

Cocoicola livistoncola, sp. nov., and notes on *Cocoicola cylindrospora* from palms

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Accepted for publication 9 June 1997

Cocoicola livistoncola, a new species from senescent petioles of *Livistona chinensis* in Hong Kong, is described. It differs from previously reported *Cocoicola* species in having differently shaped ascospores. Notes on *Cocoicola cylindrospora* which was recently collected on *Cocos nucifera* in the Seychelles are also provided.

Key Words—palm fungi; Phaeochoraceae; Phyllachorales; systematics.

Cocoicola K.D. Hyde was introduced to accommodate *Anthostomella cylindrospora* C. Booth & D.E. Shaw (type species) and *Anthostomella fusispora* C. Booth & D.E. Shaw (Hyde, 1995). Hyde (1995) discussed the peculiarities of the genus and Hyde et al. (1997) proposed a new family, the Phaeochoraceae (Phyllachorales), to accommodate *Cocoicola*, *Phaeochora* Höhn. and *Serenomyces* Petr. Species in the family have several features in common; brown unicellular ascospores; clavate to saccate evanescent asci, ascomata developing in an often complex pseudostroma; and a palm host (Hyde et al., 1997).

In *Cocoicola cylindrospora* (C. Booth & D.E. Shaw) K.D. Hyde and *Cocoicola livistoncola* sp. nov., the ascomata fuse into relatively large blister-like swellings on the host epidermis, and release their ascospores as a cirrus through common ostioles. The cavities are surrounded by a characteristic pseudostroma comprising host cells filled with brown hyphae and pseudoparenchymatous fungal cells. When cut open a reddish brown ascospore mass is revealed.

In *C. cylindrospora* ascospores are relatively large (greater than 40 μm long) and cylindrical (Booth and Shaw, 1968; Hyde, 1995). A collection of this species was recently made in the Seychelles and several new observations arise from this collection.

In *Cocoicola fusispora* (C. Booth & D.E. Shaw) K.D. Hyde ascospores are fusiform and covered in inconspicuous wall striations. We have also collected a third species of *Cocoicola* from *Livistona chinensis* (Jacq.) R. Br. in Hong Kong. It differs from *C. fusispora* in having differently shaped ascospores and is here described as new.

Materials and Methods

Materials of all species were collected from the petioles of palms. We have been unable to germinate the ascospores on agar.

