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The corticolous *Lecanora alba* was described in 1995 by H.T. Lumbsch from a Queensland collection. An Australian endemic, it has been reported from Queensland and New South Wales, and grows in mangroves and rainforest margins on the bark of species of *Alphitonia*, *Araucaria*, *Casuarina*, *Ceriops*, and *Eucalyptus*.

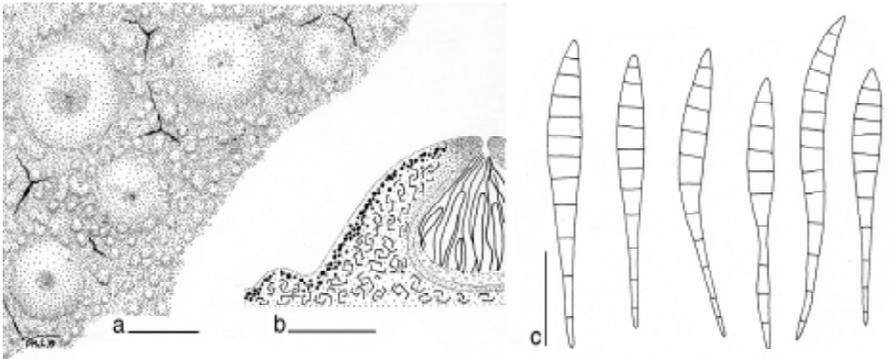
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CHECKLIST OF THE LICHENS OF AUSTRALIA AND ITS ISLAND TERRITORIES

An updated version of this on-line resource was made available on 6 April, 2006. The checklist includes publication details, synonymy, distribution and literature citations for 3238 species and infraspecific taxa in 422 genera. The latest version also includes 454 illustrations, mostly colour photographs by Bill Malcolm and line-art by Pat McCarthy. See: <http://www.anbg.gov.au/abrs/lichenlist/introduction.html>



CORRIGENDA — VOLUME 58

On page 18, line 2 of Acknowledgements: (Landcare Research, Dunedin)" should have read "(Herbarium PDD, Landcare Research, Auckland)".

On page 32, line 1: "*Opegrapha flavescens*" should have read "*Opegrapha inalbescens*".

In Articles on the back cover, Kantvilas: "*Opegrapha flavescens*" should have read "*Opegrapha inalbescens*".

RECENT LITERATURE ON AUSTRALASIAN LICHENS

- Archer, AW (2006): Additional lichen records from Australia 60: *Sclerophyton elegans*. *Australasian Lichenology* **59**, 19.
- Elix, JA (2006): Additional lichen records from Australia 57: *Xanthoparmelia*. *Australasian Lichenology* **59**, 6–11.
- Elix, JA (2006): Additional lichen records from Australia 58: Norfolk Island. *Australasian Lichenology* **59**, 12–15.
- Elix, JA (2006): Five new species of *Phyllopsora* (lichenized Ascomycota) from Australia. *Australasian Lichenology* **59**, 23–29.
- Elix, JA (2006): A new species of *Hafellia* (Physciaceae, lichenized Ascomycota) from Australia. *Australasian Lichenology* **59**, 36–38.
- Fryday, AM; Coppins, BJ (2006): Typification and identity of *Pertusaria obvelata* Nyl. *Australasian Lichenology* **59**, 34–35.
- Galloway, DJ (2006): BOOK REVIEW *Swedish Landscape Lichens*, by Arvidsson & Hultengren (eds). *Australasian Lichenology* **59**, 5.
- Grube, M; Kantvilas, G (2006): *Siphula* represents a remarkable case of morphological convergence in sterile lichens. *Lichenologist* **58**, 241–249.
- Kantvilas, G (2006): Additional lichen records from Australia 59: *Bryonora castanea*. *Australasian Lichenology* **59**, 16–18.
- Kantvilas, G; Elix, JA (2006): Further notes on the genus *Hertelidea*, with a description of a new species. *Australasian Lichenology* **59**, 30–33.
- Lücking, R; Thor, G; Aptroot, A; Kalb, K; Elix, JA (2006): The *Cryptothecia candida* complex revisited. *Lichenologist* **58**, 235–240.
- Messuti, JJ; Archer, AW; De La Rosa, IN (2006): A new species of *Pertusaria* from Valdivian rainforest, Argentina. *Lichenologist* **58**, 263–266.
- Owe-Larsson, B; Aptroot, A (2006): Additional lichen records from Australia 61: Some pyrenocarpous lichens. *Australasian Lichenology* **59**, 20–21.
- Owe-Larsson, B; Aptroot, A (2006): Additional lichen records from New Zealand 45: *Anisomeridium subprostans* and *Pyrenula concolorans*. *Australasian Lichenology* **59**, 22.

BOOK REVIEW

Svenska landskapslavor (Swedish Landscape Lichens)
by Lars Arvidsson & Svante Hultengren (eds).

Naturcentrum AB. 2005. 64 pages. ISBN 91-85221-07-4. Distributed by Naturcentrum AB, C.W. Borgs väg 4, SE-444 31 Stenungsund, Sweden. e-mail: ncab@naturcentrum.se Price 140 SEK (about NZ\$26), plus post and packaging.

Here is a small, beautifully produced “lichen coffee table book” with a difference! It deserves to have a very wide and appreciative audience among the international lichenological fraternity as well as natural historians interested in truly stunning macrophotography. The subject is lichens and the landscapes which they inhabit and often beautify by their distinctive colours, shapes, and textures in the 25 provinces of Sweden. The book has a short introduction to lichens, what they are, and what they can tell us about the health of a landscape in their role as environmental indicators, the threats to lichen growth, and the concept of rarity in the Swedish lichen mycobiota. It is written in Swedish, but that is not a serious handicap. A list of lichen taxa on the Swedish Red List is given at the end of the book, with the following categories appended where appropriate: RE (regionally extinct), CR (critically endangered), EN (endangered), VU (vulnerable), and NT (near threatened).

The bulk of the book is devoted to a particular lichen which is characteristic of the landscape in each of the 25 provinces, beginning with the flat limestone landscape of Skåne and its near-threatened calcicole *Xanthoria calcicola*, and ending with a glorious image of the wind lichen *Ophioparma ventosa* as a representative of the high-alpine glacial environments of Lappland, a remote and fabled landscape to most of us in the Southern Hemisphere. Each of the 25 provinces has a two-page spread—on the left is a dramatic close-up or a habitat shot of the lichen chosen for that province, and on the right a landscape photograph of it, a map of its known Swedish distribution, and an informative text contributed by the authors Lars Arvidsson and Svante Hultengren plus Ulf Arup, Janolof Hermansson, Fredrik Jonsson, Mats Karström, and Göran Thor. The lichens depicted range from the minute *Calicium quercinum* to the long-pendent *Usnea longissima*, and a good selection of foliose and fruticose taxa in between those extremes. Plates with resonance for New Zealand lichenologists are *Aspicilia calcarea*, *Lobaria scrobiculata*, *Verrucaria maura*, and *Fulgensia fulgens*, which was first collected by William Colenso in New Zealand in the 1850s from calcareous soil near Cape Kidnappers. A short but relevant bibliography is added at the end.

The book is produced to the highest standards, and editors, photographers, and authors as well as the printers and publishers are to be warmly congratulated on their achievement. As an introduction to lichens of a region's landscapes, the book is a model for many other countries to emulate, and at such a competitive price it is surely one of the very best lichen bargains going. Attractive front and back covers give thumbnail illustrations of nearly all the lichens photographed within (only *Evernia prunastri* is missing), and the cover blurb carries the message “Valkornmen till lavarnas värld!” (Welcome to the world of lichens). I urge everyone remotely interested in lichens to get a copy of this book. You'll be glad you did!

David J. Galloway

Landcare Research New Zealand Limited,
Private Bag 1930, Dunedin, New Zealand
gallowayd@LandcareResearch.co.nz

Additional lichen records from Australia 57
New records of *Xanthoparmelia*

John A. Elix

Department of Chemistry, The Faculties,
Australian National University, Canberra, ACT 0200, Australia

Xanthoparmelia applicata is reported as new to Australia. In addition, new State and Territory records are listed for 24 other species.

NEW RECORD FOR AUSTRALIA

Xanthoparmelia applicata Hale, *Mycotaxon* **30**, 320 (1987).

Xanthoparmelia applicata is characterized by the tightly adnate thallus, the pale brown lower surface, the absence of soredia and isidia and the presence of barbatic and 4-O-demethylbarbatic acids in the medulla. It could be confused with *X. barbatica* (Elix) Egan, but the latter species is less tightly adnate, has somewhat broader lobes (1–2.5 mm cf. 0.7–1.5 mm wide), is usually laciniate (*X. applicata* is elaciniate) and always contains additional dehydroconstipatic acid in the medulla. *Xanthoparmelia applicata* was known previously from South Africa (Hale 1990). A detailed description is given in Hale (1987, 1990).

SPECIMENS EXAMINED

Western Australia: • Kalbarri National Park, Rainbow Valley Walk, 6.5 km S of Kalbarri township, 27°45'29"S, 114°08'19"E, on sandstone rocks in coastal heath, 3.v.2004, J.A. Elix 33664, 33665, 33666, 33672, 33676, 33679, 33689 (CANB, PERTH).

NEW STATE AND TERRITORY RECORDS

1. *Xanthoparmelia barthlottii* Elix & U.Becker, *Mycotaxon* **71**, 3 (1999).

This species was reported previously from Queensland and Zimbabwe (Elix *et al.* 1999, McCarthy 2006).

SPECIMEN EXAMINED

Western Australia: • Kalbarri National Park, Murchison River Gorge, trail to Z-bend, 25 km NE of Kalbarri, 27°39'30"S, 114°27'30"E, 135 m, on sandstone rocks in *Melaleuca* heath, 2.v.2004, J.A. Elix 33629 (CANB, PERTH).

2. *Xanthoparmelia brunthalerei* (J.Steiner & Zahlbr.) Hale, *Phytologia* **28**, 486 (1974).

This species was reported previously from the Northern Territory and South Africa (Elix 1994c, Hale 1990, McCarthy 2006).

SPECIMEN EXAMINED

Western Australia: • Site 3, Wanjarri Nature Reserve, 27°26'S, 120°38'30"E, on granite rocks, 30.viii.1994, C.S. Fang & R.J. Cranfield 24/94 (PERTH).

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

Syn. *Paraparmelia crawfordensis* Elix

This Australian endemic species was reported previously from Western Australia, South Australia, New South Wales and Tasmania (Elix 2001, McCarthy 2006).

SPECIMENS EXAMINED

Australian Capital Territory: • Canberra Nature Park, The Pinnacle, Weetangera, 35°16'S, 149°03'E, 700 m, on porphyry rocks in open *Eucalyptus* woodland, 26.xii.2002, J.A. Elix 30590, 30598 (CANB).

4. *Xanthoparmelia delisei* (Duby) O.Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch, *Taxon* **53**, 967 (2004).

Syn. *Neofuscelia delisei* (Duby) Essl.

This species was known previously from South Australia, Queensland, Australian Capital Territory, New South Wales, Europe, Asia and North Africa (Elix 1994a, McCarthy 2006).

SPECIMEN EXAMINED

Victoria: • Northern Plains region, Mt Korong, 13 km SE of Wedderburn, 36°28'S, 143°45'E, 280 m, on large granite outcrop in disturbed *Eucalyptus* woodland, 6.xii.1996, H. Streimann 59142D (CANB).

5. *Xanthoparmelia dubitata* Elix & J.Johnst., in Elix *et al.*, *Bull. Brit. Mus. (Nat. Hist.) Bot.* **15**, 233 (1986).

This species was reported previously from the Northern Territory, South Australia, New South Wales and Victoria (Elix 1994c, McCarthy 2006).

SPECIMENS EXAMINED

Western Australia: • Near summit of Mount Brown, 3 km SE of York, 31°53'16"S, 116°47'07"E, 295 m, on granite rocks in remnant *Acacia* woodland, 21.iv.2004, J.A. Elix 31680 (PERTH); • Great Northern Highway, 47 km NE of Wubin, 29°50'10"S, 116°56'45"E, 305 m, on low granite outcrop in open *Eucalyptus-Acacia* woodland, 29.iv.2004, J.A. Elix 33551 (CANB).

6. *Xanthoparmelia filsonii* Elix & J.Johnst., in Elix *et al.*, *Bull. Brit. Mus. (Nat. Hist.) Bot.* **15**, 251 (1986).

