

Notes on the lichen genus *Erioderma* in La Réunion

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Abstract – The number of species of *Erioderma* known in the Reunion from where the genus was described is doubled, to six. The following new records are added: *Erioderma borbonicum* sp. nov., *E. papyraceum* and *E. solediatum*. These appear to be part of an ancient stock of Gondwana species which is surprising since the island is a fairly young, though it may have functioned as a refuge for species present in nearby older landmasses.

Biodiversity / *Erioderma* / Gondwana element / Mascarene Islands / new records & species

Résumé – Le nombre d'espèces connues d'*Erioderma* dans l'île de la Réunion est doublé, pour atteindre un nombre de six. Les nouvelles découvertes suivantes sont ajoutées : *Erioderma borbonicum* sp. nov., *E. papyraceum*, et *E. solediatum*. Ces espèces appartiennent probablement à une souche gondwanique. Cette révélation est inattendue, l'île étant d'origine assez récente. Mais elle aurait assuré un rôle de refuge pour les espèces de la région voisine.

Biodiversité / *Erioderma* / élément Gondwanique / espèces nouvelles / Isles Mascareignes

INTRODUCTION

The lichen genus *Erioderma* is historically linked to the small South Indian Ocean island Réunion (once named Ile de Bourbon) off Madagascar from where Fée (1825) described the genus based on the new species *Erioderma polycarpa* (Fig. 1). This specimen had been collected there during the French revolution (1795-98) by the exiled nobleman Louis Marie Aubert du Petit Thouars (1758-1831), who had returned to France in 1820 with his collections. However, Acharius (1810) had already described the species as *Sticta groendaliana* based on a specimen that the Finnish ship-doctor F. C. Gröndal had collected in the Mascarenes (most probably on Mauritius ("Ile de France"), see Jørgensen 2001). It must be a rare species on the islands as it to our knowledge never has been recollected in the Mascarenes before 1989 (by G. Follmann & I. Follmann-Schrag, B). This in contrast to the other species described from Réunion, *Erioderma unguigerum* (Bory) Nyl., which Jean Baptist Geneviève

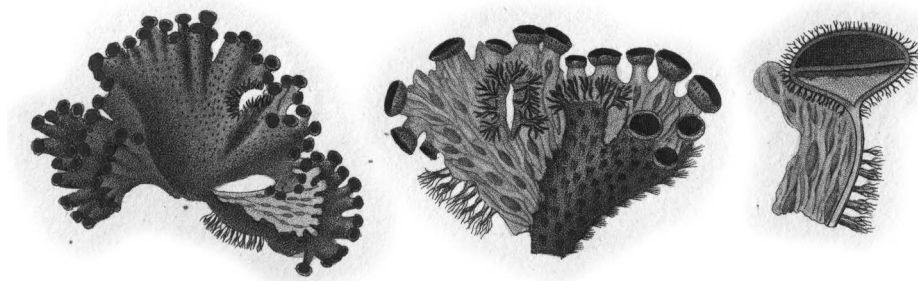


Fig. 1. The illustration of *Erioderma polycarpum* in Fée (1825).

Marcelin Bory de St Vincent (1778-1846) collected on Piton des Neiges during his stay in Réunion in the autumn of 1802. It has been repeatedly recollected through the centuries and appears still to be rather common, though local, particularly in the region of Plaine-des-Palmistes, and was recently (2008) recollected there by the second author on an excursion with B. van den Boom, D. & M. Brand and E. Sérusiaux. Bory (1804) also recorded a var. *major*, the original material of which (PC) proved to be *Erioderma leylandii* (Taylor) Müll. Arg. (Jørgensen 2001), a species that has not been recollected and was not observed recently. However, several other *Erioderma* species were collected on this recent excursion, and they will be reported on below.

NEW RECORDS

***Erioderma papyraceum* P.M. Jørg. & Arv.** has previously not been recorded outside South America, but these specimens from Réunion are very typical of the rare chemotype containing argopsin. The first collection (39927) occurred on the branches and twigs on an unidentified small tree in a humid valley with mossy, mixed forest (Fig. 2), and was growing with a few other macrolichens: *Erioderma unguigerum* (Bory) Nyl., *Leioderma erythrocarpa* (Del. ex Nyl.) D.J. Galloway & P.M. Jørg., *Pseudocyphellaria aurata* (Ach.) Vain. and *Pseudocyphellaria desfontainii* (Del.) Vain. (another species first discovered by Bory de St Vincent). The other specimen (40326) was collected on a shrub of *Hubertia* in tropical cloud forest at 1340 m, again with *Erioderma unguigerum*. This appears to be very close to its ecology in South America, on trees and shrubs in the lower part of the cloudforest (Jørgensen & Arvidsson 2002), reaching down in the rainforest.

