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Abstract

Three species are reported from Antarctica: *A. gremmenii* Øvstedal sp. nov., *A. narssaquensis* (Lynge) Thomson, which is new to the Southern Hemisphere, and *Oxneriaria virginea* (Hue) S.Y.Kondr. & L.Lökös, which is already known from the region.

Introduction

Few species of *Aspicilia* A.Massal. and *Oxneriaria* S.Y.Kondr. & L.Lökös have been reported from Antarctica, viz. *O. virginea* (Hue) S.Y.Kondr. & L.Lökös (Halici *et al.* 2018, as *Aspicilia virginea*) and *Aspicilia* cf. *aquatica* Körb. (Øvstedal & Lewis Smith 2001). In addition, two other entities, presumed to represent *Aspicilia*, were recognized but not named by Øvstedal & Lewis Smith (2001, 2004). Neighbouring regions also have few species; for example Argentina has six species (Calvelo & Liberatore 2002), the Falkland Islands one (Fryday *et al.* 2021) and New Zealand seven (Galloway 2007). By contrast, the vast and well-studied landmasses of the Northern Hemisphere support substantial floras, with 97 species known from North America (Esslinger 2019), 40 from Svalbard (Øvstedal *et al.* 2009) and 104 from Russia (Urbanavichus 2010).

Aspicilia has recently been divided into four segregate genera: *Aspicilia* s. str., *Circinaria* Link and *Sagedia* Ach., both resurrected on the basis of molecular evidence (Nordin *et al.* 2011), and the newly described and mainly molecular-based *Oxneriaria* S.Y.Kondr. & L. Lökös (Moniri *et al.* 2019). Since the material examined here is too old for molecular analyses, the present species, apart from *O. virginea*, cannot be placed in that system.

Material and methods

All material is deposited in AAS. The specimens were investigated using a Zeiss Stemo 2000C microscope and a Zeiss Axiolab compound microscope. Microscopic details were obtained by examining hand-cut sections. The sections were mounted in dilute lactophenol cotton blue or water. Measurements were made on sections mounted in 10% KOH. Chemical constituents were identified by thin-layer chromatography (Elix 2014).

The species

***Aspicilia gremmenii* Øvstedal sp. nov.**
Mycobank No.: **MB 842490**

Fig. 1

Thallus of small rosettes, lead grey, with radiating lobes at the margin. Apothecia urceolate, to 0.4 mm in diam. Ascospores 16–20 × 12–17 µm. Paraphyses not moniliform. No chemical products.

Type: Antarctica, Signy Island, Moraine Valley, 60°43'S, 45°37'W, on exposed moraine boulders. *T.N. Hooker 639*, 1.ii.1974, (holotype—AAS).

Thallus as small rosettes, up to 9 mm wide, subeffigurate, lead grey, partly with a yellowish tinge. Inner part of thallus weakly rimose, in centre with elevated, adpressed fertile areolae 0.4–0.7 mm wide. Radiating at the margin, closely adpressed, minute lobes, darkened at end. No prothallus. Cortex pseudoparenchymatous, 25–35 µm high, the uppermost cells brownish. Photobiont trebouxoid, c. 10 µm in diam. Medulla with numerous colourless oxalate crystals. Apothecia urceolate, round to irregular, 1–4 per areolae, 0.1–0.4 mm in diam. Thalline margin not seen. Proper margin thin, 20–30 µm in upper part, narrowing

