

## Fungi from palms. X\*. *Lockerbia palmicola*, a new cleistothecial genus in the Sordariales

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*Lockerbia palmicola* gen. et sp. nov. is described from dead palm fronds in north Queensland. The genus belongs in the Sordariales and is characterised by having cleistothecial ascomata, cylindrical asci lacking apical structures and brown, oval to limoniform, unicellular ascospores, which have a minutely pitted wall ornamentation and are surrounded by a hyaline mucilaginous sheath. The genus is compared with *Anixiella*, *Diplogelasinospora* and *Gelasinospora*.

Keywords: *Anixiella*, *Diplogelasinospora*, *Gelasinospora*, *Lockerbia*, palm fungi, Sordariales

Studies on the microfungi on palms in tropical rainforests are few although early 20th century workers described several taxa (Sydow & Sydow 1917; Rehm, 1913, 1914; Hennings, 1908; Penzig & Saccardo, 1897). Most of these descriptions are short Latin paragraphs, lacking illustrations, and give little clue to the true identity of the fungi. Recent publications that have examined the palm habitat include those of Hyde (1992a) redescribing or monographing existing genera and Samuels & Rossman (1987) and Hyde (1992b) describing new ascomycetous species and genera. Matsushima (1980, 1989), Hyde & Sutton (1992), Rodrigues & Samuels (1990) have also described several deuteromycetes from palms. Studies in Australian tropical rainforests have yielded numerous new microfungi and such studies are needed to gain some ideas of the biodiversity of fungi that inhabit the world's rainforests.

In this paper a new cleistothecial genus is described from dead palm fronds in north Queensland. It is placed in the Sordariales.

***Lockerbia*** K. D. Hyde, gen. nov.

Ascomata cleistothecia, globosa, superficialia, brunnea, membranacea, pariete ascomatis laevi. Peridium cellulis angularibus compositum. Paraphyses adsunt. Asci

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\* IX in *Sydowia* 45: 246–251 (1993).

octospori, cylindrici, tenuitunicati, unitunicati, pedunculati, ad apicem rotundati, apparato apicali non praediti. Ascosporae unicellulares, limoniformes vel ovaes, crassitunicatae, foveolatae, tunica gelatinosa praeditae.

Typis generis: *Lockerbia palmicola* K. D. Hyde

**Etymology.** – From ‘Lockerbie’, the type locality.

**Ascomata** cleistothecial, sphaerical, superficial, dark-brown, membranous, thin-walled, opening by splitting of the ascomata. – **Peridium** thin, comprising several layers of elongate cells which are black and undifferentiated externally. – **Paraphyses** hypha-like, filamentous, numerous, hyaline, branching and anastomosing and embedded in a gelatinous matrix. – **Asci** 8-spored, cylindrical, unitunicate, pedunculate, apically rounded and lacking apical structures. – **Ascospores** unicellular, limoniform or oval, brown, thick-walled, minutely pitted and surrounded by a hyaline sheath.

Type species: *Lockerbia palmicola* K. D. Hyde

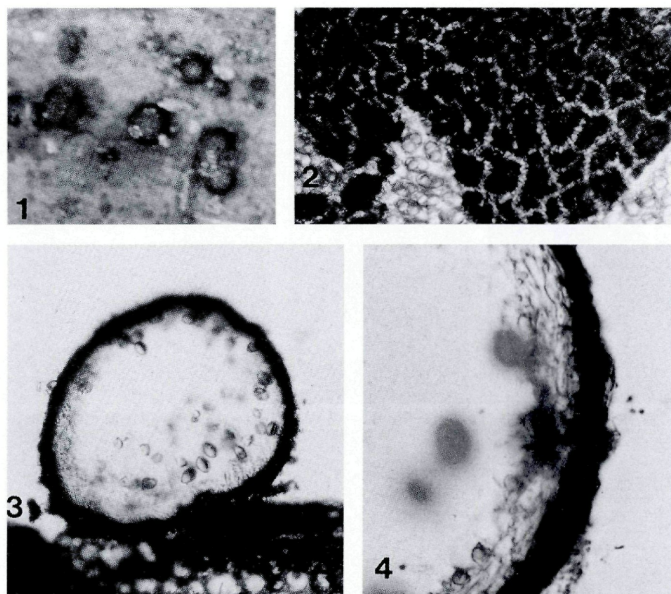
***Lockerbia palmicola*** K. D. Hyde, sp. nov. – Figs. 1–12.

