

Four Seychelles lichens new to science

Mark R. D. SEAWARD and André APTROOT

Abstract: Illustrated descriptions are provided for four new lichen species found in The Seychelles: *Arthothelium feuereri* Aptroot & Seaward, *Dimerella straminea* Aptroot & Seaward, *D. subsquamosa* Aptroot & Seaward and *Fellhanera silhouettae* Aptroot & Seaward.

Key words: *Arthothelium feuereri*, *Dimerella straminea*, *Dimerella subsquamosa*, *Fellhanera silhouettae*, Seychelles

Introduction

During the course of our researches on the lichen flora of The Seychelles (e.g. Seaward & Aptroot, 2003), four interesting crustose species, new to science, came to light. Due to the remoteness of the islands and, in the case of the taxa listed below, the antiquity of the particular islands, the likelihood of endemism should be considered. Illustrated descriptions of the four taxa are presented below.

Two of the species described here belong to the well-known genus *Dimerella*. Recently (Lücking & Kalb 2000) synonymized this genus with the tropical genus *Coenogonium* because of the similarity in ascus and apothecium structures. The conspicuous differences in thallus morphology (essentially crustose in *Dimerella* vs. filamentous in *Coenogonium*) were wholly attributed to differences in the morphology of the algal partner. However, there are other differences between the two genera: notably that all species of *Dimerella* have 1-septate ascospores, while about half of the species of

Coenogonium have non-septate ascospores; moreover, the excipulum cells in *Dimerella* are often swollen, which is never the case in *Coenogonium*. On the other hand, iodine reactions in the hymenium are variable within *Dimerella* (and even differ between the two new species described below), but appear to be constant within *Coenogonium*.

The Species

Arthothelium feuereri Aptroot & Seaward sp. nov.

Arthothelium saxicolum acidum gyrophoricum continens, cum apotheciis nigris, hypothecio hyalino, epithecio brunneo KOH viridescenti, ascosporis macrocephalis, dense muriformibus.

Typus: Seychelles, Mahé, Les Trois Frères, on granite on mountain top, alt. c. 500 m, 6 March 1994, T. Feuerer (HBG 60573—holotypus; ABL, hb. Seaward 111276 in BRAD—isotypi).

(Fig. 1)

Thallus smooth, pale brown (the colour of *Acarospora fuscata*), varnish-like, not areolated or fissured, surrounded by a c. 1 mm wide, black, effiguring hypothallus. *Algae* chlorococcoid, probably *Stichococcus* sp., cells ellipsoid, 8–15 × 5–8 µm.

Apothecia sessile, black, flat to convex, round to somewhat irregular in outline,

