

Standard Paper

The genus *Schaereria* Körb. in Australia

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Abstract

Five species of *Schaereria* Körb. are known to occur in Australia (including Tasmania). The new species *S. australis* Kantvilas is described from alpine Tasmania and New South Wales; it is characterized by a thallus lacking lichen substances, apothecia with only brown pigments, and ellipsoid, uniseriate ascospores, $10\text{--}17 \times 6\text{--}9 \mu\text{m}$. Also treated are: *S. bullata* Kantvilas, endemic to Tasmania; *S. dolodes* (Nyl. ex Hasse) Schmull & T. Sprib., first described from North America and recorded here for the first time from the Southern Hemisphere (Tasmania); the bipolar *S. fuscocinerea* (Nyl.) Clauzade & Cl. Roux and the Australian endemic *S. xerophila* Rambold & H. Mayrhofer, both recorded for the first time from Tasmania. The species are illustrated and an identification key is provided.

Keywords: *Ascomycetes*; biodiversity; lichens; new species; Tasmania; taxonomy

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Introduction

Schaereria is a small, well-defined genus of crustose lichens. It is characterized chiefly by its distinctive asci, termed *Schaereria*-type (Hafellner 1984), which are cylindrical, have a thin, faintly amyloid wall, lack a thickened tholus and contain eight, simple, thin-walled, hyaline ascospores. Furthermore, the paraphyses are extremely lax in water. The genus has posed ongoing questions with respect to its taxonomic position, summarized by Lunke *et al.* (1996) who trace its history, from being reinstated out of the form genus *Lecidea* s. lat. by Poelt & Vězda (1977), to being placed in its own family by Hafellner (1984). More recently it has been included in molecular studies (e.g. Wedin *et al.* 2005; Schmull *et al.* 2011; Miadlikowska *et al.* 2014; Resl *et al.* 2015), all of which have essentially emphasized its rather isolated and uncertain phylogenetic placement. Currently the genus remains in the monogeneric family *Schaereriaceae* and is classified in the *Schaereriales* (Kraichak *et al.* 2018). Thallus chemistry and morphology, apothecial pigmentation, and ascospore shape and arrangement in the ascus are the primary characters used to delimit the species.

Since the review of the known species of *Schaereria* by Kantvilas (1999), which included seven species, there have been additions to the genus from the Falkland Islands (Fryday & Common 2001), temperate North America (Schmull & Spribille 2005; Spribille *et al.* 2009) and Antarctica (Øvstedal

& Lewis Smith 2009), bringing the total number for the genus to 11. In this paper, a further new species from Australia is described, a first record of a species originally described from the Northern Hemisphere is reported for Australia (Tasmania), the known ranges of two other species are extended to Tasmania, and a key to the five Australian species is presented.

Material and Methods

This study is based chiefly on collections by the author, housed in the Tasmanian Herbarium (HO), with reference to selected specimens from other herbaria as indicated in the text, and on field studies undertaken in Tasmania and south-eastern mainland Australia. Anatomical observations and measurements are based on thin, hand-cut sections of the thallus, apothecia and pycnidia mounted in water, 10% KOH (K), Lugol's iodine (I), ammoniacal erythrosin and/or lactophenol cotton blue. Ascospore measurements are presented in the format 5th percentile–average–95th percentile, with outlying values in brackets and *n* signifying the number of observations. Chemical analyses were undertaken by thin-layer chromatography using standard methods (Orange *et al.* 2010); solvent A was the preferred routine medium. Terminology of apothecial pigments, specifically *fucatus*-violet, follows Kantvilas (2009).

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Key to the species of *Schaereria* in Australia

- 1 Ascospores ellipsoid 2
 Ascospores globose 3
- 2(1) Thallus containing gyrophoric acid (C+ red in squash); apothecia with blue-green epithelial pigment; ascospores $9\text{--}14 \times 5\text{--}8 \mu\text{m}$ ***S. fuscocinerea***
 Gyrophoric acid lacking; thallus C– and containing unknown substances; apothecia with brown pigments only; ascospores $10\text{--}17.5 \times 6\text{--}9 \mu\text{m}$ ***S. australis***
- 3(1) Thallus corticolous; epithecium with granules of *fucatus*-violet pigment ***S. dolodes***
 Thallus saxicolous; *fucatus*-violet pigment lacking 4
- 4(3) Thallus granular to squamulose; apothecia superficial, not immersed, basally constricted at maturity; strictly alpine
 ***S. bullata***
 Thallus crustose-areolate; apothecia semi-immersed, persistently aspicilioid; found in lowland in dry sclerophyll woodland
 ***S. xerophila***

The Species

Schaereria australis Kantvilas sp. nov.

