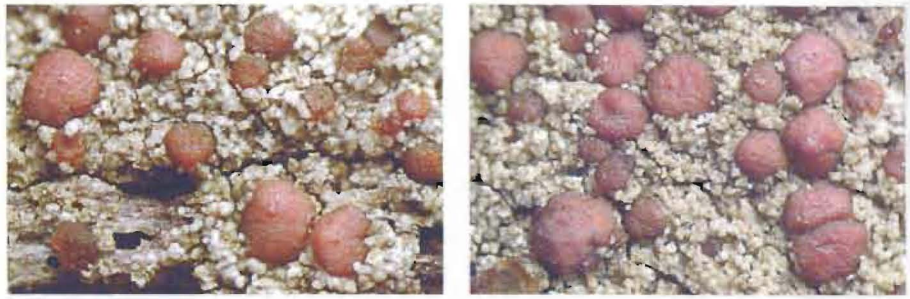
Australasian Lichenology
Number 55, July 2004



Pyrrhospora arandensis, described as new in this issue of *Australasian Lichenology*, is the fifth species of the genus known from Australia. It's characterized by an upper surface with dense globose to subcylindrical isidia which erode and become granular with age but do not become sorediate. At present it's known from only the type locality in the Australian Capital Territory. 1 mm

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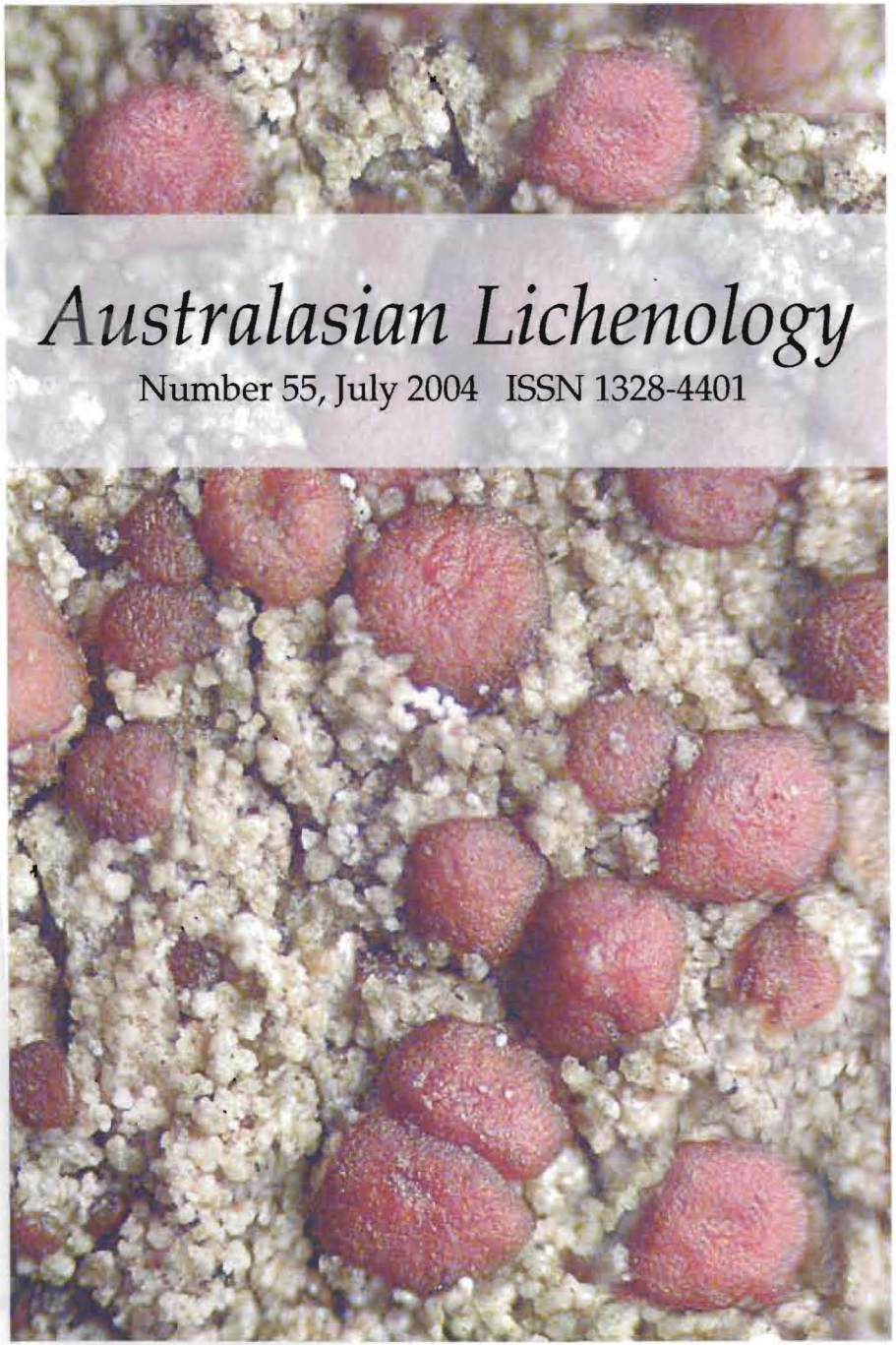

Australasian Lichenology

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16th MEETING OF AUSTRALASIAN LICHENOLOGISTS 2004

The 16th meeting of Australasian Lichenologists was held at Jindabyne, New South Wales, and adjacent Kosciuszko National Park on Saturday and Sunday, the 17th and 18th of April, 2004. A total of 16 people attended, coming from as far as Kuala Lumpur, Dunedin, and Manjimup. Apologies were received from Nell Stevens and Kath Ralston, both of whom were incapacitated because of medical misadventures (we wish both a speedy recovery). The format of the gathering differed from those held in recent years, and no formal talks were held. Instead, lichen forays to several localities in Kosciuszko National Park were undertaken on both Saturday and Sunday.

Saturday's collecting began at Charlotte's Pass (1800 m elevation), and the weather was bleak—not raining, but strong squally winds, scudding clouds, and a wind-chill factor of –20°C. The majority of collectors favoured the leeward slopes of Mount Guthrie, where there was some protection from the wind, but three intrepid lichenologists climbed to the summit of Mount Stilwell (2054 m), 1.5 km south of Charlotte's Pass. The one new species I have heard of to date (GK, personal communication), deservedly came from this locality! After lunch (spent huddled in various cars), we inspected several localities at lower elevation which had not been cindered in the devastating fires of January 2003. A group dinner was held at Brumby's Bar and Bistro on Saturday evening, and included serious pre-dinner drinks, lively and informal discussions on progress with the lichen volumes of the *Flora of Australia* (Volume 4 was published in May of 2004), various regional lichenological topics, and more particularly, of lichenologists worldwide. Despite the lively evening and exciting football results, all were present at roll-call on Sunday morning.

Sunday's field excursion was centred in Kosciuszko National Park, south of Thredbo township. Not only is Thredbo much more sheltered than Charlotte's Pass, but the weather was sunny and pleasant, and most lichenized along the Thredbo River south of Thredbo township, in *Leptospermum* and riverside habitats that had not been burnt, as well as on the rocks mid-stream. A brief stop after lunch looked at more closed habitats (Merritt's Creek), 1.5 km north of Thredbo Village. All seemed to enjoy the lichens and camaraderie (*see* photograph on facing page). The next meeting is planned for April, 2006, in Manjimup, Western Australia.

Jack Elix

caption: In front: Bronwen Myall, Patrick McCarthy. Behind from left: Pat Archer, Eric Whiting, Hannah McPherson, Rowena Whiting, Gintaras Kantvilas, Simone Louwhoff, Allison Knight, Rex Filson, Jack Elix, Alan Archer, Laily bin Din, Jean-Marc Porigneaux, Ray Cranfield. Not shown: Gordon Myall (the photographer!)

NEW PUBLICATION

Key to the Genera of Australian Macrolichens
P.M. McCarthy & W.M. Malcolm
Flora of Australia Supplementary Series, Number 23
Published by Australian Biological Resources Study, 2004
ISBN 0 642 5683 4

Macrolichens are not necessarily large lichens. Instead, the term has been used traditionally for lichens other than crustose types, i.e. scaly, leafy or shrubby lichens, usually with discrete organs of attachment to the substratum; in other words, distinctly three-dimensional, in contrast to their closely appressed or immersed, two-dimensional relatives.

This key to the genera of Australian macrolichens follows recently published guides to apothecial crusts and pyrenocarps. It covers all 135 genera of macrolichens known to occur in Australia, and illustrates two-thirds of them in full colour. To ease identification, it uses mostly traits that are visible with the naked eye or a 10× hand lens, and for all genera it adds information on habitat, distribution within Australia, and literature references.

About the book
Size: 210 × 148 mm (A5), viii + 64 pages, index, bibliography, glossary
Binding: soft cover, spiral bound
Illustrations: 115 colour plates
AUD33.00 (price includes surface postage for overseas orders, and GST and postage within Australia).