M. R. D. Seaward: Department of Environmental Science, University of Bradford, Bradford BD7 1DP, United Kingdom.

A. Aptroot: Centraalbureau voor Schimmelcultures, PO Box 85167, 3508 AD Utrecht, The Netherlands.

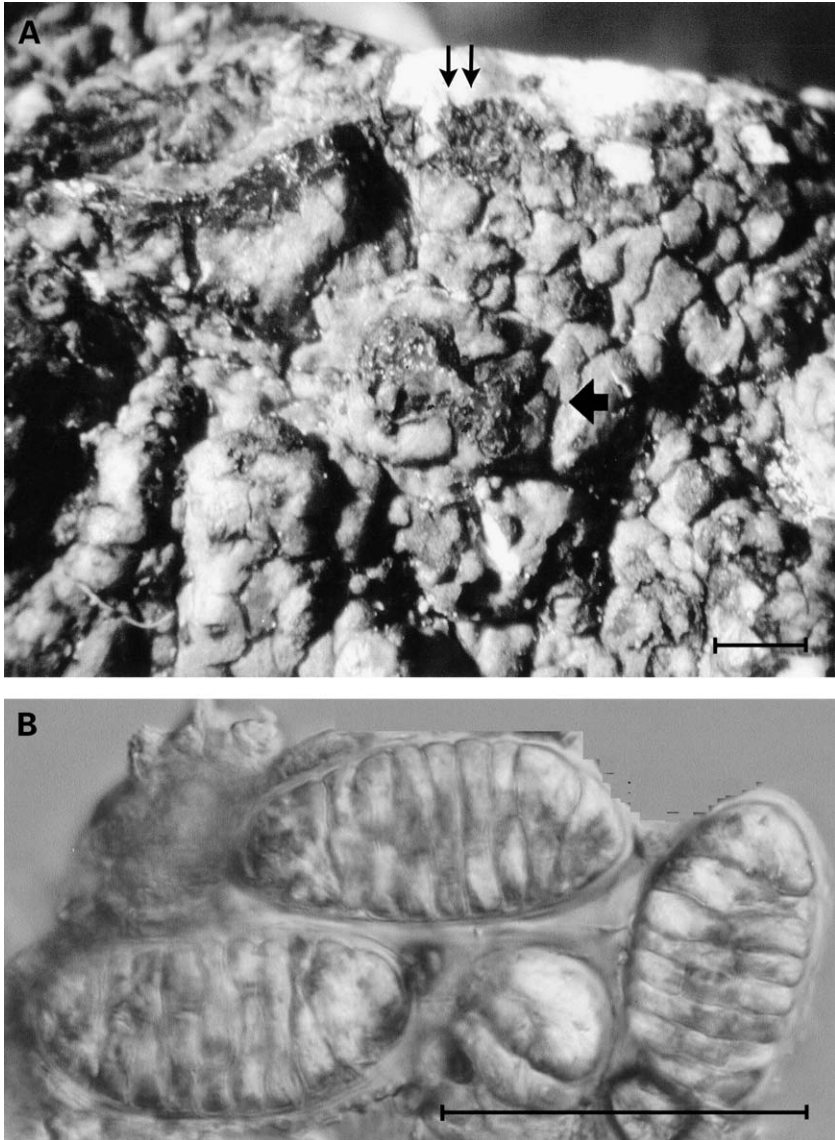


FIG. 1. *Arthothelium feuereri*, (type). A, habitus, showing thallus and apothecia (thick arrow), including dissected area to show hypothecium (thin arrows); B, ascospores. Scales: A=1 mm; B=50 μ m.

c. 0.5–1.0 mm diam., immarginate. *Epiphymenium* dark brown, densely cellular, KOH+ greenish, *c.* 20 μ m high. *Hymenium* hyaline, not interspersed, KOH–, IKI–, *c.* 200 μ m high. *Hypothecium* hyaline, *c.* 50 μ m high. Paraphysoids densely anastomosing, 1.5–2.0 μ m wide in KOH. *Asci* nearly globose, 100–150 \times 80–125 μ m, containing 4

ascospores. *Ascospores* hyaline to very pale brown, ellipsoidal, macrocephalic (both end cells much larger than other cells), densely muriform, with generally 9–11 longitudinal and 7–12 transverse septa, 40–50 \times 20–25 μ m, wall 1–2 μ m, not ornamented, surrounded by *c.* 1–2 μ m wide gelatinous sheath. *Conidiomata* not observed.

Chemistry. Thallus containing gyrophoric acid (C+ pink, K–, UV–).

Etymology. The species is named in honour of the collector, Dr Tassilo Feuerer of the University of Hamburg Botanical Institute in recognition of his support of our work, more particularly the loan of his invaluable lichen collections from The Seychelles.

Notes. This is a very unexpected species, growing together with, for example *Relicina abstrusa* (also uncharacteristically saxicolous!) on exposed granite outcrop on top of a low mountain in the tropics. The species is clearly distinguished from all other five saxicolous *Arthothelium* species, which have a thick, chalky white thallus. Most of the species are known only from coastal rocks in Chile (Follmann 1968); another species is known from India (Makhija & Patwardhan, 1997), and a further species has been described from coastal rocks (in the splash zone) on the Antarctic Marion Island (Øvstedal & Gremmen, 2001). The new species differs from all other *Arthothelium* species by the smooth, brown thallus, but resembles some corticolous *Arthothelium* species, for example *A. dictyosporum*, from all of which it differs by the ascospore septation and the thalline chemistry (namely the presence of gyrophoric acid, which is absent in those corticolous taxa studied to date).

***Dimerella straminea* Aptroot & Seaward sp. nov.**

Thallus corticola, crustaceus, cinereo-albidus vel cinereo-viridescens. Apothecia 0.20–0.35 mm lata, orbicularia, basim versus arcte constricta, diu urceolata, discis luteolis, marginibus pallidioribus, integris vel paulum dentatis. Hymenium 45–55 µm altum, hyalinum. Excipulum hypotheciumque hyalinum. Paraphyses 1.5 µm crassae, cellulis terminalibus capitatis, usque 4 µm crassis. Ascospores in ascis biseriales, anguste ellipsoideae, 9–11 × 3–3.5 µm. Pycnidia non inventa.

