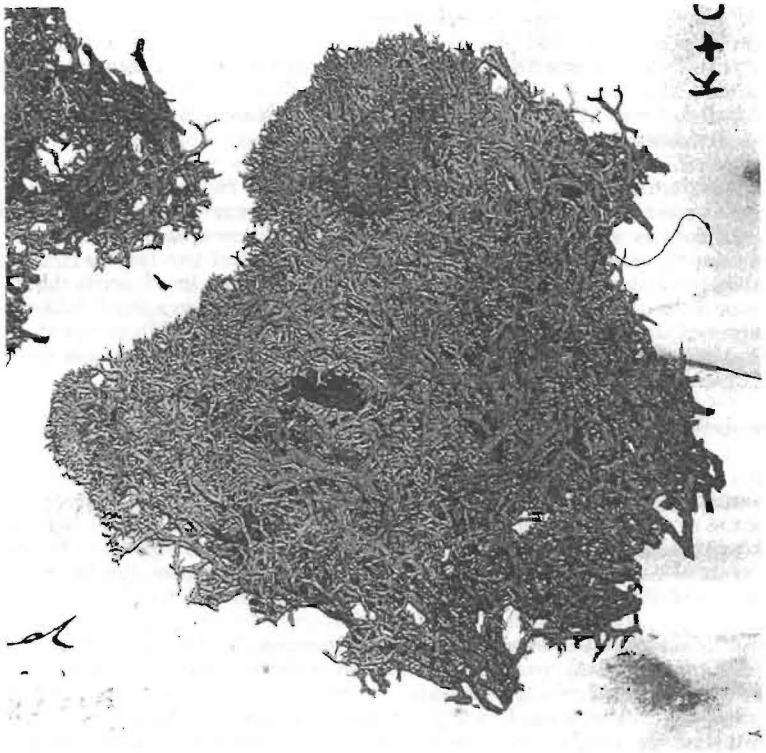

Fig. 2. Detail of type specimen of *Cladonia tasmanica*.

New species and new records of *Parmotrema* (Parmeliaceae, lichenized Ascomycota) from Queensland, Australia

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Abstract: Two new species of *Parmotrema* are described from Queensland: *P. circinatum* Elix & R.W. Rogers and *P. forsteri* Elix & R.W. Rogers. In addition, *P. fasciculatum* (Vain.) Hale and *P. merrillii* (Vain.) Hale are reported from Australia for the first time.

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 poorly collected areas, as well as some difficult species complexes, remain to be studied. A detailed survey of the family in Australia is currently being undertaken, and two further 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.

Parmotrema circinatum Elix & R.W. Rogers, sp. nov.

Thallus ut in *Parmotrema merrillii* sed lobis eciliatis et laciniae coralloidibus et circinatis differt.

Type: **Australia**: *Queensland*: East Point, Mackay, 21°09'S, 149°13'E, on twigs in open, coastal woodland *ca.* 100 m from the sea, *R.W. Rogers 10530*, iv.2003; holo: BRI; iso: CANB.

Thallus loosely to moderately adnate, coriaceous, up to 8 cm wide. Lobes subirregular to irregular, ±rounded, 5–10 mm wide; margins entire to ±irregularly incised, becoming dentate-laciniate; laciniae sublinear-elongate, flattened to subterete, 10–25 mm long, 0.5–2.0 mm wide, eciliate, dichotomously branched at first but then coralloid or coil-like. Upper surface mineral-grey, emaculate, becoming rugose-cracked towards centre, lacking isidia and soredia. Medulla white. Lower surface black, shiny, with a broad, brown, erhizinate marginal zone; rhizines very sparse in the thallus centre, simple, short. Apothecia not seen. Pycnidia common, punctiform, immersed. Conidia short, sublageniform, 6–9 × 1 µm. Fig. 1.
Chemistry: Cortex K+ yellow; medulla K–, C–, KC+ pink-red; Pd+ deep orange-red; containing atranorin, chloroatranorin, protocetraric acid (major), virensic acid (trace) and traces of unknowns.

The most distinctive feature of this new species is the very prominent, sublinear-elongate laciniae that develop along the lobe margins. These laciniae are narrow, usually subterete at the extremities and become repeatedly coralloid-branched in a curved, coil-like formation. Loosely adnate, coriaceous thalli, laciniate lobe margins, the lack of soredia and isidia and the presence of medullary protocetraric acid are also features of both *P. merrillii* and *P. disparile* (Nyl.) Hale. However, these species differ in a number of respects. Whereas *P. circinatum* is eciliate, *P. merrillii* and *P. disparile* are often sparsely ciliate in the axils of the lobes. In addition, the laciniae are linear and rarely or sparingly branched in *P. merrillii* and *P. disparile*, quite unlike the densely branched laciniae of *P. circinatum*. At present, this new species is known only from the type locality in eastern Queensland.

Parmotrema forsteri Elix & R.W. Rogers, sp. nov.

Thallus ut in *Parmotrema merrillii* sed lobis erhizinatus, eciliatis et acidum constipaticum et acidum protoconstipaticum continente differt.

Type: **Australia**: *Queensland*: Muttee Head, 10°55'S, 142°15'E, sea level, on twigs in foredune community, *P.I. Forster s.n.*, 1988; holo: BRI; iso: CANB.

Thallus loosely adnate, coriaceous, up to 12 cm wide. Lobes subirregular to sublinear, 3–10 mm wide; margins entire to ±irregularly incised, becoming laciniate, particularly in older, central lobes; laciniae linear-elongate, dichotomously branched, flat and strap-like to subterete, 5–20 mm long, 1–2 mm wide; cilia absent. Upper surface mineral-grey with a thin (0.5 mm wide), brown, margin along lobes, emaculate, lacking isidia and soredia. Medulla white. Lower surface black, shiny, wrinkled-rugulose, with a broad, brown to ivory, erhizinate marginal zone; rhizines not seen. Apothecia not seen. Pycnidia common, punctiform, immersed. Conidia short, sublageniform, 6–9 × 1 µm. Fig. 2.
Chemistry: Cortex K+ yellow; medulla K–, C–, KC–, Pd–; containing atranorin (minor), chloroatranorin (minor), constipatic acid (major), protoconstipatic acid (major).