This species was reported previously from Western Australia, Queensland, New South Wales, Victoria and Tasmania (Elix 1994c, McCarthy 2006).

SPECIMEN EXAMINED

Australian Capital Territory: • Gudgenby River Gorge, 4.5 km S of Tharwa, 35°33'S, 149°04'23"E, 600 m, on granite rocks in steep gorge, 14.x.2003, J.A. Elix 31636 (CANB).

7. *Xanthoparmelia fracticollis* Elix, *Lichenologist* **36**, 279 (2004).

This species was reported previously from South Australia and New South Wales (Elix 2004, McCarthy 2006).

SPECIMEN EXAMINED

Western Australia: • Bruce Rock, 2 km E of Bruce Rock township, 31°52'06"S, 118°10'E, 295 m, on granite rocks in remnant *Eucalyptus-Acacia* woodland, 23.iv.2004, J.A. Elix 31934 (PERTH).

8. *Xanthoparmelia franklinensis* (Elix) O.Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch, *Taxon* **53**, 968 (2004).

Syn. *Neofuscelia franklinensis* Elix

This species was reported previously from Australian Capital Territory and Victoria (Elix 1999, McCarthy 2006).

SPECIMEN EXAMINED

New South Wales: • Mount Kosciuszko National Park, Spencer Creek, 2.5 km E of Charlottes Pass, 36°26'S, 148°22'E, 1730 m, on granite rocks in alpine heath, 31.iii.2003, J.A. Elix 30641 (CANB).

9. *Xanthoparmelia leppii* (Elix) O.Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch, *Taxon* 53, 968 (2004).

Syn. *Neofuscelia leppii* Elix

This species was reported previously from South Australia (Elix 1999, McCarthy 2006).

SPECIMENS EXAMINED

New South Wales: • Sturt Highway, 40 km by road SE of Buronga, 34°24'31"S, 142°26'17"E, 45 m, on soil in mallee scrub, 24.v.2003, *J.A. Elix* 31507 (CANB). *Victoria*: • Murray-Sunset National Park, Sturt Highway, 26 km by road E of Renmark, 34°16'28"S, 140°58'04"E, 30 m, on soil in mallee scrub with saltbush, 24.v.2003, *J.A. Elix* 31426, 31435, 31447, 31448, 31449 (CANB); • Merringur Flora and Fauna Reserve, 10 km S of Sturt Highway, 3 km N of Merringur township, 34°21'52"S, 141°20'E, 80 m, on soil in *Allocasuarina-Eucalyptus* woodland, 24.v.2003, *J.A. Elix* 31462, 31477 (CANB).

10. *Xanthoparmelia luteonotata* (J.Steiner) O.Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch, *Taxon* 53, 968 (2004).

Syn. *Neofuscelia luteonotata* (J.Steiner) Essl.

This species was reported previously from Western Australia, South Australia, Victoria, Australian Capital Territory, Tasmania, Africa, New Zealand and Europe (Elix 1994a, McCarthy 2006).

SPECIMENS EXAMINED

New South Wales: • Barrier Highway, 15 km by road W of Broken Hill, 32°00'26"S, 141°16'57"E, 350 m, on gneiss rocks in rocky area with scattered saltbush and *Acacia*, 15.v.2003, *J.A. Elix* 30819, 30832 (CANB).

11. *Xanthoparmelia masonii* Elix, *Mycotaxon* 47, 124 (1993).

This species was reported previously from New South Wales, Australian Capital Territory and Tasmania (Elix 1994c, McCarthy 2005).

SPECIMEN EXAMINED

South Australia: • Kangaroo Island, Kirkpatrick Point, just N of Remarkable Rocks, 36°03'S, 136°45'E, 40 m, on granite rocks on exposed headland, 26.x.1985, *J.A. Elix* 19614 & *L.H. Elix* (CANB).

12. *Xanthoparmelia mayrhoferi* Elix, *Mycotaxon* 65, 489 (1997).

This species was reported previously from Queensland and New South Wales (Elix 1997, McCarthy 2006).

SPECIMENS EXAMINED

Western Australia: • Great Northern Highway, 47 km NE of Wubin, 29°50'10"S, 116°56'45"E, 305 m, on low granite outcrop in open *Eucalyptus-Acacia* woodland, 29.iv.2004, *J.A. Elix* 33537 (PERTH); • Bilya Rock, Gutha West Road, 27 km NW of Morowa, 29°00'29"S, 115°51'31"E, 340 m, on granite rocks on monolith with remnant *Acacia* and *Casuarina*, 1.v.2004, *J.A. Elix* 33611 (CANB).

13. *Xanthoparmelia microcephala* Elix & Kantvilas, *Mycotaxon* 73, 445 (1999).

This species was reported previously from Western Australia, Queensland, New South Wales, Australian Capital Territory and Tasmania (Elix & Kantvilas 1999, McCarthy 2006).

SPECIMENS EXAMINED

South Australia: • Germain Gorge, Port Germain to Murraytown road, 10 km E of Princes Highway, 32°58'31"S, 138°05'02"E, 200 m, on quartzite rocks in *Eucalyptus-*

Callitris woodland, 15.v.2003, *J.A. Elix* 30934, 30936 (AD, CANB); • Mount Remarkable National Park, Alligator Gorge, 32°44'49"S, 138°04'33"E, 600 m, on sandstone rocks in *Eucalyptus* woodland, 17.v.2003, *J.A. Elix* 30966 (CANB); • North Flinders Ranges, Weetootla Gorge walking track, 20 km SW of Arkaroola, 30°29'43"S, 139°15'15"E, 200 m, on laterite rocks in *Eucalyptus-Acacia* woodland, 21.v.2003, *J.A. Elix* 31264 (CANB); • North Flinders Ranges, Nooldoonooldoona Waterhole, 10 km NW of Arkaroola, 30°16'26"S, 139°17'16"E, 400 m, on schist rocks in *Eucalyptus-Callitris* woodland, 21.v.2003, *J.A. Elix* 31307 (CANB).

14. *Xanthoparmelia nebulosa* (Kurok. & Filson) Elix & J.Johnst., in Elix *et al.*, *Bull. Brit. Mus. (Nat. Hist.) Bot.* 15, 295 (1986).

This species was reported previously from New South Wales, Australian Capital Territory, Victoria and New Zealand (Elix 1994c, McCarthy 2006).

SPECIMENS EXAMINED

Tasmania: • Intersection of Elderslie Road and Black Brush Road, 9 km W of Pontville, 42°41'S, 147°10'E, 120 m, on sandstone rock in pasture, 11.xii.1993, *J.A. Elix* 40322 & *G. Kantvilas* (HO). *Western Australia*: • 1 km W of Yellowdine, 34 km E of Southern Cross along the Great Eastern Highway, 31°17'51"S, 119°38'46"E, 370 m, on granite rock on monolith with *Eucalyptus-Melaleuca* woodland, 24.iv.2004, *J.A. Elix* 32041 (PERTH); • Great Eastern Highway, 2.5 km E of Bullabulling, 27.5 km W of Coolgardie, 31°00'12"S, 120°53'13"E, 440 m, on soil in *Eucalyptus-Acacia* woodland, 24.iv.2004, *J.A. Elix* 32190 (CANB).

15. *Xanthoparmelia neodelisei* (Elix) O.Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch, *Taxon* 53, 969 (2004).

Syn. *Neofuscelia neodelisei* (Elix) Essl.

This species was reported previously from South Australia (Elix 1994a, McCarthy 2006).

SPECIMENS EXAMINED

Western Australia: • Charles Gardner Flora Reserve, north track, 18 km SW of Tammin along old York Road, 31°46'38"S, 117°28'26"E, 300 m, on laterite rocks in mallee *Eucalyptus* woodland, 22.iv.2004, *J.A. Elix* 31827 (CANB); • N side of road, 2 km from Kamballup Road House, on exposed spongolite deposit on edge of open shrubland, 29.ix.1991, *C.S. Fang s.n.* (PERTH).

16. *Xanthoparmelia paratasmanica* Elix, *Lichenologist* 36, 281 (2004).

This species was reported previously from South Australia, Queensland and New South Wales (Elix 2004, McCarthy 2006).

SPECIMENS EXAMINED

Western Australia: • 47.4 km N of Coolgardie, 2 km N of Kintore, 30°34'28"S, 121°00'38"E, 410 m, on soil in *Eucalyptus* woodland, 26.iv.2004, *J.A. Elix* 32317, 32320 (CANB, PERTH); • Depot Hill, 13 km along the Depot Hill road NW of Mingenew, 29°08'38"S, 115°21'02"E, 150 m, on lateritic sandstone in *Eucalyptus-Acacia* woodland, 4.v.2004, *J.A. Elix* 33802 (CANB).

17. *Xanthoparmelia segregata* Elix & J.Johnst., *Mycotaxon* 33, 361 (1988).

This species was reported previously from New South Wales, Victoria and Tasmania (Elix 1994c, McCarthy 2006).

SPECIMENS EXAMINED

Western Australia: • Great Eastern Highway, 2.5 km E of Bullabulling, 27.5 km W of Coolgardie, 31°00'12"S, 120°53'13"E, 440 m, on soil and laterite pebbles in *Eucalyptus-*

Acacia woodland, 24.iv.2004, J.A. Elix 32174 (CANB); • Karolin Rock, 20 km NW of Bullfinch, 31°59'01"S, 118°55'05"E, 370 m, on granite rock on monolith with scattered *Eucalyptus* and *Acacia*, 29.iv.2004, J.A. Elix 32587 (PERTH).

18. *Xanthoparmelia streimannii* (Elix & P.M. Armstr.) Elix & J. Johnst., in Elix *et al.*, *Bull. Brit. Mus. (Nat. Hist.), Bot.* **15**, 324 (1986).

This species was reported previously from South Australia, Queensland, New South Wales, Tasmania and New Zealand (Elix 1994c, McCarthy 2006).

SPECIMENS EXAMINED

Western Australia: • Near summit of Mount Brown, 3 km SE of York, 31°53'16"S, 116°47'07"E, 295 m, on granite rocks in remnant *Acacia* woodland, 21.iv.2004, J.A. Elix 31673, 31679, 31680 (CANB, PERTH); • Near summit of Mount Observation, Mount Observation National Park, 20 km W of York, 31°53'45"S, 116°33'26"E, 365 m, on lateritic rocks in *Eucalyptus* woodland, 21.iv.2004, J.A. Elix 31704, 31717 (CANB, PERTH); • Beverley-Mawson road, 26 km NE of Beverley, 32°00'29"S, 117°08'38"E, 270 m, on lateritic rocks in remnant *Eucalyptus* woodland, 22.iv.2004, J.A. Elix 31768, 31774 (CANB, PERTH); • Kokerbin Rock, S side, 34 km E of Quairading, 31°53'29"S, 117°42'11"E, 290 m, on soil and granite rocks in *Casuarina* shrubland, 23.iv.2004, J.A. Elix 31889, 31898, 31912 (CANB, PERTH); • Bruce Rock, 2 km E of Bruce Rock township, 31°52'06"S, 118°10'E, 295 m, on granite rocks in remnant *Eucalyptus-Acacia* woodland, 23.iv.2004, J.A. Elix 31940, 31954, 31959 (CANB, PERTH).

19. *Xanthoparmelia subcrustulosa* (Elix) O. Blanco, A. Crespo, Elix, D. Hawksw. & Lumbsch, *Taxon* **53**, 971 (2004).

Syn. *Neofuscelia subcrustulosa* Elix

This endemic species was reported previously from South Australia (Elix 1999, McCarthy 2006).

SPECIMEN EXAMINED

Western Australia: • Bilya Rock, Gutha West Road, 27 km NW of Morowa, 29°00'29"S, 115°51'31"E, 340 m, on granite rocks on monolith within remnant *Acacia* and *Casuarina*, 1.v.2004, J.A. Elix 33587 (CANB).

20. *Xanthoparmelia subincerta* (Essl.) O. Blanco, A. Crespo, Elix, D. Hawksw. & Lumbsch, *Taxon* **53**, 971 (2004).

Syn. *Neofuscelia subincerta* (Essl.) Essl.

This species was reported previously from Western Australia, South Australia, New South Wales, Australian Capital Territory and Tasmania (Elix 1994a, McCarthy 2006).

