

**A new species of *Sculptolumina* (Caliciaceae, Ascomycota) from Queensland, Australia**

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**Abstract**

*Sculptolumina ramboldii* Elix & H.Mayrhofer, the first known saxicolous species in the genus, is described as new to science.

This paper continues our investigations into *Buellia*-like lichens in Australia, following on from the first accounts of *Buellia* and related genera (Elix 2009, 2011) and our additional revisions of *Amandinea* (Elix & Kantvilas 2013a, 2016a; Blaha *et al.* 2016), *Buellia sens. lat.* (Elix & Kantvilas 2013b; Elix 2015b, 2016a, 2016c; Elix *et al.* 2017a,b,c), *Buellia sens. str.* (Elix & Kantvilas 2014a), *Baculifera* (Elix & Kantvilas 2014b), *Cratiria* (Elix 2014), *Monerolechia* (Elix 2015a) and other crustose Physciaceae (Elix & Kantvilas 2015, 2016b; Elix 2016b). The genus *Sculptolumina* Marbach was segregated from *Buellia* by Marbach (2000), who included two species characterized by their crustose thalli, lecideine apothecia with epruinose discs, excipula that lacked secondary lichen substances, brown hypothecia, hymenia densely interspersed with oil droplets, paraphyses with long and weakly expanded apical cells and ascospores with small funnel-shaped or rounded lumina (with thickened inner walls, of the *Mischoblastia*- or *Serotina*-types). The two species of *Sculptolumina* were subsequently found to be further characterized by having long, straight to weakly curved, filiform conidia (Giralt *et al.* 2009; Elix *et al.* 2017c). In this paper we describe a new saxicolous species of *Sculptolumina* from Queensland. Methods are as described in previous papers cited above.

**The new species**

*Sculptolumina ramboldii* Elix & H.Mayrhofer sp. nov. Figs 1, 2  
Mycobank number: **MB 823038**

Similar to *Sculptolumina japonica* (Tuck.) Marbach, but differs in having larger ascospores, in containing gyrophoric and 5-*O*-methylhiassic acids and in growing on rock.

*Type*: Australia, Queensland, Mt Archer, 7 km NE of Rockhampton, 23°20'S, 150°35'E, 480 m alt., on vertical and overhanging surfaces of exposed, E-facing, rocky outcrops, *G. Rambold 4461 pr.p.*, 13.ii.1986 (M – holotype).

*Thallus* crustose, areolate to subsquamulose; areoles 0.5–1 mm wide and to 0.5 mm thick, dispersed or rarely contiguous, sometimes becoming lobulate at the margins. Upper surface dirty white to pale grey-brown, dull, smooth; prothallus not apparent; photobiont cells 7–15 µm wide; medulla white, lacking calcium oxalate (H<sub>2</sub>SO<sub>4</sub>-), I-; *Apothecia* 0.4–0.7 mm wide, lecideine, scattered, ± round, broadly adnate to sessile and constricted at the base; disc black, epruinose, plane to markedly convex; proper exciple distinct, glossy, black, initially elevated above the disc, excluded in older convex apothecia, in section 60–75 µm thick, the outer part brown-black, K-, N-, brown within. *Hypothecium* dark brown to brown-black, 100–250 µm thick, K-, N+ orange-brown. *Ephymenium* 12–15 µm thick, olive-brown to dark brown, K-,

N-. *Hymenium* 100–130 µm thick, colourless, densely interspersed with oil droplets; subhymenium 20–30 µm thick, brown; paraphyses 1.5–2 µm wide, simple to sparsely branched, with long and weakly expanded apices (to 3 µm wide) and brown caps. *Asci* 8-spored, or with 4 or 6 spores, *Bacidia*-type. *Ascospores* of the *Serotina*-, *Pachysporaria*- or *Mischoblastia*-type, 1-septate, olive-brown to brown, ellipsoid, 16–[19.8]–24 × 9–[11.5]–14 µm, not constricted at the septum, the spore walls with a microrugulate or rugulate outer surface; ontogeny of type B (Giralt & Mayrhofer 1995). *Pycnidia* rare, punctiform, immersed; ostiole black. *Conidia* filiform, straight to weakly curved, 13–21 × 0.7–1 µm. *Chemistry*: Thallus K-, C+ red, KC+ red, P-, UV-; containing gyrophoric acid (major), 5-*O*-methylhiassic acid (major).

