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Two new species of *Acanthothecis* (lichenized *Ascomycota*) from Brazil

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Abstract – *Acanthothecis kalbii* and *Acanthothecis pruinocarpa* are described as new species.

Key words – lichens, *Graphidaceae*, restinga, Paraná

Introduction

Acanthothecis Clem. is a genus of about 28 species (Staiger & Kalb 1999, Staiger 2002, Makhija & Adawadkar 2003, 2007; Archer 2006, 2007; Archer & Elix 2007, 2008) with a pantropical-subtropical distribution (Lücking & Rivas-Plata 2008). The genus is represented in Brazil by 11 species, eight of which were described from Brazilian material.

Acanthothecis is characterized by the presence of spiny paraphyses tips and/or periphysoids in combination with oval to oblong ascomata, uncarbonized to slightly carbonized exciples, entire to striate labia, and mostly clear hymenia. The ascospores are trans-septate to muriform, mostly I–, oblong and with a thin cell wall (Staiger & Kalb 1999, Lücking & Rivas-Plata 2008).

Materials and methods

The new species were described from specimens collected in restinga, which is typical Brazilian coastal vegetation, in Paraná State, Southern Brazil. The specimens were examined using standard stereoscopic and light microscopic examination. Sections of thalli and ascomata were mounted in water, 10% KOH and Lugol's Solution. All measurements were made in water. Chemical constituents were identified by thin layer chromatography (Culberson & Ammann 1979, Elix & Ernst-Russell 1993) and by comparison with authentic samples.

Taxonomic description

Acanthothecis kalbii Dal-Forno & Eliasaro, **sp. nov.** Fig. 1

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Differt ab A. nivalis *quia offert lirellas breviores, non prominentes, discum expositum et acidum norsticticum.*

Type: **BRAZIL. Paraná**: **Pontal do Paraná**. Pontal do Sul, 28.II.2008, S25°34'02.2" W48°22'01.8", *M. Dal-Forno 518* (**Holotype**–UPCB).

Etymology: The new species is named in honour of Dr. Klaus Kalb, from Lichenologisches Institut Neumarkt, Neumarkt, Germany.

Thallus corticolous, epiperidermal, 15–40 µm thick, continuous, with few crystals; surface smooth, corticate, dull, off-white. Ascoma lirelliform, concolorous with the thallus, immersed to erumpent, 0.3–0.5(–0.9) mm long, 0.15–0.25 mm wide, with conspicuous lateral thalline margin; disc exposed, pale grey white pruinose; labia entire, convergent; excipulum uncarbonized, poorly developed, 100 µm high, 15–20 µm thick, pale yellow. Hymenium clear, 50–60 µm high, 170–180 µm wide, hyaline, I–; epithecium pale brown, 5.0 µm high; hypothecium hyaline, 5.0 µm high; paraphyses unbranched, filiform, 1.0 µm thick, with spiny tips, hyaline; periphysoids unbranched, spiny, 10–20 µm long, 1.0–4.0 µm thick, hyaline; asci ellipsoid, 40–45 × 7–10 µm; ascospores 8 per ascus, hyaline, I–, ellipsoid, transversely 3–5-septate, 9–15 µm long, 4–5 µm wide, with thin cell wall and jelly-like halo.

Chemistry: thallus K+ yellow-red (forming red crystals in microscope sections), norstictic acid present.