Mycobank No.: MB 847716

Similar to *S. porpidioides* Fryday & Common with respect to the internal, brown pigmentation of the apothecia and the absence of blue-green apothecial pigments, but differing by the well-developed thallus, smaller apothecia, 0.3–0.7 mm diam., thinner proper exciple, 45–75 μm thick, and smaller ascospores, $10\text{--}17.5 \times 6\text{--}9 \mu\text{m}$.

Type: Australia, Tasmania, Ben Lomond, Plains of Heaven, 41° 32'S, 147°39'E, 1500 m, on alpine dolerite boulders, 8 February 2022, G. Kantvilas 238/22 (holotype—HO).

(Fig. 1)

Thallus crustose, areolate, pale to dull grey-brown, forming irregular patches to c. 10 mm wide interrupted by other lichens, ecorticate, but with an outer pale brown layer 20–50 μm thick comprised of the terminal, c. 5 μm wide cells of medullary hyphae that protrude through the photobiont layer; prothallus absent; individual areoles 0.2–0.8 mm wide, to 0.6 mm thick, tightly adnate, contiguous or separated by deep, gaping cracks; medulla

I–. *Photobiont* a unicellular green alga with cells broadly ellipsoid to globose, $8\text{--}20 \times 6\text{--}18 \mu\text{m}$.

Apothecia 0.3–0.7 mm wide, at first rather sunken into the thallus, at maturity superficial and broadly adnate, roundish or somewhat deformed and irregularly rhomboid; disc black to brown-black, plane to a little concave, epruinose; proper exciple concolorous with and markedly higher than the disc, persistent, sometimes a little flexuose, in section 45–75 μm thick, at the outer edge olive-brown to reddish brown, K± intensifying, paler within, composed of radiating hyphae that become increasingly short-celled towards the outer edge and form an outermost, parenchymatous layer of c. 5–6 μm wide cells. *Hypothecium* 25–50 (–80) μm thick, hyaline to pale reddish or olive-brown, poorly differentiated from and merging with the exciple. *Hymenium* 80–125 μm thick, sometimes interspersed with occasional, scattered oil droplets, hyaline apart from an uppermost olive-brown epithelial layer 6–10 μm thick, composed of the terminal pigmented cells of the paraphyses. *Paraphyses* simple or occasionally furcate in the upper part, straight, 2–2.5 μm wide, with the apices markedly capitate, internally brown pigmented, 4–6 (–8) μm wide. *Asci* 75–110 \times 10–15 μm , of the *Schaereria*-type: narrowly clavate-cylindrical, with the wall weakly amyloid and of ± even thickness throughout; tholus likewise weakly amyloid, not prominently