*Etymology*: The species is named after Prof. Dr Gerhard Rambold, the collector of the type specimen.

**Remarks**

The new species is characterized by the dispersed, areolate to subsquamulose, dirty white to pale grey-brown, saxicolous thallus containing gyrophoric and 5-*O*-methylhiassic acids, broadly adnate to sessile, lecideine apothecia, 0.4–0.7 mm wide, asci with 4–8 spores, a densely interspersed hymenium, 1-septate ascospores of the *Serotina*-, *Pachysporaria*- or *Mischoblastia*-type, 16–24 × 9–14 µm, and the straight to slightly curved, filiform conidia, 14–20 × 0.7–1 µm. Anatomically it resembles *S. japonica* and *S. serotina* (Malme) Marbach, in that all three have densely interspersed hymenia, dark brown hypothecia, paraphyses with long and weakly expanded apical cells, ± similar sized *Serotina*-, *Pachysporaria*- or *Mischoblastia*-type ascospores and long, straight to weakly curved, filiform conidia. However, both *S. japonica* and *S. serotina* differ in growing on bark and in having crustose thalli. All three species differ chemically; *S. japonica* contains the anthraquinones 7-chloroemodin, skyrin and flavo-obscurin derivatives, whereas *S. serotina* contains lobaric acid. The thalline areoles and the size and development of the ascospores of *S. ramboldii* closely resemble those of the saxicolous *Buellia posthabita* (Nyl.) Zahlbr. from India, Central and South America (Imshaug 1955; Singh & Awasthi 1981). However, *B. posthabita* has a non-interspersed hymenium, and a colourless or very pale hypothecium, and it reacts K+ yellow, C -, KC-, (Imshaug 1955). Another saxicolous species, *B. siphoniata* Zahlbr. from the Juan Fernández Islands, has somewhat similar ascospores and a dark brown hypothecium, but it has a non-interspersed hymenium and a crustose thallus that reacts K-, C -, KC- (Zahlbruckner 1924).

At present, the new species is known from only the type locality. Associated species include *Pertusaria subventosa* Malmé var. *subventosa*, *P. xanthoplaca* Müll.Arg. and *Tephromela cf. atra* (Huds.) Hafellner.

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**References**

- Blaha, J; Mayrhofer, H; Elix, JA (2016): Five new saxicolous species of *Amandinea* (Ascomycota, Physciaceae) from New Zealand and southern Australia. *Australasian Lichenology* **79**, 35–57.  
Elix, JA (2009): *Buellia*. *Flora of Australia (Lichens 5)* **57**, 495–507.  
Elix, JA (2011): *Australian Physciaceae (Lichenised Ascomycota)*. Australian Biological Resources Study, Canberra. Version 18 October 2011. <http://www.anbg.gov.au/abrs/lichenlist/PHYSICIACEAE.html>  
Elix, JA (2014): New species and new records of the lichen genus *Cratiria* (Physciaceae, Ascomycota) in Australia. *Telopea* **16**, 141–148.  
Elix, JA (2015a): A new species of the lichen genus *Monerolechia* (Ascomycota, Physciaceae) from Australia. *Telopea* **18**, 91–95.