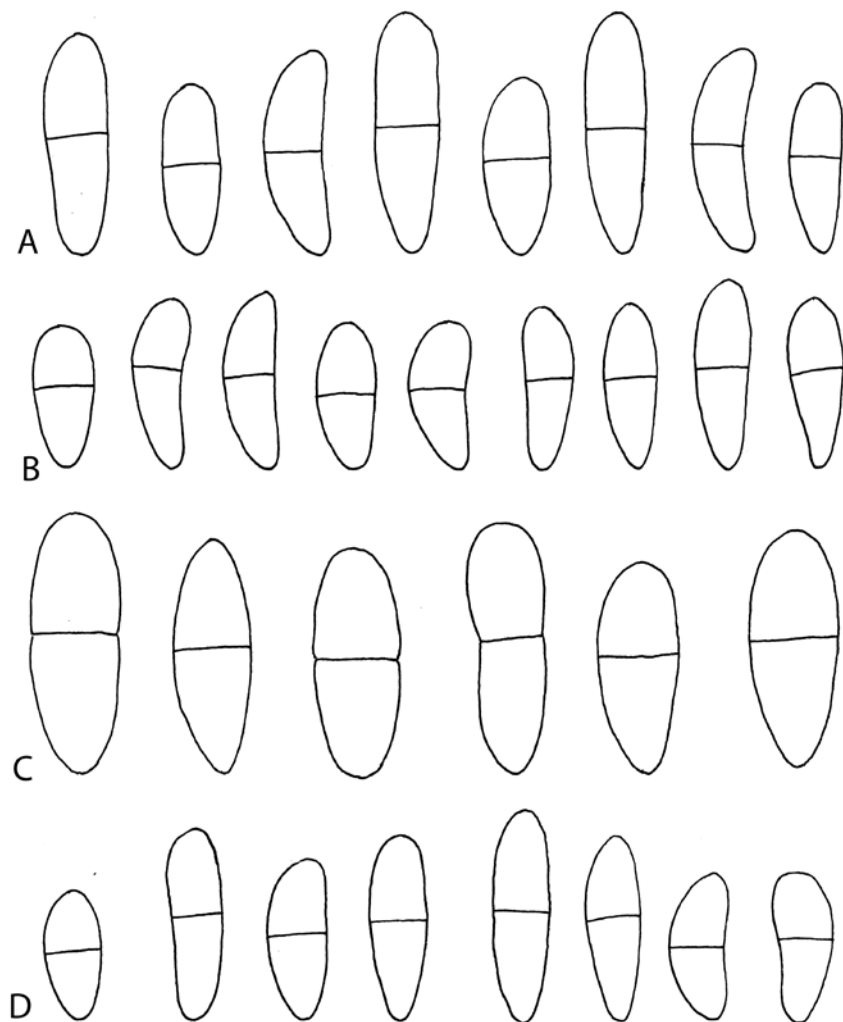


Figure 6. Ascospores of the new *Megalaria* species. A, *M. australiensis*; B, *M. crystallifera*; C, *M. norfolkensis*; D, *M. stratosa*. Scale = 20 µm.

further down, cells thick-walled. Disc black, rarely with whitish pruina. *Epithecium* brown, intensifying in K, N-. *Hymenium* 100–120 µm high, no oil droplets. *Hypothecium* colourless, composed of a pseudoparenchymatous tissue, 70–80 µm high. *Paraphyses* branched, c. 2.5 µm broad, not moniliform, cells in the uppermost part enlarged to 3–4 µm diam, tips brownish. Asci of *Aspicilia*-type, clavate, c. 55 × 30 µm. *Ascospores* hyaline, 8 in asci, broadly ellipsoid, 16–20 × 12–17 µm. *Pycnidia* not seen. *Chemistry*: TLC negative.

Etymology: Named in honour of N.J.M. Gremmen (1948–2019), a Dutch botanist who collected many lichens in the Antarctic and sub-Antarctic.

Remarks

This species was mistakenly reported as *Aspicilia* cf. *aquatica* by Øvstedal & Lewis Smith (2001). That species is grey to bluish grey, rimose-areolate, without radiating marginal lobes and with ascospores 22–24 µm long (Øvstedal *et al.* 2009). Externally the new species is similar to the boreal to Arctic *A. sublapponica* (Zahlbr.) Oxner which, however, contains substictic acid and has smaller ascospores and moniliform paraphyses (Øvstedal *et al.* 2009), while *Oxneriaria dendroplaca* (H.Magn.) S.Y.Kondr. & L.Lökös, from northern Europe and northern Russia, contains substictic acid and has smaller ascospores (Nordin *et al.* 2011). *Aspicilia mendozae* Räsänen, from Argentina, is somewhat similar, but has less-defined marginal lobes and much smaller ascospores (Räsänen 1941). The recently described *A. malviniae* Fryday & T.B.Wheeler (Fryday *et al.* 2021) from the Falkland Islands is effuse and areolate, and contains hypostictic acid. The ecology of *Aspicilia gremmenii*, occurring as it does on dry moraine boulders, is also distinctive.

ADDITIONAL SPECIMEN EXAMINED

Antarctica: ● South Orkney Islands, Signy Island, Cummings Cove, exposed moraine boulder facing west, alt. 200 ft, *T.N. Hooker 289*, 28.x.1973 (AAS).

Aspicilia narssaquensis (Lyngé) J.W.Thomson, *Bryologist* **90**, 163 (1987) Fig. 2

Thallus dimorphic; basal thallus 25–30 mm wide, effuse, pinkish, with no prothallus. Areolae raised in the inner part. *Apothecia* 1–5 per areole, 0.2–0.7 mm diam., flush with margin. Disc regular to irregular, slightly convex and sometimes pruinose, dark brown-blackish, up to 0.7 mm diam. Thalline margin prominent, up to 75 µm wide, pseudoparenchymatous, with numerous trebouxoid algae c. 10 µm diam. *Proper margin* thin, colourless, pseudoparenchymatous, c. 15 µm wide. *Hymenium* 100–110 µm high; *epithecium* pale brown. *Paraphyses* submoniliform, with brown apices. *Ascospores* 8 per ascus, 13–16 × 11–12 µm. *Pycnidia* not seen.