This species is characterized by the loosely adnate, coriaceous thallus, the linear-elongate, laciniate lobe margins, the lack of soredia and isidia, the erhizinate lower surface and by the presence of constipatic and protoconstipatic acids in the medulla. Morphologically *P. merrillii* and *P. disparile* resemble *P. forsteri*, as all three possess coriaceous thalli which lack isidia and soredia and have broad lobes which develop conspicuous laciniae at the margins (up to 10 mm or more long) which may become canaliculate. However, these species differ in a number of respects. Whereas *P. forsteri* is eciliate and erhizinate and produces the medullary fatty acids constipatic and protoconstipatic acid, *P. merrillii* and *P. disparile* are often sparsely ciliate in the axils of the lobes and sparsely rhizinate in the center of the thallus and produce protocetraric acid in the medulla (Pd+ red).
This species is named in honour of the collector, the Queensland botanist Dr Paul Forster. At present it is known from only the type collection.

New Records of *Parmotrema* for Australia

Parmotrema fasciculatum (Vain.) Hale, *Phytologia* **28**: 336 (1974).
≡ *Parmelia fasciculata* Vain., *Hedwigia* **38**: 121 (1899).

This relatively rare species is characterized by the conspicuously laciniate-dissected, ±ciliate lobe margins, the often revolute laciniae that become intricately branched and sorediate towards the apices, and by the presence of protocetraric acid in the medulla. It is known from tropical America, western Africa (Hale 1965, Kurokawa 1979) and Papua New Guinea (Louwhoff & Elix 1999, Kurokawa 1979). A detailed description follows.

Thallus membranaceous, moderately adnate, 2–5 cm wide. Lobes irregular to subirregular, rounded, 2–5(–10) mm wide; margins entire but more often crenate, becoming ±deeply laciniate-dissected, ciliate; cilia sparse or moderately dense, mostly simple or occasionally becoming forked, up to 1 mm, long. Upper surface yellowish grey-green, emaculate to ±faintly maculate towards margins, becoming irregularly cracked, laciniate; laciniae marginal, up to 1 mm wide, often revolute, becoming intricately branched and sorediate towards apices; soralia mainly restricted towards apices of laciniae, occasionally submarginal, soredia granular. Medulla white. Lower surface black, smooth, ±shiny, with a brown, erhizinate, marginal zone; rhizines black, moderately dense, simple, occasionally in clusters, slender, becoming coarse with age. Apothecia and conidia not seen. Pycnidia scattered.
Chemistry: Cortex K+ yellow; medulla K– or K+ dirty yellow-brown, C–, KC+ pinkish, Pd+ deep orange-red; containing atranorin, chloroatranorin, protocetraric acid (major) and virensic acid (trace).

SPECIMEN EXAMINED

Queensland: •Scawfell Island, 20°52'S, 149°37'E, on pencil orchid roots, *G.N. Batianoff*, 22.xi.1986 (BRI 691740).

Parmotrema merrillii (Vain.) Hale, *Contr. U.S. Natl. Herb.* **36**: 298 (1965)
≡ *Parmelia merrillii* Vain., *Philipp. J. Sci.* **4**: 658 (1909).

This species is characterized by the moderately to loosely adnate, membranaceous to coriaceous thallus, the laciniate lobe margins, the lack of soredia and isidia, the reticulately cracked upper surface and by the presence of protocetraric acid as the dominant medullary substance. Previously, *P. merrillii* was known from Indonesia, South America (Hale 1965) and Papua New Guinea (Louwhoff & Elix 1999). A detailed description follows.

Thallus loosely to moderately adnate, membranaceous to coriaceous, up to 18 cm wide. Lobes subirregular to sublinear, ±rounded, (5–)8–15 mm wide; margins entire to ±irregularly incised, becoming dentate-laciniate, particularly on older, (central) lobes; laciniae small, 2–10 mm long, 0.5–1 mm wide, ciliate; cilia very sparse to abundant, restricted to lobe axils and damaged margins, slender, simple or branched, (0.5–)1–1.5(–2) mm long. Upper surface mineral-grey with a thin (0.5 mm wide), brown margin along lobes, emaculate, becoming reticulately cracked towards centre, lacking isidia and soredia. Medulla white. Lower surface black, shiny, with a broad, brown, erhizinate marginal zone; rhizines sparse to moderately dense, simple, slender, shiny. Apothecia common, subpedicellate, 4–12 mm wide; disc brown, imperforate; exciple dentate-laciniate and ciliate or not, white-maculate; ascospores 20–32 × 12–17 µm. Pycnidia common; conidia not seen.
Chemistry: Cortex K+ yellow; medulla K–, C–, KC+ pink-red; Pd+ deep orange-red; containing atranorin, chloroatranorin, protocetraric acid (major), virensic acid (trace), conhypoprotocetraric acid (trace) and traces of unknowns.

SPECIMENS EXAMINED

Queensland: •Carlisle Island, 20°47'S, 149°17'E, on twigs, *J. Lloyd*, 6.ix.1986 (BRI 691741); •Lizard Island, summit, 14°40'S, 145°27'E, on dead twigs and branchlets, *R. Specht*, 26.xii.1974 (BRI 691654, 691655); •Eimeo Salt Flats, 14°40'S, 145°27'E, sea level, on Lumnitzera near road, *G.N. Stevens 1849C*, 14.viii.1976 (BRI).

Acknowledgment
We thank Stuart Hay and Neal McCracken of the Photographic Unit at ANU for preparing the photographs.

