

# A remarkable new lichen from the Netherlands Antilles, *Eremothecella microcephalica*

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**Abstract.** A description is presented for the new species of lichenized ascomycetes, *Eremothecella microcephalica*, and its affinity is discussed. The new species was discovered on the Windward Antilles, tropical America, and is characterised by rounded macropycnidia and microcephalic ascospores.

**Keywords:** Arthoniomycetes, taxonomy, Caribbean, lichenized fungi, new species

## 1 Introduction

During a floristic inventory on the islands Saba and St. Eustatius (Netherlands Antilles) supported by the organisation Conservation International (see website <http://sweetgum.nybg.org/saba/index.html>), a remarkable, pycnidiate lichen was found. It resembles the genus *Arthonia* by its dark greenish, crustose thallus with dark-brown, flat, discoid sporangia. However, these sporangia appeared to be no ascocarps but to produce exceptionally large, filiform, up to 100 µm long conidia. Subsequent discovery of ascocarps allowed clarifying the affinities of this species and presenting a formal description.

## 2 Material and methods

The examined specimens are deposited in the herbaria NY and B. For the morphological examination stereomicroscope and compound microscope were used, for the I-staining Lugol's solution and for the K-treatment an aqueous solution of c. 5 % KOH.

## 3 Description

*Eremothecella microcephalica* SIPMAN species nova      Fig. 1, 2

Type: Netherlands Antilles, St. Eustatius: Around-The-Mountain Trail, between Quill Trail and White Wall, 250 m, deciduous seasonal forest on S-slope of Quill, 29 Jan. 2008, H. Sipman 56666 [NY holotype, B 60 0154921 isotype].

Diagnosis: *Eremothecella macropycnidiis rotundatis*, conidiis ad 100 µm longis, ascosporis microcephalicis triseptatis 16-21 × 6-7 µm.

Thallus crustose, continuous, dull, dark greenish grey, thin, without means for vegetative reproduction, sometimes bordered by a black hypothallus line. Ascocarps irregularly

rounded, well delimited but without differentiated margin, flat or slightly convex, 0.5-1 mm in diam., sometimes seemingly confluent (oversized, partly degenerated ascocarps?), dark brown to almost black, slightly glossy; epithecium brown; hymenium pale brown, c. 50  $\mu\text{m}$  tall, I+ red, after KOH treatment I+ blue; hypothecium brown, to over 80  $\mu\text{m}$  thick in the centre of the ascocarps; asci c. 50  $\times$  25  $\mu\text{m}$ ; ascospores hyaline, turning brown when decaying, 8 per ascus, 3-septate, without swollen end locules, median locules the largest, 16-21  $\times$  6-7  $\mu\text{m}$ . Macropycnidia common, superficial, discoid with central, irregular pore, 0.1-0.2 mm in diam., black; conidia filiform, 80-100  $\times$  2  $\mu\text{m}$ , with c. 12 thin septa, easily broken, therefore length imprecise. Micropycnidia occasional (in type), similar to the macropycnidia but much smaller, c. 0.05 mm in diam.; microconidia rod-shaped, c. 3  $\times$  1  $\mu\text{m}$ . Brown pigments K-. Photobiont *Trentepohlia*-like, composed of irregularly rounded to elongate cells c. 5-12  $\times$  5-8  $\mu\text{m}$  in diam., irregularly arranged in chains.