Taxonomy

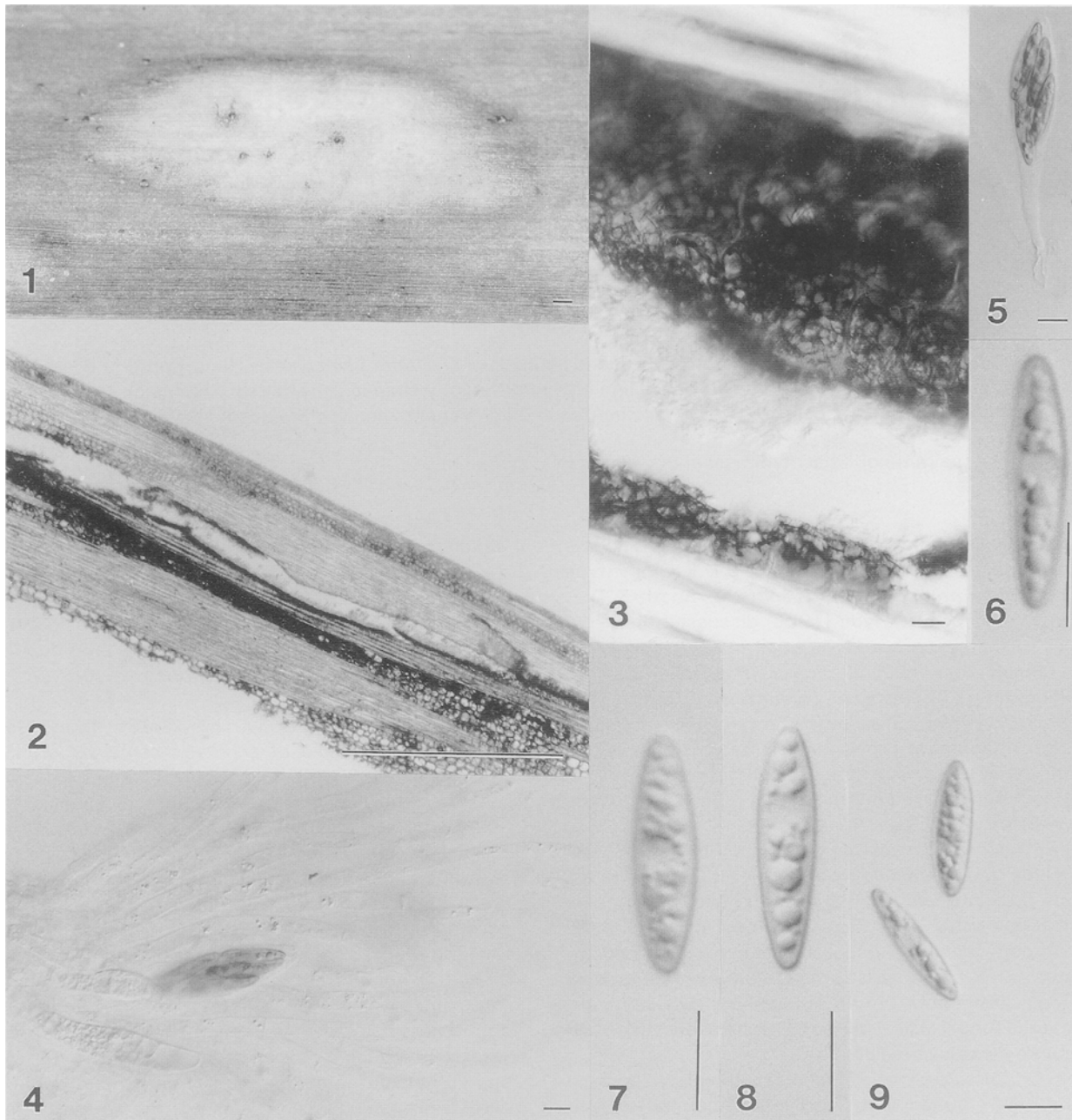
Cocoicola livistoncola K.D. Hyde, J. Fröhlich & J.E. Taylor, sp. nov. Figs. 1–9

Cocoicola fusispora (Booth & D.E. Shaw) K.D. Hyde affinis sed differt ascoporis fusiformibus utrinque rotundatibus 21–27.5 \times 5.5–7 μm .

Holotypus: Hong Kong: N.T., Tai Po, Island House, on senescent petiole of *Livistona chinensis*, 19 Sept. 1993, J. Fröhlich (HKU(M)JF194).

Stromata visible on the host surface only as irregular shallow domed regions, 3–26 mm long, 2–16 mm wide, uniloculate, the ostioles visible as small holes lined with blackened fungal tissue (Fig. 1); in section ascomatal walls appear to have disintegrated to form a cavity occupying the entire raised region, 100–200 μm high, tapering towards the sides (Fig. 2). In horizontal section circular regions of cells are cross sections of the pillars that separate the upper and lower regions of the pseudostromata. In vertical section these columns of pigmented palisade-like cells occur throughout the cavity and do not form a continuous wall around individual ascomata, but function to separate the upper and lower pseudostromata. A pseudostroma of host cells filled with sparse brown hyphae and pseudoparenchymatous fungal cells (sides and base) surround the fruiting body (Fig. 3). Ostioles, few per pseudostroma, umbilicate, lined with periphyses (Fig. 1). Paraphyses 5–7.5 μm wide, hypha-like, septate, tapering distally, deliquescing early (Fig. 4). Asci clavate or fusoid, 52.5–75 \times (11.25–)13.5–17.5(–20) μm (\bar{x} = 63.05 \times 15.75 μm , n = 25), thin walled, unitunicate, without apical thickenings, deliquescing early (Figs. 4, 5). Ascospores fusiform with rounded ends, 21–27.5 \times 5.5–7 μm (\bar{x} = 23.85 \times 6.07 μm), pale reddish brown, aseptate, thin-walled, with an ornamentation of fine oblique striations, without a gelatinous sheath (Figs. 6–9).

Habitat: On recently senescent *Livistona chinensis* rachides and petioles.



Figs. 1-9. *Cocoiocola livistonicola*.