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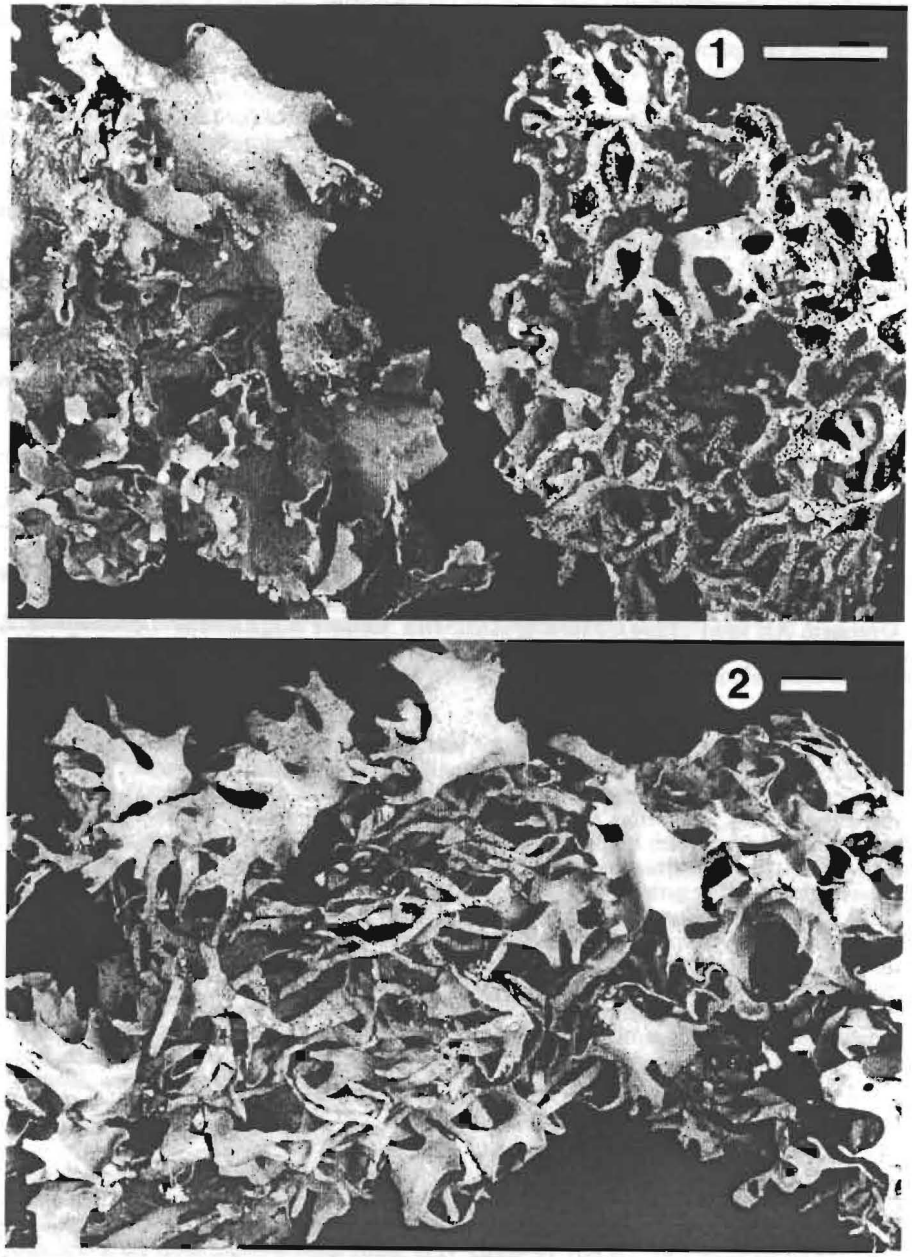

Figures 1–2. New species of *Parmotrema*. 1. *P. circinatum* (holotype in BRI); 2. *P. forsteri* (holotype in BRI). Scale bar = 5 mm.

Transfer of three New Zealand species of *Dimerella* to *Coenogonium* (Gyalectaceae)

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In 2000, Lücking and Kalb transferred seven foliicolous Brazilian species of *Dimerella* Trevis. to *Coenogonium* Ehrenb. In justifying the transfer, they pointed out that the two genera can not be distinguished reliably with mycological characters. Extreme forms can be separated easily enough—*Dimerella s.str.* thalli are strictly crustose and their apothecia are sessile, whereas *Coenogonium s.str.* thalli are thread-like and their apothecia are mostly short-stalked. However, the discovery of several intermediate forms such as *Coenogonium ciliatum and Dimerella pilifera* has rendered those characters all but useless for taxonomic separation.

They added that uniting the two genera in synonymy would be fully in line with other merges both old and new, such as *Peltigera* with *Peltidea*, and *Phylloporis* with *Strigula*. Finally, they argued that a bid to conserve the younger name *Dimerella* would almost certainly fail because (1) the two genera are cited equally frequently in modern literature, (2) some species of *Coenogonium* are now widely used as experimental subjects in studies of lichen phycobionts, symbiosis, and ultrastructure, whereas no species of *Dimerella* are, and (3) *Coenogonium* has always been used in the same sense by various authors, whereas *Dimerella* has not, and indeed came into general use only long after it was first described (Lücking & Kalb 2000).

Coenogonium as now circumscribed can be recognized by: ascoma an apothecium, ±round, pale to yellow or orange; excipulum distinct, not spreading, and para- or prosoplectenchymatous; asci thin-walled; spores simple or transversely septate.

Lücking and Kalb transferred only seven of the 50–60 species of *Dimerella*, preferring to limit the necessary new combinations to the Brazilian species they were working on. In the meantime, several other *Dimerella* species have been transferred, but three remain from New Zealand, and they are transferred here.

Coenogonium Ehrenb. in Nees, *Horae Phys. Berol*: 120 (1820).
Typus: *Coenogonium linkii* Ehrenb. (Holotypus).
= *Dimerella* Trevis., *Rendiconti Reale Ist. Lombardo Sci.*: **13**: 66 (1880).
Typus: *Dimerella lutea* (Dicks.) Trevis. (Lectotypus).

Coenogonium flavum (Malcolm & Vězda) Malcolm comb. nov.
Basionym: *Dimerella flava* Malcolm & Vězda, *Folia Geobotanica et Phytotaxonomica* **30**, 315 (1995).

Coenogonium fuscescens (Vězda & Malcolm) Malcolm, comb. nov.
Basionym: *Dimerella fuscescens* Vězda & Malcolm, *Australasian Lichenology* **41**, 35 (1997).

Coenogonium lutescens (Vězda & Malcolm) Malcolm, comb. nov.
Basionym: *Dimerella lutescens* Vězda & Malcolm, *Australasian Lichenology* **41**, 35 (1997).

Acknowledgment
I thank Phil Garnock-Jones for expert nomenclatural advice.

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Reports of *Menegazzia sanguinascens* and *M. neozelandica* from Macquarie Island are referable to *M. subpertusa*

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Abstract: Literature reports of sorediate species of *Menegazzia* (Parmeliaceae) from Macquarie Island are critically revised. The reports of *M. neozelandica* (as *M. circumsorediata*) and *M. sanguinascens* are instead referable to *M. subpertusa*, a widespread lichen known from Australasia and South America. Thus, this species is probably the only sorediate species of *Menegazzia* on Macquarie Island. Its variable soralia range from convex, confluent or infundibuliform to maniciform with a central opening. In the last case, *M. subpertusa* is very similar to *M. magellanica* from South Georgia, but they differ in other morphological characters.

Introduction

Macquarie Island (54°30'S, 158°57'E), the isolated Australian island situated between Tasmania and the Antarctic continent, is rich in lichens. Although mostly defined as 'subantarctic', from a climatic-phytogeographic point of view the island is considered to belong to the middle antiboreal subzone (Tuhkanen 1992).