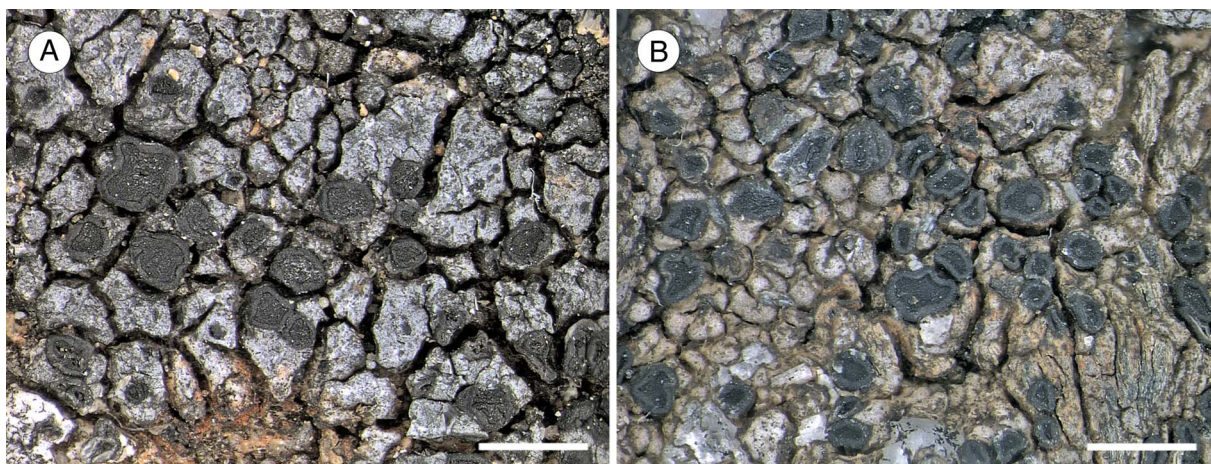


Figure 1. *Schaereria australis* morphology. A, holotype (Ben Lomond, Tasmania). B, Kantvilas 169/04 (Mt Kosciusko, NSW). Scales = 1 mm. In colour online.

thickened and lacking any internal structures. *Ascospores* hyaline, thin-walled, broadly ellipsoid, strictly uniseriate, $(10-11-13.3-16(-17.5) \times 6-7.6-9 \mu\text{m}$ ($n = 85$).

Pycnidia immersed, discernible as black specks on the thallus surface; conidia bacilliform, $5-7 \times 1 \mu\text{m}$.

Chemistry. Containing traces of an unknown compound, possibly identical to the major unknown in *S. bullata*, appearing as a colourless spot on developed TLC plates, midway between gyrophoric and norstictic acids; all spot tests of the thallus and medulla negative.

Etymology. The specific epithet alludes to the distribution of the new species in the Southern Hemisphere (Australia and Tasmania).

Remarks. The combination of a crustose, areolate thallus, absence of blue-green apothecial pigments, brown-capitate paraphyses and ellipsoid ascospores characterizes this species and readily distinguishes it from all others in the genus. It is most similar to *S. porpidioides* Fryday & Common from the Falkland Islands, sharing with that species identical apothecial pigmentation, brown-capitate paraphyses and uniseriate, ellipsoid ascospores (Fryday & Common 2001). However, there are many characters that clearly distinguish these two species, with *S. porpidioides* having considerably larger apothecia (up to 2 mm wide) with a very thick, flexuose margin (up to c. 100 μm thick) and an often pruinose disc, a highly reduced thallus and somewhat larger ascospores ($(14-15-17(-20) \times (8.5-10-12(-13.5)$ (Fryday & Common 2001); $13-15.5-19 \times 7-9.2-13 \mu\text{m}$, $n = 40$ (this study)). The new species is also very distinct when compared to the other Australian species of the genus. With its crustose-areolate thallus and alpine habitat, *S. fuscocinerea* is superficially most similar but it contains gyrophoric acid and blue-green and violet apothecial pigments. The other Australian species all contain the same brownish apothecial pigments as *S. australis* but have globose ascospores as well as other distinguishing features (see Key, above).

The distinctive *Schaereria*-type ascus has been well illustrated by previous authors (Hafellner 1984; Kantvilas 1999; Schmall & Spribille 2005) and is not depicted again here.

Distribution and ecology. *Schaereria australis* is an uncommon species known from the Mt Kosciusko area in the Australian Alps in New South Wales, and from Tasmania's Central and Ben Lomond Plateaux. It occurs on exposed, hard, siliceous, alpine boulders (dolerite in Tasmania, granite in Australia) within a rich association of mainly crustose lichens, including *Lambiella circumgrisea* (Kantvilas) Kantvilas, *Lecanora polytropa* (Ehrh.) Rabenh., *Protoparmelia badia* (Hoffm.) Hafellner, *Rhizocarpon geographicum* (L.) DC. and *Umbilicaria cylindrica* (L.) Delise ex Duby.

Additional specimens examined. **Australia:** New South Wales: Kosciusko National Park, Charlottes Pass, $36^{\circ}24'S$, $148^{\circ}19'E$, 1800 m, 2004, G. Kantvilas 169/04 (HO). **Tasmania:** Adam Peak, $41^{\circ}44'S$, $146^{\circ}41'E$, 1300 m, 2009, G. Kantvilas 12/09 (HO); Ben Lomond, unnamed summit c. 500 m S of Little Hell, $41^{\circ}32'S$ $147^{\circ}40'E$, 1530 m, 2022, G. Kantvilas 552/22 (HO).

