

## A new saxicolous species of *Porina* (Ostropales; Porinaceae) from the Falkland Islands

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ABSTRACT. – The new saxicolous species, *Porina austroatlantica*, is described from the Falkland Islands in the South Atlantic Ocean.

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### INTRODUCTION

Between 1965 and 1973 Henry Imshaug collected lichens extensively in the austral regions of the Southern Hemisphere, visiting Islas Juan Fernández (1965), the Falkland Islands (1968), Patagonia (1969, 1971), Campbell Island (1969–70), Îles Kerguelen (1971), Tierra del Fuego (1971) and the Auckland Islands (1972–73). These collections are housed in the herbarium of Michigan State University (MSC) (Fryday & Prather 2001).

The Falkland Islands (Islas Malvinas) were visited by Imshaug and his then graduate student Richard Harris, who spent six weeks on the islands and made nearly 3,000 lichen collections, by far the largest lichen collection ever made there. Although all of the specimens were assigned Imshaug collecting numbers, Imshaug's field books, which are also in MSC, indicate which collections were made by Imshaug and which by Harris. Most of this material was accessioned into MSC, and several new species identified and given *in sched.* names, but the only publication that Imshaug produced was a short, narrative report on the expedition (Imshaug 1969). More recently, however, a number of taxonomic innovations and new records for the Falkland Islands have been reported from these collections (Calvelo & Fryday 2006, Coppins & Fryday 2006, Fryday 2002, Fryday 2005, Fryday & Common 2001, Messuti & Archer 1999, Stenroos & Ahti 1992).

Whereas *Porina s. lat.* is diverse and often luxuriant in the tropics, it is far less prominent in temperate regions, and even rarer closer to the poles. Only five species have been reported from south of latitude 50°S: *P. chlorotica* (Ach.) Müll. Arg. (King George Island in the South Shetland group and Macquarie Island), *P. guentheri* (Flot.) Zahlbr. (Macquarie Island and the Auckland Islands), *P. kantvilasii* P.M. McCarthy (Campbell Island), *P. leptalea* (Durieu & Mont.) A.L. Sm. (Macquarie Island) and *P. oleriana* (A. Massal.) Lettau (Tierra del Fuego) (see McCarthy 2009 for further details). Here we report a new species of *Porina* from the Falkland Islands [51–52°S, 57.7–61.4°W], which, although known from only two collections, is highly distinctive within the genus.

### MATERIALS AND METHODS

Hand sections were examined in water and in 10% KOH; asci were also examined in Congo Red. Measurements of algae, thalline hyphae, paraphyses, ascospores and conidia were made at ×1000 magnification, those of entire asci were made at ×400 magnification. Perithecial and ascospore dimensions are presented as mean values with extreme values in parentheses. Total numbers of perithecia, asci and ascospores measured are in square brackets.

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## THE NEW SPECIES

### *Porina austroatlantica* P.M. McCarthy & Fryday sp. nov.

MYCOBANK #515577.

Thallus epilithicus, interne rimosus vel areolatus, albidus vel pallidoviridis, 30–50–(60)  $\mu\text{m}$  crassus, cortice paraplectenchymatico. Perithecia plerumque convexa vel hemisphaerica, (0.25)–0.33–(0.46) mm diametro. Involucrellum 50–70  $\mu\text{m}$  crassum, extra nigrofusum vel nigrum, intra comparate pallidum. Centrum 0.18–0.26 mm diametro. Asci 120–138  $\times$  7–9  $\mu\text{m}$ . Ascospores 3-septatae, (19)–22.0–(27)  $\times$  (4)–4.8–(6)  $\mu\text{m}$ . Conidia 2–3–(3.5)  $\times$  0.5–0.7  $\mu\text{m}$ .