Menegazzia circumsorediata R. Sant. (= *M. neozelandica* (Zahlbr.) P. James) was reported from Macquarie Island by Dodge & Rudolph (1955). In his treatment of some parmelioid genera, Filson (1981) disagreed with Dodge & Rudolph's report of *M. circumsorediata*, and instead determined the sorediate specimens as *M. sanguinascens* (Räsänen) R. Sant. Based on identifications by D.J. Galloway, Selkirk *et al.* (1990) reported two species, viz. *M. castanea* P. James & D.J. Galloway and *M. subpenusa* P. James & D.J. Galloway. Only the latter species was listed from Macquarie Island in the treatment of the Australian species of *Menegazzia* (James & Galloway 1992). In their checklists of Australian lichens, Filson (1996) and McCarthy (2003) repeated the report of *M. sanguinascens* from Macquarie Island, and also included the two species reported by Selkirk *et al.* (1990).

During the revision of the sorediate species of *Menegazzia* in southernmost South America (Bjerke & Elvebakk 2001) and Chile (Bjerke *et al.* 2003), the present author became well acquainted with *M. neozelandica* and *M. sanguinascens*, the latter a sorediate species characterized by scattered, convex soralia, greenish, glossy lobes, sympodial lobules and hypothamnolic and thamnolic acids in the medulla (see also Calvelo & Adler 1994; Bernasconi *et al.* 2002). Thus, Filson's reports of *M. sanguinascens* from Macquarie Island awoke some interest, and specimens determined as *M. sanguinascens* by Filson (1981) were therefore borrowed from MEL. The specimen reported as *M. circumsorediata* by Dodge & Rudolph (1955) was also among the twelve specimens that were borrowed. An additional specimen from Macquarie Island was seen during a visit to BM, where several *Menegazzia* holotypes were also studied. *Menegazzia sanguinascens* was also reported from the low-antarctic island South Georgia by Lindsay (1973, 1974), occurring in treeless habitats superficially similar to those on Macquarie Island. The identification of *M. sanguinascens* from South Georgia was corrected to *M. magellanica* R. Sant. by Bjerke & Elvebakk (2001) and Øvstedal & Lewis Smith (2001). Additional specimens from South Georgia were borrowed from AAS for comparison with the material from Macquarie Island. Thin-layer chromatography of acetone extracts of all specimens was performed using standard procedures (Culberson 1972, Orange *et al.* 2001).

Results and discussion

All specimens from Macquarie Island proved to belong to the same taxon, *M. subpertusa*.

Menegazzia subpertusa P. James & D.J. Galloway, *New Zealand Journal of Botany* **21**: 195 (1983).

Type: New Zealand. Wellington, Rangitikei Gorge. On *Leptospermum*, 17 June 1980, J.K. Bartlett (BM).

Illustrations: James & Galloway (1992: 243, fig. 89B); Kantvilas & Jarman (1999: 87). Description: James (1985: 288–289); James & Galloway (1992: 244); Bjerke *et al.* (2003: 90–91). Chemistry: atranorin, stictic, menegazziaic, cryptostictic and constictic acids, additional satellite compounds.

Distribution: **Australia**: New South Wales, Victoria, Tasmania, Macquarie Island (James & Galloway 1992); **New Zealand**: North Island, South Island, Stewart Island, Campbell Island, Auckland Islands (James 1985); **Chile**: regions VIII to XI (Bjerke *et al.* 2003); **Argentina**: Prov. Tierra del Fuego (Bjerke *et al.* 2003).

Notes: The holotype of *M. subpertusa* was on loan and was not seen by me during my visit to BM, but numerous other specimens determined as *M. subpertusa* by P.W. James were seen there. All specimens from Macquarie Island have a gross morphology corresponding to *M. subpertusa*, viz. neat, shortly radiating rosettes, a distinctly convex upper surface and ±pruinose, dichotomously dividing lobe apices. However, *M. subpertusa* is a rather variable species (James 1985, Bjerke *et al.* 2003), and in material from Macquarie Island, most variation is seen in the shape of the soralia. Only a few specimens have clearly convex to globose soralia. In some specimens, the soralia are confluent and more or less diffuse, whereas other specimens may also have infundibuliform to maniciform soralia with a central opening (Fig. 1). These soralia are close to those found in the South American and South Georgian species *M. magellanica*, and also resemble the soralia that emerge from the margins of the perforations in *M. neozelandica*. The infundibuliform-maniciform type was also seen in some specimens of *M. subpertusa* from South America (Bjerke *et al.* 2003), and the specimen illustrated in James & Galloway (1992) also has one such soralium.

Menegazzia neozelandica differs from *M. subpertusa* in several other characters (James 1995, James & Galloway 1992, Bjerke *et al.* 2003), and the two species are therefore relatively easily distinguished from each other despite occasional similarities in the morphology of soralia. However, *M. magellanica* is sometimes rather close to specimens of *M. subpertusa* having soralia with a central opening. Well-developed specimens of *M. magellanica* from the Magellanic Region have soralia that are larger and slightly taller than the open structures of *M. subpertusa*, but the smaller, compact specimens from South Georgia are more similar to *M. subpertusa*. In these specimens, the soralia are occasionally so small that a central opening is not evident. Minor morphological characters are then used to distinguish these two species: *M. magellanica* has slightly wider, less convex, more maculate and more intricately radiating lobes, a more marginal pruinose zone on the lobe tips, and numerous melanized spots centrally and along margins, especially in specimens from exposed habitats, such as on South Georgia. Thus, my suspicion that some of the South Georgian specimens could be *M. subpertusa* was rejected.

The variability seen within *M. subpertusa* and *M. magellanica* is considered to be modification to life in exposed habitats. in addition, some specimens of both species can have more than one type of soralium morphology. Many of the specimens from Macquarie Island are parasitized by a lichenicolous fungus (Figs. 1B, C

and D), and the shape of the soralia can be modified by the fungus. Therefore, the variants discussed here do not merit recognition at infraspecific level.