SPECIMENS EXAMINED

Victoria: • Summit of Mount Arapiles, 33 km W of Horsham, 36°45'S, 141°50'E, 370 m, on quartzite rocks in open *Eucalyptus* woodland and heath, 17.xii.1990, J.A. Elix 26095, 26096 (CANB).

21. *Xanthoparmelia subloxodella* (Elix & Kantvilas) O. Blanco, A. Crespo, Elix, D. Hawksw. & Lumbsch, *Taxon* **53**, 971 (2004).

Syn. *Neofuscelia subloxodella* Elix & Kantvilas

This species was reported previously from South Australia, New South Wales and Tasmania (Elix 1994a, McCarthy 2006).

SPECIMENS EXAMINED

Western Australia: • 8 km E of Beverley, 32°06'37"S, 117°01'27"E, on granite rock in *Eucalyptus* woodland, 12.ii.1998, R. Davis 5096 (PERTH); • 47.4 km N of Coolgardie,

2 km N of Kintore, 30°34'28"S, 121°00'38"E, 410 m, on soil in *Eucalyptus* woodland, 26.iv.2004, J.A. Elix 32323 (CANB, PERTH).

22. *Xanthoparmelia sublineola* (Elix & J. Johnst.) Elix, *Mycotaxon* **87**, 402 (2003).

Syn. *Paraparmelia sublineola* Elix & J. Johnst.

This Australian endemic species was reported previously from Queensland (Elix 1994b, McCarthy 2006).

SPECIMEN EXAMINED

Western Australia: • Bullen Hill, Little Sandy Desert, 24°53'26"S, 120°37'01"E, on rocks in open scrub and grassland, 5.ix.2002, R.J. Cranfield 18271A (PERTH).

23. *Xanthoparmelia subluminosa* Hale, *Mycotaxon* **34**, 561 (1989).

This species was reported previously from Australian Capital Territory (Elix 1994c, McCarthy 2006).

SPECIMEN EXAMINED

South Australia: • Northern Flinders Ranges, Copley-Arkaroola road, 33 km by road E of Copley, 30°31'13"S, 138°42'50"E, 580 m, on schist rocks in mallee scrub with *Acacia* and *Dodonaea*, 20.v.2003, J.A. Elix 31235 (CANB).

24. *Xanthoparmelia xanthomelanoides* Elix & J. Johnst., *Mycotaxon* **33**, 363 (1988).

This species was reported previously from Western Australian and South Australia (Elix 1994c, McCarthy 2006).

SPECIMEN EXAMINED

New South Wales: • Turnoff to Top Congi, 11 km E of Bendemeer along road to Walcha, 30°52'20"S, 151°16'12"E, 1015 m, on quartzite stones in remnant *Eucalyptus-Acacia* woodland, 27.iv.2005, J.A. Elix 36255 (CANB).

References

- Elix, JA (1994a): *Neofuscelia*. *Flora of Australia* **55**, 68–85.
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Additional lichen records from Australia 58
New records from Norfolk Island

John A. Elix

Department of Chemistry, Faculty of Science,
Australian National University, Canberra, ACT 0200, Australia

Fifteen lichens are reported as new to Norfolk Island. Four of those species, namely *Cryptothecia bartlettii*, *Lecanora dissoluta*, *Pannaria prolifera* and *Phyllopsora confusa*, are presently not known from mainland Australia.

1. *Cryptothecia bartlettii* Thor, *Symb. Bot. Upsal.* **32**, 277 (1997).

Previously this species was known from the North Island of New Zealand (Thor 1997). It is characterized by the grey to grey-white byssoid thallus, the globose glomerules on the upper surface, the weakly aggregated, 1–2-spored asci with relatively large, muriform ascospores (53–96 × 21–33 µm) and the presence of gyrophoric acid (major), ovoic acid (major), lecanoric acid (trace) and 2-*O*-methyllecanoric acid (trace) in the medulla. A detailed description is given in Thor (1997).

SPECIMENS EXAMINED

Norfolk Island: • Norfolk Island National Park, Filmy Fern Trail, 29°01'07"S, 167°56'40"E, 130 m, on *Cyathea* stump in mixed subtropical rainforest, 3.xii.1984, *J.A. Elix 18398 & H. Streimann* (CANB); • Norfolk Island National Park, track between Mt Pitt and Mt Bates, Norfolk Island National Park, 29°00'50"S, 167°56'05"E, 270 m, on dead *Cyathea* in disturbed subtropical rainforest, 15.vi.1992, *J.A. Elix 27362* (CANB); • Norfolk Island National Park, West Palm Glen Track, 29°01'06"S, 167°56'33"E, 140 m, on base of *Cyathea* in subtropical forest, 16.vi.1992, *J.A. Elix 29040, 29056, 29089* (CANB); • Norfolk Island National Park, near Duncombe Road, 29°00'35"S, 167°52'05"E, 270 m, on *Freyinetia* in subtropical forest with numerous rock outcrops, 18.vi.1992, *J.A. Elix 29223* (CANB).

2. *Lecanora dissoluta* Nyl., *Flora* **4**, 131 (1866).

This species was known previously from Java (Nylander 1866). It is characterized by the white, leprose-sorediate thallus, the fusiform-ellipsoid ascospores 14–18 × 6–7 µm and the presence of atranorin (major), zeorin (major), four minor triterpenes and rarely an orange pigment (minor) (Elix & Lumbsch 1996).

SPECIMENS EXAMINED

Norfolk Island: • Norfolk Island National Park, Track between Mt Pitt and Mt Bates, 29°00'50"S, 167°56'05"E, 270 m, on dead *Cyathea* in disturbed subtropical rainforest, 15.vi.1992, *J.A. Elix 27360, 27361, 27368, 27372* (CANB); • Norfolk Island National Park, end of abandoned track (Marsh's Road), 29°00'48"S, 167°56'50"E, 180 m, on canopy of bastard oak (*Ungeria floribunda*) in subtropical forest, 17.vi.1992, *J.A. Elix 29124* (CANB).

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

This species was known previously from Sri Lanka, Japan and New South Wales (Elix 2006a, Orange *et al.* 2001).

SPECIMEN EXAMINED

Norfolk Island: • Norfolk Island National Park, West Palm, Glen Track, 29°01'06"S, 167°56'33"E, 140 m, on base of *Cyathea* in subtropical forest, 16.vi.1992, *J.A. Elix 29043 p.p.* (CANB).

4. *Lepraria coriensis* (Hue) Sipman, *Herzogia* **17**, 28 (2004).

This species was reported previously from Korea, India, and China (Hong Kong, Taiwan), and in Australia from Northern Territory, New South Wales, South Australia and Western Australia (Elix 2006b, Laundon 2003, Sipman 2004).

SPECIMEN EXAMINED

Norfolk Island: • Norfolk Island National Park, West Palm Glen Track, 29°01'06"S, 167°56'33"E, 140 m, on base of *Cyathea* in subtropical forest, 16.vi.1992, *J.A. Elix 29039* (CANB).

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

Lepraria jackii is known from Asia, North America, Europe, New South Wales, Australian Capital Territory, Western Australia and Victoria (Elix 2006a, Kümmerling *et al.* 1995).

SPECIMEN EXAMINED

Norfolk Island: • Cascade Reserve, Cascade Creek, 29°01'20"S, 167°57'50"E, 20 m, on soil of road bank in grazed grassland, 15.vi.1992, *J.A. Elix 27352* (CANB).

6. *Lepraria lobificans* Nyl., *Flora* **56**, 196 (1873).

In Australia this cosmopolitan species has been reported from New South Wales, Australian Capital Territory, Victoria and Tasmania (McCarthy 2006).

SPECIMEN EXAMINED

Norfolk Island: • Anson Bay Road, 29°01'S, 167°55'30"E, 50 m, on rocks of road bank in *Araucaria*-dominated grassland, 9.xii.1984, *J.A. Elix 18782 & H. Streimann* (CANB).

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

This species was previously reported from East Africa and the Pacific, and in Australia from Queensland and New South Wales (Elix 2006a, Jørgensen & Galloway 1992, McCarthy 2006).

SPECIMEN EXAMINED

Norfolk Island: • Norfolk Island National Park, Mt Bates summit trail, 29°00'30"S, 167°56'30"E, 300 m, on moist base of *Araucaria* in disturbed subtropical rainforest, 6.xii.1984, *J.A. Elix 18596 & H. Streimann* (CANB) [det. P.M. Jørgensen].

8. *Pannaria elixii* P.M. Jørg. & D.J. Galloway, *Fl. Australia* **54**, 315 (1992).

This species was reported previously from New Zealand, Western Australia, New South Wales, Australian Capital Territory, Victoria, Tasmania and Queensland (Jørgensen & Galloway 1992, McCarthy 2006).

SPECIMENS EXAMINED

Norfolk Island: • Norfolk Island National Park, above road from Hollow Pine, 29°00'57"S, 167°56'08"E, 240 m, on *Araucaria heterophylla* and base of palm in regrowth rainforest, 2.xii.1984, *J.A. Elix 18260, 18264, 18288, 18331 & H. Streimann* (CANB); • Norfolk Island National Park, track at end of Selwyn Pine Road, 29°01'S, 167°56'30"E, 200 m, on *Compsis grandiflora* in open grassland with kikuyu grass, 3.xii.1984, *J.A. Elix 18463 & H. Streimann* (CANB); • Norfolk Island National Park, Mt Bates summit trail, 29°00'30"S, 167°56'30"E, 300 m, on trunk of *Araucaria* in disturbed subtropical rainforest, 6.xii.1984, *J.A. Elix 18638 & H. Streimann* (CANB); • Norfolk Island National Park, just S of Mt Pitt summit, 29°00'30"S, 167°56'E, 230 m, on mossy trunk in disturbed subtropical rainforest, 10.xii.1984, *J.A. Elix 18818 & H. Streimann* (CANB); • Norfolk Island National Park, Bird Rock Track, 29°00'30"S, 167°57'E, 210 m, on base of *Araucaria* in mixed subtropical rainforest, 10.xii.1984, *J.A. Elix 18851 & H. Streimann* (CANB) [det. P.M. Jørgensen].

9. *Pannaria fulvescens* (Mont.) Nyl., *Mem. Soc. Sci. Nat. Cherbourg* **5**, 109 (1857).

This species is known from New Zealand and the Pacific, and in Australia from Queensland, New South Wales, Victoria and Tasmania (Jørgensen & Galloway 1992, McCarthy 2006).

SPECIMENS EXAMINED

Norfolk Island: • Norfolk Island National Park, above road from Hollow Pine, 29°00'57"S, 167°56'08"E, 240 m, on tree trunk in open regrowth rainforest, 2.xii.1984, J.A. Elix 18271, 18273, 18278, 18329, 18334, 18336 & H. Streimann (CANB); • just S of Captain Cook Monument, Duncombe Bay, 29°00'15"S, 167°56'30"E, 100 m, on *Elaeodendron* in regrowth forest margins, 3.xii.1984, J.A. Elix 18386, 18391 & H. Streimann (CANB); • Norfolk Island National Park, Filmy Fern Trail, 29°01'07"S, 167°56'40"E, 130 m, on *Elaeodendron* in olive and guava infested subtropical rainforest, 3.xii.1984, J.A. Elix 18426 & H. Streimann (CANB); • Norfolk Island National Park, Mt Bates summit trail, 29°00'30"S, 167°56'30"E, 300 m, on base of *Araucaria* in mixed subtropical rainforest, 6.xii.1984, J.A. Elix 18599 & H. Streimann (CANB); • Ball Bay Reserve, 29°03'S, 167°59'E, 2 m, on volcanic rocks along the foreshore, 8.xii.1984, J.A. Elix 18836 & H. Streimann (CANB); • Norfolk Island National Park, just S of summit of Mt Pitt, 29°01'S, 167°56'E, 230 m, on *Citrus* in open regrowth rainforest, 10.xii.1984, J.A. Elix 18785 & H. Streimann (CANB); • Bumboras Reserve, 29°03'30"S, 167°56'30"E, 25 m, on volcanic rocks in *Araucaria*-dominated grassland, 10.xii.1984, J.A. Elix 18835 & H. Streimann (CANB) [det. P.M. Jørgensen].

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

In Australia this widespread subtropical species was previously known from Queensland and New South Wales (Elix 2006a, Jørgensen & Galloway 1992).