To purchase: contact Pat McCarthy, ABRS, GPO Box 787, Canberra, A.C.T. 2601, Australia
phone: (02) 6250–9447; fax: (02) 6250–9448, e-mail: Patrick.McCarthy@deh.gov.au

NEW PUBLICATION

Flora of Australia Volume 56A: Lichens 4
Various Authors, Illustrators & Photographers
Published by Australian Biological Resources Study & CSIRO Publishing, 2004
Hardcover: ISBN 0 643 09056 8 **[AUD95.00]**
Softcover: ISBN 0 643 09057 6 **[AUD80.00]**

Volume 56A provides treatments of *Pertusaria* and *Lecanora*, two of the most speciose and ecologically significant, crustose genera on rock and bark in Australia. *Pertusaria*, second only to *Xanthoparmelia* (Parmeliaceae) in terms of the diversity of Australian species, exhibits a high degree of species endemism and is often dominant in tropical, temperate and alpine communities in eastern Australia. The Australian species of *Lecanora* occur on rock, soil, and on trunks and canopy branches of trees in all ecosystems; some are especially prominent in the comparatively species-poor lichen floras of semi-arid and arid regions. Also included here is *Usnea*, a genus of robust and often luxuriant lichens ranging from almost rigid tufts on exposed, alpine rocks to metre-long skeins hanging from the canopies of temperate rainforest trees.

Complete or partial accounts of nine families are provided in Volume 56A, including 17 genera and 287 species and infra-specific taxa. This brings to 1168 the number of Australian lichen species and infra-specific taxa treated in the four volumes published.

Taxa included:
LECANORALES: Aphanopsidaceae, Haematommataceae, Lecanoraceae (part), Miltideaceae, Roccellinastraceae, Sarrameanaceae, Usneaceae. PERTUSARIALES: Pertusariaceae (*Pertusaria*). TELOSCHISTALES: Fuscideaceae.

About the book
Size: 250 × 176 mm (B5), xvi + 222 pages, index, glossary, bibliography
Binding: Hard cover, section stitched
Illustrations: 56 colour plates, 3 black and white plates, 287 maps

Available from CSIRO Publishing, NOT from ABRS.
To purchase: go to http://www.publish.csiro.au/nid/21/pid/3887.htm

Additional lichen records from New Zealand 42.

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Following field work for a phytosociological study on the epiphytic and lianoid vegetation on *Weinmannia racemosa* L. in Camp Creek, Central Westland, South Island, New Zealand (Setzepfand 2002), some new and interesting lichen records are reported.

A. Lichens new to New Zealand:

Arthonia tasmanica Kantvilas & Vězda, *Telopea* 4: 662 (1992)
This species was previously known from only Tasmania (Kantvilas & Vězda 1992). In Camp Creek, it was found three times growing in shaded localities. Associated lichen species are *Coccotrema cucurbitula, Phaeographis exaltata, Pertusaria jamesii, Catillaria* spp., *Psoroma pholidotoides, Sticta latifrons,* and *Leifidium tenerum*. It associates with many hepatics as well. *Arthonia tasmanica* usually forms only small patches bearing numerous small ascocarps, and can easily be overlooked. Spore length given in Kantvilas & Vězda (1992) is (28–)30–40 µm, but one specimen had slightly smaller spores not exceeding 30 µm.

SPECIMEN EXAMINED
South Island: •Central Westland, Alexander Range, Camp Creek, 16 km SSE of Moana, 42°42.3'S, 171°33.5'E, 800 m a.s.l., on smooth bark of *Weinmannia racemosa* at buttress and on lower stems (1.5 m) in conifer-broadleaved forest with *Libocedrus bidwillii, Quintinia acutifolia*, and several species of shrubs, ii.1997, *M. Setzepfand* (CHR: MS 819.2; B: MS 819.1).

Porina elegantula Müll. Arg., *Bull. Herb. Boissier* 1: 63 (1893)
Porina elegantula is known from southern Victoria, Australia, and from islands in Bass Strait, between mainland Australia and Tasmania (McCarthy 2001). The New Zealand material is minute and had only a few perithecia because its host tree was densely covered with lianoid *Metrosideros* species which inhibited the growth of corticolous cryptogams. Only a few associated lichens could be found, namely *Thelotrema lepadinum, Lopadium monosporum*, and an undetermined crustose lichen. The species is superficially similar to *Porina decrescens* P.M. McCarthy & Kantvilas, but is distinguished from that species by its acicular, 11–21-septate spores.

SPECIMEN EXAMINED
South Island: •Central Westland, Alexander Range, Camp Creek, 16 km SSE of Moana, 42°41.5'S, 171°33.3'E, 500 m a.s.l., on smooth bark of *Weinmannia racemosa* on lower stems (1.5 m) in dense conifer-broadleaved forest with *Metrosideros umbellata, Quintinia acutifolia*, and several species of shrubs, 18.i.1998, *M. Setzepfand* (CHR: MS 509.1).

B. Lichens otherwise interesting:

Pertusaria jamesii Kantvilas, *Lichenologist* 22: 296 (1990)
This is the second find of this unusual species in New Zealand, and the first on the South Island. The first was from Urewera National Park, and the species is otherwise known from Tasmania, New South Wales, and southernmost Chile (Archer 1997). Superficially, it resembles a species of *Gyalecta*.

SPECIMEN EXAMINED
South Island: •same locality, habitat, and date, *M. Setzepfand* (CHR: MS 550.1; B: MS 551.1).

Psoromidium versicolor (Hook.f & Taylor) D.J. Galloway, *New Zealand J. Bot.* 21: 196 (1983)
This is a fairly widespread species in the temperate zone of the Southern Hemisphere, and is known from southermost Chile and Argentina, Tasmania, Macquarie Island, and the Auckland Islands (Galloway & James 1985). It is reported here for the first time from the South Island.

SPECIMEN EXAMINED
South Island: •same locality, habitat, and date, *M. Setzepfand* (CHR: MS 850.2).

Lopadium monosporum (C. Knight) Hellb., *Bihang K. Sv. Vet.-Akad. Handl.* 21(3) 13: 96 (1896)
The genus *Lopadium*, in the restricted sense proposed by Hafellner (1984), is represented in the Southern Hemisphere by only two species in Tasmania (Kantvilas & James 1991) and by the New Zealand endemic *L. monosporum*. This appears to be the first record of this species since the collection of the type specimen, and the first on the South Island.

SPECIMEN EXAMINED
South Island: •same locality, habitat, and date, *M. Setzepfand* (CHR: MS 556.2).

References

Archer, AW (1997): The lichen genus *Pertusaria* in Australia. *Bibliotheca Lichenologica* 69, 1–249.
Hafellner, J (1984): Studien in Richtung einer natürlicheren Gliederung der Sammelfamilien Lecanoraceae und Lecideaceae. *Beiheft zur Nova Hedwigia* 79, 241–371.
Galloway, DJ; James, PW (1995): The lichen genus *Psoromidium* Stirton. *Lichenologist* 17, 173–188.
Kantvilas, G; James, PW (1991): Records of crustose lichens from Tasmanian rainforest. *Mycotaxon* 41, 271–286.
Kantvilas, G; Vězda, A (1992): Additions to the lichen flora of Tasmania. *Telopea* 4, 661–670.
McCarthy, PM (2001): Trichotheliaceae. *Flora of Australia* 58A, 105–157.
Setzepfand, M (2002): *Die epiphytische und lianoide Vegetation auf* Weinmannia racemosa *in warm-temperaten Regenwäldern in Camp Creek, Zentral-Westland, Südinsel, Neuseeland.* <http://www.freidok.uni-freiburg.de/volltexte/434>

Additional lichen records from Indonesia and Malaysia 5. Lichens from Bukit Larut, Peninsula Malaysia

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Abstract: *Heterodermia appendiculata, Hypotrachyna ikomae, H. toiana, Parmotrema rampoddense*, and *Stereocaulon coniophyllum* are reported as new to Malaysia.

Bukit Larut (formerly known as Maxwell Hill) is a peak in the Bintang Range in Perak, in the north-east of Peninsula Malaysia. This hill resort is noted for its beautiful gardens and is surrounded by virgin tropical montane rainforest. In this paper we record 22 lichens collected from Bukit Larut, five of which are new records for Malaysia.

1. **Heterodermia appendiculata** (Kurok.) Swinscow & Krog, *Lichenologist* **8**: 114 (1976).
≡ *Anaptychia appendiculata* Kurok., *Beih. Nova Hedwigia* **6**: 61 (1962).

This species was previously known from Africa (Kurokawa 1962, Swinscow & Krog 1976) and Australia (Kurokawa 1973). It is characterized by the ecorticate lower surface, sympodially branched, radially extending main lobes with short lateral lobes, dense squamules, and the presence of zeorin, 6α-acetoxyhopane-16β, 22-diol, norstictic acid, and constipatic acids as major medullary metabolites. A detailed description is given in Kurokawa (1962) and Swinscow & Krog (1976).

SPECIMEN EXAMINED
Malaysia: •Perak, Bukit Larut (Maxwell Hill), 9 km E of Taiping, 4°50'N, 100°48'E, 1035 m, on bark in montane rainforest, *L.B. Din* BLT 1, 26.vi.1999 (CANB, UKM).

2. **Hypotrachyna ikomae** (Asahina) Hale, *Phytologia* **28**: 341 (1974).
≡ *Parmelia ikomae* Asahina, *J. Jap. Bot.* **28**: 134 (1953).

