

Parmeliella borbonica, a new lichen species from Réunion

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Abstract: The new species *Parmeliella borbonica* is described. It belongs in a small group of species, which, unlike all other *Parmeliella* species except those of the *Parmeliella mariana* group, have thalline squamulose margins of the apothecia, and are thus superficially reminiscent of *Pannaria*. The group is mainly Indo-pacific. A key to the species is given. *Parmeliella borbonica* appears to be an addition to the many remarkable endemic members of the *Pannariaceae* found in Réunion which has retained old Gondwana elements, as its lowland forests have not been destroyed as much as those in the neighbouring region. The very rare *Coccocarpia imbricascens* Nyl. was found as new to the island, and the rare endemic *Pannaria multifida* P. M. Jørg close to its type locality.

Key words: endemism, Indo-pacific relations, taxonomy

Introduction

Despite its rather young age, Réunion is a lichenologically most interesting island, home to a number of endemic species, particularly in the *Pannariaceae* (Jørgensen *et al.* 2009). The second author visited the island in 2009 and collected several interesting specimens of the *Pannariaceae*, which have been revised by the first author. Among them was a very unusual looking collection, at first sight reminiscent of the West-Indian *Pannaria caesiocinerea* (Vain.) P. M. Jørg., but on closer inspection proving to contain no secondary lichen substances and to have an amyloid, internal apical ring-structure (Fig. 1C), both characters clearly placing it in *Parmeliella*, in spite of the squamulose thalline margin of the apothecia. It certainly belongs in that little group of species where the newly described *Parmeliella zeylanica* P. M. Jørg. is placed (Jørgensen 2009), which may prove to need acceptance on some level, but at the moment is best kept within the genus *Parmeliella*. The specimen from Réunion is clearly different from any other in

this mainly Indo-pacific group (see below), and is accordingly described as new.

Material and Methods

The material is that cited below and the methods are the same as in previous papers by the first author.

The New Species

Parmeliella borbonica P. M. Jørg. & F. Schumm sp. nov.

Parmeliellae zeylanicae similis, sed thallo tenue, applanato et caesiocinereo, medulla incolorata et sporis magnis, 10–15 × 8–10 µm.

Typus: La Réunion, Takamaka, low mountain forest near the electrostation, alt. 790 m, 10 September 2009, J.-P. Frahm & F. Schumm (BG—holotypus!; hb. Schumm 15265—isotypus).

(Fig. 1)

Thallus bluish grey with whitish margins, squamulose, forming appressed, orbicular patches, up to 3 cm diam. of imbricating lobes, centrally nearly crustose, marginally up to 3 mm broad, 60–100 µm thick with a paraplectenchymatous upper cortex. The blackish prothallus is poorly developed, mostly crustaceous and not extending