Typus: Seychelles, Silhouette, on trail to Jardin Marron, alt. 220 m, on *Tabebuia*, 26 July 2000, M. R. D. Seaward (hb. Seaward 112463 in BRAD—holotypus).

(Fig. 2)

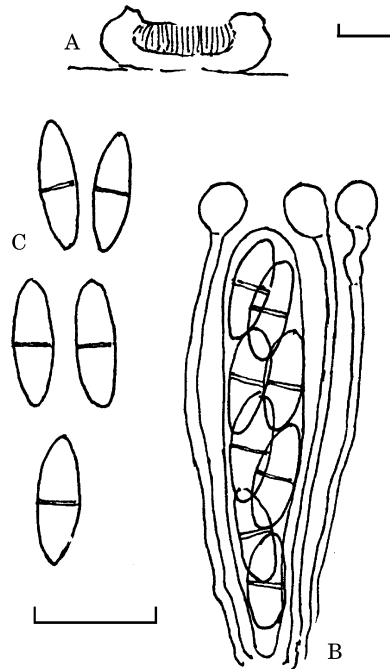


FIG. 2. *Dimerella straminea*, (type). A, apothecium; B, ascus; C, spores. Scales: A=0.1 mm; B & C=10 µm

Thallus crustose, not delimited, grey-white to grey-green, very thin (bark cells clearly visible from above), not areolate.

Apothecia 0.20–0.35 mm wide, orbicular, slightly waxy, more or less urn-shaped with constricted base, disc yellowish with paler, entire or slightly dentate margin. **Hymenium** 45–55 µm high, hyaline. **Excipulum** and **hypothecium** hyaline, pale blue in K/I, cells c. 3–4 µm diam., mostly globose, in an irregular pattern. **Paraphyses** 1.5 µm wide, with capitate terminal cells up to 4 µm wide. **Ascospores** biserialate, narrowly ellipsoid, 9–11 × 3–3.5 µm.

Pycnidia not observed.

Chemistry. Nil.

Notes. Listed as *Dimerella* sp. 2 in Seaward and Aptroot (2003). It is characterized by the nature and coloration of the apothecial discs and margins. This new species closely resembles *Dimerella dilucida* (Kremp.) R. Sant., a common foliicolous

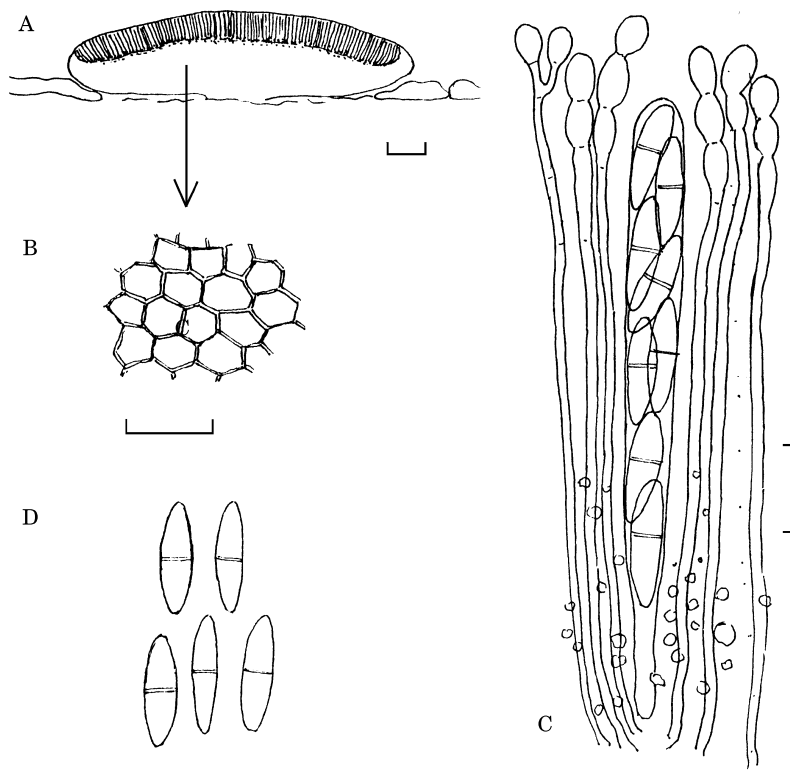


FIG. 3. *Dimerella subsquamosa* (type). A, apothecium; B, excipulum; C, ascus; D, spores. Scales: A=0.1 mm; B–D=10 μ m.

species which also rarely occurs on bark. It agrees in the small apothecia and ascospores, and the waxy texture, for which reason it was also known until recently under the synonymous name *Gyalecta perminuta* Vain. The new species differs mainly in having biseriata rather than irregularly uniseriate ascospores.