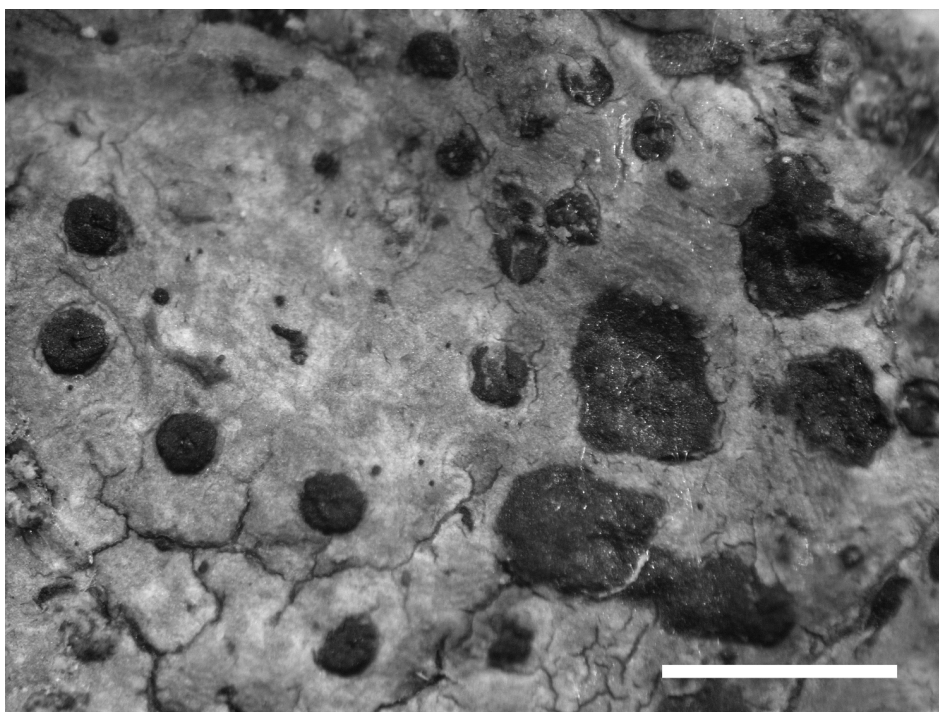


Fig. 1: *Eremothecella microcephalica*, thallus with macropycnidia (dark, rounded discs with irregular, central pores, left side) and ascocarps (larger, more irregular dark spots without central pore, right side). Scale = 1 mm.

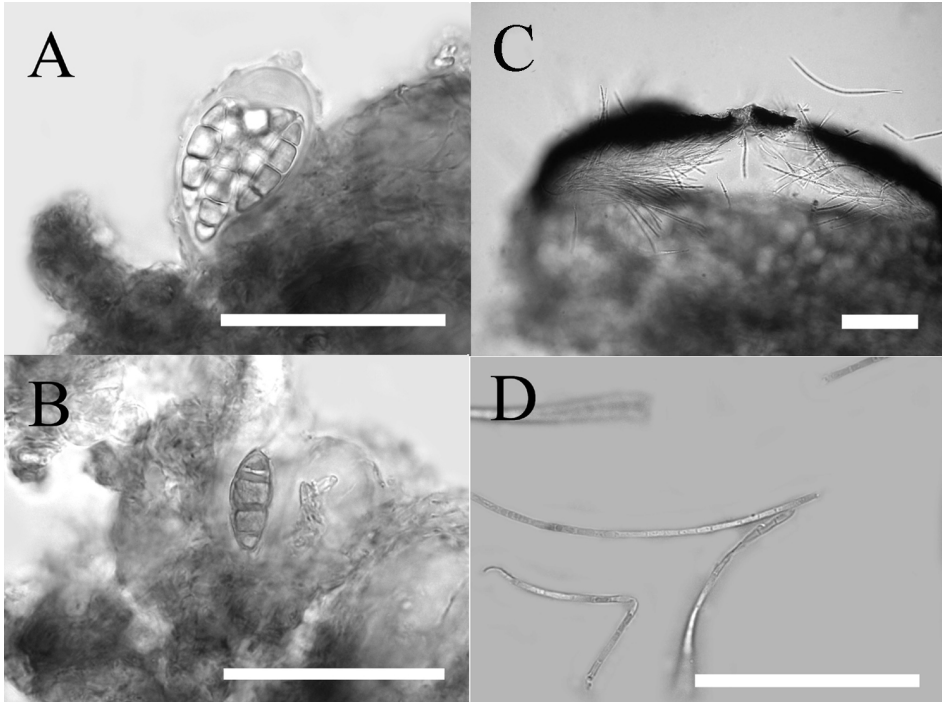


Fig. 2: *Eremothecella microcephalica*. A. Ascospores in ascus (type specimen); B. Decaying, brown ascospore (type specimen); C. Macropycnidium section showing conidia originating from the edges (Sipman 56779a); D. Septate macroconidia (Sipman 56779a). Scale = 50  $\mu$ m.