SPECIMENS EXAMINED

Menegazzia subpertusa from Macquarie Island: •cliffs on the W side of the Island, *R.B. Filson 5903*, 3.ii.1964 (MEL 1024214); •coastal rocks N of Lusitania Bay, *N. Haysom MI/49/Z127*, 23.iii.1950 (MEL 7710); •on S side of the outlet creek from Lake Tiobunga, *K. Simpson B72*, 12.ix.1965 (MEL 1023831); •mouth of Flat Creek, *K. Simpson E27*, 18.xi.1966 (MEL 1000283); •Handspike Point, *R.B. Filson 6315 &. P. Atkinson*, 11.iii.1964 (MEL 1023845); •Douglas Mawson's old wireless hut, *R.B. Filson 5721*, 15.i.1964 (MEL 1024213); •on top of hill above Bauer Bay, *R.B. Filson 6264 &. P. Atkinson*, 1.iii.1964 (MEL 1023841); •1/2 mile up to Stoney Creek from Bauer Bay, *R.B. Filson 5861*, 29.i.1964 (MEL 1024212); •creek draining Lake Tiobunga near the foot of the escarpment, *K. Simpson A99*, 12.ix.1965 (MEL 1023829); •round the top of the falls, Waterfall Lake, *R.B. Filson 6053 & P. Atkinson*, 12.ii.1964 (MEL 1024208); •1/4 mile S of Douglas Point, *K. Simpson E23*, 9.xi.1965 (MEL 1000412); •Nuggets Point, *R.B. Filson 648 &. P. Atkinson*, 18.iii.1964 (MEL 1023839); •*sine loco*, *N.R. Laird 256*, between 1947 and 1949 (BM).

Menegazzia magellanica from South Georgia (see also Bjerke & Elvebakk 2001): •NW side of promontory on S side of Nunez Peninsula, *R.I.L. Smith 1348 & 1608*, 30.xii.1970 (AAS); •N of lower end of Sörling Valley, Barff Peninsula, *R.I.L. Smith 1136 & 1333*, 12.iii.1971 (AAS); •NW side of Undine Harbour, *R.I.L. Smith 1725*, 27.xii.1970 (AAS); •N side of Husvik Harbour, *R.I.L Smith 8381*, 17.xi.1991 (AAS).

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I thank the curators of MEL and AAS for the loan of specimens, and the curators of BM for permission to visit their herbarium. I am grateful to Dr Gintaras Kantvilas (Tasmanian Herbarium) for help with literature and Dr Arve Elvebakk (University of Tromsø) for comments on the manuscript.

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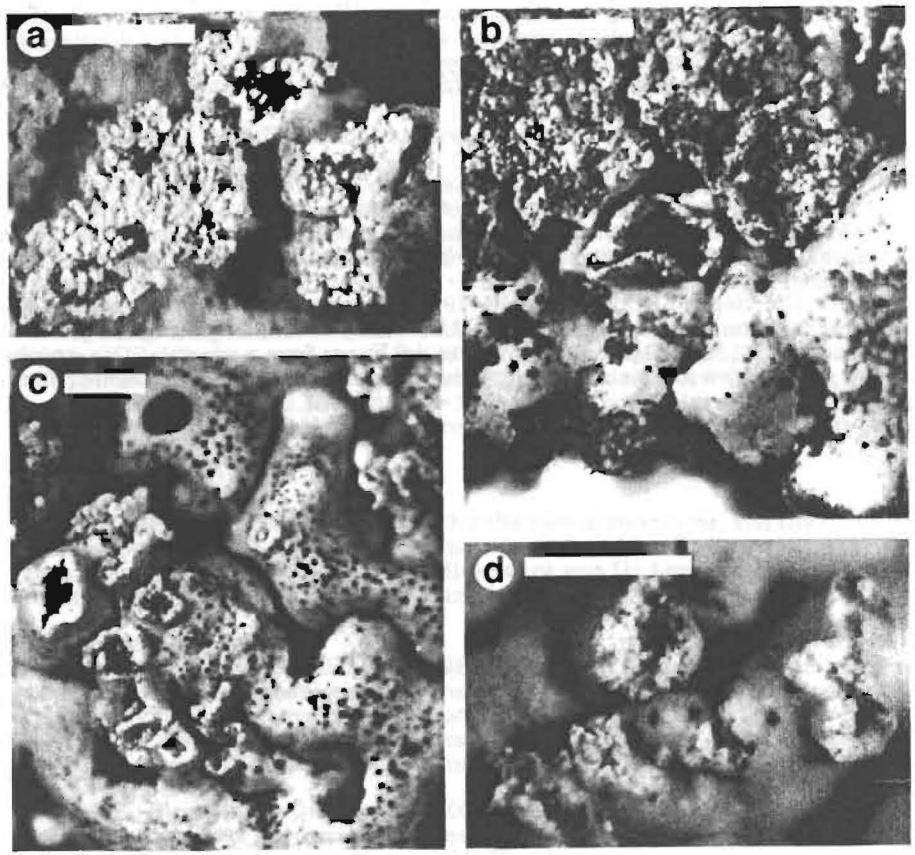

Fig. 1: Various types of infundibuliform to maniciform soralia with a central opening in specimens of *Menegazzia subpertusa* from Macquarie Island. **a**: *R.B. Filson 6264 &. P. Atkinson*; **b**: *R.B. Filson 5903*; **c**: *R.B. Filson 6348 &. P. Atkinson*; **d**: *K. Simpson E27*. Scale bars = 1 mm.

Additional lichen records from Australia 53. *Kroswia crystallifera* P.M. Jørg. and *Pannaria molkenboeri* Mont. & Bosch

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Abstract: *Kroswia crystallifera* P.M. Jørg. is reported as new to Australia. The correct name for *Pannaria tjibodensis* Zahlbr. is *P. molkenboeri* Mont. & Bosch.

Kroswia crystallifera P.M. Jørg. *Lichenologist* **34**, 299 (2002).

This recently described lichen (Jørgensen 2002) was located among unidentified material which I collected on an excursion during the 1981 International Botanical Congress in Australia.

SPECIMEN EXAMINED
New South Wales: •Gudgenby River Gorge, 4 km S of Tharwa, 30.viii.1981, *P.M. Jørgensen 8148a* (BG).

This distinctive species could be confused with *P. globigera* (or *P. fulvescens*) because its thallus swells in humid air to about 500 µm thickness, and its margins have bluish, coarse, soralia-like structures (gymnidia). However, the thallus is homoiomerous and lacks an upper cortex, contains no pannarin (Pd–), and its terpenoids crystallize strongly in storage (hence the epithet).

Kroswia crystallifera is apparently rare, because the collection site did not appear to be unusual ecologically, and yet no other specimen has turned up in the rich collections by Elix & Streimann from the same area.