SPECIMENS EXAMINED

Norfolk Island: • Norfolk Island National Park, above road from Hollow Pine, 29°00'57"S, 167°56'08"E, 240 m, on tree and twigs of shrub in regrowth rainforest, 2.xii.1984, J.A. Elix 18255, 18275 & H. Streimann (CANB); • Norfolk Island National Park, track at end of Selwyn Pine Road, 29°01'S, 167°56'30"E, 200 m, on *Compsis grandiflora* in open woodland, 3.xii.1984, J.A. Elix 18450 & H. Streimann (CANB) [det. P.M. Jørgensen].

11. *Pannaria prolifera* Müll. Arg., *Flora* 65, 319 (1882).

This species was known previously from New Caledonia (Müller 1882). It resembles *P. lurida*, but its thalli have microphylline lobulae on the upper surface (*P. lurida* is elobulate), and the apothecia have thicker, plicate thalline margins. A detailed description is given in Müller (1882).

SPECIMENS EXAMINED

Norfolk Island: • Rocky Point Reserve, 29°03'S, 167°55'E, 60 m, on moist base of *Araucaria* in mixed *Araucaria* and exotic woodland, 2.xii.1984, J.A. Elix 18214, 18219 & H. Streimann (CANB) [det. P.M. Jørgensen].

12. *Parmeliella aggregata* P.M. Jørg. & D.J. Galloway, *New Zealand J. Bot.* 37, 262 (1999).

This species has been reported from Queensland, New South Wales and New Zealand (Jørgensen 1999, McCarthy 2006).

SPECIMEN EXAMINED

Norfolk Island: • Norfolk Island National Park, Mt Bates summit trail, 29°00'30"S, 167°56'30"E, 300 m, on moist base of *Araucaria* in disturbed subtropical rainforest, 6.xii.1984, J.A. Elix 18597 & H. Streimann (CANB) [det. P.M. Jørgensen].

13. *Phyllopsora buettneri* (Müll. Arg.) Zahlbr., *Cat. Lich. Univ.* 4, 396 (1926).

This tropical species was known previously from Africa, Papua New Guinea, the Philippines, Tahiti and Queensland (Brako 1991). Specimens collected in Norfolk Island contain argopsin, norargopsin and zeorin.

SPECIMENS EXAMINED

Norfolk Island: • Norfolk Island National Park, track between Mt Pitt and Mt Bates, 29°00'50"S, 167°56'05"E, 270 m, on dead *Cyathea* in disturbed subtropical rainforest, 15.vi.1992, J.A. Elix 27365 (CANB); • Norfolk Island National Park, West Palm Glen Track, 29°01'06"S, 167°56'33"E, 140 m, on base of *Cyathea* in subtropical forest, 16.vi.1992, J.A. Elix 29047 (CANB).

14. *Phyllopsora confusa* Swinsc. & Krog, *Lichenologist* 13, 229 (1981).

In overall morphology and chemistry, *P. confusa* closely resembles *P. foliata*, but it can readily be distinguished by its significantly smaller ascospores (6–11 × 2.0–2.5 µm cf. 11–18 × 2.5–3.0 µm). *Phyllopsora confusa* was known previously from East Africa and the Mascarene Islands (Timdal & Krog 2001). A detailed description is given in Timdal & Krog (2001).

SPECIMEN EXAMINED

Norfolk Island: • Norfolk Island National Park, track leading W from Mt Bates, 29°00'30"S, 167°56'40"E, 240 m, on base of *Araucaria heterophylla* in disturbed forest on ridge, 6.xii.1984, H. Streimann 34332 (CANB).

15. *Phyllopsora foliata* (Stirt.) Zahlbr., *Cat. Lich. Univ.* 4, 397 (1926) var. *foliata*

This Australian species was known previously from Queensland (McCarthy 2006).

SPECIMEN EXAMINED

Norfolk Island: • Norfolk Island National Park, Mt Pitt Road, 29°01'30"S, 167°56'15"E, 230 m, on vine in disturbed forest with palms, 2.xii.1984, H. Streimann 31918 (CANB).

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Bryonora castanea

Gintaras Kantvilas

Tasmanian Herbarium, Private Bag 4, Hobart, Tasmania, Australia 7001

Abstract: *Bryonora castanea* (Hepp) Poelt (Lecanoraceae) is reported from Victoria, representing the first record of this bipolar genus for Australia. The species is described and illustrated.

Introduction

Routine re-examination of lichens housed in the Tasmanian Herbarium (HO) has revealed a specimen of *Bryonora*, a genus of Lecanoraceae previously unrecorded in Australia. *Bryonora* was first described by Poelt (1983), and comprises lichens with a small-fruticose, squamulose or crustose thallus, a trebouxoid photobiont, apothecia having a proper exciple with a conglutinated cortex, eight-spored, *Lecanora*-type asci and simple to septate, hyaline ascospores (see also Poelt & Obermayer 1991, Purvis 1994).

Species of *Bryonora* occur exclusively on moss, soil or detritus in cold, treeless environments at alpine altitudes or in the high latitudes. The most recent account of the genus deals with 11 species (Poelt & Obermayer 1991). The centre of speciation of *Bryonora* appears to be the Asian mountains, notably the Himalayas, but some species occur in Europe (Holtan-Hartwig 1991) and North America (Thomson 1997), whereas Øvstedal & Lewis Smith (2001) record two from Antarctica, one of which is endemic. One species of *Bryonora* has also been collected in New Zealand (Poelt & Obermayer 1991).

Materials and Methods

Anatomical observations were undertaken on hand-cut sections of the thallus and apothecia, mounted in water, 10% KOH, and Lugol's Iodine after pretreatment with KOH.

Bryonora castanea (Hepp) Poelt

Nova Hedwigia 38: 86 (1983); *Biatora castanea* Hepp, *Fl. Europ.*: 270 (1857).

Fig. 1

Thallus indeterminate, whitish, very thin to endophloeodal, in section K+ pale yellowish and soon forming red, needle-like crystals (norstictic acid); photobiont cells roundish to very broadly ellipsoid, 8–18 µm wide. Apothecia to 1.5 mm diam., crowded and overlapping, basally constricted; disc reddish brown, plane to undulate, epruinose; margin concolorous with the disc or slightly paler, very thin, soon ±excluded. Exciple in section cupular, 30–80 µm thick, colourless within, reddish brown at the outer edge, composed of rather loose, radiating, anastomosing hyphae to c. 2 µm thick, with the outermost cells swollen, densely packed, conglutinated and forming a parenchymatous cortex, cortical cells roundish or rhomboid, brownish, 6–10 µm wide, thick-walled with the lumen mostly c. 3–4 µm wide. Hypothecium 50–60 µm thick, colourless, with photobiont cells in the subhypothecium. Hymenium 50–70 µm thick, intensely IKI+ blue, colourless in the lower part, reddish brown, K+ yellow-brown to olive-brown in the upper part. Asci elongate-clavate, 40–65 × 15–24 µm (12 measured), of the *Lecanora*-type, with an intensely amyloid tholus, penetrated entirely by a ±cylindrical, non-amyloid to weakly amyloid masse axiale. Paraphyses simple, remaining coherent in KOH, 1.5–2.5 µm thick, with distinctly capitate, brownish apices, 3–5 µm wide. Ascospores ellipsoid to narrowly ellipsoid, mostly simple but occasionally with a thin, ±spuriose, crooked septum, (13–)17.6(–24) × (6–)7.4(–10.5) µm (45 measured); wall distinct, c. 0.6 µm thick. Pycnidia not found.

Chemistry: norstictic acid, confirmed in the Australian specimen by the formation of

red, needle-like crystals in the thallus and subhypothecium. The specimen is too small for analysis by standard chromatographic methods. The concentration of norstictic acid appears to be low and patchy.

Remarks: The foregoing description is based on the Australian specimen. Further descriptions have been published by Poelt (1983), Poelt & Obermayer (1991), Øvstedal & Lewis Smith (2001) and Thomson (1997). *Bryonora castanea* is the most widespread species of the genus. It displays a typical bipolar distribution, having been recorded from alpine continental Europe, Spitzbergen, Greenland, Iceland, arctic-alpine and boreal North America, Antarctica and New Zealand (Mt Peel). It is a tiny but distinctive species recognized by its rather flat, reddish brown, clustered, biatorine apothecia. Anatomically, the combination of *Lecanora*-type asci, capitate paraphyses and relatively large ascospores, and the formation of norstictic acid crystals in thalline and apothecial squashes make the species very distinctive. I am not aware of any potentially confusing species in the Australian flora.

The sole Australian specimen seen is from dead grasses at alpine altitudes at Mt Buller, Victoria. However, it is very likely to have been overlooked, or to be present in existing herbarium collections under *Lecidea* or *Biatora*.

SPECIMENS EXAMINED

Australia: Victoria, Mt Buller, 37°09'S, 146°27'E, 9.xii.1973, G.C. Bratt 73/1340 & R.C. Weeks (HO).

Switzerland: Albula Tal near Muntische, 46°35'N, 9°45'E, in alpine meadow, 2200–2600 m altitude, 5.ix.1999, G. Kantvilas s.n. (HO).

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Additional lichen records from Australia 60
Sclerophyton elegans Eschw.

Alan W. Archer
National Herbarium of New South Wales,
Mrs Macquaries Road, Sydney, N.S.W. 2000, Australia

Abstract: The pantropical species *Sclerophyton elegans* Eschw. (Roccellaceae) is reported for the first time from Australia, from coastal rainforest in eastern Queensland.

Sclerophyton elegans Eschw., *Systema Lichenum*: 25 (1824).

The species is characterized by the corticolous habit, the thin (0.05 mm wide) brown, immersed, branched lirellae (cf. Sparrius 2004, p. 128, Fig. 44), the darkened base of the hymenium (cf. Sparrius *op. cit.*, p. 11, Fig. 1), the hyaline, rounded-ellipsoid, 4-locular ascospores, 14–17 × 5 μm, and the presence of psoromic acid.

A detailed description is given by Sparrius (Sparrius *op. cit.*), who reported the species to be pantropical and cited specimens from India, South Africa and Papua New Guinea among others.

SPECIMEN EXAMINED

Queensland: • Noosa, Noosa National Park, Palm Grove Walk, on fallen twig in coastal rainforest, 26°23'S, 153°07'E, 21.x.2003, A.W. Archer G691 (NSW 725108).

Sclerophyton rostratum Egea & Torrente and *S. circumscriptum* (Taylor) Zahlbr., were previously reported from Australia (Archer & Elix 2003), but *S. circumscriptum* is now *Peterjamesia circumscripta* (Taylor) D. Hawksw. (Hawksworth 2006).

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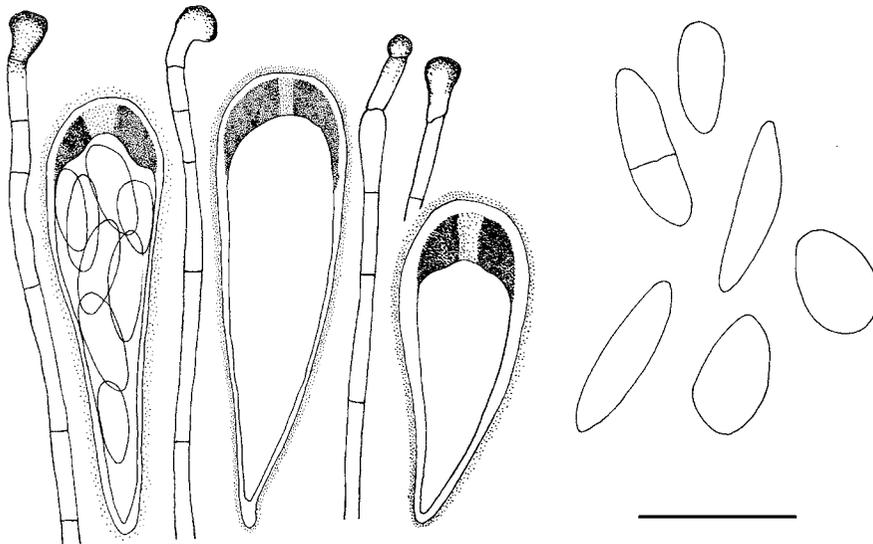


Fig. 1. Asci (with amyloid parts stippled), paraphyses and ascospores of *Bryonora castanea* (Bratt 73/1340 & Weeks, HO). Scale = 20 μm.