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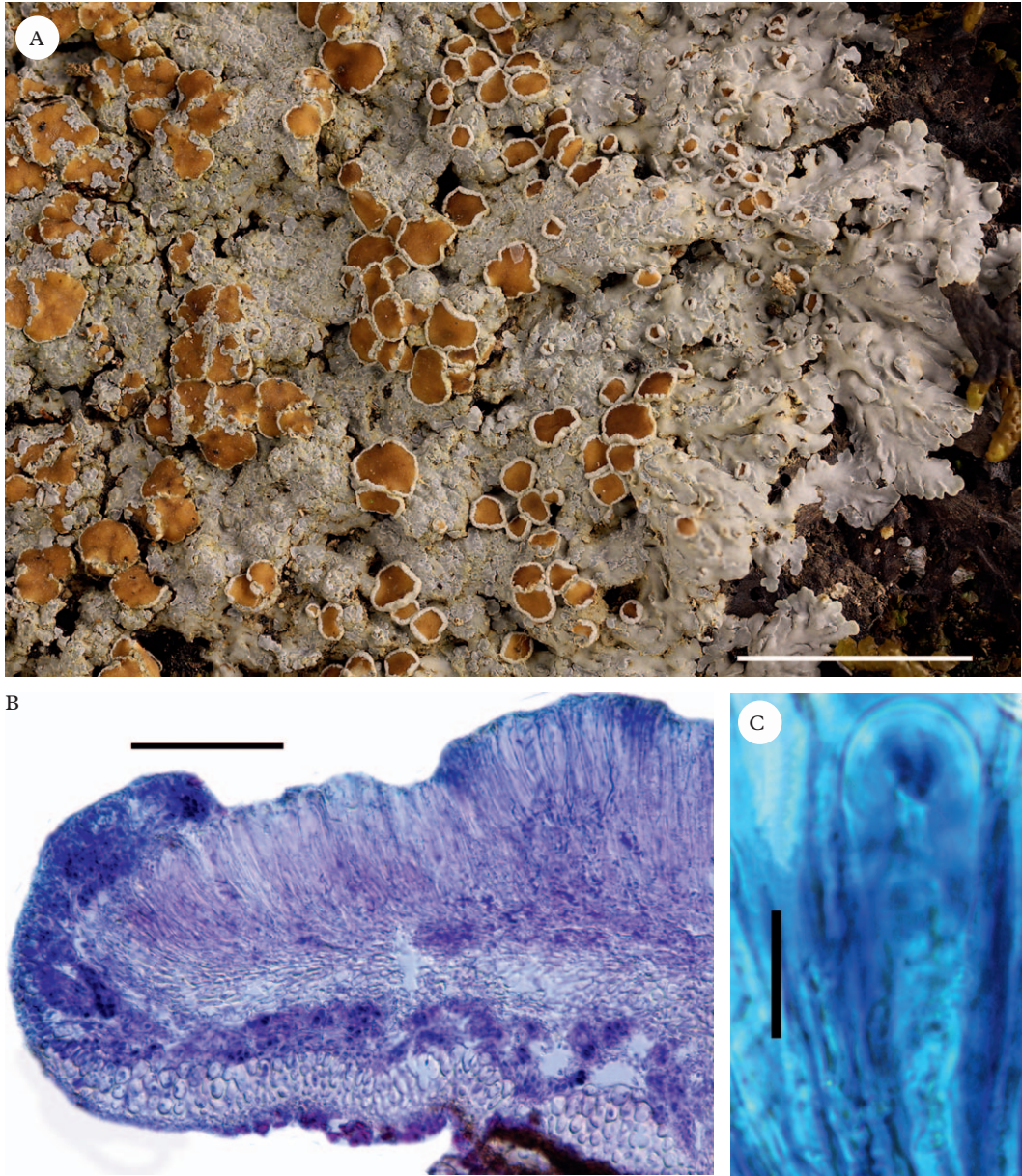


FIG. 1. *Parmeliella borbonica*. A, habitus; B, anatomy of the apothecium; C, an ascus in Lugol's iodine. Scales: A = 5 mm; B = 100 μ m; C = 10 μ m.

beyond the marginal lobes. Upper cortex distinct, cellular 15–25 μ m wide, upon a loose medullary layer, enclosing packets of *Nostoc*, individual cells of which measure 3–5 μ m diam. Lower cortex absent.

Apothecia laminal, sessile, up to 1.5 mm diam., often aggregated in groups, disc light brown, flat; margins wavy to slightly lobed with thalline squamules attached. *Hymenium* 100–125 μ m high, I+ blue, made

up of simple, septate hyphae, apically thickened with external brown pigment. *Asci* narrowly subcylindrical, $70\text{--}80 \times 6\text{--}10 \mu\text{m}$, apically with internal amyloid ring-structure (Fig. 1), 8-spored. *Ascospores* subglobose, simple, colourless, $10\text{--}15 \times 8\text{--}10 \mu\text{m}$ with fairly smooth exospore without extensions.

Conidiomata not observed.

Chemistry. All reactions negative. No lichen substances or pigments detected by TLC.

Additional specimen examined. **La Réunion:** NE of Plaine-des-Palmistes, trail E of lake 'Grand Étang', from parking lot to the lake in sloping W-exposed, tropical rainforest on guave, alt. 570 m, 2008, P. & B. van den Boom, A. M. Brand, E. Sérusiaux 40037 (hb. P. v.d. Boom).