This species was previously known from Japan (Asahina 1953) and mainland China (Xu 1989, Chen *et al.* 2003). It is characterized by the broad, subirregular lobes with subrotund apices, ±sparse cilia, mostly cylindrical to irregularly thickened isidia and by the medullary chemistry. A detailed description follows.

Thallus moderately adnate to adnate, 3–10 cm wide. Lobes subcontiguous, occasionally becoming imbricate, subirregular, irregularly branched, 2–10 mm wide; margins entire, often irregularly incised or crenate; apices subrotund. Upper surface grey to grey-green, faintly white-maculate, smooth or finely rugulose, isidiate; isidia laminal or submarginal, rarely marginal, scattered to moderately dense, cylindrical to irregularly thickened, erect or rarely procumbent, squamiform and sublobulate, simple or branched; isidia apices syncorticate, intact. Medulla white. Lower surface black, shiny, smooth to rugulose, brownish towards margins, sparse to moderately rhizinate; rhizines moderately dichotomously branched, sometimes present along lobe margins. Apothecia and pycnidia not seen.

Chemistry: cortex K+ yellow; medulla K–, C–, KC–, P–, UV–; containing atranorin (minor), chloroatranorin (minor), lichesterinic acid (major), isonephrosterinic acid (major), protolichesterinic acid (minor) and nephrosterinic acid (minor).

SPECIMEN EXAMINED
Malaysia: •Perak, Bukit Larut (Maxwell Hill), 9 km E of Taiping, 4°50'N, 100°48'E, 1035 m, on bark in montane rainforest, *L.B. Din* BLT 32, 26.vi.1999 (CANB, UKM).

3. **Hypotrachyna toiana** Elix, *Mycotaxon* **63**: 420 (1997).

Previously this species was known only from Papua New Guinea (Louwhoff & Elix 2002a). It is characterized by the centrally crowded lobes with ±revolute or hooded apices and ±lobulate-dissected margins, the slightly inflated and often erumpent isidia, by the medulla which is yellow-pigmented in part, and by the presence of barbatic acid (major), 4-*O*-demethylbarbatic acid (major), pigmentosin A (minor), and vioxanthin (minor) as significant medullary metabolites. *Hypotrachyna toiana* resembles the closely related *H. orientalis* (Hale) Hale and *H. imbricatula* (Zahlbr.) Hale, but can be separated from both those species by its lobulate-dissected lobe margins, erumpent isidia and pigmented medulla. A detailed description is given in Louwhoff & Elix (2002a).

SPECIMEN EXAMINED
Malaysia: •Perak, Bukit Larut (Maxwell Hill), 9 km E of Taiping, 4°50'N, 100°48'E. 1035 m, on bark in montane rainforest, *L.B. Din* BLT 13, BLT 39, BLT 46, 26.vi.1999 (CANB, UKM).

4. **Parmotrema rampoddense** (Nyl.) Hale, *Phytologia* **28**: 338 (1974).
≡ *Parmelia rampoddensis* Nyl., *Acta Soc. Sci. Fenn.* **26**: 7 (1900).

A widespread species known from West Africa, North, Central and South America, Sri Lanka and India (Hale 1965), Australia (Elix 1994), Papua New Guinea (Louwhoff & Elix 1999), the Philippines (Elix & Schumm 2001), and New Caledonia (Louwhoff & Elix 2002b). This species is characterized by the conspicuously ciliate, crenate to dissected, sorediate lobe margins, the pale yellow-orange pigmented lower medulla, and by the presence of alectoronic acid (major), α-collatolic acid (major/minor) and skyrin (minor/trace) as significant medullary metabolites. A detailed description is given in Louwhoff & Elix (1999).

SPECIMEN EXAMINED
Malaysia: •Perak, Bukit Larut (Maxwell Hill), 9 km E of Taiping, 4°50'N, 100°48'E, 1035 m, on bark in montane rainforest, *L.B. Din* BLT 43, 26.vi.1999 (CANB, UKM).

5. **Stereocaulon coniophyllum** Lamb, *Botaniska Notiser* **114**: 266 (1961).

A widespread species known from Europe, North America, Africa (Uganda), northern India, and Nepal (Lamb 1977). This species is characterized by the phyllocladioid branchlets with a corticated upper surface and sorediate lower surface, the protosacculate cephalodia, and by the presence of lobaric acid as the major medullary metabolites. A more detailed description is given in Swinscow & Krog (1988).

SPECIMEN EXAMINED
Malaysia: •Perak, Bukit Larut (Maxwell Hill), 9 km E of Taiping, 4°50'N, 100°48'E, 1035 m, on bark in montane rainforest, *L.B. Din* BLT 17, 26.vi.1999 (CANB, UKM).

Other species collected

The following species were also collected from Bukit Larut: *Bulbothrix isidiza* (Nyl.) Hale, *Chrysothrix candelaris* (L.) Laundon, *Cladonia adspersa* Mont. & v.d. Bosch, *C. verticillata* Hoffm., *Coccocarpia palmicola* (Spreng.) Arvids. & D.J. Galloway, *Heterodermia flabellata* (Fée) Awasthi, *H. japonica* (Sato) Swinscow &

Krog, *H. obscurata* (Nyl.) Trev., *Hypotrachyna imbricatula* (Zahlbr.) Hale, *Leptogium azureum* (Ach.) Mont., *Parmelinella wallichiana* (Taylor) Elix & Hale, *Parmotrema tinctorum* (Nyl.) Hale, *Physma byrsaeum* (Ach.) Müll. Arg., *Rimelia clavulifera* (Räsänen) Kurok., *R. reticulata* (Taylor) Hale & A. Fletcher, *Usnea baileyi* (Stirt.) Zahlbr., and *U. rubrotincta* Stirton.

Acknowledgements

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References

Asahina, Y (1953): Lichenes Japoniae novae vel minus cognitae (11). *Journal of Japanese Botany* **28**, 134–141.

Chen, J-B; Xu, L; Qian, Z-G; Elix, JA (2003): Parmeliaceae (Ascomycota) lichens in China's mainland. II. The genus *Hypotrachyna*. *Mycotaxon* **86**, 359–373.

Elix, JA (1994): *Parmotrema*. *Flora of Australia* **55**, 140–162.

Elix, JA; Schumm, F (2001): New species and new records in the lichen family Parmeliaceae (Ascomycotina) from the Philippines. *Mycotaxon* **79**, 253–260.

Kurokawa, S (1962): A monograph of the genus *Anaptychia*. *Beihefte zur Nova Hedwigia* **6**, 1–115.

Kurokawa, S (1973): Supplementary notes on the genus *Anaptychia*. *Journal of the Hattori Botanical Laboratory* **37**, 563–607.

Lamb, IM (1977): A conspectus of the lichen genus *Stereocaulon* (Schreb.) Hoffm. *Journal of the Hattori Botanical Laboratory* **43**, 191–355.

Louwhoff, SHJJ; Elix, JA (1999): *Parmotrema* and allied genera in Papua New Guinea. *Bibliotheca Lichenologica* **73**, 1–152.

Louwhoff, SHJJ; Elix, JA (2002a): *Hypotrachyna* (Parmeliaceae) and allied genera in Papua New Guinea. *Bibliotheca Lichenologica* **81**, 1–149.

Louwhoff, SHJJ; Elix, JA (2002b): The Parmeliaceae (lichenized Ascomycota) of New Caledonia. *Lichenologist* **34**, 373–394.

Swinscow, TDV; Krog, H (1976): The genera *Anaptychia* and *Heterodermia* in East Africa. *Lichenologist* **8**, 103–138.

Swinscow, TDV; Krog, H (1988): *Macrolichens of East Africa*. British Museum, London.

Xu, BS (1989): *Cryptogamic Flora of the Yangtze Delta and Adjacent Regions*. Shanghai Scientific & Technical Publications, Shanghai.

RECENT LITERATURE ON AUSTRALASIAN LICHENS

Archer, AW (2003): New species in the lichen family Graphidaceae (Ascomycota) from Australia and the Solomon Islands. *Mycotaxon* **88**, 143–148.

Archer, AW (2004): Additional synonymy in the Australian Graphidaceae. *Australasian Lichenology* **55**, 16–17.

Blanchon, DJ; Bannister, J (2004): *Ramalina pollinaria* (Westr.) Ach. in New Zealand. *Australasian Lichenology* **55**, 18–20.

de los Ríos, A; Wierzchos, J; Sancho, LG; Grube, M; Ascaso, C (2002): Microbial endolithic biofilms: a means of surviving the harsh conditions of the Antarctica. pp. 219–222. In *Proceedings of the Second European Workshop on Exo/Astrobiology*. Graz, Austria, 16–19 September 2002.

Din, LB; Zakaria, Z; Elix, JA (2004): Additional lichen records from Indonesia and Malaysia 5. Lichens from Bukit Larut, Peninsula Malaysia. *Australasian Lichenology* **55**, 10–12.

Elix, JA (2004): Vioxanthin from a lichen source. *Australasian Lichenology* **55**, 14–15.

Elix, JA (2004): A new species of *Pyrrhospora* (Lecanoraceae, lichenized Ascomycota) from Australia. *Australasian Lichenology* **55**, 26–28.