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Some pyrenocarpous lichens

Björn Owe-Larsson

Museum of Evolution, Botany Section (Fytoteket), Evolutionary Biology Center,
Uppsala University, Norbyvägen 16, SE-752 36 Uppsala, Sweden

André Aptroot

ABL Herbarium, G. v.d. Veenstraat 107, NL-3762 XK Soest, The Netherlands

Abstract: *Pyrenula nitidula* and *P. thelemorpha* are reported for the first time from Australia. *Polymeridium quinqueseptatum* was previously found in Queensland, but is here reported from Northern Territory. *Tomasellia eschweileri* was previously found in Queensland, and is new for New South Wales.

Introduction

The first author collected lichens during travels to Australia in 1992 (jointly with Roland Moberg) and 1994. The second author has examined some pyrenocarpous lichens from those collections, and several new records among them are reported below. The specimens are deposited in UPS.

1. *Polymeridium quinqueseptatum* (Nyl.) R.C. Harris, *Bryologist* 83: 12 (1980).

SPECIMEN EXAMINED

Northern Territory: •Kakadu National Park, Nourlangie Rock area, c. 1 km from the start along Bark trail, c. 100 m, 12°52'S, 132°49'E, on deciduous tree in open forest with *Pandanus* in small creek with seasonal water, S slope, 22.iii.1994, *Owe-Larsson* 6276 (UPS).

Previously found in Queensland (McCarthy 2005). New for Northern Territory.

2. *Pyrenula nitidula* (Bres.) R.C. Harris, *Bryologist* 64: 164 (1997).

SPECIMEN EXAMINED

Queensland: •Eubenangee Swamp National Park, c. 13 km NW of Innisfail, c. 100 m, 17°25'S, 145°59'E, on solitary, exposed deciduous tree on the top of grassy hill, 6.iv.1994, *Owe-Larsson* 6439a (UPS).

New to Australia (McCarthy 2005). Pantropical, the species is characterized by the 3-septate ascospores that have the lumina of the end cells directly against the outer wall (ascospores of “*pseudobufonia*-type”, in combination with the absence of lichen-xanthone (UV-fluorescence) and hymenium inspersion.

3. *Pyrenula thelemorpha* Tuck., *Gener. Lich.*: 275 (1872).

SPECIMEN EXAMINED

New South Wales: •Barrington Tops National Park, Careys Peak Trail, 900 m, 32°05'S, 151°28'E, on *Nothofagus* in dark forest, 24.iii.1992, *R. Moberg* A85:11 & *B. Owe-Larsson* (UPS).

New to Australia (McCarthy 2005). Probably pantropical, this species is characterized by the densely fusiform ascospores with rounded lumina, and the emergent black ascocarps.

4. *Tomasellia eschweileri* (Müll. Arg.) R.C. Harris, *Bryologist* 83: 19 (1980).

= *Mycoporum eschweileri* (Müll. Arg.) R.C. Harris.

SPECIMEN EXAMINED

New South Wales: •Stuart's Point, 32 km NNE of Kempsey, 5 m, 30°49'S, 150°00'E, mangrove on E side of the inlet across the footbridge, 27.iii.1992, *R. Moberg* A89:20 & *B. Owe-Larsson* (UPS).

Previously found in Queensland (Aptroot 1997). New to New South Wales.

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Additional lichen records from New Zealand 45
Anisomeridium subprostans and *Pyrenula concaterovans*

Björn Owe-Larsson

Museum of Evolution, Botany Section (Fytoteket), Evolutionary Biology Center,
Uppsala University, Norbyvägen 16, SE-752 36 Uppsala, Sweden

André Aptroot

ABL Herbarium, G. v.d. Veenstraat 107, NL-3762 XK Soest, The Netherlands

Abstract: *Anisomeridium subprostans* and *Pyrenula concaterovans* are reported for the first time from New Zealand.

Introduction

During travels in 1992 (jointly with Roland Moberg) and 1994 to New Zealand, the first author collected lichens which are now deposited in UPS. The second author has examined some pyrenocarpous lichens from those collections. Two species previously not found in New Zealand (Malcolm & Galloway 1997, Galloway pers. comm.) are reported.

1. *Anisomeridium subprostans* (Nyl.) R.C. Harris, *Bryologist* 83: 4 (1980).

SPECIMEN EXAMINED

South Island: •Hackett River abandoned chromite mine, 300 m, 41°24'S, 173°14'E, on *Meliclytus alpinus*, 27.iv.1994, Owe-Larsson 6662 (UPS).

Pantropical, this species is characterized by elongate ascospores that are constricted at the median septum, and have an upper cell conspicuously larger than the lower cell. New to New Zealand (Malcolm & Galloway 1997, Galloway pers. comm.).

2. *Pyrenula concaterovans* (Nyl.) R.C. Harris, *Bryologist* 83: 15 (1980).

SPECIMEN EXAMINED

North Island: •North Auckland, Omanaia River, One Creek, 12 km ENE of Opononi, 1.4 km WNW of Mt Takiritau, 5 m, 35°27'S, 173°30'E, on *Avicennia* sp. along road to Kaikohe, 11.iv.1992, R. Moberg NZ21:6 & B. Owe-Larsson (UPS).

Pantropical, this species is characterized by 3(–5)-septate ascospores that become distinctly orange when post-mature. The thallus is often greenish and usually has pseudocyphellae. The shape and immersion of the ascomata are extremely variable, even within one thallus. New to New Zealand (Malcolm & Galloway 1997, Galloway pers. comm.).

Acknowledgement

David Galloway is thanked for up-to-date information about the lichen flora of New Zealand.

Reference

Malcolm, WM; Galloway, DJ (1997): *New Zealand Lichens. Checklist, Key, and Glossary.* Museum of New Zealand Te Papa Tongarewa, Wellington.

Five new species of *Phyllopsora* (lichenized Ascomycota) from Australia

John A. Elix

Department of Chemistry, Faculty of Science,
Australian National University, Canberra, ACT 0200, Australia
email: John.Elix@anu.edu.au

Abstract: *Phyllopsora chodatunica* Elix, *P. conwayensis* Elix, *P. homosekikaica* Elix, *P. methoxymicareica* Elix and *P. neofoliata* Elix are described as new to science.

The morphology and anatomy of the lichen genus *Phyllopsora* Müll. Arg. (Bacidiaceae) have been described in detail by Swinscow & Krog (1981), Brako (1991) and Timdal & Krog (2001). Like Timdal & Krog, I consider that the vegetative dispersal units (isidia and lacinules), the thalline growth form (crustose or squamulose), the pruinosity and pubescence of the thallus, the type and thickness of the upper cortex, the degree of pigmentation of the exciple and hypothecium, ascospore size and shape and the presence of diagnostic lichen substances to be important taxonomic characters. In the present work, chemical constituents were identified by thin-layer chromatography (Elix & Ernst-Russell 1993), high-performance liquid chromatography (Elix *et al.* 2003) and by comparison with authentic samples.

***Phyllopsora chodatunica* Elix, sp. nov.**

Figures 1 & 2

Thallus ut in *Phyllopsora albicans* sed superfice et subtus flavescens et chodatunicum, 5,7-dichloro-3-O-methylnorlichexanthonicum et 2,5,7-trichloro-3-O-methylnorlichexanthonicum continente differt.

Etymology: The specific epithet refers to the occurrence in this species of a chemosyndrome of xanthonenes based on chodatins.

Type: Australia: *Queensland:* Blencoe Creek, Cardwell Range, 48 km NW of Cardwell, 18°03'S, 145°39'E, 740 m, on mossy trunk in Lauraceae-*Syzygium-Prunus*-dominated forest, 17.vi.1986, J.A. Elix 20109 & H. Streimann; holotype: BRI; isotype: CANB.

Thallus effuse, squamulose. Prothallus usually well developed, pale red-brown. Squamules 0.3–0.5 mm wide, ascending or not, elongate, 1.0–1.5 mm long, often imbricate, incised to deeply divided, plane to weakly convex; upper side pale green to ±intense yellow-green or orange-yellow, glabrous, epruinose; margin concolorous with the upper side, sometimes finely pubescent, lacking isidia. Lacinules common, developed from the lobe tips, 0.05–0.15 mm wide. Lower surface pigmented yellow in part. Upper cortex of type 1 (Swinscow & Krog 1981), 25–60 µm thick. Apothecia rare, 0.8–1.5 mm wide, rounded or somewhat irregular at the margins, simple to slightly conglomerate, weakly to moderately convex, reddish brown, with an indistinct, darker margin. Exciple reddish brown; hypothecium red brown to dark red brown; hymenium pale yellow-brown; epithecium deep golden yellow. Ascospores narrowly ellipsoid, simple, 7–11 × 2.0–3.0 µm. Pycnidia not seen.

Chemistry: Cortex K+ yellow; medulla K+ yellow, C+ faint orange, KC–, P+ yellow; containing chodatins (major), 5,7-dichloro-3-O-methylnorlichexanthone (minor), 2,5,7-trichloro-3-O-methylnorlichexanthone (minor), di-O-methylthiophanic acid (minor), 3-O-methylthiophanic acid (trace), isoarthothelin (trace), ±demethylchodatins (trace).

The most characteristic feature of this new species is the presence of a chemosyndrome of xanthonenes based on chodatins and 2,5,7-trichloro-3-O-methylnorlichexanthone. The presence of these compounds is reflected in the yellow colouration of both the upper cortex and the lower surface of the squamules. This is the first species

of *Phyllopsora* reported to contain xanthones. Morphologically this species resembles *P. albicans* Müll.Arg. in that both species have relatively large squamules that bear marginal lacinules, but lack isidia and a pruinose upper surface. *Phyllopsora albicans* can best be distinguished chemically, because it contains argopsin, \pm norargopsin, and \pm pannarin, and reacts P+ orange, and by its somewhat larger ascospores (8–13 \times 2.5–3.5 μ m cf. 7–11 \times 2.0–3.0 μ m.). This species occurs in the montane rainforests of northern Queensland.

SPECIMENS EXAMINED

Queensland: • Mt Spec State Forest, Paluma Range, 6 km W of Paluma, 19°01'S, 146°09'E, 920 m, on sapling in Lauraceae-*Syzygium*-dominated forest, 18.vi.1986, J.A. Elix 20242 & H. Streimann (CANB); • Crediton State Forest, 20 km SSW of Finch Hatton, 21°19'S, 148°33'E, 840 m, on canopy of *Argyrodendron* in rainforest dominated by *Syzygium* and *Argyrodendron trifoliatum*, 1.vii.1986, J.A. Elix 21023 & H. Streimann (CANB).

Phyllopsora conwayensis Elix, sp. nov.

Figures 3 & 4

Thallus ut in *Phyllopsora foliata* sed lacinulis simplicibus, sporae acicularis et acidum 3-chlorostenosporicum acidum 3-chloroperlatolicum et acidum 3-chlorodivariaticum continente differt.

Etymology. The specific epithet derives from the Latin *-ensis* (place of origin) and Conway State Forest, the type locality.

Type: Australia: Queensland: Conway State Forest, 18 km E of Proserpine, 20°21'S, 148°45'E, 180 m, on tree trunk in lowland rainforest, 28.vi.1986, J.A. Elix 20190 & H. Streimann; holo: BRI; iso: B, CANB.

Thallus effuse, squamulose. Prothallus usually well developed, white to red-brown. Squamules small, 0.13–0.25 mm wide, not ascending, elongate, 0.5 mm long, contiguous to imbricate, flat to weakly convex; upper side off-white to yellow or pale tan, epruinose; margin concolorous with the upper side, sometimes finely pubescent, lacking isidia. Lacinules common, developed from the margins, 0.05–0.1 mm wide, not proliferating. Upper cortex of type 2 (Swinscow & Krog 1981), 15–25 μ m thick. Apothecia common, 0.25–1.5 mm wide, rounded or somewhat irregular at the margins, simple to conglomerate, moderately convex, pale pink to pale orange or orange-brown, with an indistinct, paler margin. Exciple pale orange; hypothecium pale yellow; hymenium colourless to pale yellow; epithecium pale orange. Ascospores acicular, simple, 25–33 \times 0.8–1.25 μ m. Pycnidia not seen.

Chemistry: Cortex K–; medulla K–, C–, KC–, P–; containing 3-chlorostenosporic acid (major), 3-chloroperlatolic acid (minor), 3-chlorodivariatic acid (minor), \pm perlatolic acid (trace).