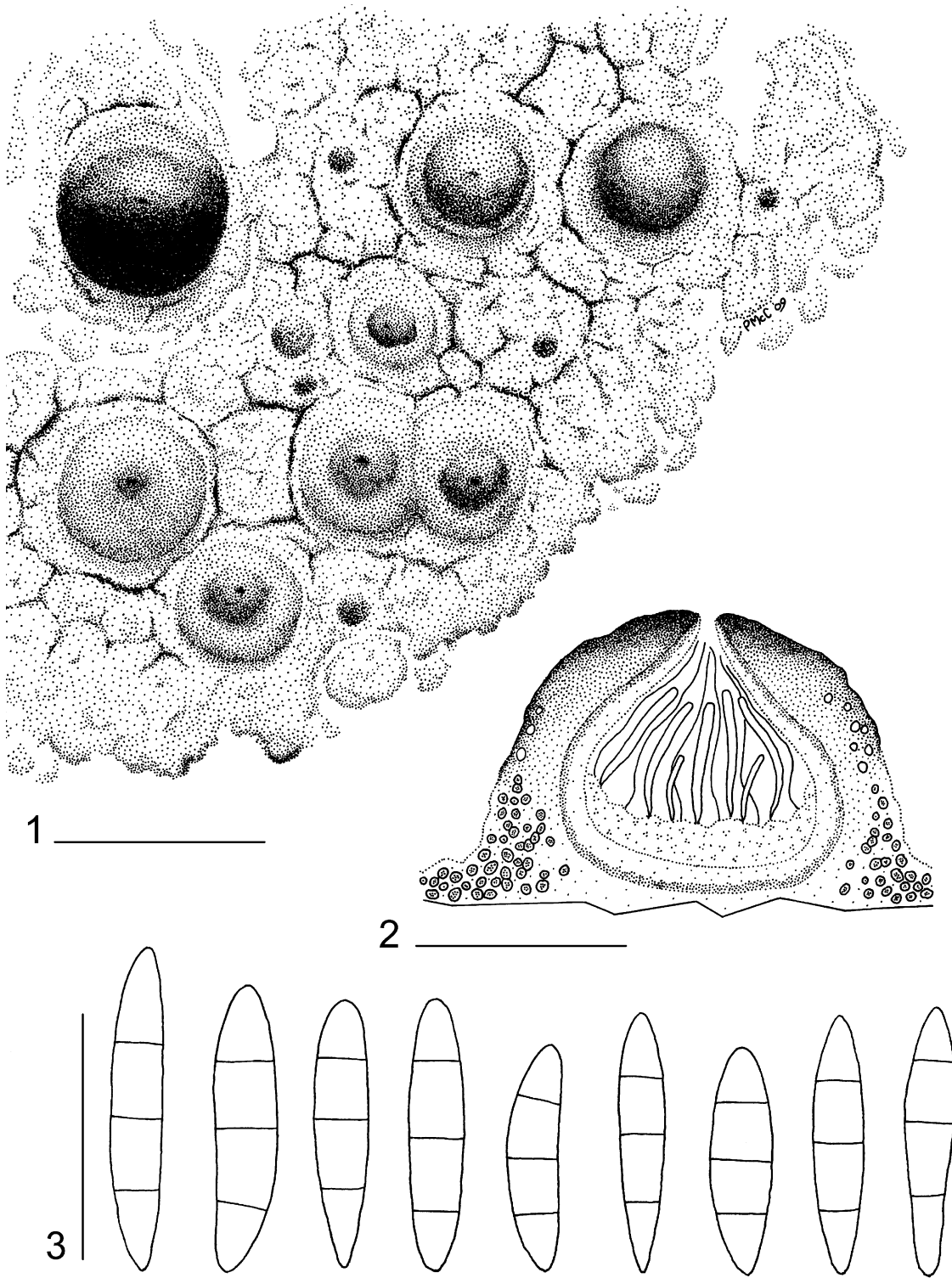
TYPE: **FALKLAND ISLANDS**: East Falkland, Stanley, Mullet Creek, stream below fiord, UTM Grid 21F VC 3270, alt. 100–150 ft [c. 30–45 m, on quartzitic rock], 30.i.1968, *H.A. Imshaug 41472 & R.C. Harris* [collected by Harris] (MSC, holotype).