Comparative material of *Schaereria porpidioides* studied. **Falkland Islands:** West Falkland: Mt Adam, H. A. Imshaug

41048 & R. C. Harris (HO, E, isotypes). East Falkland: Mt Osborne, H. A. Imshaug 40073 & R. C. Harris (BM).

Schaereria bullata Kantvilas

Lichenologist 31, 232 (1999); type: Tasmania, Legges Tor, $41^{\circ}32'S$, $147^{\circ}39'E$, on skeletal soil or directly on flat rock surfaces in alpine boulder field, 1570 m, 28 April 1998, G. Kantvilas 103/98 (holotype—HO!).

(Fig. 2C)

Thallus granular-squamulose, dark brown to grey-brown, forming irregular patches to 30 mm across, \pm corticate but overlain by an epinecral layer c. 10 mm thick, loosely adnate to the substratum, lacking a prothallus; squamules 0.1–1 mm wide, 200–500 μm thick, convex to strongly bullate, crowded and fusing together. **Photobiont** a unicellular green alga with \pm globose cells, 8–13 μm wide, encased in a gelatinous sheath 1–2 μm thick.

Apothecia 0.5–1 mm wide, superficial and basally constricted, never adnate, roundish to a little irregular when crowded together; disc black-brown to black, persistently plane, sometimes verruculose when old; proper exciple \pm concolorous with the disc, prominent and persistent, \pm inrolled, in section dark brown to reddish brown, K+ dull brown at the outer edge, pale brown to hyaline within, basally c. 80 μm thick, laterally 55–140 μm thick, composed of roundish cells 6–9 μm diam. **Hypothecium** 60–160 μm thick, hyaline to pale brown. **Hymenium** 85–120 μm thick, not interspersed, hyaline, I+ blue, overlain by a reddish brown to yellowish brown epithelial layer. **Paraphyses** simple or occasionally furcate in the upper part, 1.5–2.5 μm thick, with apices moniliform, usually expanded to 3.5–4.5 μm , typically faint to deep brown. **Asci** 80–110 \times 10–13 μm . **Ascospores** globose, strictly uniseriate, $(6.5-7-8.7-10(-11) \mu\text{m}$ diam.

Pycnidia immersed; conidia cylindrical, $3-6 \times 0.5-1 \mu\text{m}$.

Chemistry. Containing unknown substances; all spot tests negative.

Remarks. For further discussion of this species, see Kantvilas (1999). It is distinguished from the Northern Hemisphere's *S. cinereorufa*, which also has a brown, \pm squamulose thallus, mainly by the absence of blue-green epithelial pigments. Furthermore, *S. cinereorufa* also contains gyrophoric acid, albeit in trace amounts. Amongst the Australian members of the genus, there are no species with which *S. bullata* could be confused, and it is readily distinguished by the superficial, basally constricted apothecia and globose ascospores. The most similar taxon is *S. dolodes*, which shares these characters but is corticolous, has a less well-developed thallus and contains *fucatus*-violet as an additional apothecial pigment. In the field, *S. bullata* is very easily recognized, with perhaps the only morphologically similar species being small members of the *Pannariaceae* that occur in similar habitats (e.g. *Siphulastrum mamillatum* (Hook. f. & Taylor) D. J. Galloway and *Parmeliella ligulata* P. M. Jørg. & D. J. Galloway), although these taxa are clearly minutely lobate at the thallus margins and contain cyanobacteria.

Distribution and ecology. *Schaereria bullata* is widespread in alpine Tasmania, where it occurs exclusively on dolerite.