Ecology and distribution. As yet known only from two localities, and possibly an endemic. The type grows on an old tree in a wet, lowland forest at 790 m altitude near the beginning of the trail that leads down from the station Belvédère (EDF electro power station) to the reservoir Takamaka. This steep, north side of the Rivière des Maison canyon, where also Grand Étang (the other collection) is situated, is one of the two wettest regions in the east of Réunion (annual rainfall 7 m). In the vicinity numerous species of the *Coccocarpiaceae*, *Collemataceae* (e.g., *Leptogium denticulatum* auct.), *Pannariaceae* and *Stictaceae* (e.g., *Pseudocyphellaria desfontainii* (Delise) D. J. Galloway) occur, with the commonest foliose lichen in that locality being *Sticta caperata* (Nyl.) Bory, a palaeotropical species described from Réunion. Remarkable occurrences here are the very rare *Coccocarpia imbricascens* Nyl., which until recently was known only from its unlocalized type (Arvidsson 1983), but has since been discovered in South America (Lücking *et al.* 2007), as well as the palaeotropical *Coccocarpia smaragdina* Pers., and the endemic *Pannaria multifida* P. M. Jørg. (Jørgensen 2004). The concentration of rare and endemic species, mostly with palaeotropical affinity, in this locality is most possibly due to the rarity of this kind of lowland forest, which has been cleared away

in most of the neighbouring islands (e.g., Madagascar and Mauritius), but is still present on the steep mountain-sides in Réunion where obviously many of the once presumably more widespread, palaeotropical species are still to be found. This is confirmed by the occurrence in the second locality, which is also in a lowland, moist tropical forest, close to the type locality of *Pannaria multifida*.

Notes. In spite of the external *Pannaria*-like appearance, the bluish grey thallus and apothecia with thalline margins, this is a *Parmeliella* as is obvious from the lack of pannarin in the thallus, and above all by the internal apical apparatus of the asci which is amyloid and forms a ring-structure (Fig. 1C), most typical of the genus *Parmeliella*. This genus typically (traditionally) has no thalline margin of the apothecia, although this character is now known to be of little taxonomic value. There are quite a few similar species, mainly tropical, with these characteristics, the *Parmeliella mariana* group, most of which form large, circular thalli with spreading marginal lobes, resting on a conspicuous mat of rhizohyphae, usually called a hypothallus. There are also a few more squamulose taxa, mostly in the Indo-pacific region, to which this species is most closely related, though it probably reminds one mostly of the South American *Parmeliella imbricatula* (Müll. Arg.) P. M. Jørg. (a species belonging in the *P. mariana* group), which has a thicker thallus of more discrete squamules and more regular, strongly margined apothecia (see Jørgensen 2003), with narrower, ellipsoid spores. It is definitely closer to the two brownish species from Sri Lanka. The equally small-squamulose *Parmeliella zeylanica* P. M. Jørg. has a looser thallus with yellowish medulla and smaller spores. In many ways *P. borbonica* appears to be closest to *P. leiostroma* (Nyl.) P. M. Jørg., owing to the thin, adnate thallus, which in that species is brownish and rests on a distinct mat of brownish rhizohyphae. The spores of that species are also ellipsoid and narrower than in *P. borbonica*. These species appear to form a neat group, the most widespread species of

which is *P. endomilta* Vain., a brownish species with a thin thallus and an orange medulla and citriform spores, distributed throughout the region of the Indian Ocean eastwards to New Guinea (Jørgensen &

Sipman 2006). A key to the members of this highly characteristic group, which may prove to be in need of a higher taxonomic rank, is presented below.

Key to *Parmeliella endomilta* and allies

- 1 Thallus bluish grey, medulla always unpigmented 2
 Thallus brownish, medulla often pigmented 3
- 2(1) Thallus cracked, on a distinct hypothallus; spores narrowly ellipsoid, 12–15 × 5–6 µm; South America . ***Parmeliella imbricatula* (Müll. Arg.) P. M. Jørg.**
 Thallus continuous, no hypothallus visible; spores subglobose, 10–15 × 8–10 µm; Réunion ***Parmeliella borbonica* P. M. Jørg. & F. Schumm**
- 3(1) Thallus with yellow or orange medulla, hypothallus indistinct 4
 Thallus with unpigmented medulla, hypothallus distinct; Sri Lanka.
 ***Parmeliella leiostroma* (Nyl.) P. M. Jørg.**
- 4(3) Thallus skin-like, more or less continuous, medulla orange, spores citriform, hypothallus indistinct; widespread in Indo-Pacific region
 ***Parmeliella endomilta* Vain.**
 Thallus discretely squamulose, medulla pale yellow, hypothallus indistinct, spores drop-like; Sri Lanka ***Parmeliella zeylanica* P. M. Jørg.**

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