Chemistry: containing substictic acid (TLC).

SPECIMEN EXAMINED

Antarctica: ● Antarctic Peninsula, James Ross Island, E side Lachman Craigs, dry boulders, alt. 20–30 m, *R.I. Lewis Smith 7363*, 31.i.1989 (AAS).

Remarks

Aspicilia narssaquensis is characterized by the dimorphic thallus and the presence of substictic acid. Reported as *Aspicilia* sp. in Øvstedal & Lewis Smith (2004). Distribution: Svalbard, North America, Greenland, China (Hou *et al.* 2014), Antarctica.

Oxneriaria virginea (Hue) S.Y.Kondr. & L.Lökös, *Acta Botanica Hungarica* **59**, 358 (2017)

Thallus areolate, up to 30 mm wide; areolae elongate at the periphery, yellowish white. *Prothallus* absent. *Apothecia* urceolate, 1–3 per areole, 0.2–0.4 mm wide, black, not pruinose.

Thalline margin not present, but a raised grey rim surrounds each apothecium. *Proper margin* pale brown, entire, c. 30 µm wide, pseudoparenchymatous. *Hymenium* 100–120 µm high; *epithecium* pale brown. *Paraphyses* not moniliform, c. 1 µm wide. *Ascospores* 8 per ascus, ellipsoid, 17–19 × 9–11 µm. *Pycnidia* not seen. *Chemistry*: TLC negative.

SPECIMEN EXAMINED

Antarctica: ● Antarctic Peninsula, James Ross Island, north-eastern part, on stones at margin of melt stream, alt. 50 m., *R.I. Lewis Smith 7605 B*, i.1989 (AAS).

Remarks

This species was first reported from the Antarctic by Halici *et al.* (2018), who determined it using nrITS markers. It was reported as *Aspicilia* sp. A in Øvstedal & Lewis Smith (2001). It also occurs in Fennoscandia and Arctic Canada (Nordin *et al.* 2011).

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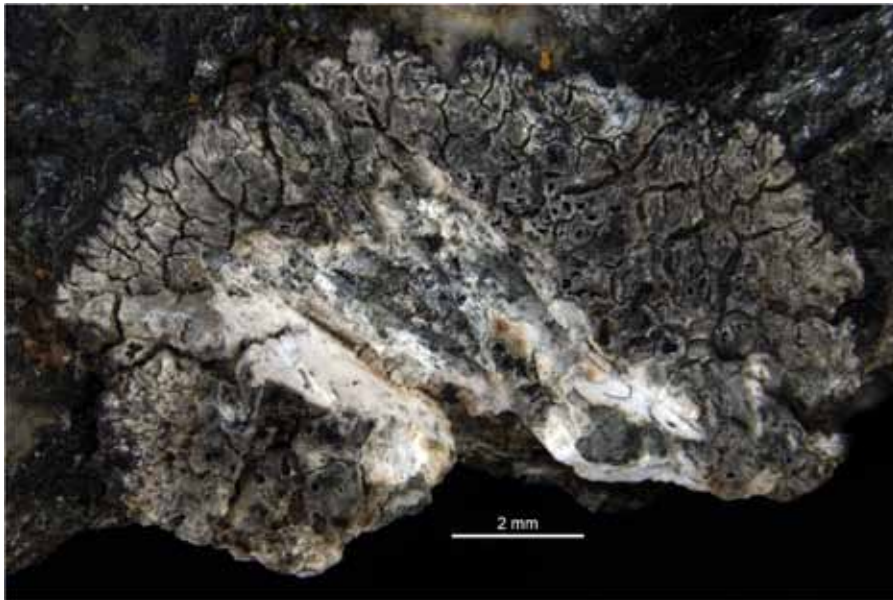


Figure 1. *Aspicilia gremmenii* (holotype in AAS).