Dimerella subsquamosa Aptroot & Seaward sp. nov.

Thallus corticola, crustaceus, modice crassus, areolato-subsquamosus, flavus. Apothecia regulariter dispersa, orbicularia, biatorina, discis planis dein convexis, flava, basim versus arcte constricta sed non stipitata, 0.7–1.1 mm lata. Hymenium hyalinum, 70–90 μ m altum, in parte basali granulibus hyalinis adpersum. Excipulum hypotheciumque hyalinum. Paraphyses simplices vel in zona ephymeniali pro parte furcatae, 1.5 μ m crassae, 1–3 cellulis apicalibus inflatis, ad 4 μ m crassis. Ascospores anguste ellipsoideae, 12–15.5 \times 3–3.5 μ m. Pycnidia non inventa.

Typus: Seychelles, Silhouette, seashore, La Passe, on *Calophyllum*, 29 July 2000, M. R. D. Seaward (hb. Seaward 112497 in BRAD—holotypus; 112498 in BRAD—isotypus).

(Fig. 3)

Thallus crustose, dull, moderately thick, smooth or cracked areolate or nearly subsquamulose, distinctly yellow (of the same colour as the apothecia but paler), not delimited, or with a white hypothallus, areoles c. 0.1 mm diam, c. 50 μ m high.

Apothecia regularly dispersed, orbicular, biatorine, with flat, later convex disc, deep yellow with paler margin that remains visible, urn-shaped with constricted base but not stipitate, 0.7–1.1 mm wide. *Hymenium* hyaline, 70–90 μ m high, in K/I unchanged, but asci turning blue in K/I, interspersed with pale yellow granular exudate towards the

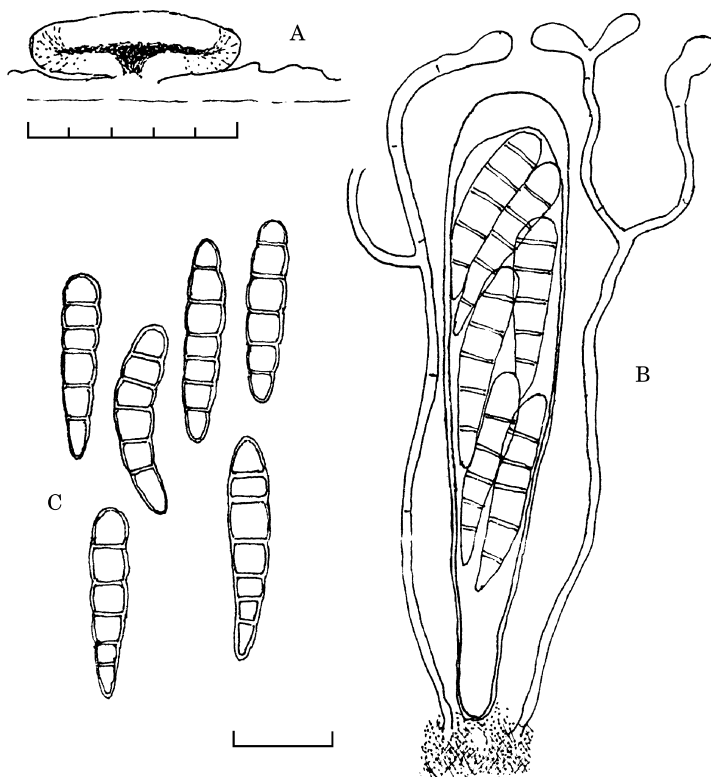


FIG. 4. *Fellhanera silhouettae* (type). A, apothecium; B, ascus; C, spores. Scales: A=0.5 mm; B & C=10 μ m.

base. *Excipulum* and *hypothecium* hyaline, but heavily interspersed with yellow pigments, cells *c.* 4–5 \times 5–8 μ m or 5–6 μ m diam., mostly in regular radial rows and often elongated in the radial direction. *Paraphyses* simple or partly furcate in the epihymenial zone, 1.5 μ m wide, 1–3 apical cells inflated, to 4 μ m wide. *Ascospores* narrowly ellipsoid, 12–15.5 \times 3–3.5 μ m.