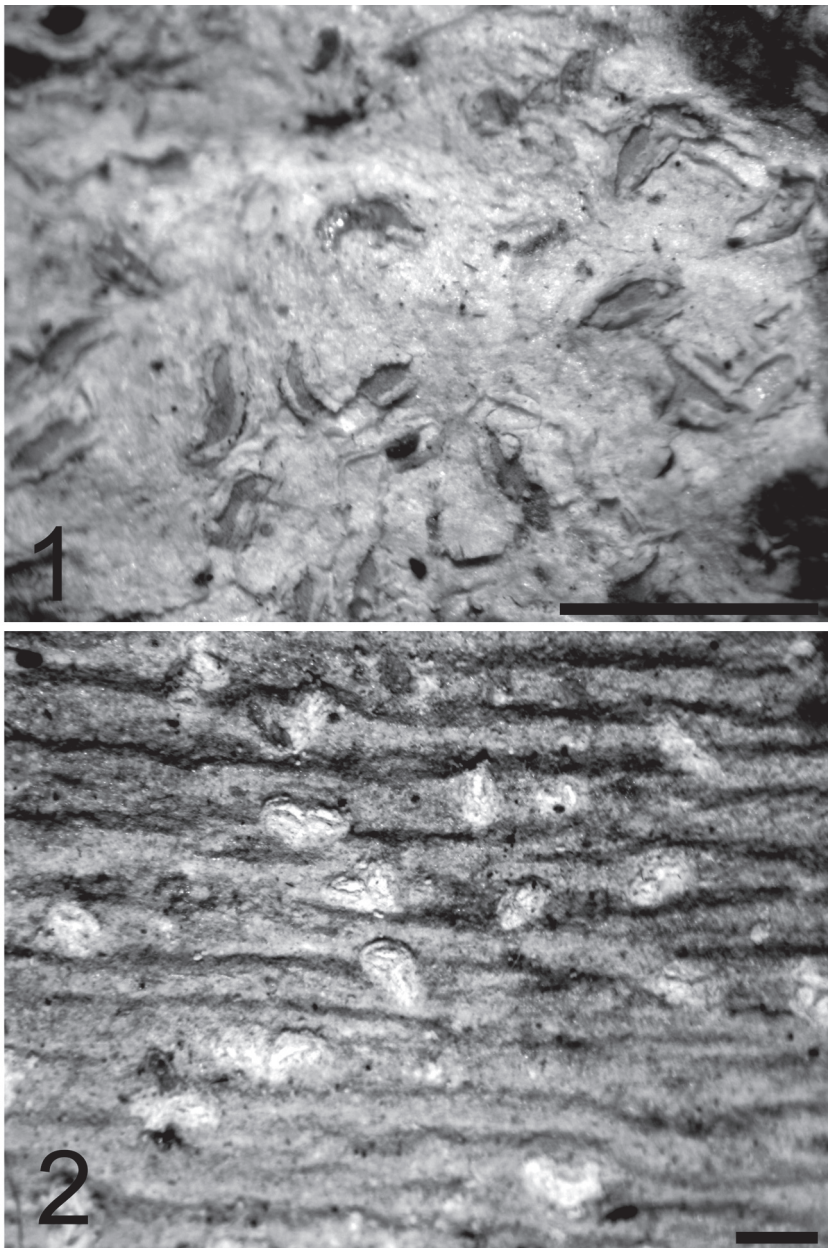
Additional specimens examined – **BRAZIL. Paraná**: **Pontal do Paraná**. Pontal do Sul, 28.II.2008, S25°34'11.1" W48°21'32.4" *M. Dal-Forno 491, 496b* (UPCB).

Comments – *Acanthothecis kalbii* is characterized by the oblong lirellae, with grey white pruinose discs, spiny paraphyses-tips and periphysoids, an uncarbonized excipulum, hyaline ascospores, I–, transversely 3–5-septate, 9–15 × 4–5 µm, and the presence of norstictic acid.

Acanthothecis nivalis Makhija & Adaw. shares some characteristics with *A. kalbii*, such as size and septation of ascospores and spiny paraphyses-tips and periphysoids. However, *A. nivalis* has prominent and longer (2–8 mm) lirellae, concealed discs, and psoromic acid (K–).

Acanthothecis kalbii resembles the saxicolous species *A. silicicola* (Redinger) Staiger & Kalb in size and septation of ascospores and presence of norstictic acid. However *A. silicicola* does not show the distinct spiny paraphyses-tips and periphysoids, present in *A. kalbii*.