Ascomata cleistothecia, 260–390  $\mu\text{m}$  diam, globosa, superficialia, brunnea, membranacea, pariete ascomatis laevi. Peridium ad 20  $\mu\text{m}$  crassum, cellulis angularibus compositum. Paraphyses adsunt. Asci 120–160  $\times$  16–20  $\mu\text{m}$ , octospori, cylindrici, recti vel curvati, tenuitunicati, unitunicati, pedunculati, ad apicem rotundati, apparato apicali non praediti. Ascosporae 18–24  $\times$  13–16  $\mu\text{m}$ , unicellulares, limoniformes vel ovaes, brunneae, crassitunicatae, foveolatae et tunica gelatinosa praeditae.

**Holotype.** – AUSTRALIA: north Queensland, ‘Lockerbie’ rainforest, on dead palm rachides (possibly *Archontophoenix*) on forest floor, Feb. 1992, K.D. Hyde, 1052, BRIP 21334.

**Etymology:** from palm and –cola, meaning ‘dwelling on palms’.

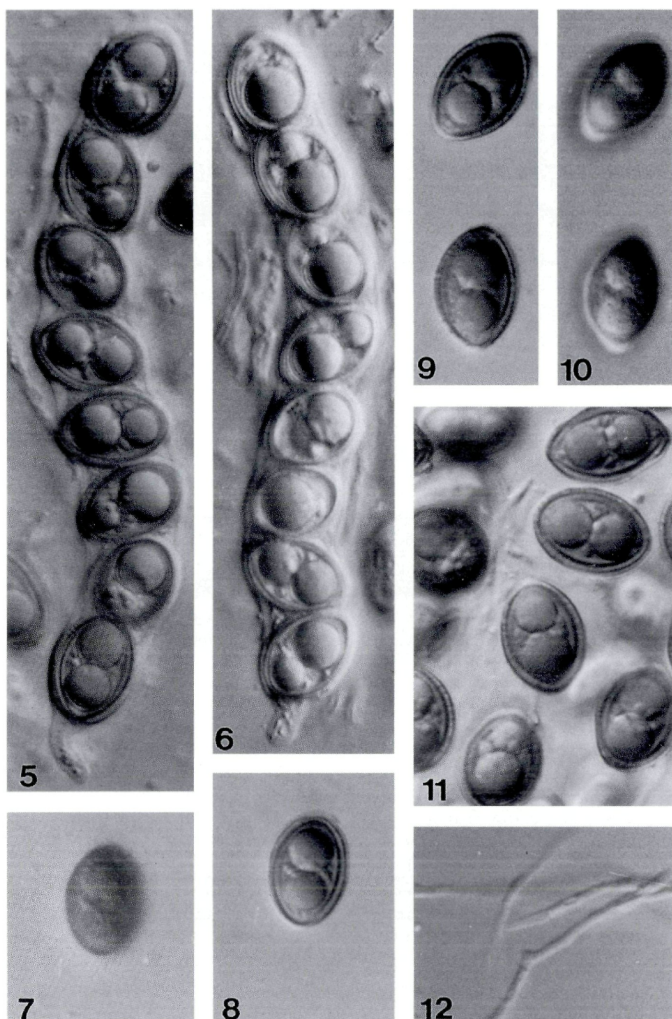
**Ascomata** 260–390  $\mu\text{m}$  diam, sphaerical, superficial, cleistothecial, dark-brown, membranous, thin-walled, opening by splitting of the ascomata (Figs. 1, 3). – **Peridium** thin, to 20  $\mu\text{m}$  wide, comprising two layers; inwardly hyaline elongate cells; and an outer layer of black undifferentiated tissue, in surface view mottled with angular patches separated by light lines (Figs. 2, 4). – **Paraphyses** up to 2  $\mu\text{m}$  wide, hypha-like, filamentous, numerous, hyaline, branching and anastomosing and embedded in a gelatinous matrix (Fig. 12). – **Asci** 120–160  $\times$  16–20  $\mu\text{m}$ , 8-spored, cylindrical, straight or curved, thin-walled, unitunicate, with a knob-like peduncle, apically rounded and lacking any apical structures (Figs. 5, 6). – **Ascospores** 18–24  $\times$  13–16  $\mu\text{m}$ , unicellular, limoniform or