Friedmann, EI (2003): [BOOK REVIEW of D.O. Øvstedal & R.I. Lewis Smith's 2001 *Lichens of Antarctica and South Georgia: a Guide to their Identification and Ecology*. Cambridge University Press, Cambridge. *Arctic, Antarctic, and Alpine Research* **35**, 409–410.

Galloway, DJ (2004): Notes on some lichen names recorded from the Snares Islands, southern New Zealand. *Australasian Lichenology* **55**, 21–25.

Kantvilas, G; Louwhoff, S (2004): A new eight-spored species of *Menegazzia* from Australia. *Lichenologist* **56** 103–111.

Kantvilas, G (2004): A new species of *Solenopsora* from Tasmania. *Lichenologist* **56**, 113–117.

Kondratyuk, SY (2002): Notes on lichenicolous fungi associated with xanthorioid lichens. *Ukrayins'kyi Botanichnyi Zhurnal* **59**, 309–314.

Kooperberg, R (2003): Lichen ramble. *Auckland Botanical Society Journal* **58**, 129–130.

Martin, TJ (2003): The flora of "The Grotto": a volcanic collapse pit on the lower slopes of Onehunga, Auckland. *Auckland Botanical Society Journal* **58**, 122–129.

Martínez, I; Burgaz, AR; Vitikainen, O; Escudero, A (2003): Distribution patterns in the genus *Peltigera* Willd. *Lichenologist* **35**, 301–323.

Messuti, MI; Vobis, G; Lumbsch, HT (2003): Additions to the lichen flora of Tierra del Fuego. *Bryologist* **106**, 596–598.

Myllys, L; Stenroos, S; Thell, A; Ahti, T (2003): Phylogeny of bipolar *Cladonia arbuscula* and *Cladonia mitis* (Lecanorales, Euascomycetes). *Molecular Phylogenetics and Evolution* **27**, 58–69.

Nott, J; Hayne, M (2001): High frequency of "super-cyclones" along the Great Barrier Reef over the past 5000 years. *Nature* **413** (4 October), 508–512.

Robinson, CH (2001): Cold adaptation in Arctic and Antarctic fungi. *New Phytologist* **151**, 341–353.

Schmitt, I; Lumbsch, HT; Søchting, U (2003): Phylogeny of the lichen genus *Placopsis* and its allies based on Bayesian analyses of nuclear and mitochondrial sequences. *Mycologia* **95**, 827–835.

Setzepfand, M; Sipman, HJM (2004): Additional lichen records for New Zealand 42. *Australasian Lichenology* **55**, 8–9.

Wiklung, E; Wedin, M (2003): The phylogenetic relationships of the cyanobacterial lichens in the Lecanorales suborder Peltigerineae. *Cladistics* **19**, 419–431.

Zoller, S; Lutzoni, F (2003): Slow algae, fast fungi: exceptionally high nucleotide substitution rate differences between lichenized fungi *Omphalina* and their symbiotic green algae *Coccomyxa*. *Molecular Phylogenetics and Evolution* **29**, 629–640.

Vioxanthin from a lichen source

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Abstract: The naphthopyrone vioxanthin has been shown to be the major yellow-green pigment present in the medulla of the lichen *Hypotrachyna osseoalba*.

Vioxanthin is one of a family of lichen pigments previously referred to as the schenckiana pigments, the schenckiana unknowns (Hale 1990), or pigmentosin B (Louwhoff & Elix 2001). This family of related yellow-green pigments is found in the medulla of a number of species of *Hypotrachyna, Parmelina* and *Xanthoparmelia*. Although the presence of these pigments has been accepted as a primary species character in some cases (Hale 1990), the compound(s) responsible have not been separated from lichen sources, nor have their chemical structures been elucidated. I have now shown that the major yellow-green pigment present in *Hypotrachyna osseoalba* (Vain.) Park & Hale is the naphthopyrone vioxanthin (1), first isolated from the microfungi *Trichophyton violaceum* Sabouraud *ex* Bodin (Blank *et al.* 1966) and *Penicillium citreo-viride* Biourge (Zeeck *et al.* 1979).

Materials and methods

Authentic material of vioxanthin (1) was supplied by Prof. Dr. Michael Müller and was obtained by extraction of *Penicillium citreo-viride*.

The lichen-derived vioxanthin (1) was characterized by thin-layer chromatography (TLC), high performance liquid chromatography (HPLC), and ultraviolet spectroscopy (see below).

Chromatography. The lichen pigment (1) was characterized by thin-layer chromatography (TLC) according to the methods standardized for lichen products (Culberson 1972, Elix & Ernst-Russell 1993), and by high-performance liquid chromatography (HPLC) with retention index values (R_I) calculated from benzoic acid and solorinic acid controls (Elix *et al.* 2003, Feige *et al.* 1993). The HPLC was coupled to a photodiode array detector for ultraviolet spectroscopic comparisons. By this means the ultraviolet spectra observed for the various components eluting in the HPLC chromatogram were recorded and computer-matched against a library of ultraviolet spectra recorded for authentic metabolites under identical conditions. In the present case, the correlation of ultraviolet spectra of the authentic pigment (1) with that of the lichen metabolite was greater than 99.9%.

Vioxanthin (1) exhibited standard TLC R_F values: R_F (A) 0.42; R_F (B) 0.14; R_F (C) 0.52. Standard HPLC: R_T 26.14 min.; R_I 0.28. Ultraviolet spectrum λ_{max}/nm (ε/M^{-1} cm^{-1}MeOH) 267 (61000), 310sh (8000), 379 (17000) [Zeeck *et al.* 1979].

Lichen material

Hypotrachyna osseoalba (Vain.) Park & Hale
AUSTRALIA. *New South Wales*: •Hanging Mountain, Hanging Mountain Forest Reserve, 24 km SW of Moruya, 36°01'S, 149°52'E, 550 m, on rocks, *J.A. Elix 25492*, 20.vi.1990 (CANB); •Mt Banda Banda, 31°09'S, 152°26'E, 1250 m, on fallen branch, *J.A. Elix 42654*, 5.x.1997 (CANB).
PAPUA NEW GUINEA. *Morobe Province*: •Mt Kaindi, 5 km W of Wau, 7°21'S, 146°41'E, 2300 m, on branch, *H. Streimann 33177*, 9.i.1983 (CANB). *Southern Highlands Province*: •Onim Forestry Station, Iaro River, 14 km NNW of Ialibu, on dead log, *H. Streimann 24026*, 11.ix.1982 (CANB).

Discussion and results

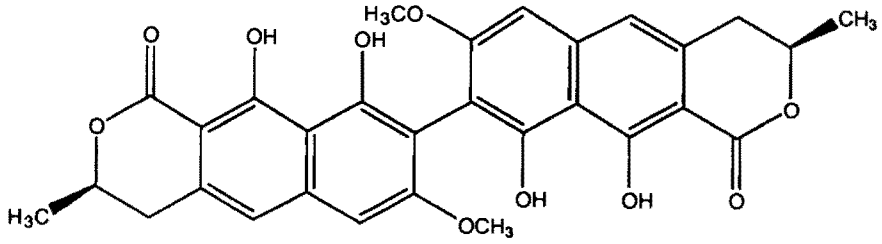
The natural occurrence of vioxanthin (1) in the extracts of the lichen *Hypotrachyna osseoalba* has now been confirmed. Comparisons were conducted between the authentic pigment (1), and the total acetone extracts of the above lichens by TLC in three independent solvent systems and by HPLC coupled to a photodiode array detector for ultraviolet spectroscopic comparisons. In addition to the yellow-green pigment (1), *H. osseoalba* also contains minor quantities of the red pigment skyrin (Elix 1994) together with lichexanthone (major), lividic acid (major), 4-*O*-methylphysodic acid (major or minor), oxyphysodic acid (minor), colensoic acid (minor), methoxycolensoic acid (minor), physodic acid (minor), 4-*O*-methyllividic acid (minor) and hydroxycolensoic acid (trace).

Acknowledgement

I thank Prof. Dr. Michael Müller of the Institut für Biotechnologie 2, Forschungszentrum Jülich GmbH, D-52425, Jülich, Germany, for generous samples of authentic vioxanthin and semi-vioxanthin.

References

Blank, F; Ng, AS; Just, G (1966). Metabolites of Pathogenic Fungi V. Isolation and tentative structures of vioxanthin and viopurpurin, two coloured metabolites of *Trichophyton violaceum*. *Canadian Journal Chemistry* **44**, 2873–2879.
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.
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.
Feige, GB; Lumbsch, HT; Huneck, S; Elix, JA (1993): The identification of lichen substances by a standardized high-performance liquid chromatographic method. *Journal of Chromatography* **646**, 417–427.
Zeeck, A; Russ, P; Laatsch, H; Loeffler, W; Wehrle, H; Zähner, H; Holst, H (1979): Isolierung des Antibioticums *semi*-Vioxanthin aus *Penicillium citreo-viride* und Synthese des Xanthomegnins. *Chemische Berichte* **112**, 957–978.



Additional synonymy in the Australian Graphidaceae

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Abstract: *Graphina erythrella* (Mont. & Bosch) Zahlbr. is reported as an earlier synonym of *G. incisa* A.W. Archer, *Graphis aphanes* Mont. & Bosch as an earlier synonym of *G. vermifera* Müll. Arg. and *Graphis intricata* Fée as an earlier synonym of *Graphis centrifuga* Räsänen.