The most characteristic features of this new species are the acicular ascospores and the unique medullary chemistry. Acicular ascospores are unusual in *Phyllopsora*, known from only the African species *P. borbonica* Timdal & Krog and *P. longispora* Swinsc. & Krog (Timdal & Krog 2001). *Phyllopsora borbonica* can be distinguished by its crustose thallus and the lack of squamules and lacinules, while *P. longispora* is an isidiate species. Both of those African species lack lichen substances. The rare chlorodepsides 3-chlorostenosporic acid, 3-chloroperlatolic acid and 3-chlorodivariatic acid have been detected in several species of *Dimelaena* Norman (Elix *et al.* 1988), but have not been recorded previously for the genus *Phyllopsora*. At present this distinctive new species is known from only the type collection.

Phyllopsora homosekikaica Elix, sp. nov.

Figures 5 & 6

Thallus ut in *Phyllopsora furfuracea* sed acidum homosekikaicum et acidum hyperhomosekikaicum continente differt.

Etymology. The specific epithet refers to the secondary metabolite, homosekikaic acid, present in this species.

Type: Australia: Queensland: Mt Spec State Forest, Paluma Range, 6 km W of Paluma, 19°01'S, 146°09'E, 920 m, on sapling in Lauraceae-*Syzygium*-dominated forest, 18.vi.1986, J.A. Elix 20241 & H. Streimann; holo: BRI; iso: CANB.

Thallus crustose, formed by prothallus and by isidia developing directly from the prothallus; isidia dominating. Prothallus well developed, white to reddish brown or black. Isidia abundant, to 0.8 mm high, 30–80 μ m wide, pale to dark green, often with a brown tinge, glabrous, simple to branched or sometimes coralloid, subcylindrical, often curved, decumbent to ascending. Apothecia common, 1–2 mm wide, roundish to irregular in shape, \pm conglomerate, convex, pale brown to dark cinnamon-brown, immarginate or with an indistinct, often slightly darker margin, the margin paler or pubescent when young. Exciple brown to black-brown; hypothecium reddish brown in the lower part, golden yellow in the upper part; hymenium pale yellow; epithecium pale brown. Ascospores narrow-ellipsoid, simple, 7–11 \times 2–3 μ m. Pycnidia not seen. *Chemistry:* Cortex K–; medulla K–, C–, KC+ red, P–; containing homosekikaic acid (major), hyperhomosekikaic acid (major).

This species is characterized by the dominant isidia and the presence of homosekikaic and hyperhomosekikaic acids. In overall morphology, this new species closely resembles densely isidiate forms of *P. furfuracea* (Pers.) Zahlbr. However, the latter can readily be distinguished by the colour of the hypothecium (pale brown in the lower part and reddish brown in the upper part) and the presence of furfuraceic acid (furfuracein) or the absence of lichen compounds (Timdal & Krog 2001). In addition to the copious isidia, the thallus of *P. furfuracea* typically comprises minute, adnate, isodiametric areolae which often fuse and form a continuous crust. Such areolae have not been observed in *P. homosekikaica*. This species occurs in coastal and hinterland rainforests of northern Queensland.

SPECIMEN EXAMINED

Queensland: • Conway State Forest, 18 km E of Proserpine, 20°21'S, 148°45'E, 180 m, on tree trunk in lowland rainforest, 28.vi.1986, J.A. Elix 20203 & H. Streimann (CANB).

Phyllopsora methoxymicareica Elix, sp. nov.

Figures 7 & 8

Thallus ut in *Phyllopsora furfuracea* sed sporis latioribus et acidum methoxymicareicum continente differt.

Etymology. The specific epithet refers to the occurrence of methoxymicareic acid in this species.

Type: Australia: New South Wales: Clyde Mountain, below the road, 20 km SE of Braidwood, 35°35'S, 149°57'E, 700 m, on base of *Eucalyptus viminalis* in wet-sclerophyll forest, 14.ii.1989, J.A. Elix 22773; holo: CANB.

Thallus crustose, formed by prothallus and by isidia developing directly from the prothallus; isidia dominating. Prothallus well developed, white to reddish brown. Isidia abundant, 0.1–0.2 mm high, 15–20 μ m wide, pale green, often with a brown

tinge, glabrous, branched and densely coralloid, subcylindrical, often curved, decumbent or ascending. Apothecia common, 0.5–1.2 mm wide, roundish to irregular in shape; disc plane to weakly convex, pale yellow-orange to pale tan or orange-brown, with a paler margin in young apothecia, immarginate with age. Exciple pale yellow-orange; hypothecium pale brown in the lower part, orange-brown in the upper part; hymenium pale yellow; epithecium orange-brown. Ascospores ellipsoid, simple, 10–14 × 3–5 μm. Pycnidia not seen.

Chemistry: Cortex K–; medulla K–, C–, KC–, P–; containing methoxymicareic acid (major), hydroxymicareic acid (trace).

This species is characterized by the dominant isidia, the relatively broad, ellipsoid ascospores and the unique medullary chemistry. Previously methoxymicareic acid was only known from a chemical race of *Micarea prasina* Fr. (Elix *et al.* 1984). In overall morphology this new species closely resembles that of densely isidiate forms of *P. furfuracea*. However, the latter can readily be distinguished by its narrowly ellipsoid ascospores (7–13 × 2–3 μm cf. 10–14 × 3–5 μm) and the presence of furfuraceic acid (furfuracein) or the absence of lichen compounds (Timdal & Krog 2001). In addition to the copious isidia, the thallus of *P. furfuracea* typically comprises minute, adnate, isodiametric areolae which often fuse and form a continuous crust. Such areolae have not been observed in *P. methoxymicareica*. At present this new species is known from only the type collection.

Phyllopsora neofoliata Elix, sp. nov.

Figures 9 & 10

Thallus ut in *Phyllopsora foliata* sed sporis brevioribus et acidum furfuraceicum continente differt.

Etymology: The specific epithet derives from the Greek *neos* (new or lately found) and the similar species, *Phyllopsora foliata*.

Type: Australia: *New South Wales*: Lord Howe Island, Max Nicholls Track, 31°31'08"S, 159°03'03"E, 5 m, on tree in lowland forest, 20.vi.1992, J.A. Elix 32714; holo: CANB.

Thallus effuse, squamulose, to 5 cm wide. Prothallus well developed, white. Squamules 0.3–0.8 mm wide, adnate at first, isodiametric, flat to weakly convex, crenate-incised to digitate-incised, imbricate, later ascending, lacking isidia but becoming lacinulate. Upper surface yellow-green to pale green, shiny or often becoming finely pubescent along the margin. Lacinules common, developed from the lobe apices or margins, subglobose at first but becoming elongate, more or less imbricate. Upper cortex type 2 (Swinscow & Krog 1981), 5–15 μm thick. Apothecia common, 0.5–1.5 mm wide, simple or conglomerate; disc plane to convex, pale yellow-orange to pale tan or orange-brown, ±darker in the centre, immarginate or with a distinctly paler margin; margins pubescent at least in some young apothecia. Exciple pale orange-tan; epithecium golden yellow; hymenium pale yellow; hypothecium intense golden yellow. Ascospores simple, narrow-ellipsoid, 10–15 × 2–3 μm. Pycnidia not seen.

Chemistry: Cortex K–; medulla K–, C–, KC–, P–, UV+ blue-white; containing furfuraceic acid (furfuracein) (major), ±physodic acid (minor or trace).

In its overall growth habit, this new species resembles *P. foliata* (Stirt.) Zahlbr., but *P. neofoliata* can be distinguished by its somewhat shorter ascospores (10–15 μm cf. 11–18 μm long), its non-proliferating lacinules (the lacinules are densely proliferating and imbricate in *P. foliata*), and the presence of furfuraceic acid (*P. foliata* lacks lichen substances). *Phyllopsora furfuracea* has chemistry identical to that of *P. neofoliata*, but can be distinguished by the presence of isidia. At present this species is known from coastal forests of New South Wales and Lord Howe Island.

SPECIMENS EXAMINED

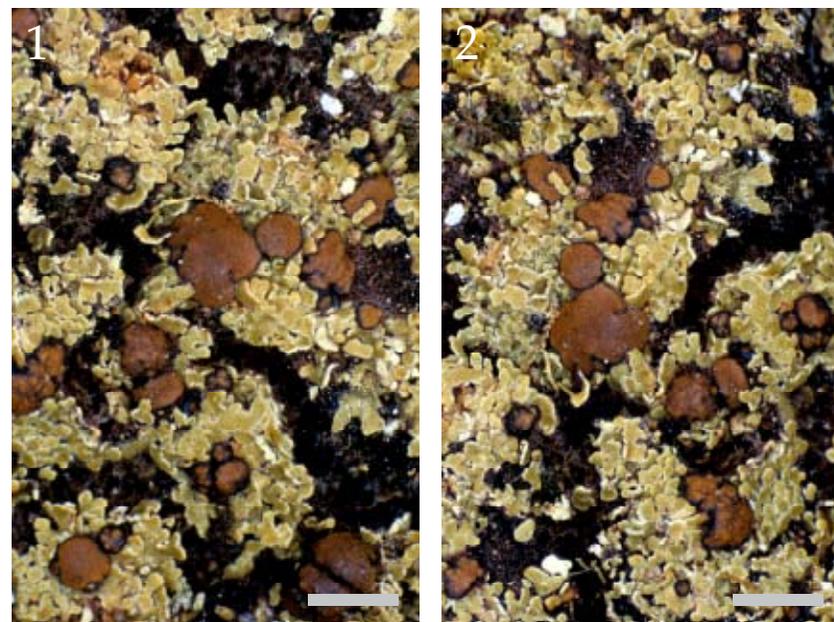
New South Wales: • Saltwater, E of Taree, 31°59'S, 152°34'E, on tree trunk in coastal forest, 7.x.1977, J.A. Elix 3993 (CANB); • Misty Mountain Road, Currowan State Forest, 23 km NW of Batemans Bay, 35°34'S, 149°59'E, 400 m, on *Atherosperma moschatum* in remnant rainforest, 14.ii.1989, J.A. Elix 22750 (CANB).

Acknowledgments

I thank Neal McCracken and Stuart Hay of ANU Photography for preparing the photographs.

References

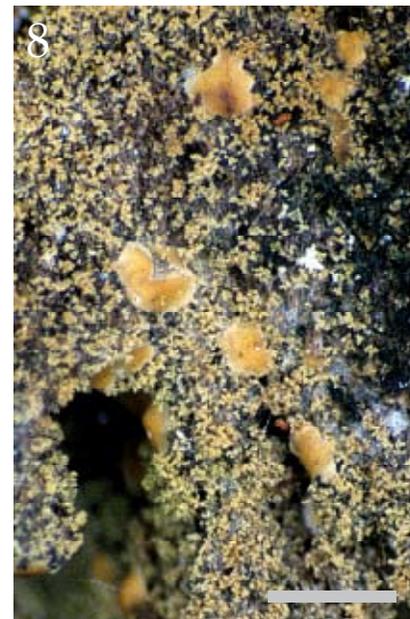
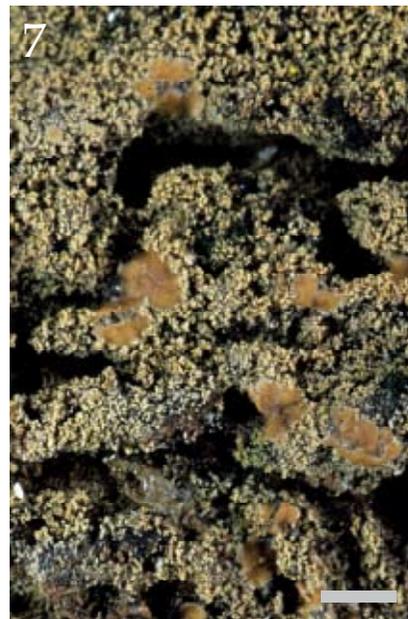
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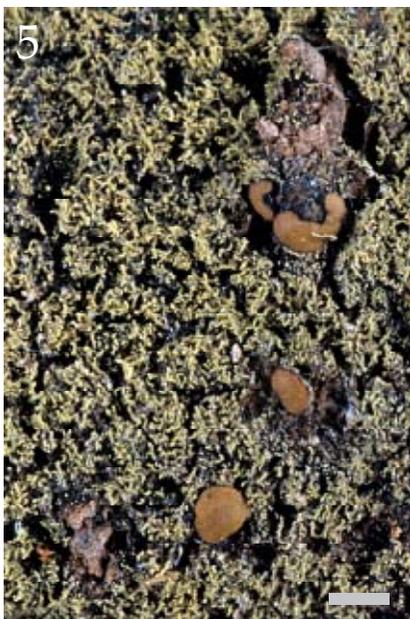
Figures 1 & 2. *Phyllopsora chodatnica* (part of holotype in BRI). Bar = 1 mm.



