Biodiversity and ecology of lichens – Liber Amicorum Harrie Sipman.
A. Aptroot, M.R.D. Seaward & L.B. Sparrius (eds): Bibliotheca Lichenologica 99: 367-372.
J. Cramer in der Gebrüder Borntraeger Verlagsbuchhandlung, Berlin & Stuttgart, 2009.

Micarea sipmanii, a new species with arbuscular pycnidia from the West Indies

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Abstract: *Micarea sipmanii* Sérus. & Coppins is described as new from Basse-Terre Island in the Guadeloupe Archipelago (West Indies). It belongs to the *M. peliocarpa-alabastrites-cinerea* group and is easily characterized by its spectacular, arbuscular pycnidia.

Key words: *Micarea*, Guadeloupe, West Indies, new species

Introduction

As in many tropical zones, the lichen flora of the West Indies is poorly known and, although the biomes present are not the most diverse in the Neotropics, they host several interesting taxa (LÜCKING et al. 2005; ØVSTEDAL & ELIX 2007). A fascinating species of *Micarea*, collected by the first author from the Guadeloupe National Park in 1995, is described here as new to science.

The species

Micarea sipmanii Sérus. & Coppins, sp. nov.

Micareae cinereae et *M. peliocarpae* similis, sed pycnidiis pedicellos longos (ad 2.2 mm) vulgo ramosa arnorescentes evolutis.

Type: WEST INDIES, GUADELOUPE. Basse-Terre, Rivière du Grand Carbet, between the 1st and 2nd waterfalls, 16°02'33'' N 61°38'55'' O, 820 m, very wet forest on ridge, on vertical tree by the track, 22. IV. 1995, E. Sérusiaux s. n. [LG holotype; E isotype].

(Figs 1-2)

Thallus corticolous, epixylic, made of tiny whitish-grey to bluish-grey granules, separated from each other or agglomerated into tiny coralloid masses, rarely exceeding 0.1 mm in diam., ecorticate but a hyaline amorphous covering layer is easily seen; K–, C+ red and P– (gyrophoric acid demonstrated by TLC). *Photobiont* micareoid: cells thin-walled, globose, 5-6 µm in diam., usually arranged in pairs and with intracellular haustoria (COPPINS 1983: 25-26).