Graphina erythrella (Mont. & Bosch) Zahlbr., *Cat. Lich. Univ.* **2**, 405 (1924)
= *Ustalia erythrella* Mont. & Bosch, *Plant. Junghuhn.* **4**, 478 (1855)
Type: Java [Indonesia] *s. loc., Teysmann s.n.*, no date; syntype: L.
= *Graphina incisa* A.W. Archer, *Mycotaxon* **77**, 166 (2001)
Type: Australia, Queensland, Big Tableland, 26 km S of Cooktown, *H. Streimann 46361*, 11.xii.1990; holotype: CANB; isotype: B.

Graphis incisa was characterised by the presence of narrow, slit-like lirellae, and that character was used to differentiate the species from *G. erythrella*, which has open lirellae. An examination of *Graphina* specimens from the Solomon Islands and the Philippines showed the presence of specimens (in particular *Hill 10704* from the Solomon Islands) with both open and closed lirellae on the same thallus. Consequently *G. incisa* can no longer be maintained as a separate species, and is here reduced to synonymy with *G. erythrella*. In Australia, *G. erythrella* occurs in northern Queensland, and is also found in Indonesia, the Solomon Islands, Thailand and the Philippines [from where *Graphis cladophora* Vain. is an additional synonym (H. Sipman, *in litt.*, 2001)].

Graphis aphanes Mont. & Bosch, *Plant. Junghuhn.* **4**, 474 (1855)
Type: Java [Indonesia] *s. loc., Teysmann s.n.*, no date; syntype: L.
= *Graphis vermifera* Müll. Arg., *Flora* **70**, 401 (1887)
Type: Australia, Trinity Bay [Cairns], *W.A. Sayer, s.n.*; holotype: G.

An examination of *Graphis* specimens from the Solomon Islands showed a number of specimens characterised by large, multi-locular ascospores, complete, pale orange-brown exciples and the presence of stictic acid. These were at first identified as *G. vermifera*, but a comparison of Redinger's description of *G. aphanes* (Redinger 1936) and a recent description of *G. vermifera* (Archer 1999), and comparison of colour photographs of the corresponding type specimens, showed them to be identical. Thus *G. aphanes* becomes an earlier name for *G. vermifera*. In Australia *G. aphanes* occurs in Queensland, with one older [*ca.* 1890] specimen from the Big Scrub (now almost completely cleared) in northern New South Wales. The species also occurs in India, Indonesia, the Solomon Islands and Thailand.

Graphina erythrella and *Graphis ophanes* are illustrated by Nakanishi *et al.* (2001, Figs. 1b and 2d respectively), who also report *Graphis glaucocinerea* Vain. (Vainio 1907) as an additional synonym of *Graphis aphanes*.

Graphis intricata Fée, *Essai Crypt. Écorc.* 42 (1825)
Type: South America, *s. loc.*, in cortice *Cinchona scrobiculata*; holotype: G.
= *Graphis centrifuga* Räsänen, *Arch. Soc. Zool. Bot. Fenn.* "Vanamo" **3**, 187 (1949)
Type: Australia, New South Wales, *F.R.M. Wilson s.n.*, 1892; holotype H.

Graphis centrifuga was indicated as a possible synonym of *G. intricata* by Archer (1999), but at that time the chemistry of *G. intricata* had not been reported. However, a recent examination of the type of *G. intricata* showed it to contain norstictic acid (Staiger 2002). Because the two species are morphologically and chemically identical, they are considered to be synonymous, and the earlier name *G. intricata* prevails. In Australia, *G. intricata* occurs in Queensland, New South Wales and Victoria, and is also found in Brazil and Japan. The species was first reported from Australia by Crombie (1880).

References

Archer, AW (1999): The lichen genera *Graphis* and *Graphina* (Graphidaceae) in Australia 1. Species based on Australian type specimens. *Telopea* **8**, 273–295.
Crombie, JM (1880): Enumeration of Australian lichens in Herb. Robert Brown (Brit. Mus.) with descriptions of new species. *Journal of the Linnean Society, Botany* **17**, 390–401.
Nakanishi, M; Kashiwadani, H; Moon, KH (2001): Notes on the genera *Graphina* and *Graphis* (Graphidaceae) in Thailand. *Bulletin of the National Science Museum, Tokyo, Series B*, **27**, 47–55.
Redinger, KM (1936): Die Graphideen der Sunda-Inseln. *Revue Bryologique et Lichénologique* **9**, 37–122.
Staiger, B (2002): Die Flechtenfamilie Graphidaceae. *Bibliotheca Lichenologica* **85**, 1–526.
Vainio, EA (1907): Lichenes novi rarioresque IV. *Hedwigia* **46**, 168–181.

Ramalina pollinaria (Westr.) Ach. in New Zealand

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Abstract: The presence of *Ramalina pollinaria* (Westr.) Ach. is confirmed for New Zealand.

Introduction

Zahlbruckner (1941) determined a specimen (*J.S. Thomson 1397*, collected 1934) from Trotters Gorge, Otago, New Zealand, as *Ramalina pollinaria* var. *humilis* Ach., and subsequently this name was listed by Martin (1966) in his census of the New Zealand lichen flora. Further collections were made in 1959 by J. Murray (*J. Murray 3867*, OTA 48504 and 48507). Galloway (1985) also listed *Ramalina pollinaria* (Westr.) Ach., but for specimens from the Old Man Range and with "?Divaricatic acid", which would correspond more with *R. fimbriata* Krog & Swinscow. Galloway (1992) referred New Zealand specimens previously known as *R. pollinaria* to *R. unilateralis* F. Wilson, while Blanchon *et al.* (1996) referred specimens to *R. fimbriata, R. canariensis* Steiner or *R. unilateralis*, all of which contain divaricatic acid.

Recent investigation of the morphology and anatomy of Trotters Gorge herbarium material and fresh material from the rediscovered collection site match the description of *Ramalina pollinaria*. Thin layer chromatography indicated the presence of evernic acid, and more detailed analysis (J. Elix, pers. comm. 2000) revealed evernic acid (major), obtusatic acid (minor) and usnic acid (minor). These are commonly found in *R. pollinaria*, but not in any previously recorded species of *Ramalina* in New Zealand.

Ramalina pollinaria (Westr.) Ach., *Lichenogr. Universalis* 608 (1810).
= *Lichen pollinarius* Westr., *Kongl. Vetensk. Acad. Nya Handl.* **16**: 56 (1795).

Type: Howe (1913) noted that the type was possibly from Sweden, but that a Westring type was unknown. He noted that there were varietal types in the Acharius herbarium at H. Krog & James (1977) designated a neotype (H-Ach. 1831D, var. *humilis* material) and an isoneotype (BM-Ach. 804A).

Description: Thallus saxicolous, pale whitish green when fresh, ivory-white when dry, caespitose in small tufts 10–15 mm tall, each tuft formed by a cluster of erect branches growing from the base, no evidence of sward formation (as seen in European material); branching mainly without lateral branches at first, then dichotomous to irregular, with more branching towards the apices; branches solid, 0.5–1.0 mm wide, flattened (but not compressed) to subterete towards the tips; branches are very fragile as no intact tips with meristems seen; surface smooth, matt to shiny, in places with shallow depressions; pseudocyphellae absent, but loss of areas of cortex from broken branches and where soredia are released do expose the medulla in places; lower surface splitting or cracking irregularly, disintegrating to release soredia, occurring mainly near the tips of the main and short lateral branches; soralia spread over the laminal surface, reaching the margins in places; branch tips appearing flattened where soredia are exposed, but no sign of hooded tips (cf. *R. obtusata* (Arnold) Bitter); soredia large, granular, 50–90 mm (average 66 mm) (measured in water) exposed on a thick, white, felty medulla where the cortex has disintegrated. The chondroid layer in the cortex is thin, possibly causing branch fragility and ease of cortical disintegration to release soredia; chondroid tissue is not seen in the medulla; algae are not restricted to a layer beneath cortex, nor in clusters between ridges, but scattered through the medulla. Pycnidia not seen. Apothecia not seen. Chemistry: K– C– P–, UV+ white, containing evernic, obtusatic, and usnic acids.

Notes: *Ramalina pollinaria* is known from only two sites in New Zealand. One is a local area of calcareous cement within greywacke and quartz conglomerate on shaded vertical rock faces under overhanging bluffs in Trotters Gorge, Otago, alt. 70 m. The other is on marble bedrock on the base of overhanging bluffs at Owen River, Nelson, 600 m (mapped as *R. fimbriata* in Bannister *et al.* 2004).

Ramalina pollinaria is widely distributed in the Northern Hemisphere, being known from the British Isles and mainland Europe (Krog & James 1977) and North America (Howe 1913, Brodo *et al.* 2001). It is also known from East Africa (Krog & Swinscow 1976). Specimens previously named as *R. pollinaria* in Hong Kong have been renamed as *R. throwerae* (Aptroot & Sipman 2001). Stevens (1987) did not record the species for Australia.