Pycnidia not observed.

Chemistry. Nil.

Notes. Listed as *Dimerella* sp. 1 in Seaward and Aptroot (2003). It is characterized by the deep yellow apothecia and the yellow thallus. In external appearance, it is somewhat reminiscent of *Caloplaca flavovirescens* (Wulfen) Dalla Torre & Sarnth. The size of the apothecia is comparable to *Dimerella lutea* (Dicks.) Trevis., but the ascospores

are longer and the thallus is yellow, not green.

Additional specimens examined. **Seychelles:** *Silhouette*: seashore, NNW of La Passe, 27 July 2000, M.R.D. *Seaward* (hb. Seaward 112462 & 112499 in BRAD—paratypi).

***Fellhanera silhouettae* Aptroot & Seaward sp. nov.**

Thallus crustaceus, epiphloeodes vel muscicola, continuus, granuloso-leprosus, viridis. Apothecia orbicularia, basi arcte constricta, pallide fusca, primum plana marginibus indistinctis, demum discis elevatis, 0.35–0.5 (–0.8) mm lata, 0.1–0.5 mm alta. Excipulum laterale hyphis radiantibus plectenchymaticis, in parte subhymeniale paraplectenchymaticum. Hypothecium rubrofuscum, in KOH intense rubrum. Hymenium *c.* 70 μ m altum, hyalinum. Paraphyses flexuosae, ramosae, rarius anastomosantes, 1.5 μ m crassae, apicibus incrassatis ad 4 μ m crassis. Asci cylindrico-clavati, membranis in apicibus incrassatis, (4–) 6 (–8)-spori. Ascospores ellipsoideae vel in partibus apicalibus

paulum incrassatae, 5(–6)-septatae, ad septa paulum constrictae, $20\text{--}25 \times 4\text{--}5 \mu\text{m}$. Pycnidia ignota.

Typus: Seychelles, Silhouette, on trail to Jardin Marron, alt. 220 m, on base of *Tabebuia*, 26 July 2000, M. R. D. Seaward (hb Seaward 112495 in BRAD—holotypus).

(Fig. 4)

Thallus crustose, growing on bark or mosses, continuous, granulose-farinose, greyish green.

Apothecia orbicular, urn-shaped with constricted base, orange-brown with paler margin, firstly plane and with indistinct margin, later with elevated disc $0.35\text{--}0.5$ (– 0.8) mm wide, $0.1\text{--}0.5$ mm high. *Epihymenium* thin, pale brown. *Excipulum* pale brown, with radiating plectenchymatous hyphae up to $3 \mu\text{m}$ wide, the outermost hyphae slightly protruding, the subhymenial part paraplectenchymatous. *Hypothecium* orange-brown (intense red in KOH), apothecial base not aeruginose. *Hymenium* c. $70 \mu\text{m}$ high, hyaline. *Paraphyses* flexuose and branching, rarely anastomosing, $1.5 \mu\text{m}$ wide, apices thickened to $4 \mu\text{m}$. *Asci* cylindrical-clavate, with thickened apical membrane, tholus in K/I intense blue except for a thin central canal (*Byssoloma*-type), containing (4–) 6 (–8) spores. *Ascospores* elongate-clavate, subapical cells occasionally thickened, 5(–6)-septate, at the septa slightly constricted, $20\text{--}25 \times 4\text{--}5 \mu\text{m}$, 4–6 times as long as broad.

Pycnidia not present.

Notes. Listed as *Fellhanera* sp. in Seaward and Aptroot (2003). It is characterized by the orange-brown apothecia with orange-brown (in KOH red) hypothecium without aeruginose base and the slightly clavate,

5(–6)-septate spores. The foliicolous *Fellhanera subfuscatula* Lücking most closely resembles this species, but differs by the aeruginose apothecium base and the ascospores, which are consistently 5-septate and range from $14\text{--}26 \mu\text{m}$. Pycnidia, which distinguish the genera *Fellhanera* and *Fellhaneropsis*, are not present, but this species is so reminiscent of some other *Fellhanera* species that it is assigned with confidence to this genus here. The outermost hyphae of the excipulum are slightly protruding, but not like in the genus *Byssoloma*, which shares the same ascus type.

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