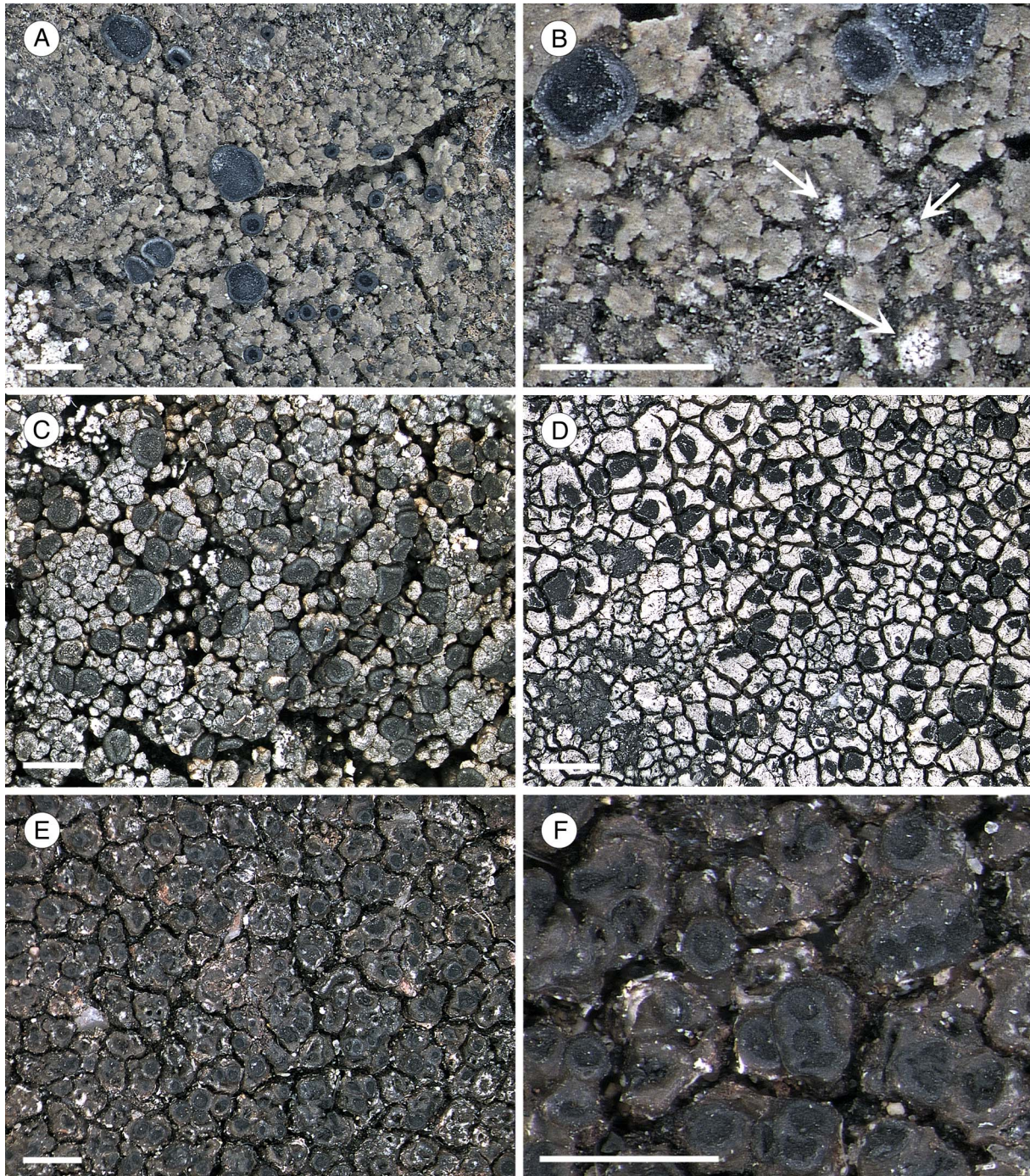


Figure 2. Morphology of Australian *Schaereria* species. A, *S. dolodes*. B, *S. dolodes* detail, showing incipient soralia (arrowed). C, *S. bullata*. D, *S. fuscocinerea*. E, *S. xerophila*. F, *S. xerophila* detail, showing aspicilioid apothecia. Scales = 1 mm. In colour online.

It grows on exposed rocks, overgrowing tufts of the moss *Andreaea*, on very thin soil or directly on the rock surface (see Kantvilas 1999).

Selected specimens examined. **Australia: Tasmania:** Anderson Bluff, South Picton Range, 43°13'S, 146°35'E, 1090 m, 1999, G. Kantvilas 18/99 (HO); Mt Gould, 41°59'E, 146°03'E, 1470 m, 2004, G. Kantvilas 5/04 (HO); Mersey Crag, 41°46'S, 146°20'E, 1420 m, 2010, G. Kantvilas 58/10 (HO); Hartz Peak, 43°15'S,

146°46'E, 1250 m, 2014, G. Kantvilas 501/14 (GZU, HO); Fisher Bluff, c. 2.5 km E of summit, 41°43'S, 146°21'E, 2022, G. Kantvilas 402/22 (HO).

Schaereria dolodes (Nyl. ex Hasse) Schmall & T. Sprib.