In New Zealand the species is known only from rock, but in Europe it is found on acid rocks and some trees (Krog & James 1977). Several specimens from BM from woody substrates were in fact *Ramalina canariensis* (with divaricatic acid), while those on rock appear to be *R. pollinaria* (with evernic acid). Krog & James (1977) noted that saxicolous specimens were usually richly branched and dissected, while corticolous specimens were often less dissected and more flattened. Nimis (1993) notes that it is a very polymorphic species, growing on bark and rocks, and that it is one of the few *Ramalina* species able to grow on calcareous substrata. North American specimens are usually known from trees, with occasional saxicolous specimens previously referred to *R. pollinaria* var. *humilis* (Howe 1913), although recent accounts do not use varietal ranks (Brodo *et al.* 2001). East African material is corticolous (Krog and Swinscow 1976).

Ramalina pollinaria is characterized by the small, saxicolous, solid thallus, with fragile branches. It has large soredia released by the disintegration of the cortex laminally (sometimes reaching the margins but not truly marginal). The species has a dense medulla and contains both evernic and obtusatic acids. *Ramalina fimbriata* can be superficially similar, but is inflated (most obvious basally), with occasional perforations and an arachnoid medulla. *Ramalina canariensis* is mainly corticolous, the margins split to release smaller soredia, and the medulla is less dense. *Ramalina unilateralis* is also mainly corticolous, has a thicker chondroid layer and is not so fragile. It has smaller soredia and does not have a dense medulla. All three species have divaricatic acid.

SPECIMENS EXAMINED
Otago: •Trotters Gorge, 70 m, i.1934, *J.S. Thomson 1397* (OTA 30058 & CHR 378154); •Trotters Gorge, 70 m, i.1959, *J. Murray 3867* (OTA 48504 & 48507); •Trotters Gorge, 70 m, 15.i.2003, *A. Knight & D.J. Blanchon (J.M. Bannister 1993)* (OTA 59533 & UNITEC 1061). *Nelson*: •Owen River, on marble bedrock on base of overhanging bluffs, 600 m, 27.iv.2003, *D. Glenny 8845* (CHR 569757, OTA 58066).

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References

Aptroot, A; Sipman, HJM (2001): New Hong Kong lichens, ascomycetes and lichenicolous fungi. *Journal of the Hattori Botanical Laboratory* **91**, 317–343.

Bannister, P; Bannister, JM; Blanchon DJ (2004): Distribution, habitat, and relation to climatic factors of the lichen genus *Ramalina* Ach. in New Zealand. *New Zealand Journal of Botany* **42**, (in press).

Blanchon, DJ; Braggins, JE; Stewart, A (1996): The lichen genus *Ramalina* in New Zealand. *Journal of the Hattori Botanical Laboratory* **79**, 43–98.

Brodo, IM; Sharnoff, SD; Sharnoff, S (2001): *Lichens of North America*. Yale University Press, New Haven/London.

Galloway, DJ (1985): *Flora of New Zealand Lichens*. Government Printer, Wellington.

Galloway, DJ (1992): *Checklist of New Zealand lichens*. DSIR Land Resources, Christchurch.

Howe, RH (1913): North American species of the genus *Ramalina* – Part II. *Bryologist* **16**, 81–88.

Krog, H; James, PW (1977): The genus *Ramalina* in Fennoscandia and the British Isles. *Norwegian Journal of Botany* **24**, 15–43.

Krog, H; Swinscow, TDV (1976): The genus *Ramalina* in East Africa. *Norwegian Journal of Botany* **23**, 153–175.

Martin, W (1966): Census catalogue of the lichen flora of New Zealand. *Transactions of the Royal Society of New Zealand (Botany)* **3**, 139–159.

Nimis, PL (1993): *The Lichens of Italy. An Annotated Catalogue*. Torino.

Stevens, GN (1987): The lichen genus *Ramalina* in Australia. *Bulletin of the British Museum (Natural History) Botany Series* **16** (2), 107–223.

Zahlbruckner, A (1941): Lichenes Novae Zelandiae a cl. H.H. Allan eiusque collaboratoribus lecti. *Denkschriften Mathematische Naturwissenschaftliche Klasse. Akademie der Wissenschaften in Wien* **104**, 363–364.

Notes on some lichen names recorded from the Snares Islands, southern New Zealand

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Abstract: New lichen names introduced by C.W. Dodge in 1969 for material from the Snares Islands in southern New Zealand are discussed. *Aspicilia composita* C.W.Dodge, and *Lecanora prolifera* C.W.Dodge, are new synonyms of *Lecanora symmicta; Lecidea (Biatora) fineranii* C.W.Dodge is a new synonym of *Lecanora flavopallida; Opegrapha fineranii* C.W.Dodge is an additional synonym of *Dirina neozelandica; Phaeographis (Solenothecium) fineranii* C.W.Dodge is doubtfully synonymized with *Opegrapha agelaeoides*; and the new combination *Solenopsora sordida* (C.W.Dodge) D.J.Galloway is proposed, based on *Haematomma sordidum* C.W.Dodge. Several other errors in Dodge names applied to Snares material are also briefly discussed.

Introduction

During work on the forthcoming second edition of *Flora of New Zealand Lichens* (Galloway 2004), several lichen names introduced by the late Carroll Dodge (1895–1988) for material collected on the Snares Islands in southern New Zealand (lat. 48°0.7'S, long. 166°35.8'E) by Brian Fineran in 1961, were checked, and the specimens on which these names were based were obtained from CANU for study. Of the 45 lichens recorded from the Snares (Fineran 1969), five were newly described by Dodge: *Aspicilia composita* C.W.Dodge, *Haematomma sordidum* C.W.Dodge, *Lecidea (Biatora) fineranii* C.W.Dodge, *Opegrapha fineranii* C.W.Dodge, and *Phaeographis (Solenothecium) fineranii* C.W.Dodge. They are discussed below, together with comments on some of the other species recorded in the Snares list.

Carroll Dodge published widely on Antarctic and Subantarctic lichens (see for example, Dodge & Baker 1938; Dodge 1948, 1968, 1971, 1973; Rudolph 1990), but many of his determinations were subsequently shown to be in error (Castello & Nimis 1995, 1997; Øvstedal & Lewis Smith 2001), and he had a reputation of being a cavalier taxonomist, often making new species on fragmentary, sterile or unrepresentative material. Indeed, in a review of Dodge's *Antarctic Lichen Flora*, the Swedish lichenologist Ove Almborn noted "...From a letter written by one of the leading lichenologists of today, otherwise known for his moderate judgement, may be quoted: 'This author has caused untold damage to taxonomic lichenology. His publications unfortunately cannot be simply ignored. Future serious lichenologists will have to spend much time and trouble in evaluating and identifying all his mainly worthless taxa'" (Almborn 1974). To an extent, that is also true of Dodge's identifications of New Zealand lichens, although to be fair to him, he did at least attempt to name material from collections sent to him, and at least some of his new taxa are still valid, even though many are contradictory, confusing or erroneous, but I cannot agree with his obituarist, Emanuel Rudolph, who stated "...Like the solid granite of Vermont, the works of Carroll William Dodge will endure and serve as foundations for those that follow" (Rudolph 1990). A later publication will attempt to deal critically with lichen names introduced by Dodge for New Zealand lichens. This contribution re-examines some of Dodge's determinations of lichens collected on the Snares Islands, in particular those he described from there as new.

Aspicilia composita C.W.Dodge in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 245 (1969).
Type: New Zealand. Snares Islands, on branch of *Hebe elliptica*, Feb. 7, 1961, *B.A. Fineran 120* (CANU! – holotype).

This material is referable to *Lecanora symmicta* (Ach.) Ach., a lichen widespread on dry twigs and lignum (Galloway 1985, 2004; Lumbsch & Elix 2004).

Solenopsora sordida (C.W.Dodge) D.J.Galloway, comb. nov.
≡ *Haematomma sordidum* C.W.Dodge in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 247 (1969).
Type: New Zealand. Snares Islands, on rock near shore, Jan. 30, 1961, *B.A. Fineran 86* (FH – holotype; CANU! - isotype).

Description: Thallus crustose, spreading in irregular, areolate patches, 1–3 cm diam., of clumped, minute squamules on a thin to subbyssoid black prothallus. Squamules minute, granular, 0.1–0.5 mm diam., margins scalloped to minutely lobulate, hummocky, coalescing in friable clumps to 1 mm diam., separated by narrow to widely gaping cracks and exposing black prothallus. Surface matt, pale greenish when moist, dirty cream to pale fawnish when dry. Apothecia widely scattered, infrequent, sessile, constricted at base, 0.2–1 mm diam., rounded; disc plane to shallowly convex, yellowish brown to dark brown, epruinose. Epithecium brown, 8–10 µm thick, unchanged in K. Hymenium colourless, 45–55 µm tall. Hypothecium opaque, of densely interwoven hyphae, to 125 µm thick. Asci clavate, 35–45(–50) × 13–17 µm, 8-spored, with a thick tholus, 8–10 µm tall, occasionally with a small ocular chamber. Paraphyses lax, slender, 1.5–2.5 µm thick; apices dark brown, swollen, to 3.5 µm diam. Ascospores fusiform-ellipsoid, colourless, 1-septate (mature, released spores are vacuolate or can have several spurious plasma bridges, appearing 4- or more septate; spores in the ascus are always consistently 1-septate), 15–18(–20) × 3.5–5 µm, with pointed apices and without a perispore.