Figs. 1-4. *Lockerbia palmicola*. - 1. Cleistothecia on host surface. - 2. Surface structure of peridium. - 3. Section of ascoma. - 4. Peridium. Bars 1 = 1 mm; 2, 4 = 10  $\mu$ m; 3 = 50  $\mu$ m.

oval, brown, thick-walled, wall with a minutely pitted ornamentation and lacking germ pores, but thin at the apices, and surrounded by a hyaline mucilaginous sheath (Figs. 7-11).

Both *Anixiella* Saito & Minoura and *Diplogelasinospora* Cain should be compared with *Lockerbia*. In *Anixiella* asci are broadly clavate with an indistinct thickened ring in the apex, with paraphyses existing only early in ascomatal development. Ascospores are broadly ellipsoidal, brown, and thick-walled with circular or slightly irregular, hyaline pits (Cain, 1961; Uecker, 1979). *Anixiella* is considered a synonym of *Gelasinospora* by von Arx (1982), but reasons for their separation are presented by Uecker (1979). In *Diplogelasinospora* asci are cylindrical with an indistinct, thickened and evanescent apical ring, while ascospores are two-celled, with one cell being hyaline and one becoming black and opaque. The ascospore wall is also pitted (Cain, 1961; von Arx, 1982). *Lockerbia* differs from



Figs. 5–12. Interference contrast micrographs of *Lockertia palmicola*. – 5, 6. Asci. 7–11. Ascospores. Note the mucilage sheath in 7, 10 & 11 and wall ornamentation in 8, 9. 12. Paraphyses. Bars – 10  $\mu\text{m}$ .

both genera, presently included in the Sordariaceae (Barr, 1990), but is closely related, having unicellular sheathed ascospores, persistent asci and paraphyses, and cylindrical asci lacking apical structures. *Lockerbia* appears to have only recently evolved as a cleistothecial fungus having retained the ascal presence and shape at maturity, but having lost the apical ring. Although single spore isolations were attempted, the ascospores did not germinate.

The taxonomic placement of *Lockerbia* is difficult to establish, since the ascomata are cleistothecial, the asci are cylindrical and unitunicate, lacking any apical structures and there are numerous paraphyses. It seems best placed in the Sordariales. The combination of cleistothecioid ascomata with cylindrical asci is most unusual and indicate the genus can neither be included adequately in the Tripterosporeaceae or Sordariaceae of the Sordariales (*sensu* Barr, 1990). The lack of an apical ring supports inclusion in the Tripterosporeaceae, but in this family asci are inflated ellipsoid or short clavate. The Sordariaceae is also unsuitable since asci are clavate in cleistothecial forms, while there is no ascal apical annulus in *Lockerbia*. However, since *Diplogelasinospora* has cylindrical asci and is placed in the Sordariaceae by Barr (1990), *Lockerbia* can presently be included here.

Few sordariaceous genera are known from palms. Two species of *Sordaria* Ces. & de Not., *S. consanguinea* Ces. and *S. palmicola* Auerw. are described from *Sabal* and *Chamaerops* respectively, however these fungi belong in *Anthostomella* Sacc. (Saccardo, 1882; Francis, 1975; Hyde, unpublished). *Lockerbia palmicola* is unlike any *Anthostomella* species described from palms. Several lasiosphaeriaceous taxa are also described from palms, but these have hyaline ascospores (Hyde, 1992a, 1992b).

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