The discovery is phytogeographically important in that *K. crystallifera* is an addition to the lichen species shared by Australia and South Africa (Rogers 1992), although the species is distributed more widely in the Paleotropics, being known from Taiwan as well as Sri Lanka and East Africa (the Mascarenes).

Pannaria molkenboeri Mont. & Bosch, in Montagne, *Syll. Gen. Sp. Crypt.* **33** (1856).
= *Pannaria tjibodensis* Zahlbr., *Ann. Crypt. Exot.* **1**, 165 (1928).

Material collected recently from Melanesia has proved that the scanty type of *Pannaria molkenboeri* Mont. & Bosch (H-NYL 31265, lectotype *fide* Jørgensen & Galloway 1992: 316) is just a small, immature specimen of *P. tjibodensis* Zahlbr. Because the name *P. molkenboeri* is about 70 years older than *P. tjibodensis*, it has priority. There are no compelling reasons to request conservation of *P. tjibodensis*, because the name has only rarely appeared in recent treatments except my own in 2001. In the *Flora of Australia*, both names were incorrectly treated as synonyms of *P. lurida*. *Pannaria molkenboeri* is a species of the primary rainforests of SE Asia and NE Australia (Queensland), and differs from *P. lurida* in having larger, thinner thalli and smaller ovoid spores.

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Additional lichen records from Australia 54. *Dictyonema moorei* (Nyl.) Henssen

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Abstract: *Dictyonema moorei* has been found in Queensland and Western Australia.

Dictyonema moorei was initially named *Leptogidium moorei* by Nylander in 1890, based on a type from Japan. Henssen (1963) gave a brief account of that "unfortunate" name, made the new combination, and also recorded the species from Chile. Since then the species has been reported from New Zealand (Tschermak-Woess 1983), Papua New Guinea (Hoffmann & Büdel 1992) and Hawaii (Elix & McCarthy 1998, citing a Vězda exsiccate not seen by me). Brodo's 1995 record from British Columbia was based on a misidentification (see http://www.for.gov.bc.ca/hfd/pubs/docs/Srs/Srs09/09Part08.pdf). I have seen only herbarium specimens (all held at CANB), so the descriptions of macroscopic details are of dried material. The microscopic features were observed in weak KOH, and I found neither spores nor basidia in any of the specimens. Parmasto (1978) has noted that many herbarium specimens of *Dictyonema* are sterile, probably owing to slow drying of the collections. Lichenologists would tend to dry their collections slowly, without artificial heat, whereas corticioid fungi need quicker drying for optimum herbarium material, and *Dictyonema* is a lichenized corticioid fungus.

Description

To the naked eye, the specimens are crustose to pilose and coloured in shades of dark khaki-green to dark olive-green. Under a low power microscope, the specimens show occasional blue-green patches, and are composed of numerous short filaments. In some cases, the filaments are densely packed and compressed, so that individual filaments are discernible only at the margins. In other cases, the growth is not so dense, and many individual filaments can be seen. Each filament is somewhat glassy, with a thin hyaline sheath surrounding the broad central core of colour.

The trichomes (of *Scytonema* sp.) are usually biseriate, occasionally irregularly bi- or triseriate. They are 18–30(–40) µm in diameter, though the end of a trichome can be swollen to twice the general diameter. The individual cells are 4–12 µm long, and heterocysts are common. All hyphae are hyaline, smooth, with unclamped septa and 3.2–12 µm in diameter. The shell hyphae are highly flexuous (in parts almost polygonal) and thin-walled. There are few free hyphae, and these are non-flexuous, branch at right angles, and have walls up to 3.2 µm thick.

SPECIMENS EXAMINED

Queensland: •Hugh Nelson Range, along Plath Road, 15 km S of Atherton, 17°25'S, 145°26'E, 1080 m, on base of *Eucalyptus grandis* in *E. grandis* woodland, *J.A. Elix 16388 & H. Streimann*, 25.vi.1984; •Big Tableland, 26 km S of Cooktown, 15°43'S, 145°17'E, 610 m, on *Cyathea* stumps along the margin of stunted rainforest, *J.A. Elix 17308 & H. Streimann*, 4.vii.1984; •Crediton State Forest, 16 km SW of Finch Hatton, 21°15'S, 148°31'E, 700 m, on base of *Eucalyptus grandis* in *E. grandis*–dominated woodland, *J.A. Elix 21092 & H. Streimann*, 1.vii.1986. *Western Australia*: •track to Toolbrunup Peak, Stirling Range, Stirling Range National Park, 40 km SW of Borden, 34°23'S, 118°03'E, 680 m, on moist flat rock in small cave in moist gully with large spreading treelets, *H. Streimann 54515*, 17.ix.1984.

Notes

Given the cryptic nature of this species, there could well be more collections in Australian herbaria, perhaps incorrectly filed. Henssen (1963) noted that this lichen could easily be confused with greenish species of *Polychidium*, in particular *P. dendriscum*. Of the four collections cited, one had been filed as *Dictyonema* sp., two as *Polychidium* sp. and the fourth as *Ephebe* sp. I searched through the undetermined CANB collections in a number of byssoid or filamentous lichen genera, but failed to find any more specimens of *Dictyonema moorei*. Specimens could of course also turn up in undetermined algal collections.

Acknowledgement

I am indebted to Judith Curnow's notes on the Western Australian specimen, for she had noted the biseriate trichomes, which alerted me to the interesting nature of that collection and set off the search which led to the above finds.

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Additional lichen records from New Zealand 41. Saxicolous and lichenicolous species of the genus *Rinodina*

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Abstract: The lichenicolous lichen *Rinodina insularis* is reported for the first time from New Zealand. New records of *R. bischoffii, R. blastidiata, R. cacaotina, R. immersa, R. jamesii, R. luridata, R. murrayii, R. nigricans,* and *R. tibellii* are provided.

Introduction

Saxicolous taxa of *Rinodina* from New Zealand were discussed by Mayrhofer (1983), who also prepared a general account of the genus in New Zealand (Mayrhofer 1985). Subsequently, several papers have been published concerning saxicolous taxa occurring in New Zealand including Mayrhofer *et al.* (1990), Matzer & Mayrhofer (1994), Matzer *et al.* (1998), and Trinkaus *et al.* (1999). Further records are provided by Leuckert & Mayrhofer (1984), Anonymous (1985, 1989, 1993), Vězda (1987, 1995), and Obermayer (1999a, 1999b, 2002).