Lichenologist 37, 528 (2005).—*Lecidea dolodes* Nyl. ex Hasse, *Bull. Torrey Bot. Club* 24, 447 (1897).

(Fig. 2A & B)

Thallus areolate to minutely subsquamulose, chestnut brown, \pm ecorticate, overlain by an epinecral layer *c.* 10 mm thick, loosely attached to the substratum, lacking a prothallus; areoles 0.2–0.5 mm wide, to *c.* 100 μ m thick, convex, contiguous to imbricate, with occasional, scattered, incipient, pale yellowish green soralia. *Photobiont* a unicellular green alga with \pm globose cells, 7–17 μ m wide, encased in a gelatinous sheath 1–2 μ m thick.

Apothecia 0.4–1 mm wide, superficial and basally constricted, never adnate, roundish to a little irregular when crowded together; disc black, concave at first, soon becoming plane; proper exciple \pm concolorous with or paler than the disc, sometimes brownish grey towards the base, prominent and persistent, \pm inrolled, in section opaque brown, 40–140 μ m thick at the base and sometimes extending a ‘foot’ into the thallus, laterally 40–80 μ m thick, with both brown and violet, K+ turquoise pigments, the latter \pm dissolving in K, composed of roundish cells 5–6 μ m diam. *Hypothecium* 50–90 μ m thick, hyaline. *Hymenium* 80–120 μ m thick, not interspersed, hyaline, I+ blue, overlain by a diffuse or lumpy, violet, K+ turquoise epithelial layer. *Paraphyses* simple or sparingly branched, 1.5–2 μ m thick, with apices hyaline, sometimes moniliform and expanded to 3–4 μ m. *Asci* 70–85 \times 9–12 μ m. *Ascospores* globose, strictly uniseriate, 6–7.1–8.5(–9) μ m diam.

Pycnidia immersed; conidia cylindrical, 4–5.5 \times 1 μ m.

Chemistry. Containing traces of unknown substances; all spot tests negative.

Remarks. *Schaereria dolodes* is the sole corticolous member of the genus to be recorded for the Southern Hemisphere, and as such has no species with which it could be confused in the Australian lichen biota. There are three other corticolous species known from cool temperate parts of the Northern Hemisphere but these all differ unequivocally from *S. dolodes*. *Schaereria parasemella* (Nyl.) Lumbsch and *S. corticola* Muhr & Tønsberg both contain gyrophoric acid, have a blue-green apothecial pigment and ellipsoid ascospores; furthermore, the former can be lichenicolous (on *Biatora* in the case of the type) whereas the latter is sorediate. *Schaereria brunnea* Björk *et al.* contains fatty acids, has only brown apothecial pigments and ellipsoid ascospores (Schmull & Spribille 2005; Spribille *et al.* 2009). The violet pigment (*fucatus*-violet of Kantvilas (2009)) is particularly noteworthy and distinctive, especially due to its vivid turquoise reaction in K. It is occasional in the saxicolous *S. fuscocinerea* and also known from several species of *Mycoblastus* and other lichens.

The single Tasmanian specimen corresponds well with published descriptions (Schmull & Spribille 2005) and reference material of this species. However, a small part of the collection displays the incipient development of soredia (Fig. 2B), the significance of which cannot be evaluated at this stage.

Distribution and ecology. This species was first described from California and has a broad distribution northward to southern British Columbia (Schmull & Spribille 2005). The sole Tasmanian specimen was removed from a collection of *Lepra gymnospora* (Kantvilas) I. Schmitt *et al.* (syn. *Pertusaria gymnospora* Kantvilas), which was distributed by Weber (1976) as No. 479 to numerous world herbaria. Multiple other exemplars of this collection have been examined but the *Schaereria* was not observed on any of them. The Tasmanian Herbarium holds numerous additional collections of *L. gymnospora* from the

same locality, and these are also not associated with *S. dolodes*. The author has visited the locality himself and searched for the lichen without success. The Tasmanian collection of *S. dolodes* is recorded as occurring on dead wood, soil and rotten leaves in sheltered areas of rainforest. The associated *Lepra gymnospora* is a common lichen in scrubby rainforest and subalpine heathland, occurring over epiphytic or ground-dwelling bryophytes, on peat-encrusted bases of trees and shrubs, or directly on bark.