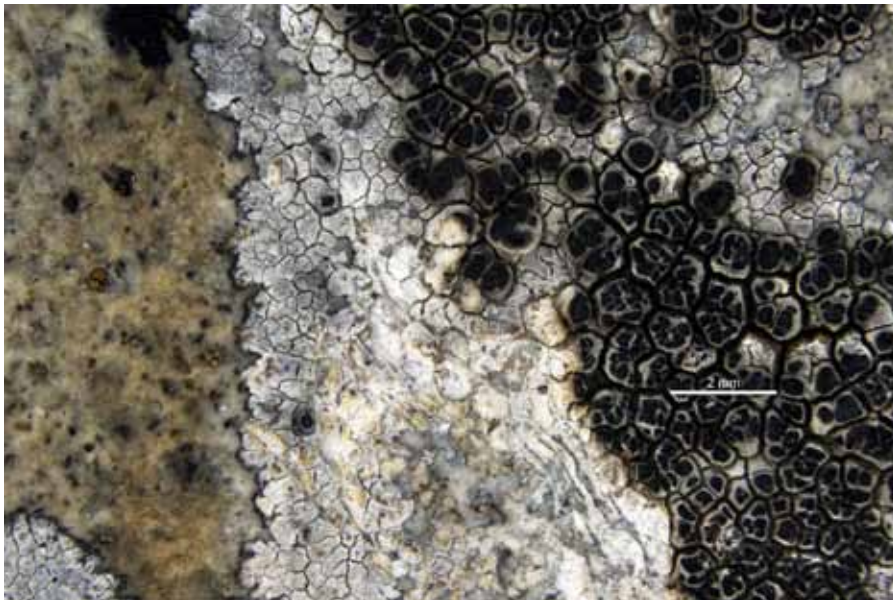


Figure 2. *Aspicilia narssaquensis* (R.I. Lewis Smith 7363, AAS).

Additional lichen records from Australia 88

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Abstract: *Lepra variolina* (Nyl.) Q.Ren and *Pseudopyrenula papuana* Aptroot are reported for the first time from Australia. New State, Territory and oceanic island records are provided for 60 other species.

New records for Australia

Lepra variolina (Nyl.) Q.Ren, *Mycosystema* **38**(11), 1858 (2019)

Pertusaria variolina Nyl., *Lich. Japon.* 56 (1890).

Pertusaria violacea Oshio, *J. Sci. Hiroshima Univ.*, Ser. B, Div. 2, **12**(1), 92 (1968); *Lepra violacea* (Oshio) I.Schmitt, B.P.Hodk. & Lumbsch, in Wei *et al.*, *PloS ONE* **12**(7): e0180284, 10 (2017).

This species was previously known from Japan and China (Ren 2014). It is characterized by a sterile, grey, thin, white to grey-white sorediate thallus with rounded convex soralia and the presence of thamnolic acid (Figure 1).

SPECIMENS EXAMINED

Victoria: • Arte River, 30 km NE of Orbost, 37°35'S, 148°46'E, 300 m alt., on forest tree in wet sclerophyll forest, *J.A. Elix 24211*, 14.ii.1990 (CANB); • Cabbage Tree Creek Flora reserve, 17 km ESE of Orbost, 37°44'S, 148°39'E, 30 m alt., on forest tree in *Acmena*-dominated creek flats, *J.A. Elix 24249*, 14.ii.1990 (CANB).

Pseudopyrenula papuana Aptroot, in Aptroot *et al.*, *Biblioth. Lichenol.* **64**, 148 (1997)

Previously known only from Madang Province in Papua New Guinea (Aptroot *et al.* 1997; Aptroot & Lücking 2016), this species has a nondescript, crustose thallus without an obvious photobiont. Perithecia are very prominent, conico-hemispherical, 0.7–1.4 mm wide and dull black except for the slightly glossy, short-apiculate periostiole (Figure 2). The perithecial wall is hard, carbonized and up to 170 µm thick, pseudoparaphyses are tightly conglutinate, anastomosing and 0.5–1 µm wide, and the narrowly cylindrical asci are 140–180 × 12–16 µm, with 4–8 uniseriate ascospores. The latter are astrothelioid, oblong to fusiform, 4-locular, hyaline, and in the one possibly significant departure from the anatomy of the type specimen, the ascospores are 25–36(–40) × 9–13 µm ($n = 60$; vs 25–29 × 7–9 µm, *vide* Aptroot *et al.* 1997).

SPECIMENS EXAMINED

Christmas Island: • c. 750 m SW of Hanitch Hill, 10°27.20'S, 105°39.30'E, alt. 280 m, on bark in moderately dense primary forest, *P.M. McCarthy 1463*, 28.vii.2000 (CANB); • North-South Baseline Road, c. 1 km S of airport terminal building, 10°27.64'S, 105°41.24'E, alt. 230 m, on bark in moderately dense primary forest, *P.M. McCarthy 1375*, 31.vii.2000 (CANB).

New State, Territory and oceanic island records

Amandinea conglomerata Elix & Kantvilas, *Australas. Lichenol.* **72**, 4 (2013)

This endemic species was previously known from New South Wales and Tasmania (Elix & Kantvilas 2013).