Material and methods

Unless otherwise cited, the specimens are held in GZU; duplicates of selected specimens will be distributed to WELT and CHR. Most of the collections examined were made during two trips in 1985 and 1992.

The species

Rinodina bischoffii (Hepp) A. Massal., *Framm. Lich.* **26** (1855)
Rinodina bischoffii shows a cosmopolitan distribution and is known from Europe, North Africa, North America, Asia, and Australia (Mayrhofer 1984a, 1984b, Esslinger & Egan 1995). In New Zealand this species always occurs on calcareous rocks. It was previously reported from Canterbury and Southland only (Mayrhofer 1983).

SPECIMENS EXAMINED
North Island: *Hawkes Bay*: •Te Mata Peak SE of Havelock North, limestone, 39°42'S, 176°55'E, alt. 370 m, *H. Mayrhofer 12222, 12231 & E. Hierzer*, 17.viii.1992. **South Island**: *Nelson*: •Golden Bay, E of Takaka, limestone outcrops, 40°51.5'S, 172°49.5'E, alt. 20 m, *H. Mayrhofer 13137, 13138*, 25.viii.1992; •Golden Bay, E of Upper Takaka, limestone outcrops, 41°02'S, 172°51'E, alt. 250 m, *H. Mayrhofer 10812 & N. & B. Malcolm*, 27.viii.1992; •Pig Valley S of Wakefield, SW of Nelson, limestone outcrops, 41°28'S, 173°03'E, *H. Mayrhofer 12320, B. Malcolm & B. Polly*, 25.viii.1992; •N.W. Nelson: Kaihoka Coast, Puponga, on coastal limestone, *J.K. Bartlett 25673a*, 12.xii.1982 (AK). *Marlborough*: •Peninsula SE of Kaikoura, W of Whaler's Bay, coastal rocks, 42°26'S, 173°43'E, *H. Mayrhofer 12177 & C.D. Meurk*, 31.viii.1992. *Canterbury*: •6 km ESE of Waiau, Lowry Peaks Range, Mt. Palm, open tussock grassland area, ca. 300 m, 42°41'S, 173°06'E, *L. Tibell 9842a*, 4.xii.1980 (UPS); •Napenape, SW of Hurunui River, S of Cheviot, coastal rocks, 42°57'S, 173°15'E, *H. Mayrhofer 12182 & C.D. Meurk*, 1.ix.1992; •Motunau Beach, 43°03'S, 173°05'E, *H. Mayrhofer 12102 & C.D. Meurk*, 1.ix.1992; •end of Reeces Road SE of Omihi, Montserrat, limestone outcrops, alt. 400–450 m, 43°04'S, 172°56'E, *H. Mayrhofer 12094, 12097 & C.D. Meurk*, 2.ix.1992; •Broken River, 43°13'S, 171°56'E, *G.C. Bratt 7211921*, 12.xi.1972, (HO 65269); •Rangitata Valley, Coal Creek, limestone, 43°45'S, 171°09'30"E, *H. Mayrhofer 7400, 7408, H. Hertel, C.D. Meurk & B.P.J. Molloy*, 17.i.1985. *Otago*: •Fortification Road c. 5 km south of Oamaru, limestone outcrops, 145°09'S, 170°58'E, *H. Mayrhofer 7473, 10498 & H. Hertel*, 14.ii.1985.

Rinodina blastidiata Matzer & H. Mayrhofer, *Acta Bot. Fennica* **150**, 110 (1994)
This species is known from siliceous coastal cliffs and boulders in Tasmania, southeastern mainland of Australia, and New Zealand. Matzer & Mayrhofer (1994) reported it from North Auckland, Auckland, Wellington, Nelson, Marlborough, and Canterbury.

SPECIMENS EXAMINED
North Island: *Wellington*: •Mirimar Peninsula E of Wellington, Waser Bay, coastal rocks, 41°19'S, 174°49'E, *H. Mayrhofer 12246, D. Glenny, W. Nelson, B. Polly & C. West*, 22.viii.1992. **South Island**: *Marlborough*: •NE of Kaikoura, NE of Irongate Stream, coastal rocks, 42°16.5'S, 173°47'E, *H. Mayrhofer 10870 & C.D. Meurk*, 31.viii.1992.

Rinodina cacaotina Zahlbr., *Denkschr. Akad. Wiss. Wien math.-naturwiss. Kl.* **104**, 377 (1941)
Rinodina cacaotina is another species occurring on coastal rocks. It is only known from New Zealand. Zahlbruckner (1941) and Anonymous (1989) report it from Auckland, Mayrhofer (1983) from North Auckland, Canterbury and Otago, and Obermayer (1999a) from Marlborough.

SPECIMENS EXAMINED
North Island: *Auckland*: •Kawakawa Bay E of Auckland, Papanui Point, coastal rocks, 36°56'S, 175°13'E, alt. 0–20 m, *H. Mayrhofer 5830, H. Hertel & G.J. Samuels*, 12.i.1985. *Wellington*: •Cape Palliser Road ca. 13 km N of Ngawihi, rock outcrops near the sea, 41°29'S, 175°13'E, *H. Mayrhofer 10843 & E. Hierzer*, 18.viii.1992.

Rinodina immersa (Körb.) Arnold, *Flora* **67**, 319 (1884)
Rinodina immersa is known from Europe, North Africa and Asia (Mayrhofer 1984a). This species occurs always on limestone and has been previously reported from Canterbury only (Mayrhofer 1983).

SPECIMENS EXAMINED
South Island: *Marlborough*: •Kaikoura Peninsula SE of Kaikoura, W of Whaler's Bay, coastal rocks, 42°26'S, 173°43'E, *H. Mayrhofer 12174 & C.D. Meurk*, 31.viii.1992. *Canterbury*: •6 km ESE of Waiau, Lowry Peaks Range, Mt. Palm, open tussock grassland area, 42°41'S, 173°06'E, alt. 300 m, *L. Tibell 9843*, 4.xii.1980 (UPS); •Napenape, SW of Hurunui River, S of Cheviot, coastal rocks, 42°57'S, 173°15'E, *H. Mayrhofer 12183 & C.D. Meurk*, 1.ix.1992; •Limestone outcrops E of Coringa Station NW of Motunau Beach, 43°02'S, 173°02'E, alt. 150–200 m, *H. Mayrhofer 12115 & C.D. Meurk*, 2.ix.1992; •Rangitata Valley, Coal Creek, limestone, 43°45'S, 171°09'30"E, *H. Mayrhofer 7386, H. Hertel, C.D. Meurk & B.P.J. Molloy*, 17.i.1985.