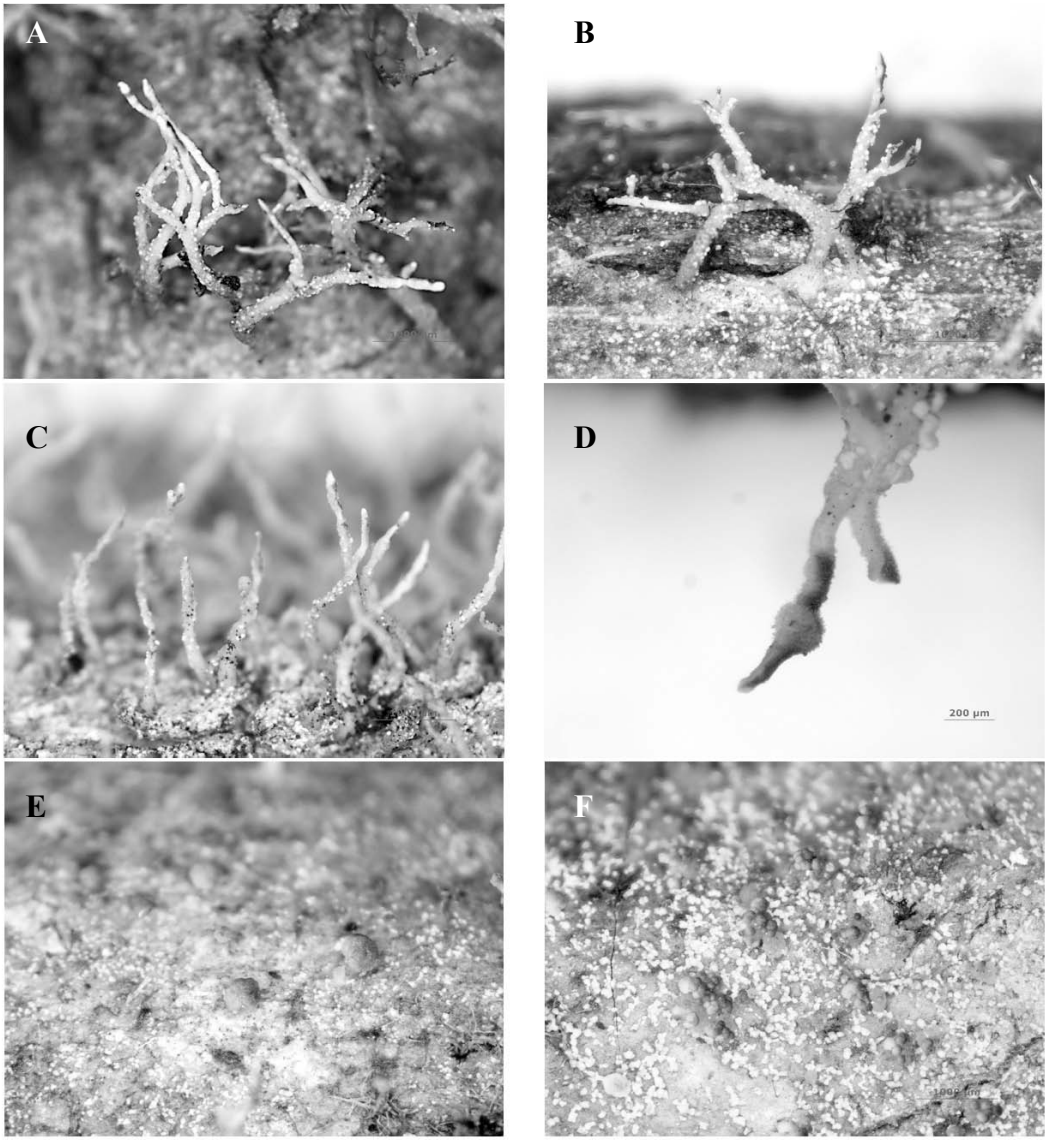

Fig. 1 *Micarea sipmanii* (holotype). A-C. Arbuscular pycnidia. D. Close-up of a fully ripe pycnidium, showing the terminal rostrum and the pilose surface. E. Fully mature apothecia. F. Exuberant regeneration of apothecia on old discs.

Apothecia absent or numerous, 0.1-0.4(-0.5) mm in diam., convex to hemispherical, usually tuberculate, and proliferating over old ones, adnate and constricted at the base, or sometimes shortly but distinctly stipitate (and then up to 0.3 mm high); disc pale orange-brown to bluish-grey or aeruginose, non-pruinose, margin absent. *Excipulum* almost absent or laterally developed when apothecia proliferate and become tuberculate; made of branched and anastomosing hyphae, hyaline. *Hymenium* hyaline, bluish or aeruginose in upper parts, K– and HNO_3+ reddish, soon fading, 50-65 µm high. *Hypothecium* hyaline, c. 15 µm high, with numerous ascogenous hyphae with swollen cells 2-5 µm wide. *Paraphyses* numerous, richly branched and anastomosed, 1-1.5 µm in diam., hyaline, apices