The species is known so far only from two small volcanic islands in the Windward Antilles, Saba and St. Eustatius, where it appears to be not rare between c. 50 and 300 m elevation. It seems to avoid both the dry, open lowland vegetation and the frequently fog-exposed vegetation of the highest peaks and ridges. The available specimens are on smooth, thin bark of branches and trunks of small trees near the ground in low forest on volcano slopes, within few km from the coast. The similarity of the bark in all collections suggests that it might be phorophyte specific. Most specimens have macro- and micropycnidia. Viable apothecia were available in only two specimens, nr. 56655 and 56666, and in these the pycnidia tend to be empty. Some thalli in 56655 had ascocarps only.

*E. microcephalica* is the first corticolous species in the genus. The further species are all foliicolous. Since all currently known reports are from the Netherlands Antilles only, the species may be a local endemic. However, because of the scarcity of ascocarps it may have been underrecorded elsewhere.

## 4 Affinity

The new species is most notable by its discoid macropycnidia, which dominate the thalli of all available specimens (Fig. 1) and produce filiform, septate, 80-100  $\mu\text{m}$  long conidia. Similar conidia are known among lichens only from the genus *Eremothecella*. The genus was reinstated to accommodate species formerly included in *Arthonia* but deviating by scattered, globose asci with distinct stalk, large ascospores and unusual pycnidia producing very large, filiform conidia (SÉRUSIAUX 1992, FERRARO & LÜCKING 1997). It is a close relative of *Arthonia*, which is very similar in ascocarp structure but has much shorter pycnospores (SANTESSON 1952, MATZER 1996). The pycnidia of the new species resemble those of *E. calamicola* SYD., the only *Eremothecella* species where pycnidia are known so far, not only in their oversized, filiform, septate conidia, but also in the concentration of the conidiogenous cells in the edge of the pycnidia (Fig. 2C). The macropycnidia in *E. calamicola* differ by their elongate shape with an eccentric pore, the conidiogenous cells are restricted to the opposite edge, and the pycnospores are longer, up to c. 150  $\mu\text{m}$ . The scattered, wide asci and the final browning of the ascospores do also agree with *Eremothecella*. A conspicuous difference is in the shape and size of the ascospores: in *E. calamicola* and the other species of the genus the spores are macrocephalic and large, in the new species microcephalic and medium-sized. Since the pycnidial characters are very unusual, it is assumed here that the agreement in pycnidia is more indicative for the taxonomic affinity of the new species than the differences in the spores. Seemingly the spore shape is of minor taxonomic significance in the genus. This opinion is supported by the report of a species with muriform spores, *Eremothecella cingulata* (R. SANT.) FERRARO & LÜCKING (FERRARO & LÜCKING 1997). However, it remains to be seen whether the large-spored species included in the genus, of which no macropycnidia are known, are really congeneric with *A. calamicola* and *A. microcephalica*.

## 5 Additional specimens

NETHERLANDS ANTILLES, **Saba**: Wells Bay end of North Coast Trail, in ravine near the road, c. 50 m, low secondary forest on bottom of ravine, 10 March 2007, H. Sipman 54897 [B, NY]; Dancing Place Trail near Windwardside, end, c. 320 m, dry, open forest on steep slope, 12 March 2007, H. Sipman 54978, 54992 [B, NY]. **St. Eustatius**: Quill Trail, lower part till Around-The-Mountain Trail, 150-200 m, thorny woodland and transition to deciduous seasonal forest on S-slope of Quill, 29 Jan. 2008, H. Sipman 56655 [B 60 0154910, NY]; Quill Trail, lower part till Around-The-Mountain Trail, 150 m, thorny woodland and transition to deciduous seasonal forest on S-slope of Quill, 1 Feb. 2008, H. Sipman 56779A [B 60 0163049, NY]; SW-slope of the Quill volcano, 250 m, c. 5 m tall dry secondary forest with *Pisonia subcordata*, *Guettarda scabra*, epiphytic, 7 August 1980, H. Sipman 15143 [B 60 0103865].

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