Rinodina insularis (Arnold) Hafellner, *Beih. Nova Hedwigia* **62**, 87 (1979)
Rinodina insularis occurs on *Lecanora rupicola* agg. and is known from Europe, the Canary Islands, North America, and Australia (Mayrhofer 1984a, Triebel *et al.* 1991, Hafellner 1995). According to Rambold *et al.* (1994), its generic position is questionable. This species is new to New Zealand.

SPECIMENS EXAMINED
South Island: *Otago*: •Central Otago: Alexandra, "The Lookout" E of Alexandra, 45°15'30"S, 169°24'E, alt. 275 m, on *Lecanora rupicola*, *H. Mayrhofer 10508, H. Hertel & P. Child*, 2.ii.1985; •Alexandra, Little Valley Road 6 km from Alexandra, 45°17'S, 169°27'E, alt. 460 m, on *Lecanora rupicola*, *H. Mayrhofer 10507, H. Hertel & P. Child*, 2.ii.1985.

Rinodina jamesii H. Mayrhofer, *Lichenologist* **15**, 272 (1983)
This species, occurring on low siliceous boulders, is known only from New Zealand. Mayrhofer (1983) and Anonymous (1993) reported it from Otago.

SPECIMENS EXAMINED
North Island: *Wellington*: •Cape Palliser Road ca. 13 km N of Ngawihi, rock outcrops near the sea, 41°29'S, 175°13'E, *H. Mayrhofer 10862 & E. Hierzer*, 18.viii.1992. **South Island**: *Canterbury*: •Taylors Mistake SE of Christchurch, 43°35'S, 172°47'E, *H. Mayrhofer 10810*, 4.ix.1992.

Rinodina luridata (Körb.) H. Mayrhofer, Scheid. & Sheard, *Biblioth. Lichenol.* **38**, 346 (1990)
Rinodina luridata is known from Europe, Asia, North Africa, North America, and Australasia (Mayrhofer *et al.* 1990). Mayrhofer (1983) published one record from Canterbury under *Rinodina lecanorina*. Mayrhofer *et al.* (1990) also reported *R. luridata*, always growing on limestone, from Nelson and Southland.

SPECIMENS EXAMINED
South Island: *Canterbury*: •End of Reeces Road SE of Omihi, Montserrat, limestone outcrops, 43°04'S, 172°56'E, alt. 400–450 m, *H. Mayrhofer 12095, 12096, 12122 & C.D. Meurk*, 2.ix.1992.

Rinodina murrayii H. Mayrhofer, *Lichenologist* **15**, 273 (1983)
This species is known from schistose rocks in Australia and from Otago in New Zealand (Mayrhofer 1983, Leuckert & Mayrhofer 1984), from where it has also been reported by Obermayer (1999b).

SPECIMENS EXAMINED
South Island: *Otago*: •Alexandra, "The Lookout" east of Alexandra, 45°15'30"S, 169°24'E, alt. 275 m, *H. Mayrhofer 10511, H. Hertel & P. Child*, 2.ii.1985; •Alexandra, little Valley Road 4 km from Alexandra, 45°17'S, 169°26'E, alt. 425 m, *H. Mayrhofer 10503, H. Hertel & P. Child*, 2.ii.1985.

Rinodina nigricans H. Mayrhofer, *Lichenologist* **15**, 274 (1983)
This species always occurs on more or less horizontal surfaces of limestone boulders in open pastures. It was known from only a few localities in Canterbury (Mayrhofer 1983, Vězda 1995).

SPECIMEN EXAMINED
South Island: *Canterbury*: •Limestone outcrops E of Coringa Station NW of Motunau Beach, 43°02'S, 173°02'E, alt. 150–200 m, *H. Mayrhofer 12116 & C.D. Meurk*, 2.ix.1992.

Rinodina tibellii H. Mayrhofer, *Lichenologist* **15**, 280 (1983)
Rinodina tibellii is known only from New Zealand. The species occurs on various types of siliceous rocks and boulders, both at coastal and inland sites. It was known from Canterbury and Otago (Mayrhofer 1983), and from Hawkes Bay (Obermayer 2002).

SPECIMENS EXAMINED
North Island: *North Auckland*: •Leigh, Goats Island Beech to Cape Rodney, coastal rocks, 36°16'S, 174°48'E, alt. 0–20 m, *H. Mayrhofer 6872 & G.J. Samuels*, 7.i.1985. *South Auckland*: •Kamai-Mamuku Forest Park: Mount Te Aroha, siliceous outcrops, 37°33'S, 175°45'E, alt. 930–952 m, *V. Wirth 28432 & A. Green*, 26.x.1981, (STU); •Mt. Maunganui, coastal rocks, 37°39'S, 176°12'E, 18.vi.1977, *J.K. Bartlett 24701*. *Wellington*: •Cape Palliser Road ca. 13 km N of Ngawihi, rock outcrops near the sea, 41°29'S, 175°13'E, *H. Mayrhofer 10863 & E. Hierzer*, 18.viii.1992. **South Island**: *Nelson*: •Stephens Bay S of Kaiteriteri, N of Motueka, coastal rocks, granite, 41°03'S, 173°01'E, *H. Mayrhofer 10755*, 28.viii.1992; •Cable Bay NE of Nelson, Ataata Point, coastal rocks, 41°09.5'S, 173°24'E, *H. Mayrhofer 10732, B. Polly & N. & B. Malcolm*, 25.viii.1992. *Marlborough*: •Whites Bay NE of Rarangi, NE of Blenheim, coastal rocks, greywacke, 41°22.5'S, 174°04.5'E, *H. Mayrhofer 13923*, 30.viii.1992; •Ward Beach E of Ward, SW of Cape Campbell, coastal rocks, 41°50'S, 174°11'E, *H. Mayrhofer 12187, 12193, 12198*, 30.viii.1992. *Canterbury*: •Witch Hill S of Christchurch, 43°36'S, 172°40.5'E, alt. 400 m, *H. Mayrhofer 12087, 12089 & C.D. Meurk*, 2.ix.1992; •Lyttelton Harbour: Cass Bay W of Lyttelton, coastal rocks, basalt, 43°36.5'S, 172°41.5'E, *H. Mayrhofer 10795*, 4.ix.1992; •Rangitata Valley Coal Creek, 43°45'S, 171°09'30" E, *H. Mayrhofer 7412, H. Hertel, C.D. Meurk & B.P.J. Molloy*, 17.i.1985.

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