- Elix, JA (2015b): New species of *Buellia sens. lat.* (Physciaceae, Ascomycota) from tropical Australia. *Australasian Lichenology* **77**, 42–51.
- Elix, JA (2016a): New species of *Buellia sens. lat.* (Physciaceae, Ascomycota) from southern mainland Australia. *Australasian Lichenology* **78**, 32–45.
- Elix, JA (2016b): New species of *Gassicurtia* and *Stigmatochroma* (Physciaceae, Ascomycota) from Queensland, Australia. *Australasian Lichenology* **79**, 3–9.
- Elix, JA (2016c): New species and new records of buellioid lichens from islands of the South Pacific Ocean. *Telopea* **19**, 1–10.
- Elix, JA; Kantvilas, G (2013a): New species and new records of *Amandinea* (Physciaceae, Ascomycota) in Australia. *Australasian Lichenology* **72**, 3–19.
- Elix, JA; Kantvilas, G (2013b): New taxa and new records *Buellia sensu lato* (Physciaceae, Ascomycota) in Australia. *Australasian Lichenology* **73**, 24–44.
- Elix, JA; Kantvilas, G (2014a): New taxa and new records *Buellia sens. str.* (Physciaceae, Ascomycota) in Australia. *Australasian Lichenology* **74**, 17–25.
- Elix, JA; Kantvilas, G (2014b): New species and new records of the lichen genus *Baculifera* (Physciaceae, Ascomycota) in Australia. *Australasian Lichenology* **75**, 28–37.
- Elix, JA; Kantvilas, G (2015): New taxa and new records of crustose lichens in the family Physciaceae (Ascomycota) in Australia. *Australasian Lichenology* **76**, 16–23.
- Elix, JA; Kantvilas, G (2016a): *Amandinea conioops* (Physciaceae, Ascomycota) and its mimics in Tasmania and New Zealand. *Australasian Lichenology* **78**, 22–31.
- Elix, JA; Kantvilas, G (2016b): New species and new records of buellioid lichens (Ascomycota, Physciaceae) in Tasmania. *Australasian Lichenology* **79**, 26–34.
- Elix, JA; Knight, A; Blanchon, D (2017a): New species and new records of buellioid lichens (Physciaceae, Ascomycota) from New Zealand and Tasmania. *Australasian Lichenology* **80**, 46–52.
- Elix, JA; Mayrhofer, H; McCarthy, PM (2017b): New species and a new record of buellioid lichens (Ascomycota, Physciaceae) in Australia. *Australasian Lichenology* **80**, 28–37.
- Elix, JA; Kantvilas, G; McCarthy, PM (2017c): Thirteen new species and a key to buellioid lichens (Caliciaceae, Ascomycota) in Australia. *Australasian Lichenology* **81**, 26–67.
- Giralt, M; Mayrhofer, H (1995): Some corticolous and lignicolous species of the genus *Rinodina* (lichenized Ascomycetes, Physciaceae) lacking secondary lichen compounds and vegetative propagules in Southern Europe and adjacent regions. *Bibliotheca Lichenologica* **57**, 127–160.
- Giralt, M; Paz-Bermúdez, G; Elix, JA (2009): New data on *Sculptolumina japonica* (Physciaceae). *Bryologist* **112**, 397–403.
- Imshaug, HA (1955): The lichen genus *Buellia* in the West Indies. *Farlowia* **4**, 473–512.
- Marbach, B (2000): Corticole und lignicole Arten der Flechtengattung *Buellia sensu lato* in den Subtropen und Tropen. *Bibliotheca Lichenologica* **74**, 1–384.
- Singh, SR; Awasthi, DD (1981): The lichen genus *Buellia* in India. *Biological Memoirs* **6**, 169–196.
- Zahlbruckner, A (1924): Die Flechten der Juan-Fernandez-Inseln pp. 315–408, in C. Skottsberg (Ed.): *The natural history of Juan Fernandez and Easter Island*, Botany, **2**(11). Almqvist & Wiksells, Uppsala.



Figure 1. *Sculptolumina ramboldii* (holotype in M). Scale bar = 1 mm.

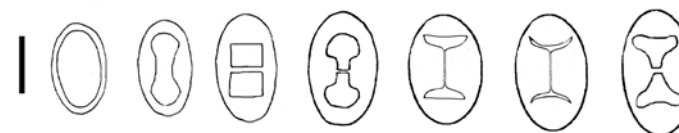


Figure 2. Ascospore ontogeny of *S. ramboldii*. Scale bar = 10 µm