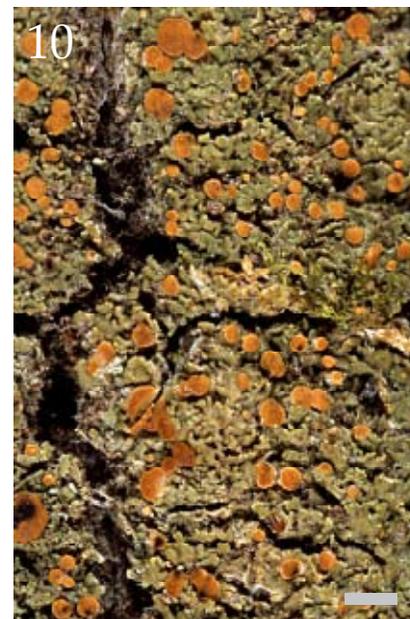
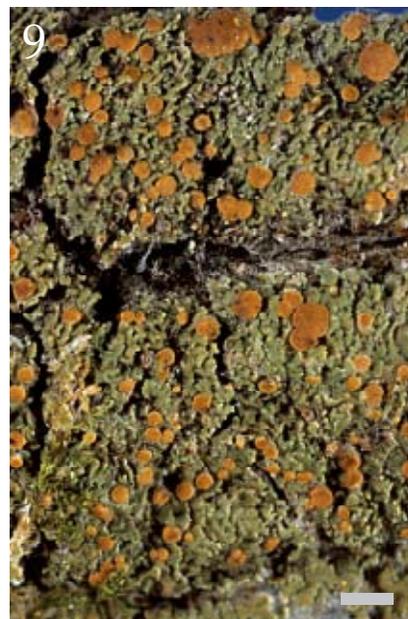
Figures 3 & 4. *Phyllopsora conwayensis* (part of holotype in BRI). Bar = 1 mm.



Figures 7 & 8. *Phyllopsora methoxymicareica* (part of holotype in CANB). Bar = 1 mm.



Figures 5 & 6. *Phyllopsora homosekikaica* (part of holotype in BRI). Bar = 1 mm.



Figures 9 & 10. *Phyllopsora neofoliata* (part of holotype in CANB). Bar = 1 mm.

Further notes on the genus *Hertelidea*, with a description of a new species

Gintaras Kantvilas

Tasmanian Herbarium, Private Bag 4, Hobart, Tasmania, Australia 7001

John A. Elix

Chemistry Department, The Faculties,
Australian National University, Canberra, A.C.T., Australia 0200

Abstract: The new species *Hertelidea wankaensis* Kantvilas & Elix (Stereocaulaceae) from Queensland is described. It is distinguished from the other species of the genus by a unique chemical composition comprising the constipatic acid chemosyndrome, and by its poorly developed exciple. Additional notes on *H. eucalypti* Kantvilas & Printzen and a new record of *H. aspera* (Müll. Arg.) Kantvilas & Elix are presented.

Introduction

Hertelidea is a small genus of crustose lichens characterized chiefly by having a *Trebouxia*-like photobiont, lecideine apothecia with a persistent proper margin, eight-spored, *Micarea*-type asci and mostly simple, hyaline, non-halonate ascospores (see Printzen & Kantvilas 2004 for complete description). Species of *Hertelidea* are mostly lignicolous (although they also occur on bark or soil), and the Australian environment, with an abundance of slow-rotting wood, usually of *Eucalyptus*, appears to provide much ideal habitat. Since first being described, additional information continues to accumulate on the genus as previously unidentified collections of *Lecidea*-like lichens are reviewed (for example, see Kantvilas & Elix 2005). In this paper, we describe a further new species and provide additional distributional data on two other Australian species.

Materials and Methods

The study is based on collections compiled by the authors and housed in CANB and HO. Anatomical observations and measurements were made on hand-cut sections mounted in water, 10% KOH (K), Lugol's Iodine after pretreatment with KOH (K/I) and Lactophenol Cotton Blue. Measurements of photobiont cells, asci, ascospores and conidia are based on 30–60 observations of each. For asci and ascospores, the sizes are presented as (smallest value)–mean–(highest value).

Chemical analyses were performed using standard methods of thin-layer chromatography (Elix & Ernst-Russell 1993) and high-performance liquid chromatography (Elix *et al.* 2003).

Hertelidea wankaensis Kantvilas & Elix, sp. nov.

Apotheciis lecideinis, ascis ad *Micaream* pertinentibus et ascosporis simplicibus hyalinisque, 6–13 μm longis, 4–6 μm latis, primo adspectu *Hertelideam* typicam similibus sed a speciebus aliis generis excipulo debiliter evoluto et compositione chemicali, acidum constipaticum includenti, differt.

Type: Australia: *Queensland*, Wanka Road, 29 km S of Dalby along Cecil Plains Road, 27°26'51"S, 151°14'21"E, 340 m altitude, on dead wood in grassland with remnant *Eucalyptus*, 8.v.2005, J.A. Elix 36443 & H. Lepp (HO—holotype; BRI, CANB—iso-types).

Thallus crustose, not delimited, dull grey, composed of scattered, irregular, rather gnarled and knobby areoles 0.1–0.3 mm wide, becoming abraded and rather granular but not sorediate; prothallus absent. Photobiont trebouxoid, with cells \pm globose, 9–20 μm diam. Apothecia numerous, sessile, basally constricted, 0.3–0.8 mm diam., single or occasionally fused in clusters of 2 or 3; disc plane to convex to undulate,

red-brown to dark brown, matt, epruinose; proper margin very thin; brown-black to black, persistent but often barely evident, typically with a thin, \pm discontinuous layer of adhering thalline tissue (best observed in thin vertical sections). Excipulum in section very poorly developed, \pm cupular; at the sides reddish brown, K \pm olive-brown, 10–15 μm thick and composed of branched and anastomosing, entangled hyphae 1–1.5 μm thick, interspersed with minute, non-soluble (in KOH) crystals, typically with an external, rather ragged thalline layer 30–50 μm thick containing photobiont cells; at the base colourless, 10–30 μm thick, \pm prosoplectenchymatous and very poorly differentiated from the hypothecium. Hypothecium colourless, 50–80 μm thick. Hymenium (30–)35–40 μm thick, in the upper part reddish brown, K \pm olive-brown, K/I+ blue but with amyloid reaction confined to the asci. Asci clavate, of the *Micarea*-type, (25–)32.2(–40) \times (10–)12.2(–15) μm . Paraphyses simple to sparingly branched, 1.5–2 μm thick, cohering in water and KOH; apices distinctly capitate, 3–4 μm wide, with an internal dark brown cap. Ascospores simple, hyaline, broadly ellipsoid to ovate, (6–)9.1(–13) \times (4–)5.2(–6) μm . Pycnidia very abundant, scattered, black, glossy, superficial to semi-immersed, flask-shaped, usually with a gaping ostiole. Conidia of two types: macroconidia ellipsoid, 8–12 \times 3.5–4 μm usually with two vacuoles; microconidia bacilliform to fusiform with blunt apices, 5–7.5 \times 1.5(–2) μm .

Chemistry: containing constipatic acid (major), dehydroconstipatic acid (minor), subdecipienic acid A (minor) and subdecipienic acid B (minor); all standard spot tests negative.

Etymology: the specific epithet derives from the Latin suffix *-ensis* (place of origin) and the type locality, Wanka Road in southern Queensland.

Remarks: The new species displays typical features of *Hertelidea* as defined by Printzen & Kantvilas (2004), namely the trebouxoid photobiont, *Micarea*-type asci, capitate paraphyses and relatively small, simple, hyaline ascospores. However, unlike in the other species of the genus, botryose clusters of apothecia have not been observed. Its habitat, on dead wood, is also characteristic for the genus. It is distinguished from the other species first and foremost by its chemistry; all the other species contain perlatolic or homosekikaic acids. The undescribed fatty acids, subdecipienic acids A and B, are part of the constipatic acid chemosyndrome, and were first observed in *Xanthoparmelia decipiens* (Vain.) Hale, where they co-occur with constipatic acid, protoconstipatic acid, dehydroconstipatic acid, protodehydroconstipatic acid, myelochroic acid and isomyelochroic acid. The excipulum of the new species is also unusual, being very thin and poorly defined, and surrounded by ragged thalline tissue; photobiont cells also extend beneath the apothecium. The apothecia lack any KOH-soluble crystalline inclusions that fluoresce in polarized light; such crystals are common in *H. aspera* and *H. pseudobotryosa*. The presence of abundant pycnidia and two types of conidia in the new species is very significant, because pycnidia have hitherto been observed only in *H. pseudobotryosa* where they were filiform and measured 15–19 \times 1 μm . (R.C. Harris in Printzen & Kantvilas 2004).

Distribution and ecology: The new species is known only from the type locality where it is lignicolous on dead *Eucalyptus* logs in grassland with scattered, remnant *Eucalyptus* trees. Commonly associated species include *Flavoparmelia rutidota* (Hook. f. & Taylor) Hale, *Caloplaca* sp., *Candelariella xanthostigmoides* (Müll.Arg.) R.W. Rogers and *Tephromela atra* (Huds.) Hafellner *sens. lat.*

Observations on other species

1. *Hertelidea aspera* (Müll.Arg.) Kantvilas & Elix

This species was previously known from Victoria and Tasmania (Printzen & Kantvilas 2004, Kantvilas & Elix 2005), but has now been found in New South Wales.

SPECIMEN EXAMINED

New South Wales: • Great Dividing Range, 13 km E of Bungendore, 35°12'S, 149°53'E, 820 m alt., 23.iii.1977, J.A. Elix 3017 (CANB).

2. *Hertelidea eucalypti* Kantvilas & Printzen

When first described, this species was known only from moist, soft, rotting bark or wood in wet forest, with the large buttresses of mature *Eucalyptus* trees a particularly favoured habitat. Since then, *H. eucalypti* has also been recorded from alpine heathland where it grows on peaty soil. Gaps in such heathlands typically support a dense, ±continuous turf of herbs, straggling microshrubbery, small sedges, bryophytes and lichens such as species of *Cladia*, *Cladonia* and *Siphula*. In moister depressions where frost heaving is also likely to occur, lichens such as *Trapeliopsis colensoi* (C. Bab.) Gotth. Schneid. predominate or the peat is seemingly bare. However, very inconspicuous, granular, dark olive-brown to brown-black encrustations of *Hertelidea* thalli are present there also. Such forms of this species are rather reminiscent of *Placynthiella icmalea* (Ach.) Coppins & P. James, which may occur in similar habitats. Although superficially very distinctive, the *Hertelidea* thalli contain homosekikaic acid, have apothecia that sometimes have a slightly pruinose margin, and ascospores 9.5–15 × 5–6 μm; with respect to those details, they are identical to typical *H. eucalypti* from forest habitats.

SPECIMENS EXAMINED

Tasmania: • Mt Mueller, western peak, 42°06'S, 146°28'E, 1150 m alt., 16.xii.1998, G. Kantvilas 262/98 (HO); • summit area of Ironstone Mtn, 41°43'S, 146°28'E, 1440 m alt., 20.xi.2005, G. Kantvilas 329/05 (HO).