Localities: La Réunion, NW of Plaine-des-Palmistes, forêt de Bébour, Ravine Misère, roadside, alt. 1530 m, 27 May 2008, P. & B. van den Boom 39927, D. & M. Brand, E. Sérusiaux (herb. van den Boom, LG); small paved road to the east, to Échelles (trail to Takamaka), alt. 1370 m, 8 June 2008, P. & B. van den Boom 40889, D. & M. Brand, E. Sérusiaux (herb. van den Boom).

***Erioderma sorediatum* P.M. Jørg. & D.J. Galloway.** This is a widespread species in the Indo-Pacific region (Jørgensen & Arvidsson, 2001) which is the sorediate counterpart of *E. unguigerum*, though previously only recorded once from the East African mountains (Usambara) in Africa, as well as St. Helena in the Atlantic



Fig. 2. The humid, mossy valley where *Erioderma papyraceum* was found. Photo: B. van den Boom



Fig. 3. The open shrub-vegetation where *E. sorediatum* grows with *E. borbonicum*. Photo: B. van den Boom.

(Jørgensen, 2003). It was once found fertile (a first record, with just one apothecium) and occurred exclusively on *Philippia* bushes in mixed shrub vegetation in a rather well lit area (Fig. 3) where even the ground had a rich lichen coverage: *Cladia aggregata* (Sw.) Nyl. with a number of *Baeomyces* and *Cladonia* species. On the bushes it grew with *E. borbonicum* and several foliose and crustose lichens (for details see below).

Localities: La Réunion, NW side of Forêt de Bébour, trail GR R1 from Gîte de Bélouve, ca. 2.5 km to the south-west, to Caverne Mussard, alt. 1980 m, 2 June 2008, P. & B. van den Boom 40524, D. & M. Brand, E. Sérusiaux (herb. van den Boom); c.2.5 km to the SW to Caverne Mussard, alt. 1880 m, 2 June 2008, P. & B. van den Boom 40449, D. & M. Brand, E. Sérusiaux (herb. van den Boom).

NEW SPECIES

Erioderma borbonicum P.M. Jørg. & van den Boom sp. nov.

(Fig. 4)

Erriodermi glorioso similis sed thallo caespitoso, lobis in parte imbricatis marginalibus sinuatis cum pycnidiis, subtus cremicolor sine pigmentiis aurantiacis; acidum argopsicum continens. Apothecia breviter stipitata, laminalia vel submarginalia, extus pubescentia, sine trichomatibus nigris.

Type: La Réunion, NW of Plaine-des-Palmistes, NW side of Forêt de Bébour, trail GR R1 from Gîte de Bélouve, ca. 3.5 km to the SW to Caverne Mussard, alt. 1980 m, 2 June 2008, P. & B. van den Boom 40503, D. & M. Brand, E. Sérusiaux (B, holotype).

Thallus caespitose, 3-4 cm diam. with incised, flat, partly imbricating lobes up to 3 mm broad with sinuous margins, some ascending and exposing the lower, cream-coloured surface when dry; upper surface grey-brown, covered in bundles of simple, colourless, soft hairs. In section 200-250 µm thick with a rather regularly celled upper cortex, to 60 µm thick. The medullary layer is filled by mainly vertical chains of *Scytonema*, individual cells about 10 µm diam. No lower cortex.

Apothecia marginal to submarginal, shortly stipitate, brownish black with paler, often downy exciple, 1-2 mm diam. Subhymenium brown of densely interwoven hyphae, 60-80 µm wide. Hymenium 100-120 µm high, colourless, but dark pigmented in upper part, I+ consistently blue. Asci cylindrical with internal, amyloid apical sheets, 8-spored; ascospores colourless, subglobose 9-12 × 8-9 µm.

Conidiomata marginal pycnidia, brownish black, wart-like to 200 µm diam., producing bacilliform conidia 2-4 × 1-1.5 µm.

Chemistry: Pd+orange, containing argopsin (major) and norargopsin (minor). No traces of eriodermanons (TLC).

Habitat & distribution: This species was only found once on a *Philippia* in shrub vegetation in a rather well lit area (Fig. 3), and apparently is more light tolerant than *E. gloriosum*. It grew in a lichen rich society with *E. sorediatum* (see above) and *Hypotrachyna sinuosa* (Sm.) Hale, *Megalospora tuberculosa* (Fée) Sipman, *Normandina pulchella* (Borr.) Nyl. and species in the genera *Anzia*, *Coccocarpia*, *Fissurina*, *Lecidella*, *Leiorreuma*, *Menegazzia*, *Micarea* and *Sticta*.