Staiger & Kalb (1999) mentioned three *Acanthothecis* species that were well distinguished from other known *Acanthothecis* species but did not describe them as new for science because the material was too scarce. *Acanthothecis*



Figures 1–2: *Acanthothecis* species. 1: *A. kalbii* (holotype, UPCB); 2: *A. pruinocarpa* (holotype, UPCB); bars = 1mm.

kalbii closely resemble one of them, "*Acanthothecis farinosa*", which has an uncarbonized excipulum, trans-septate and small ascospores, a clear hymenium and norstictic acid but this species is distinguished from *A. kalbii* by the larger ascospores, 20–25 × 5–7 µm, 6–9-locular, the smooth paraphyses-tips and the ecorticate thallus when compared with *A. kalbii,* which has ascospores 9–15 × 4–5 µm, 4–6-locular, spiny paraphyses-tips and a corticate thallus.

Acanthothecis pruinocarpa Dal-Forno & Eliasaro, **sp. nov.** Fig. 2

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Differt ab A. corcovadensis *quia offert paraphyses spinosas, periphysoides breves, ascosporas minores et ascomata irregulariter disciformia.*

Type: **BRAZIL**. **Paraná**: **Pontal do Paraná**. Pontal do Sul, 28.II.2008, S25°34'02.2" W48°22'01.8", *M. Dal-Forno 553* (**Holotype**-UPCB).

Etymology: The specific epithet is derived from the Latin *pruina* (= a powdery deposit) + *carpus* (the Latin form of the Greek *karpos* = fruit), a reference to the ascoma with white pruina.

Thallus corticolous, epiperidermal, 40–80 µm thick, continuous, with crystals; surface smooth, corticate, dull, pale grey. Ascoma irregularly disciform, with powdery white pruina, erumpent to prominent, 0.5–1.0 mm long, 0.4–0.5 mm wide, with lateral thalline margin; disc concealed or slightly exposed, grey white pruinose; labia striate, convergent; excipulum uncarbonized, well developed, 180–240 µm high, yellow. Hymenium clear, 110–150 µm high, 160–180 µm wide, hyaline, I–; epithecium pale brown, 5.0 µm high; hypothecium indistinct; paraphyses unbranched, filiform, 1.0 µm thick, with spiny tips, hyaline; periphysoids unbranched, spiny, 10–20 µm long, 1.0–2.0 µm thick, hyaline; asci ellipsoid, 90–95 × 20–25 µm; ascospores 2 per ascus, hyaline, I–, ellipsoid, muriform, (11–)13–16 × 2–4-locular, 40–70 µm long, (7–)9–14 µm wide, with thin cell walls.

Chemistry: thallus K+ yellow, stictic acid and other stictic acid satellites present.

Additional specimens examined – **BRAZIL**. **Paraná**: **Pontal do Paraná**. Pontal do Sul, 28.II.2008, S25°34'11.1" W48°21'32.4" *M. Dal-Forno 349* (UPCB).

Comments – *Acanthothecis pruinocarpa* is characterized by the irregularly disciform ascomata, spiny paraphyses-tips and periphysoids, an uncarbonized excipulum, hyaline, muriform ascospores, I–, 2 per ascus, 40–70 × (7–)9–14 µm, and the presence of stictic acid.

Only three species of *Acanthothecis* with muriform ascospores and stictic acid as the major chemical compound are known, namely *Acanthothecis corcovadensis* (Redinger) Staiger & Kalb, *A. dialeuca* (Kremp.) Staiger & Kalb and *A. gyridia* (Stirt.) A.W. Archer.

Acanthothecis corcovadensis differs from *A. pruinocarpa* in having periphysoids that can reach more than 40 µm in length and ascospores longer than 90 µm and lirelliform ascomata (Staiger & Kalb 1999) whereas *A. dialeuca* and *A. gyridia* have smaller ascospores, up to 30 µm long, and lirelliform apothecia (Staiger 2002, Archer 2006), when compared with *A. pruinocarpa*.

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