Notes: The holotype material was examined by Staiger & Kalb (1995), who found it to contain 1-septate ascospores [the protologue states "ascosporae octone acidulares [sic], 8-loculares, 20 × 2.5 µm" (Fineran 1969)], and considered it referable to *Solenopsora*, although they did not make the appropriate combination (Kantvilas 2004). That is now made here. Material in FH comprises the holotype (*Fineran 86*) and four additional collections (*Fineran 63, 83* [Genevieve Lewis-Gentry pers. comm.]), while the CANU isotype comprises two small fragments. The recently described *S. tasmanica* (Kantvilas 2004) is an alpine species with a thinner thalline margin, darker apothecial discs and shorter ascospores.

Lecidea (Biatora) fineranii C.W.Dodge in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 248 (1969).
Type: New Zealand. Snares Islands, on trunk of *Olearia lyallii*, Feb. 7, 1961, *B.A. Fineran 117* (CANU – holotype). This material is referable to *Lecanora flavopallida* Stirt., a species widespread on the bark of trees and shrubs and on lignum (Galloway 1985, 2004; Guderley *et al.* 1998; Lumbsch & Elix 2004).

Opegrapha fineranii C.W.Dodge in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 248 (1969).
Type: New Zealand. Snares Islands, on rock in forest behind Biological Station, Feb. 3, 1961, *B.A. Fineran 116* (CANU – holotype).

This material is referable to *Dirina neozelandica* (Redinger) Sparrius, a lichen occurring on coastal rocks at high tide mark, forming prominent pale brownish or creamish to purplish thick patches amongst mosaics of white *Pertusaria graphica* and *Opegrapha diaphoriza*, commonly also with *Caloplaca circumlutosa, Pertusaria graphica, Tephromela atra* and *Tylothallia pahiensis*. It also grows in the upper parts of the black *Verrucaria* zone (Galloway 2004). The transfer of *Enterographa neozelandica* to *Dirina* was recently proposed by Sparrius (2004), and *Opegrapha fineranii* becomes an additional synonym, along with *Placidiopsis novozelandica* C.W.Dodge (Dodge 1971, Sparrius 2004, Galloway 2004). Holotype material was examined and illustrated by Glenys Hayward as *Arthonia* sp. (Hayward 1977, fig. 12C).

Phaeographis (Solenothecium) fineranii C.W.Dodge in B.A. Fineran, *Trans. Roy, Soc. N. Z. (Bot.)* **3** (17), 249 (1969).
Type: New Zealand. Snares Islands, on branch of *Hebe elliptica*, Feb. 7, 1961, *B.A. Fineran 120a* (CANU – holotype).

The holotype material consists of three minute scraps of bark with only two small lirellae present. In her treatment of New Zealand names in the families Graphidaceae and Opegraphaceae, Glenys Hayward commented "This type cannot be characterized or compared with any New Zealand species because the holotype is fragmentary" (Hayward 1977), a position I also endorse. From the protologue, though, it seems most likely that the material is referable to *O. agelaeoides* Nyl., a widespread species known from the Three Kings Islands to Stewart Island (Hayward 1977; Galloway 1985, 2004).

Caloplaca litoralis Zahlbr. in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 246 (1969).

Snares material seen ("on dead stems of *Hebe elliptica, B.A. Fineran 123*" – CANU), is referable to *Caloplaca flavorubescens* (Galloway 2004).

Chiodecton macquariense C.W.Dodge in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 246 (1969).

Snares material seen ("on rock, ridge leading to SW Promontory, *B.A. Fineran 37*" – CANU) is referable to *Pertusaria graphica* (Galloway 1985, 2004).

Kuttlingeria macquariensis C.W.Dodge in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 247 (1969).

Snares materials seen ("coastal rocks, *B.A. Fineran 72, 73, 76*; on timber of Provision Depot, *B.A. Fineran 125*" – CANU) is referable to *Caloplaca cribrosa* (Poelt & Pelleter 1984; Galloway 1985, 2004), a species seldom seen on worked or decorticated wood.

Lecanora prolifera C.W. Dodge, *Nova Hedwigia* **15**, 290 (1968).
Type: Macquarie Island, Wireless Hill, 45–90 m, saxicole, *D.A. Brown 100* – FH (not seen).

Snares material seen ("on trunks of dead *Olearia lyallii, B.A. Fineran 97, 98*; on timber of Provision Depot, *B.A. Fineran 124, 126*; on signpost South Promontory, *B.A. Fineran 107*" – CANU), is referable to *Lecanora symmicta*. Fineran & Dodge (1973) also record *Lecanora prolifera* from Mt Haast at 2950 m, but this probably refers to *Lecanora polytropa*.

Opegrapha macquariensis C.W.Dodge, *Nova Hedwigia* **19**, 440 (1971) ["1970"].

Snares material seen ("on rock on ridge leading to SW Promontory, *B.A. Fineran 36, 39*" – CANU) is referable to *Opegrapha diaphoriza* (Hayward 1977).

Parmelia (Hypotrachyna) brownii C.W.Dodge in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 249 (1969).

Snares material seen ("from trunk of *Olearia lyallii, B.A. Fineran 48, 53*" – CANU)

is referable to *Parmelia cunninghamii*, as is also the type from Macquarie Island (Hale 1987, Elix 1994).

Phyllopyrenia sp. in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 250 (1969).
Snares material seen ("on coastal rocks, *B.A. Fineran 74* ["too immature to describe properly, C.W. Dodge"], South Promontory on rock in open forest, *B.A. Fineran 68a* ("sterile thallus, suggestive of *Phyllopyrenia*, C.W. Dodge"]" – CANU), is referable to *Pertusaria graphica*, with both specimens typically developed and fertile!

Physcia crispa (Pers.) Nyl., in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 250 (1969).
Snares material seen. ("South Promontory near penguin rookery, 1961, *B.A. Fineran 90*" – CANU), is referable to *Physcia nubila* Moberg (Moberg 2001, Galloway 2004, Galloway & Moberg 2005).

Xanthoria aurea (A.Rich.) Müll.Arg. in B.A. Fineran, *Trans. Roy. Soc. N. Z. (Bot.)* **3** (17), 247 (1969).
Snares material seen ("near Boat Harbour, 1961, *B.A. Fineran 67*" – CANU), is referable to *Xanthoria ligulata* (Galloway 1985, 2004).

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References
Almborn, O (1974): Dodge, Carroll W: *Lichen Flora of the Antarctic Continent and Adjacent Islands* [Review]. *Botaniska Notiser* **127**, 454–455.
Castello, M; Nimis, PL (1995): A critical revision of Antarctic lichens described by C.W. Dodge. *Bibliotheca Lichenologica* **57**, 71–92.
Castello, M; Nimis, PL (1997): Diversity of lichens in Antarctica. In: B. Battaglia, J. Valencia & D.W.H. Walton (eds) *Antarctic Communities: Species, Structure and Survival*. Pp. 15–21, Cambridge University Press, Cambridge.
Dodge, CW (1948): Lichens and lichen parasites. *British Australia New Zealand Antarctic Research Expedition, 1929–31 Reports*, Series B, **7**, 1–276.
Dodge, CW (1968): Lichenological notes on the Flora of the Antarctic Continent and the subantarctic islands. VII and VIII. *Nova Hedwigia* **15**, 285–332.
Dodge, CW (1971) ["1970"]: Lichenological notes on the Flora of the Antarctic Continent and the subantarctic islands IX–XI. *Nova Hedwigia* **19**, 439–502.
Dodge, CW (1973): *Lichen Flora of the Antarctic Continent and Adjacent Islands*. Phoenix Publishing, Canaan, New Hampshire.
Dodge, CW; Baker, GE (1938): The Second Byrd Antarctic Expedition – Botany. II. Lichens and lichen parasites. *Annals of the Missouri Botanical Garden* **25**, 438–577.
Elix, JA (1994): *Parmelia*. *Flora of Australia* **55**, 114–124.
Fineran, BA (1969): The flora of the Snares Islands, New Zealand. *Transactions of the Royal Society of New Zealand, Botany* **3**, 237–270.
Fineran, BA; Dodge, CW (1973): Lichens from the Southern Alps, New Zealand II, records from the Mt. Cook district. *Pacific Science* **27**, 274–280.
Galloway, DJ (1985): *Flora of New Zealand Lichens*. P.D. Hasselberg, N.Z. Government Printer, Wellington.