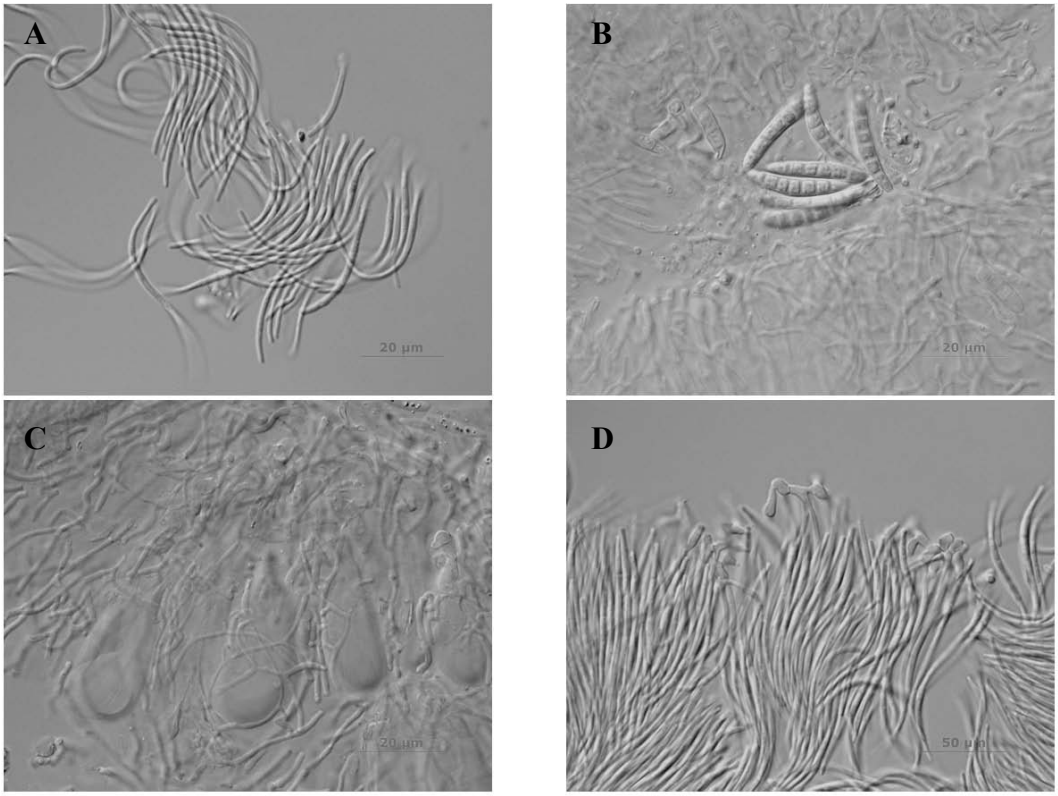

Fig. 2 *Micarea sipmanii* (holotype). A. Conidia. B. Ascospores. C. Asci and paraphyses. D. Conidia with conidiogenous cells.

not swollen. *Asci* (4-)8-spored, clavate to cylindrical-clavate, 40-55 × 12-15 µm; in K/I with a strongly blue outer layer and an unstained wall underneath, apical dome strongly blue but no ring structure seen. *Ascospores* oblong-fusiform with rounded ends, straight or slightly curved, 7-septate, 27-33 × 4-4.5 µm.

Pycnidia usually numerous and spectacular, made of a long pedicel carrying an elongate, inflated, rostrate pycnidium cavity. *Pedicels* standing perpendicular to the trunk surface and (as the trunk was vertical) standing horizontally or almost so, simple or branched, sometimes with a complex pattern (pedicels laterally fused, trifurcate extremities, etc.), 1.4-2.2 mm long and c. 0.1-0.12 mm in diam. pycnidia up to 0.3 mm in diam.; surface covered with tiny thallus glomerules near the base and thinly but distinctly (arachnoid) pilose in the upper parts, translucid or pale orange to slightly bluish-grey in upper parts (incl. the pycnidium s. str.), pigment K– and HNO_3+ faintly red. Axis very brittle when dry, chondroid, made of densely interwoven, thick-walled hyphae without any pattern of organization; rostrum made of longitudinally arranged, rather thin-walled hyphae, forming a pallisade tissue, not forming a genuine ostiole but a closed "tulip bud" that is usually filled by an enormous mass of conidia that can protrude through its tip. *Conidiogenous cells* numerous, lining the entire inner surface of the pycnidium, arranged in regular rows and rather swollen, and with a lateral neck producing the conidia. *Conidia* filiform, with rounded, almost truncate ends, curved and usually sigmoid, non-septate or faintly 1-3-septate, 44-52 × 1-1.2 µm.