Specimen examined. **Australia:** *Tasmania:* forest around Lake Judd, 42°59'S, 146°25'E, 640 m, 1973, G. C. Bratt 73/900 p.p. (HO).

Comparative material also examined. **USA:** *Idaho:* Boomer Co., NW side of town of Sandpoint along Mickinnick Trail, 48° 18.612'N, 116°34.456'W, 767 m, 2006, T. Spribille 21564 (HO).

Schaereria fuscocinerea (Nyl.) Clauzade & Cl. Roux

Bull. Soc. Bot. Centre-Ouest, Nouv. Sér., num. spec. 7, 829 (1985).—*Lecidea fuscocinerea* Nyl., *Bot. Notiser* **11–12**, 177 (1852).

(Fig. 2D)

Thallus crustose, areolate, dull grey, forming small patches to *c.* 30 mm wide, ecorticate but overlain by an epinecral layer *c.* 10 mm thick, tightly adnate to the substratum, lacking a prothallus; areoles rather angular, 0.2–0.5 mm wide, to 250 μ m thick, plane to slightly convex, separated by deep cracks. *Photobiont* a unicellular green alga with \pm globose cells, 8–20 μ m wide, encased in a gelatinous sheath 1–2 μ m thick.

Apothecia 0.15–0.5 mm wide, immersed at first, at length adnate, roundish to rather angular; disc black, concave to plane; proper exciple concolorous with the disc, very thin to \pm excluded, in section dull brown, basally 30–60 μ m thick, laterally much reduced, to *c.* 20 μ m thick and poorly differentiated from adjacent tissues. *Hypothecium* 20–40 μ m thick, hyaline. *Hymenium* 90–120 μ m thick, interspersed with occasional oil droplets, hyaline, I+ blue, overlain by a bluish green, N+ crimson epithelial layer, interspersed with occasional, violet, K+ vivid green granules. *Paraphyses* simple, 2(–2.5) μ m thick, with apices not markedly thickened but often coated in pigment. *Asci* 75–95 \times 12–15 μ m. *Ascospores* ellipsoid to oblong, biseriolate in the upper part of the asci, uniseriate below, (9–)10–11.5–13(–14) \times 5–6.3–7.5(–8) μ m.

Pycnidia immersed; conidia cylindrical, 6–9 \times 1.5–2 μ m.

Chemistry. Gyrophoric acid; inferred from the C+ red reaction of thallus squashes under the microscope (material too scant to analyze by TLC).

Remarks. Further descriptive data for this species is provided by Rambold (1989) and Gilbert & Hawksworth (2009). Despite its small size, the single Tasmanian specimen displays the salient features of the species: gyrophoric acid in the thallus, a blue-green epithecium and ellipsoid ascospores, features that readily distinguish it from numerous, superficially similar, small crustose lichens from unrelated genera such as *Buellia*, *Lecanora* s. lat. and *Lecidea* s. lat. that occur in the same habitat. The violet granules are *fucatus*-violet pigment as seen in *S. dolodes*. It is also similar to *S. australis*, which is distinguished mainly by its brown epithecium and the absence of gyrophoric acid.

Distribution and ecology. *Schaereria fuscocinerea* is widely distributed in cold climates in both hemispheres and was first recorded for mainland Australia by Rambold (1989). This is the first Tasmanian report, based on a single, small specimen with relatively immature apothecia. In Tasmania, it was recorded on the island's highest plateau, at 1500 m, growing on an exposed dolerite boulder. The habitat is extremely rich in crustose lichens, notably from the genera *Porpidia*, *Poeltiaria*, *Lambiella* and *Rhizocarpon*, and *S. fuscocinerea* formed tiny islands amongst these thalli. Its distribution on the Australian mainland is likewise mostly alpine.

Selected specimens examined. **Australia:** *Tasmania:* Ben Lomond, c. 750 m SE of Giblin Peak, 41°32'S, 147°40'E, 1530 m, 2022, G. Kantvilas 298/22 (HO). *Australian Capital Territory:* Mt Murray, 35°41'26"S, 148°47'35"E, 2013, P. M. McCarthy 4287 (HO).

