

**A new sorediate species of *Amandinea*
(Caliciaceae, Ascomycota) from Antarctica**

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Abstract

The new species *Amandinea clearyi* Elix & Øvstedal, is described from Marie Byrd Land and MacRobertson Land, Antarctica.

Introduction

In the austral summer 1987–88, a combined geological and biological expedition was made to Edward VII Peninsula (77°00'–78°30'S, 152°–156°W), Marie Byrd Land, Antarctica. A general survey was made of algae, mosses, lichens and microfauna (Broady 1989) and of bird life (Broady *et al.* 1989). 376 samples of lichens were collected on 23 nunataks in the Rockefeller and Alexandra Mountains. Amongst them was a unique species with a placodioid thallus with effigurate marginal areoles, curved filiform conidia and medullary usnic acid. The species was also discovered in several collections made in 1986 by Rex Filson at Mount Henderson in MacRobertson Land.

Material and methods

Material from the expedition described above (deposited at CHR) as well as several collections from MEL were studied. The specimens were examined using a Zeiss Stemi 2000C microscope and a Zeiss Axiolab compound microscope. Microscopical 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 water or 10% KOH. Chemical constituents were identified by thin-layer chromatography (Elix 2014).

Amandinea clearyi Elix & Øvstedal, sp. nov.
Mycobank No. **MB 830225**

Fig. 1

Similar to *Amandinea latemarginata*, but differs in having a sorediate upper surface and in containing usnic acid. No apothecia seen.

Type: Antarctica, Marie Byrd Land, Edward VII Peninsula, Alexandra Mountains, Clark Peak, [77°30'52"S, 154°11'45"W], on siliceous rock. *P. Broady s.n.*, xii.1987–i.1988, (holotype – CHR 647811).

Thallus crustose to placodioid, forming orbicular or confluent patches, to 12 mm wide and 0.12 mm thick, lobate-effigurate at the periphery, the inner part unevenly verrucose or rimose-areolate, often eroding and the areoles dispersed with age; areoles of irregular form, 2–3 mm wide, marginal areoles radially elongate; apices blackened, 0.1–0.2 mm wide. *Upper surface* pale yellow to whitish or darkening with age, mealy, sorediate; soralia 0.1–0.3 mm diam.,

sessile, subglobose, deep yellow then darkening with age, laminal or rarely marginal; soredia deep yellow, dark brown to blackish with age, $18.9 \pm 1.8 \mu\text{m}$ wide ($n = 20$), without protruding hyphae. *Upper cortex* pseudoparenchymatous, often disrupted, the individual cells 1.5–2 μm diam., with some brown spots. *Medulla* white, composed of intertwined hyphae, lacking calcium oxalate (H_2SO_4^-), I–. *Photobiont* green, trebouxioid, concentrated just above the lower surface; cells 7–16 μm diam. *Lower cortex* pseudoparenchymatous, 15–25 μm thick, dark brown, individual cells 1.5–2 μm wide; hapters and rhizines absent. *Apothecia* not seen. *Pycnidia* immersed in thallus areoles, indicated by small, slightly prominent dark spots; conidia curved, filiform, 16–23 \times 0.7 μm .

Chemistry: Thallus K–, C–, KC+ yellow, P–, UV–; containing usnic acid by TLC.

Etymology: the species is named in honour of Peter J. Cleary who, as field leader of the expedition to Edward VII Peninsula, was critical to its success.

Remarks

The generic placement of the new species is problematic, because we have yet to encounter fertile material. Several genera with placodioid thalli were considered but discounted. For example, *Dimelaena* Norman has similar thalli but short bacilliform conidia, while *Placopsis* (Nyl.) Linds. has curved, filiform conidia, but invariably has cephalodia on the upper surface, which the present species lacks. On the other hand, four buellioid species in Antarctica have similar placodioid thalli and effigurate or subeffigurate margins [*Amandinea babingtonii* (Hook.f. & Taylor) Søchting & Øvstedal, *A. latemarginata* (Darb.) Søchting & Øvstedal, *A. petermannii* (Hue) Matzer, H.Mayrhofer & Scheid. and *Buellia frigida* Darb.] The buellioid genus *Amandinea* M.Choisy ex Scheid. & H.Mayrhofer has been defined as having brown, 1-septate ascospores and curved, filiform conidia (Scheidegger 1993). Although several published phylogenies contain species with both filiform and bacilliform conidia (Wedin *et al.* 2002; Prieto & Wedin 2016), indicating that species with filiform conidia are not a monophyletic group, *Amandinea* is retained here until its status has been clarified further.

Nine saxicolous species of *Amandinea* have been recorded for Antarctica (Lamb 1968; Øvstedal & Lewis Smith 2001; Søchting *et al.* 2004; Elix 2019), seven of which are restricted to continental Antarctica or to Antarctica plus the subantarctic islands. Three of the Antarctic-subantarctic species are characterized by effigurate or subeffigurate marginal lobes (elongated areoles) as mentioned above. Given the morphological attributes of the new species, we are confident in assigning it to *Amandinea*.

Morphologically, the new species closely resembles a diminutive thallus of *Amandinea latemarginata*, with effigurate margins and areoles within. However, the latter has an esorediate upper surface and contains medullary norstictic acid (Lamb 1968). *Buellia soredians* Filson has areoles with a sorediate upper surface and contains usnic acid, but it differs in having minute areoles up to 1 mm wide dispersed on a prominent, black prothallus that never becomes contiguous or agglomerated. Moreover, it produces short, bacilliform conidia, 3–4 \times 0.5 μm (Filson 1974). A similar species, *A. puertomontensis* Elix, H.Mayrhofer & J.M.Rodr. from southern Chile, has a thallus with subeffigurate margins and a sorediate upper surface, but it lacks lichen substances (Elix *et al.* 2018).

At present, the new species is known only from continental Antarctica (MacRobertson Land in east Antarctica and Marie Byrd Land in west Antarctica). Associated species include *Buellia frigida* Darb., *Pseudophebe minuscula* (Nyl. ex Arnold) Brodo & D.Hawksw., *Umbilicaria decussata* (Vill.) Zahlbr., *Tetramelas lokenensis* Elix and *Usnea antarctica* DuRoi.

SPECIMENS EXAMINED

Antarctica. ● MacRobertson Land, Mt Henderson, N end of Goldsworthy Ridge, *R.B. Filson 4186 pr.p.*, *4191 pr.p.*, 1.viii.1962 (MEL); ● Marie Byrd Land, Edward VII Peninsula, Rockefeller Mountains, Mount Franklin, on siliceous rock, *P. Broady s.n.*, xii.1987–i.1988, (CHR 647571); ● Marie Byrd Land, Edward VII Peninsula, Rockefeller Mountains, Breckinridge Peak, on siliceous rock, *P. Broady s.n.*, xii.1987–i.1988 (CHR 647643).

Acknowledgements

The expedition to Edward VII Peninsula, Marie Byrd Land was supported logistically by the Antarctic Division, DSIR, New Zealand (now Antarctica New Zealand) and the US National Science Foundation. PAB gratefully acknowledges the support of his field companions Peter Cleary, Chris Adams and Steven Weaver. Mrs Kristine Kongshavn, Bergen, is thanked for photographic assistance.

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Figure 1. *Amandinea clearyi* (holotype in CHR). Scale = 10 mm.