Ecology and distribution: So far, *Micarea sipmanii* is known only from the type locality on the island of Basse-Terre in the Guadeloupe Archipelago. It was growing on a vertical smooth trunk in a very wet stand of the rainforest, on a small ridge. This forest type is described in detail by SASTRE & BREUIL (2007: 152-178, under the subtitle "forêt dense humide"), and the type locality lies just in the middle of the front picture of the book, in the splendid scenery of the "Chutes du Carbet" (waterfalls). Although spectacular and carefully looked for during further surveys of this forest type in Basse-Terre, the species has not been seen elsewhere.

Discussion

The following characters assign this species to the *Micarea peliocarpa–alabastrites–cinerea* aggr. (group C in COPPINS 1983: 99): bluish-aeruginose, K– and HNO_3+ red pigment; several septate, fusiform ascospores; filiform (macro) conidia, and production of gyrophoric acid. This aggregate, together with *M. coppinsii* and *M. leprosula*, form a well-supported clade (ANDERSEN & EKMAN 2005); this molecular phylogenetic analysis, based on Bayesian tree sampling and maximum likelihood analysis of mtSSU sequences, shows that *Micarea* in its classical delimitation (COPPINS 1983) is polyphyletic. Besides the likely assignment of several species to other genera (*Helocarpon* and *Scoliciosporum*), at least two different taxa are involved: the *M. bauschiana* aggr. (group I in COPPINS 1983), which is close to *Psora decipiens,* and the remaining species, forming a complex, partly unresolved, paraphyletic clade, with all tested representatives of the Pilocarpaceae nestled within it. Without further data to support the current topology of that phylogenetic tree, the inclusion of our new species in *Micarea* is appropriate.

The unusual pycnidia may also point to a relationship with the recently resurrected genus *Szczawinskia* A. Funk (SÉRUSIAUX in APTROOT et al. 1997, HOLIEN & TØNSBERG 2002). The type species of this genus, together with *M. prasinella* (*Micarea clavopycnidiata* being a synonym of *S. tsugae*), form a very distinct and well-supported clade nestling within the large clade of *Micarea* s. str. (ANDERSEN & EKMAN 2005). Even if the genus name *Szczawinskia* is used in a future rearrangement of *Micarea*, we strongly believe that *M. sipmanii* will remain inside the *Micarea peliocarpa—alabastrites–cinerea* aggregate. The only, albeit spectacular, difference lies with the branched, arbuscular pycnidia. Indeed, the same type of pycnidium is found in the foliicolous *Woessia pseudo-hyphophorifera* Lücking & Sérus. (1995), currently known from Costa Rica, Hong Kong, Korea and St-Lucia (West Indies) and that of a closely related, undescribed species occurring on living leaves in Gabon (Africa). The similarities between the pycnidia produced by these species and *M. sipmanii* are striking: pedicels producing a (sub)terminal pycnidium, projecting horizontally in the environment, genuine ostiole not developed but a "tulip-shaped" pycnidium containing an extraordinary mass of filiform conidia. Such a convergence between unrelated genera (*Woessia* is now regarded as a synonym of *Bacidia*, a genus definitely belonging to the Bacidiaceae) is probably the result of environmental pressure, e.g. dispersing conidia in a very wet and constantly saturated atmosphere.

Acknowledgements

The authors dedicate this paper to their most distinguished colleague and friend Dr Harrie Sipman on the occasion of his 64th birthday, in honour of his many important contributions to lichenology, especially in the Neotropics. The first author is most grateful to the authorities of the National Park of Guadeloupe, especially Dr L. Redaud, for their precious help and authorization to collect there.

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