Galloway, DJ (2004): *Flora of New Zealand Lichens, Revised Second Edition – Including Lichen-forming and Lichenicolous Fungi*. Manaaki Whenua Press (in prep.).
Galloway, DJ; Moberg, R (2005): The lichen genus *Physcia* (Schreb.) Michx. (Physciaceae: Ascomycota) in New Zealand. *Tuhinga* (accepted).
Guderley, R; Lumbsch, HT; Elix, JA (1998): *Lecanora flavopallida*, a species of *Lecanora sensu stricto* with almost biatorine apothecia (Lecanorales). *Bryologist* **101**, 103–108.
Hale, ME Jr (1987): A monograph of the lichen genus *Parmelia* Acharius *sensu stricto* (Ascomycotina: Parmeliaceae). *Smithsonian Contributions to Botany* **66**, 1–55.
Hayward, GC (1977): Taxonomy of the lichen families Graphidaceae and Opegraphaceae in New Zealand. *New Zealand Journal of Botany* **15**, 565–584.
Kantvilas, G (2004): A new species of *Solenopsora* from Tasmania. *Lichenologist* **36**, 113–117.
Lumbsch, HT; Elix JA (2004): *Lecanora*. *Flora of Australia* **56A**, 12–62.
Moberg, R (2001). The lichen genus *Physcia* in Australia. *Bibliotheca Lichenologica* **78**, 289–311.
Øvstedal, DO; Lewis Smith, RI (2001): *Lichens of Antarctica and South Georgia. A guide to their Identification and Ecology*. Cambridge University Press, Cambridge.
Poelt, J; Pelleter, U (1984): Zwerstrauchige Arten der Flechtengattung *Caloplaca*. *Plant Systematics and Evolution* **148**, 51–88.
Rudolph, E (1990): Carroll William Dodge, 1895–1988. *Mycologia* **82**, 160–164.
Sparrius, LB (2004): A monograph of *Enterographa* and *Sclerophyton*. *Bibliotheca Lichenologica* **89**, 1–141.
Staiger, B; Kalb, K (1995): *Haematomma*-Studien. 1. Die Flechtengattung *Haematomma*. *Bibliotheca Lichenologica* **59**, 1–198.

A new species of *Pyrrhospora* (Lecanoraceae, lichenized Ascomycota) from Australia

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Abstract: *Pyrrhospora arandensis* Elix, a species new to science, is described from the Australian Capital Territory.

The lichen genus *Pyrrhospora* Körb. (Lecanoraceae) is quite widely distributed in Australia, occurring on rocks, dead wood, and twigs. Species are characterized by a crustose thallus, prominent orange, red or red-brown, biatorine apothecia with *Lecanora*-type asci, and simple colourless spores. Four species have been reported from Australia (McCarthy 2003), 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 (Feige *et al.* 1993, Elix *et al.* 2003) and comparison with authentic samples.

Pyrrhospora arandensis Elix, sp. nov. Figure 1

Thallus ut in *Pyrrhospora laeta* sed densis isidiatis, sporis brevioribus et acidum fumarprotocetraricum continente differt.

Type: **Australia**: Australian Capital Territory: Canberra Nature Park, Aranda Bushland, 4 km W of Canberra, 35°16'03"S, 149°04'40"E, 660 m, on dead wood in dry *Eucalyptus* woodland, *J.A. Elix 26306*, 19.viii.1991; holo: CANB; iso: GZU, HO, MEL.

Thallus crustose, superficial, whitish grey to pale grey or grey-green, indistinctly areolate, densely isidiate; isidia globose to subcylindrical or rarely squamiform, simple or sparingly branched and becoming ±fused, granulose and then eroding with age. Prothallus not apparent. *Apothecia* 0.4–1.5 mm wide, strongly convex to ±flat, often irregular in shape, dark reddish brown; true exciple excluded; epithecium interspersed with reddish brown granules, K+ reddish purple; hymenium colourless, I+ blue; hypothecium colourless; hamathecium of paraphyses, simple or sparingly branched towards the apices, apices not conspicuously swollen, septate, constricted at septa. *Asci* 8-spored, lacking a distinct perispore, 9–12 × 2.5–4 µm. *Pycnidia* not seen.

Chemistry. Thallus K– or K+ yellow-brown, C–, P+ deep orange-red (fumarprotocetraric acid and trace of protocetraric acid); apothecia K+ reddish purple (russulone and trace of norrussulone).

The apothecia of the new species closely resemble those of *Pyrrhospora laeta* (Stirt.) Hafellner, although in some instances they are somewhat darker red-brown in colour. The most characteristic feature of the new species is the isidiate upper surface, with dense, globose to subcylindrical isidia which erode and become granular with age, but do not become sorediate. By contrast, the upper surface of *P. laeta* is more or less smooth despite becoming cracked and areolate with age. In addition, the spores of *P. laeta* are longer (13–19 × 3.0–3.5 µm cf. 9–12 × 2.5–4 µm), and its thallus lacks the medullary fumarprotocetraric acid present in *P. arandensis*. Fumarprotocetraric acid is quite a common metabolite in the genus *Pyrrhospora*, being present in the well-known Northern Hemisphere species *P. russula* (Ach.) Hafellner and *P. cinnabarina* (Sommerf.) M. Choisy (Brodo *et al.* 2001). Both of the latter species lack isidia. Furthermore, *P. cinnabarina* has a sorediate thallus and contains additional atranorin, while *P. russula* is esorediate but contains additional lichexanthone and norstictic acid. At present, the new species is known from only the type locality, where it is very common on dead wood.

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References

Brodo, IM; Sharnoff, SD; Sharnoff, S (2001): *Lichens of North America*. Yale University Press, New Haven and London.

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.

Feige, GB; Lumbsch, HT; Huneck, S; Elix, JA (1993): The identification of lichen substances by a standardized high-performance liquid chromatographic method. *Journal of Chromatography* **646**, 417–417.

McCarthy, PM (2003): *Catalogue of Australian Lichens*. Flora of Australia Supplementary Series No. 19. Australian Biological Resources Study, Canberra.

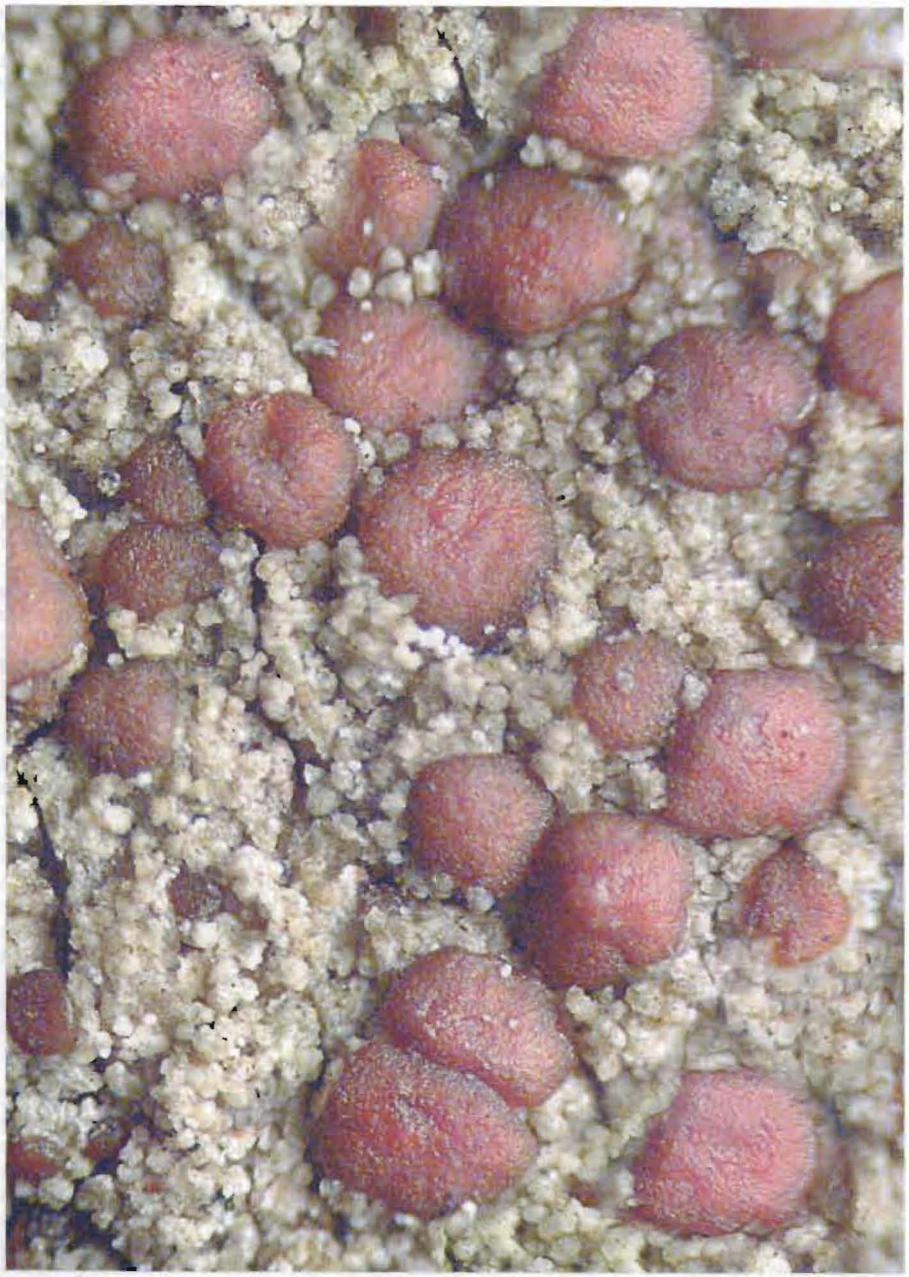

Figure 1. *Pyrrhospora arandensis* (part of holotype in CANB). 1 mm