It is interesting that the same bush had two species of *Erioderma*, a phenomenon also observed in the Andes (Jørgensen & Arvidsson, 2002), and also

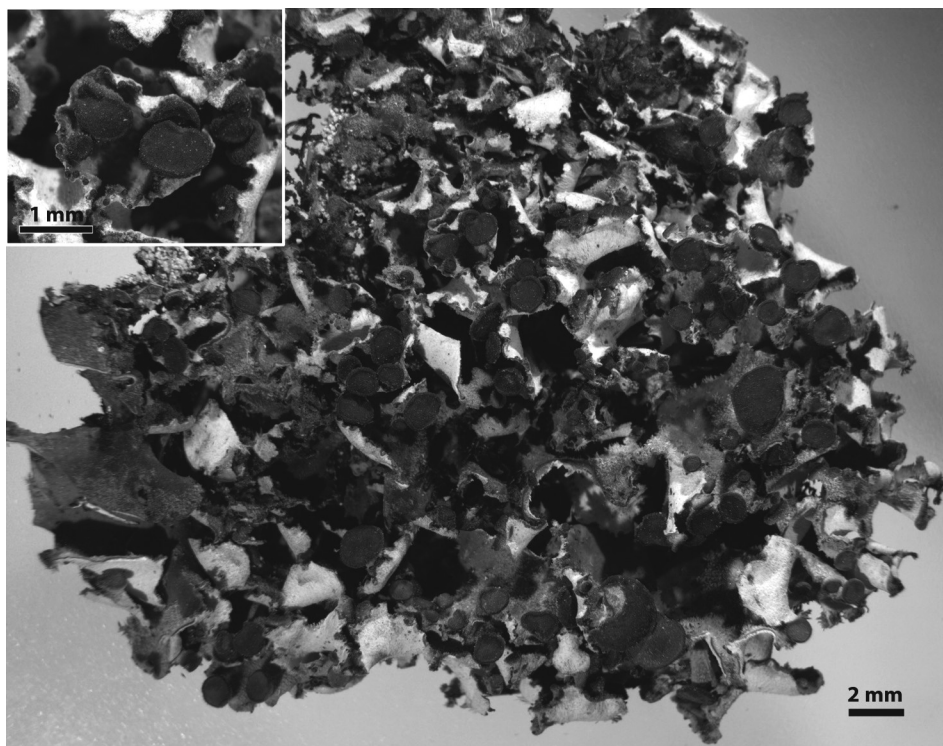


Fig. 4. The type of *Erioderma borbonicum* with inserted detail of apothecia. Photo: Jan Berge

in the case of *E. papyraceum* in Réunion (see above), one which is hard to explain since there are many available bushes of approximately the same ecological quality in the vicinity and they have no species of this genus.

Note: This is definitely a species of the *E. divisum*-group, closely related to *E. gloriosum* P.M. Jørg. & Arv. which previously was mainly known from South America (Jørgensen & Arvidsson, 2002), but later also were found in New Guinea (Jørgensen & Sipman, 2002). It differs from that species in the non-elongating, slightly imbricating lobes and the caespitose growthform and in the undulating margins which are beset with pycnidia. The lower surface is creamy, intensifying under the apothecia, but without orange pigments, not reacting K+red.

It appears to be more brittle than *E. gloriosum* and the type-specimen is thinner than any known of that species with a thicker upper cortex.

CONCLUSION

The small island La Réunion is shown to contain no less than six different species of *Erioderma*, as many as the whole continent of Africa (Jørgensen, 2003), three of them not known from the continent. Three new species have been added

on a recent collecting trip, one of which *Erioderma borbonicum* is a new species, the third with its type locality on this island. This is the more remarkable since Réunion is a volcanic island of fairly low age (a few million years). However, contrary to the neighbouring much larger (about 200 times) and older (about 100 times) island Madagascar from which only four species of *Erioderma* are known (*E. leylandii*, *E. tomentosum*, *E. unguigerum*, and surprisingly also the South American *E. verruculosum*), the vegetation has remained rather undisturbed. This is particularly relevant in relation to the bush vegetation in the fog-zone which is known to be a favorite locality for species of this genus (see Jørgensen & Arvidsson, 2002). This may have acted as a refuge for species of ancient origin. From the known species it is apparent that different plantgeographical elements are present. *E. groendalianum* is a rather a cool-temperate element, today mainly present in South America (as well as Tristan da Cunha), while *E. unguigerum* and its sorediate counterpart *E. sorediatum* is subtropical, like *E. leylandii* and quite widespread, particularly in the Southern Hemisphere. The newly described species, *E. borbonicum* may prove to be endemic, though it is closely related to the mainly paleotropical *E. divisum* group (with two species in South America though). It is probably an addition to the Gondwana stock of species already pointed out by Jørgensen & Sipman (2002), and so is obviously *Erioderma papyraceum* which was previously thought to be one of several species originating in connection with the formation of the Andes mountains.

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