Selected comparative material also examined. **USA:** *Colorado:* Clear Creek County, 1.9 km W of Silver Plume, 39°41'30"N, 105°44'W, 1977, R. A. Sanderson & J. Poelt (H. Hertel: *Lecideaceae Exsicc.* 218) (HO).—**Ireland:** *County Kerry:* V.C. 2, Dingle Peninsula, 1978, J. Poelt (H. Hertel: *Lecideaceae Exsicc.* 136) (HO).—**Finland:** Korppoo, Jurmo, 59°50'N, 21°36'E, 3 m, 1989, H. Hertel 36870 (H. Hertel: *Lecideaceae Exsicc.* 240) (HO).

Schaereria xerophila Rambold & H. Mayrhofer

In Rambold, *Biblioth. Lichenol.* **34**, 313 (1989); type: Australia, Queensland, Nathan Gorge, Cabbagetreec Crossing, 25°27'S, 150°09'E, 200 m, 31 August 1985, R. W. Rogers 7848 (holotype—MEL!).

(Fig. 2E & F)

Thallus crustose, areolate, olive-brown, forming irregular, rather discontinuous thalli to c. 40 mm across, with a thin cortex c. 10 µm thick comprised of the terminal, pigmented cells of vertically orientated hyphae, overlain by an epinecral layer c. 10 mm thick, ±loosely attached to the substratum, lacking a prothallus; areoles irregular, 0.4–1 mm wide, to 0.5 mm thick, convex and unevenly lumpy, separated by deep cracks. *Photobiont* a unicellular green alga with ±globose cells, 7–20 µm wide, encased in a gelatinous sheath 1–2 µm thick.

Apothecia 0.2–0.5 mm wide, aspicilioid, immersed at first, remaining persistently sunken into the thallus surface or broadly adnate, roundish; disc brown-black to black, persistently concave; proper exciple colorless with the disc, persistent, frequently enveloped by thalline tissue and the apothecia appearing lecanorine, in section red-brown at the outer edge, ±hyaline within, basally 20–60 µm thick, laterally much reduced, to c. 20 µm thick and poorly differentiated from adjacent tissues. *Hypothecium* 20–40 µm thick, hyaline. *Hymenium* 80–100 µm thick, not interspersed, hyaline, I+ blue, overlain by a deep reddish brown, K+ dull olive-brown epithelial layer. *Paraphyses* simple, 1.5–2.5 µm thick, with apices usually furcate, markedly capitate, internally brown, 4–6 µm wide. *Asci* 60–80 × 8–11 µm. *Ascospores* globose, strictly uniseriate, 6–7.5–9(–9.5) µm diam.

Conidiomata not found.

Chemistry. No substances detected by TLC but, due to the scant material, analyses are ambiguous; all spot tests negative.

Remarks. For further descriptive data, see Rambold (1989). The distinctive, aspicilioid apothecia (Fig. 2F), sunken into a well-developed brown thallus, are unique for the genus, and there are no superficially similar species known in the Australian lichen biota. Anatomically, the brown apothecial pigmentation, globose ascospores, capitate paraphyses and absence of identifiable lichen substances suggest a close relationship to *S. dolodes* and *S. bullata*.

Distribution and ecology. Originally described from south-eastern Queensland, where it appears to be uncommon, this species is recorded here for Tasmania for the first time. Its habitat, on exposed rocks in dry sclerophyll forest, is widely distributed in temperate Australia, and the disjunct known distribution of *S. xerophila* suggests that it could be more widespread but has been overlooked. The Tasmanian collection was from a boulder of Tertiary laterite in open, eucalypt-dominated dry sclerophyll forest. This rock type is unusual for Tasmania and at this locality supported a very diverse lichen biota that included *Caloplaca lateritia* (Taylor) Zahlbr., *Carbonea latypizodes* (Müll. Arg.) Knoph & Rambold, *Lecanora galactiniza* Nyl., *Rinodina teniswoodiorum* Elix & Kantvilas and *Xanthoparmelia mougeotina* (Nyl.) D. J. Galloway. The site and its unusual biota are discussed by Baker *et al.* (2019), where the *Schaereria* is referred to as a putative undescribed species.

Specimens examined. **Australia:** *Tasmania:* Wind Song Property, Ronnies Spur, 42°21'S, 147°55'E, 30 m, 2018, G. Kantvilas 113/18 (HO). *Queensland:* next to Warrego Hwy, 4 km E of Wallumbilla, 26°35'51"S, 149°16'37"E, 2014, R. W. Rogers 12484 (BRI).

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