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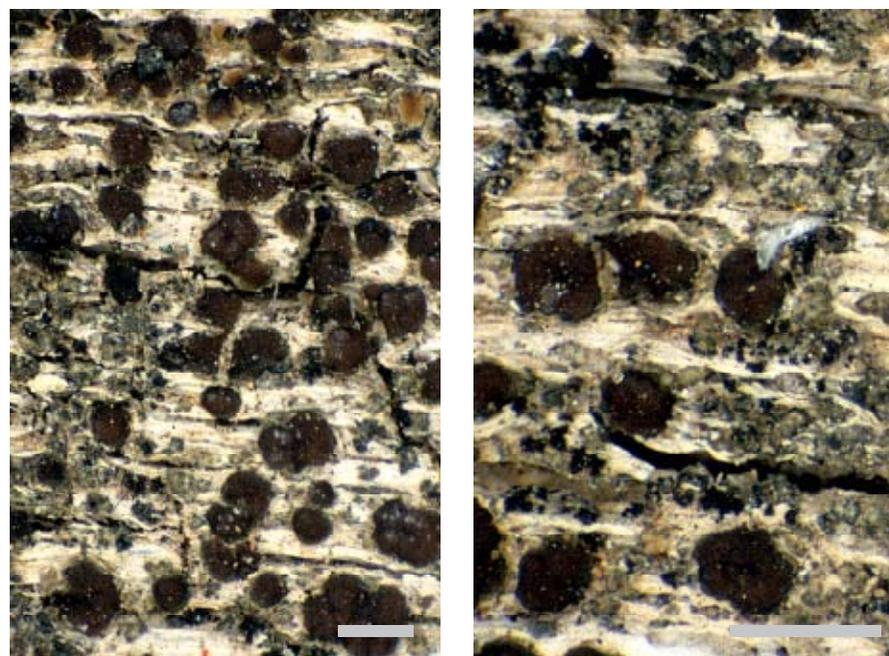


Figure 1. *Hertelidea wankaensis* habit (part of isotype in CANB). Bar = 1 mm.

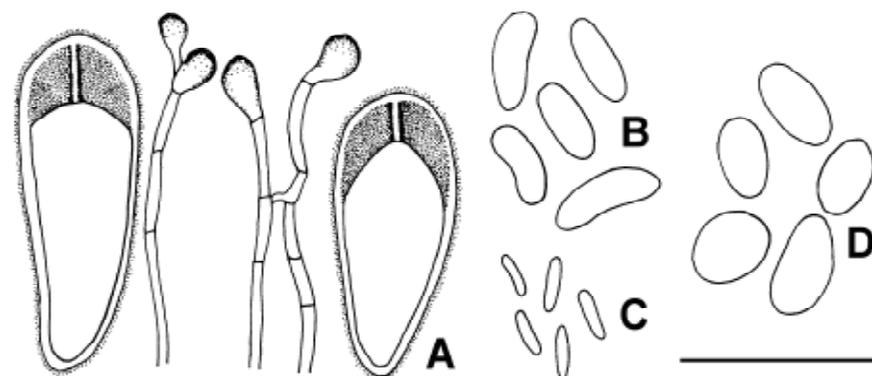


Figure 2. *Hertelidea wankaensis* anatomy. A: Asci (with amyloid parts stippled) and paraphyses; B: macroconidia; C: microconidia; D: ascospores. Scale = 20 μm.

Typification and identity of *Pertusaria obvelata* Nyl.

Alan M. Fryday

Herbarium, Department of Plant Biology, Michigan State University
East Lansing, Michigan, 48824–1312, USA

Brian J. Coppins

Royal Botanic Garden, Edinburgh, EH3 5LR, UK

Abstract: The typification of *Pertusaria obvelata* Nyl. is discussed and the name shown to be a synonym of *P. velata* (Turner) Nyl.

Introduction

Pertusaria obvelata Nyl. was described by Nylander from collections made from near Dunedin by Lindsay in 1861. Initially, Nylander (1866) reported them as *P. velata* (Turner) Nyl., but later (Nylander 1888) described them as a new species, *P. obvelata*, citing the C– reaction of the thallus as the only significant difference (“Subsimilis *P. velatae* Turn., reacto K–, CaCl–”). Nylander included *P. velata* in his later treatment (Nylander 1888), but only as a corticolous species.

Typification

There are only two collections in E, where Lindsay’s collections are housed, and H-NYL, where there are smaller duplicates, which are candidates for selection as the lectotype of *P. obvelata*. Both were collected by Lindsay in October, 1861, from the Green Island area (now a suburb of Dunedin, c. 8 km south of the city centre), and probably on the same day. One (south of Green Island Peninsula) has a strong C+ reaction in thallus and apothecia and is clearly *P. velata* growing on rock, whereas the other (Green Island Bluff) has a much weaker C+ reaction that is confined to the thallus medulla and apothecia (where it is often difficult to demonstrate), but is otherwise morphologically similar to *P. velata*. Both collections contain lecanoric acid by TLC. The collection with the weaker C reaction was selected as the lectotype of *P. obvelata* (Galloway 1985), even though the protologue of *P. obvelata* clearly states that the species is C–. However, given that the C+ red reaction of the medulla is patchy and easily overlooked, and there are no better candidates for a lectotype, we must assume that Nylander overlooked the C+ reaction and the lectotypification should be allowed to stand.

Identity

Because *P. velata* and *P. obvelata* both contain lecanoric acid, are morphologically similar, and occur on basaltic rocks in the same area, it is our opinion that only one species is involved, and that *P. obvelata* should be included in the synonymy of *P. velata*.

Lichenicolous Fungus

The isolectotype (in E) of *P. obvelata* is parasitized by a *Melaspilea* with simple, opegraphoid lirellae (ascospores hyaline to brown, constricted at septum, 17–17.5 x 8.5–9 µm; exciple dark brown in K); surprisingly not noted by Lindsay. A specimen determined as *P. obvelata* in MSC (Elix 7828) from the same area as the lectotype (Pipikarutu Beach, Otago Peninsula) has a similar *Melaspilea* sp., but with slightly larger ascospores (22–24 x 10–11 µm), yet is otherwise identical in all other respects and is surely the same species.

Acknowledgements

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A new species of *Hafellia* (Physciaceae, lichenized Ascomycota) from Australia

John A. Elix

Department of Chemistry, Faculty of Science,
Australian National University, Canberra, ACT 0200, Australia
e-mail: John.Elix@anu.edu.au

Abstract: *Hafellia xanthonica* Elix is described as new to science.

The examination of various collections of crustose lichens in preparation for the fifth lichen volume of the *Flora of Australia* has led to the identification of several undescribed species. A new species of *Hafellia* is described in the present paper. Chemical constituents were identified by thin-layer chromatography (Elix & Ernst-Russell 1993), high performance liquid chromatography (Elix *et al.* 2003) and comparison with authentic samples.

Hafellia xanthonica Elix, sp. nov.

Figures 1–4

Thallus ut in *Hafellia demutans* sed superfice viridigriseus et 4,5-dichlorolichexanthonicum continente differt.

Etymology. The specific epithet refers to the occurrence of a xanthonone in this species.

Type: AUSTRALIA. *Western Australia:* Wotto Nature Reserve, First North Road, 21 km by road NE of Eneabba, 29°42'29"S, 115°24'37"E, 275 m, on *Melaleuca* in *Eucalyptus* woodland with *Melaleuca* and laterite rocks, 5.v.2004, *J.A. Elix 28876*; holo: PERTH, iso: CANB.

Thallus crustose, continuous, thin, smooth to indistinctly areolate, with a roughened, occasionally warty surface, yellow-white, greenish grey to pale yellow grey or yellow-green. Prothallus not present or appearing as a black line surrounding the thallus. Apothecia lecideine, adnate to sessile, 0.4–1.5 mm wide; disc black, flat to weakly convex; margin concolorous with the disc, usually persistent, becoming excluded in convex apothecia; exiple of radiating hyphae, rim more distinctly pigmented than the inner part; epithecium brown, 10–20 µm thick; hymenium colourless, with oil droplets, 70–120 µm thick; hypothecium brown, c. 150 µm thick; paraphyses 1–2 µm thick, occasionally branched, septate, with clavate apices 3–5 µm thick, brown. Asci 8-spored, or more rarely with 2 or 4 mature spores together with aborted spores; broadly clavate. Ascospores brown, *Callispora*-type, with apical wall thickenings, smooth, 1-septate, ellipsoid with somewhat pointed ends when mature, 14–30(–35) × 6–13(–15) µm. Pycnidia not seen.

Chemistry: Thallus K–, C–, KC–, PD–; containing 4,5-dichlorolichexanthonone (major), ±brialmontin 1 (minor).

Notes. The growth habit, apothecial anatomy and ascospores of this species closely resemble those of *Hafellia demutans* (Stirt.) Pusswald, but *H. xanthonica* can readily be distinguished by its distinctly greenish grey to yellow-grey upper surface (white or off-white in *H. demutans*) and by its chemistry (Marbach 2000, Pusswald *et al.* 1994, Pusswald 1995). Whereas *H. demutans* contains atranorin (major), diploicin (major), isofulgidin (minor) and ±fulgidin (trace), *H. xanthonica* contains 4,5-dichlorolichexanthonone (major) and ±brialmontin 1 (minor). *Hafellia xanthonica* is the first species of the genus known to contain 4,5-dichlorolichexanthonone. In the field this species superficially resembles a *Lecidella* species, but can easily be distinguished by its brown, 1-septate *Callispora*-type ascospores.

At present this species is known from a number of localities in subarid areas of south-western Western Australia and inland areas of New South Wales, where it is

corticolous on *Allocasuarina*, *Melaleuca* and *Acacia*. Commonly associated species include *Flavoparmelia rutidota* (Hook.f. & Taylor) Hale, *Hafellia dissa* (Stirt.) H. Mayrhofer & Sheard, *Pertusaria gibberosa* Müll. Arg., *Physcia jackii* Moberg, *Parmelina pseudorelicina* (Jatta) Kantvilas & Elix, *Punctelia subalbicans* (Stirt.) D.J. Galloway & Elix, *Ramboldia brunneocarpa* Kantvilas & Elix and *Usnea scabrida* Taylor.

ADDITIONAL SPECIMENS EXAMINED

New South Wales: • Terraban Gap Nature Reserve, 31 km E of Dunedoo along Black Stump Way, 31°58'20"S, 149°20'22"E, 560 m, on twigs of shrub in *Eucalyptus-Callitris* woodland, 25.iv.2005, *J.A. Elix 36121* (CANB); • Cottan-Bimbang National Park, 4.8 km from W end of Myrtle Gully Road, c. 70 km W of Walcha, 31°21'45"S, 152°00'38"E, 980 m, on fallen branch in rainforest with isolated *Eucalyptus*, 28.iv.2005, *J.A. Elix 36308* (CANB); • Cottan-Bimbang National Park, junction of Oxley Highway and Tobins Road, c. 70 km W of Walcha, 31°22'22"S, 152°03'37"E, 1040 m, on dead *Acacia* in wet *Eucalyptus* forest with tree fern understorey, 28.iv.2005, *J.A. Elix 36369* (CANB); • Dangars Gorge, Oxley Wild Rivers National Park, 18.5 km SSE of Armidale, 30°40'27"S, 151°43'35"E, 945 m, on *Acacia* in *Eucalyptus-Allocasuarina* woodland along stream, 29.iv.2005, *J.A. Elix 36436* (CANB, HO, NSW); on *Allocasuarina*, 29.iv.2005, *J.A. Elix 36445* (CANB).

Western Australia: • Gwambygine Nature Reserve, 11 km S of York, 31°58'24"S, 116°48'38"E, 245 m, on *Acacia* in *Acacia acuminata* woodland with scattered *Melaleuca* on river flats, 22.iv.2004, *J.A. Elix 31740* (CANB); • Nookaminne Picnic Area, 4 km W of Quairading, 32°01'19"S, 117°22'19"E, 250 m, on dead twigs of *Allocasuarina* in mixed shrubland, 22.iv.2004, *J.A. Elix 31793* (CANB); • Great Northern Highway, 72 km NE of Wubin, 29°39'53"S, 117°07'11"E, on *Acacia* in *Eucalyptus-Acacia* woodland, 29.iv.2004, *J.A. Elix 33487* (CANB, PERTH); • Wotto Nature Reserve, First North Road, 21 km by road NE of Eneabba, 29°42'29"S, 115°24'37"E, 275 m, on *Melaleuca* in *Eucalyptus-Melaleuca* woodland, 5.v.2004, *J.A. Elix 28873* (CANB); • Western Flora camp area, 20 km N of Eneabba, 29°37'30"S, 115°13'30"E, on branch of *Acacia*, 4–6.vi.2005, *E. McCrum WF252a* (CANB, PERTH).

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Figures 1–4. *Hafellia xanthonica* (Elix 31793 in CANB). 1–2: habit, bar = 1 mm. 3: an 8-spored ascus, 4: ascus with two mature spores and aborted spores, bar = 10 μ m.

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