1. Appearance of the fungus on host surface. 2. Section through pseudostroma. 3. Section of pseudostroma illustrating cells. 4. Paraphyses and developing ascus. 5. Ascus. 6-9. Ascospores. Bars: 1, 2, 1 mm; 3-9, 10 μm.

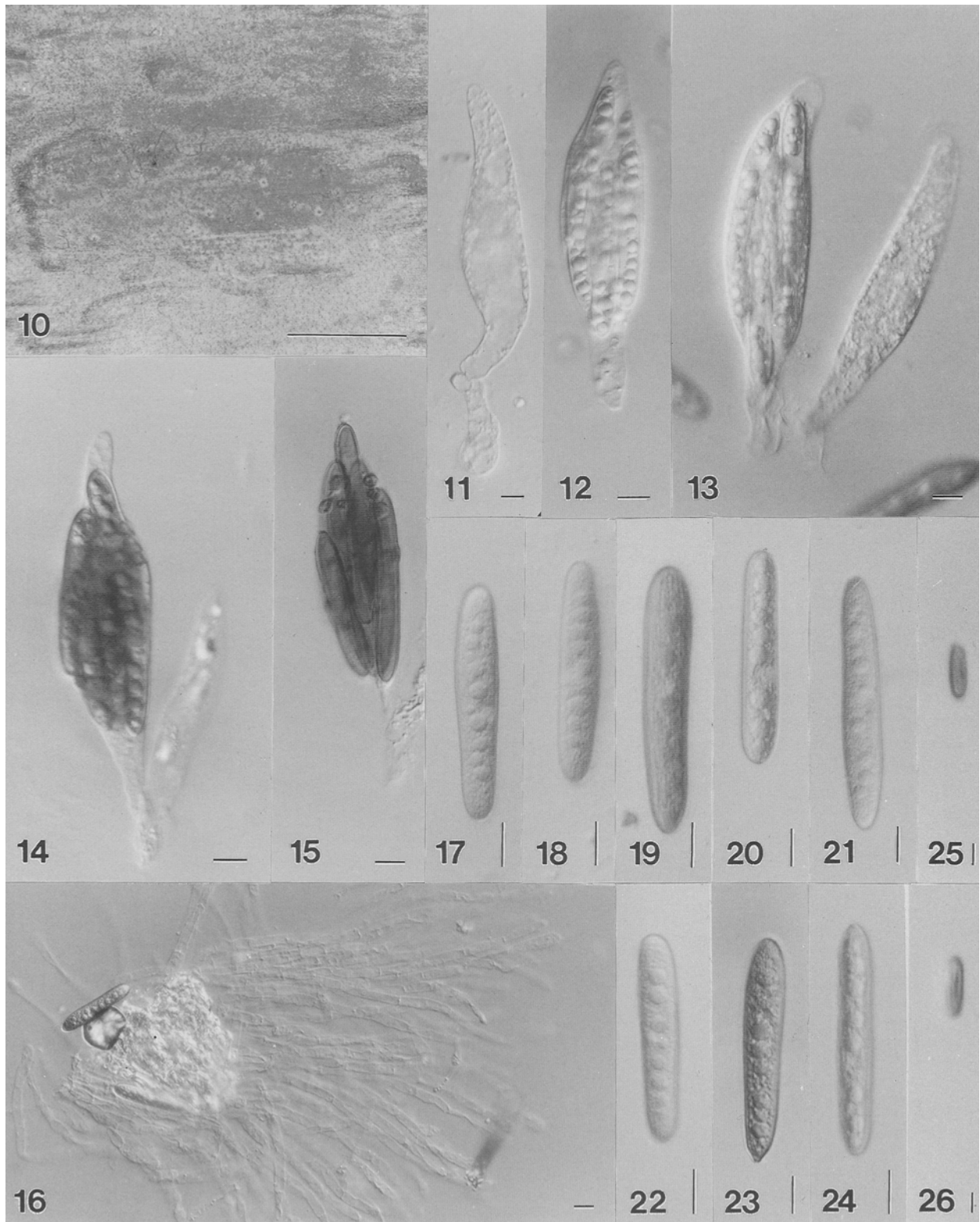
Known distribution: Hong Kong.