DESCRIPTION. – *Thallus* crustose, epilithic, c. 1–2 cm wide, effuse, determinate or partly eroded, continuous towards the margin, rimose to sparingly areolate towards the center, off-white to pale greenish, smooth to rugulose or verruculose (largely determined by the microtopography of the substratum), 30–50–(60)  $\mu\text{m}$  thick, lacking a dark basal layer, corticate, K–, calcium oxalate crystals absent. *Cortex* hyaline, paraplectenchymatous, 10–15–(20)  $\mu\text{m}$  thick; cells tightly packed, angular to rounded, 3–5–(6)  $\mu\text{m}$  wide. *Photobiont Trentepohlia*; cells broadly ellipsoid to globose, 8–16  $\times$  7–12  $\mu\text{m}$ . *Interstitial hyphae* moniliform to long-celled, 2–4–(6)  $\mu\text{m}$  thick. *Prothallus* a thin, discontinuous brownish black line, or not apparent. *Ascomata* perithecia, numerous, solitary or in short rows or small clusters, partly immersed in thalline verrucae, convex to hemispherical, often appearing superficial where the surrounding thallus has been eroded, (0.25)–0.33–(0.46) mm diam. [50], outwardly dull to glossy brownish black or black at the apex or in the upper half, or almost completely dark; often the lower parts distinctly thalline; apex rounded or distorted; ostiole inconspicuous or in a shallow c. 30–50  $\mu\text{m}$  wide depression. *Involucrellum*  $\pm$  apical or extending more than half-way to excipulum-base level, 50–70  $\mu\text{m}$  thick, outer layers dark olive-brown to blackish brown in thin section, reddish brown or orange-brown internally, the colours darkening and intensifying in K; ostiolar region occasionally with a bluish tint that is K+ grey. *Centrum* subglobose to depressed-obovate, 0.18–0.26 mm wide. *Excipulum* c. 20–25  $\mu\text{m}$  thick at the base and sides of the centrum, predominantly hyaline from base to apex, the outer layers pale to medium orange-brown or greenish brown, K+ pinkish red. *Subhymenium* 25–35  $\mu\text{m}$  deep. *Paraphyses* unbranched, 0.8–1.2  $\mu\text{m}$  thick. *Periphyses* absent. *Asci* 8-spored, with a rounded or subtruncate apex and a indistinct, apical chitinoid ring that darkens in Congo Red, 120–138  $\times$  7–9  $\mu\text{m}$  [14]. *Ascospores* oblong to fusiform, mostly straight, usually with pointed ends, overlapping-uniseriate or slightly oblique in the ascus, hyaline, 3-septate, (19)–22.0–(27)  $\times$  (4)–4.8–(6)  $\mu\text{m}$  [75]; perispore very thin or not apparent; contents usually clear. *Conidiomata* pycnidial, moderately numerous, semi-immersed to almost completely immersed in the thallus, 0.1–0.15 mm diam., plane to convex and dark greenish brown above, hyaline below, with a simple to richly convoluted conidiogenous layer. *Conidia* simple, elongate-ellipsoid to fusiform or bacilliform, 2–3–(3.5)  $\times$  0.5–0.7  $\mu\text{m}$ .

ETYMOLOGY. – The epithet “austroatlantica” alludes to the type locality, the Falkland Islands in the South Atlantic Ocean.

DISTRIBUTION. – This species is known from only two collections: the type locality on the east coast of East Falkland Island, where it grows on coastal quartzitic rock, and from granitic rock at 900 ft (275 m) on western West Falkland.

DISCUSSION. – *Porina austroatlantica* is characterised by the thin and very pale thallus lacking calcium oxalate crystals, prominent perithecia with a variably developed involucrellum that is blackish externally but reddish brown within, a rather thick excipulum, elongate narrowly cylindrical asci, small 3-septate ascospores and minute conidia. In addition to the illustrations provided here (Plate 1), habit and anatomical photographs of the type specimen are also available (Fryday 2009).



**Plate 1.** *Porina austroatlantica* (holotype). Figure 1, habit of thallus, perithecia and conidiomata (scale bar = 0.5 mm). Figure 2, sectioned perithecium and adjacent thallus (semi-schematic; scale bar = 0.2 mm). Figure 3, ascospores (scale bar = 20  $\mu$ m).

Although the characters listed above are diagnostic for the new species, comparison with other saxicolous *Porina* species with 3-septate ascospores from tropical and subtropical South America is useful (see McCarthy 1993, 2000, 2009). *Porina melanops* Malme, confirmed from southern Brazil, has a pale brown thallus containing crystals of calcium oxalate and considerably larger algae, and although the perithecia are similar to those of *P. austroatlantica* in appearance and anatomy, the ascospores are 19–35 × 3–4.5 µm. *Porina nigrofusca* Müll. Arg., from southern Brazil and tropical Australia, has an exceptionally thick, K+ red-brown thallus, perithecia without thalline elements, and conidia 3–5–(7) µm long. Finally, *P. sphaeralis* Malme, from Paraguay, is a particularly distinctive lichen, having subglobose perithecia that are markedly attenuated at the base, a greatly reduced involucrellum, algal cells that are incorporated into the perithecial wall almost to the apex, and shorter and broader asci. Other saxicolous species with 3-septate ascospores and broadly similar perithecial structure, e.g. *P. weberi* P.M. McCarthy from Chile (perithecia 0.4–1.5 mm diam.), the palaeotropical *P. ulceratula* Zahlbr. (K– involucrellum; asci 97–110 × 12–15 µm) and the palaeotemperate *P. corrugata* Müll. Arg. (perithecia 0.4–1.5 mm diam.), have even less potential for confusion with *P. austroatlantica*.

ADDITIONAL SPECIMEN EXAMINED. – **FALKLAND ISLANDS**: West Falkland, Hill Cove, ridge of N slope of Mt Fagen, UTM 21F TC 7289, alt. 900 ft [275 m], outcrops and Polsterboden [granitic rock], 26.i. 1968, H.A. Imshaug 41177 & R.C. Harris [collected by Imshaug] (MSC).

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