Other material examined: Hong Kong: The Peak, on senescent petiole of *Livistona chinensis*, 15 July 1996, K.D. Hyde (HKU(M)2620).

Cocoiocola livistonicola differs from *C. fusispora* in having ascospores with rounded as compared to acute ends.

Cocoiocola cylindrospora (Booth & D.E. Shaw) K.D. Hyde, *Nova Hedwigia* **60**: 600. 1995. Figs. 10-26

Stromata visible from the host surface only as irregular shallow blister-like regions, 1.5-5 mm long, 0.7-3 mm wide, uniloculate, the ostioles visible as small holes lined with blackened fungal tissue (Fig. 10); in section ascomatinal walls appear to have disintegrated to form a cavity occupying the entire raised region, 100-200 μm high, tapering towards the sides. In horizontal section circular regions of cells are cross sections of the pillars that separate the upper and lower regions of the pseudostromata. In vertical section these columns of pigment-



Figs. 10–26. *Cocoicola cylindrospora*.

10. Appearance of fungus on host surface. 11–15. Developing and mature asci. 16. Paraphyses and developing ascus. 17–24. Type 1 ascospores. 25, 26. Type 2 ascospores. Bars: 10, 1 mm; 11–26, 10 μm.

ed palisade-like cells occur throughout the cavity and do not form a continuous wall around individual ascoma, but function to separate the upper and lower pseudostromata. A pseudostroma of host cells filled with sparse brown hyphae (sides and base) surrounds the fruiting body. Ostioles, few per pseudostroma, umblicate, lined with paraphyses. Paraphyses 4–7.5 μm wide, hypha-like, septate, unbranched, tapering slightly, with swollen ends (Fig. 16). Asci fusoid, 90–114 \times 22–28 μm , thin walled, unitunicate, pedicel indistinct, without apical thickenings, deliquescing early (Figs. 11–15). Ascospores dimorphic; 1) 35–62 \times 8–10 μm , mainly cylindrical with slightly acute ends, some clavate, pale reddish brown, aseptate, thin-walled, with longitudinal striations, lacking a gelatinous sheath, with a nipple-like scar (possibly a germ pore) at one end (Figs. 17–24), or 2) 4–12 \times 3–4 μm , rounded to fusiform, and reddish brown (Figs. 25, 26).

Habitat: On recently senescent *Cocos nucifera* L. rachides and petioles.

Known distribution: Papua New Guinea, Seychelles.

Material examined: Seychelles: North Point, on senescent petiole of *Cocos nucifera*, Aug. 1996, K.D. Hyde (HKU(M)2626, holotype); Barbarons, on senescent petiole of *Cocos nucifera*, Aug. 1996, K.D. Hyde (HKU(M)4241); *ibid.*, K.D. Hyde (HKU(M)4246).

The ascomata of *C. cylindrospora* were illustrated by Hyde (1995) as a large, cylindrical cavity with an individual central ostiole. This representation is confusing; in the collection from the Seychelles the pseudostromata are uniloculate, with ostioles visible as small holes lined with blackened fungal tissue; in section ascomatal walls appear to have disintegrated to form a cavity occupying the entire raised region, tapering towards the sides. Asci and paraphyses which are lacking in the type collection in this species (and genus) are illustrated here for the first time. It was also found that *C. cylindrospora*

produces dimorphic ascospores, and their presence in asci was confirmed.

These species on palms are relatively inconspicuous and easily overlooked. The ascomata form under uncoloured blister-like swellings on recently dead palm rachides, still attached to the mother tree. Even if there has been little rain the fungus can still develop on the relatively damp (moisture in the sap) senescent fronds. The older fallen fronds quickly dry and in these specimens the swellings contain a mass of dry ascospores. This indicates an endophytic relationship, the species being present within the living frond, and then taking up a saprophytic lifestyle on the damp, recently dead rachides. At this early stage in decay there are usually no other fungi sporulating on the rachides.

If *Cocciola* is a host specific endophyte, further collections from recently dead rachides of palms should reveal other new species. Numerous species of the suspected endophyte *Oxydothis* have been found when examining new hosts (Hyde, 1994).

Acknowledgements—We thank H. Leung, A. Southern and A.Y.P. Lee for technical assistance. Thanks are extended to Dr. T. K. Goh for commenting on the draft manuscript.

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