

COCOICOLA

Cocoicola K.D. Hyde, *Nova Hedwigia* **60**: 600 (1995).

Type species: *Cocoicola cylindrospora* (C. Booth & D.E. Shaw) K.D. Hyde.

Ascomata developing beneath light brown blister-like regions on the host surface, colouring the underlying tissue, visible as scattered ostiolar dots, strongly flattened, irregular, with a central ostiole or a series of separate ostioles when individual ascomata fuse. *Stroma* present above and below ascomata, comprising host cells filled with brown irregular hyphae. *Peridium* comprising angular dark brown cells. *Interascal tissue* composed of wide, cylindrical paraphyses, tapering towards the apex, very thin-walled, evanescent at an early stage. *Asci* 6–8-spored, clavate, thin-walled, without separable wall layers, the apex rounded, without apical structures. *Ascospores* arranged multiseriately, cylindrical or fusiform, yellow or olivaceous, unicellular, with narrow irregular longitudinal striations.

Notes: *Cocoicola* was introduced to accommodate *Anthostomella cylindrospora* C. Booth & D.E. Shaw and *A. fusispora* C. Booth & D.E. Shaw (Hyde, 1995a). In *C. cylindrospora* the ascospores are cylindrical and relatively large (> 40 µm long), and their striations immediately invite comparison with *Serenomyces* Petr. *Cocoicola cylindrospora* differs significantly from *Serenomyces* as circumscribed here, species of which have shorter (< 30 µm) fusiform ascospores and smaller, exclusively uniloculate ascomata which usually have elongated necks. We therefore retain *Cocoicola* as a distinct genus. *Cocoicola fusispora* resembles *Serenomyces californica* in having ascomata which are apparently multi-ostiolate and lack necks; ascospores are fusiform in both species. *Serenomyces californica* is accordingly transferred to *Cocoicola*, and two further species found on *Livistona* are also included.

Most previous accounts of the genus have stated that interascal tissue is absent, but Hyde *et al.* (1997b) have observed copious wide, thin-walled paraphyses in young fresh material of two species of *Cocoicola*, which deliquesce and are not detectable in dried material.

Key to species of *Cocoicola*

- | | | |
|-------|--|----------------------|
| 1 | Ascospores cylindrical with rounded ends, dimorphic with one morph pale brown and 35–62 × 8–10 µm, the other reddish-brown and 4–12 × 3–4 µm | cylindrospora |
| | Ascospores fusiform or fusiform-ellipsoidal, not dimorphic | 2 |
| 2 (1) | Ascospores > 21 µm long | 3 |
| | Ascospores < 21 µm long | 4 |
| 3 (2) | Ascospores 28–37 × 8.5–11 µm, broadly fusiform, with acute ends | fusispora |
| | Ascospores 21–27.5 × 5.5–7 µm, narrowly fusiform, with rounded ends | livistoncola |
| 4 (2) | Ascospores 16–21 × 5.5–6.5 µm, fusiform, with acute ends | californica |
| | Ascospores 14.5–19 × 6.5–8 µm, fusiform-ellipsoidal, one end obtuse (very rarely slightly apiculate) and the other end rounded | piperata |

Cocoicola californica (M.E. Barr, Ohr & M.K. Murphy) K.D. Hyde & P.F. Cannon, **comb. nov.**
Serenomyces californica M.E. Barr, Ohr & M.K. Murphy, *Mycologia* **81**: 50 (1989).

Lesions: *Stromata* visible as a raised region to 25 mm long and 18 mm wide, with numerous ostiolar dots.

Anamorph: Not known.

Teleomorph: *Ascomatal cavity* occupying the entire raised region, to 160 µm high, tapering towards the edges, with scattered rounded pillars forming a palisade extending from floor to roof. *Stromatic tissue* surrounding the cavity, composed of host cells occupied by sparse brown hyphae at the side and by hyaline cells above, with an inner peridial layer composed of angular cells with thick brown walls. *Interascal tissue* composed of short wide very thin-walled hypha-like filaments. *Asci* c. 40 × 25–30 µm (Barr *et al.*, 1989), clavate-saccate, thin-walled at all stages, without separable wall layers, short-stalked, the apex rounded, with an inconspicuous apical ring which does not blue in iodine, 8-spored. *Ascospores* arranged multiseriately, 16–21 × 5.5–6.5 µm, fusiform, both ends acute, pale brown, aseptate, with delicate longitudinal striations, without a gelatinous sheath.

Typification: USA: California: Riverside, University of California at Riverside, on dead rachis of *Washingtonia filifera*, Mar. 1987, H.D. Ohr s. num. (BPI!, holotype, MASS, UCR, isotypes of *Serenomyces californica*).

Illustrations: Figs 2, 3.

Host: *Washingtonia filifera* (Linden) H. Wendl.

Distribution: USA (California); known only from a few collections in the south of the state.

Notes: The species can only be distinguished reliably from the others recognized here by details of ascospore size and shape. *Cocoicola californica* is considered to be a biotrophic fungus at least for part of its life cycle, but its capability of saprobic growth was demonstrated by Barr *et al.* (1989) through its successful culture, although sporulation was not achieved. Growth in standard culture conditions is a further reason to suppose that the *Phaeochooraceae* and *Phyllachoraceae* are distantly related, although other members of the former family (e.g. *C. cylindrospora*) have not been successfully cultured.

The type material also contains stromata of *Phaeochooropsis neowashingtoniae*.

Cocoicola cylindrospora (C. Booth & D.E. Shaw) K.D. Hyde, *Nova Hedwigia* **60**: 600 (1995).

Anthostomella cylindrospora C. Booth & D.E. Shaw, *Papua New Guin. agr. J.* **19**(2): 98 (1967, publ. 1968).

Lesions: Very inconspicuous, visible only as irregular, sometimes elongated, light brown blisters to 30 mm diam., rarely to 300 mm long (Booth & Shaw, 1968), the ascomata apparent only as patches of minute ostiolar dots.

Anamorph: Not known.

Teleomorph: *Stromata* composed of extended, very deeply immersed structures, either with fused locules or multi-ostiolate, developing into strongly flattened chambers partially divided by longitudinal columnar structures composed of tissue intermediate between *textura perfecta* and *angularis*, thin-walled cells with very varied amounts of melanin deposits. Tissues above and below *ascomatal cavity* composed of host cells filled with irregular brown hyphae. *Peridium* composed of an outer layer of rather thin-walled angular dark brown cells

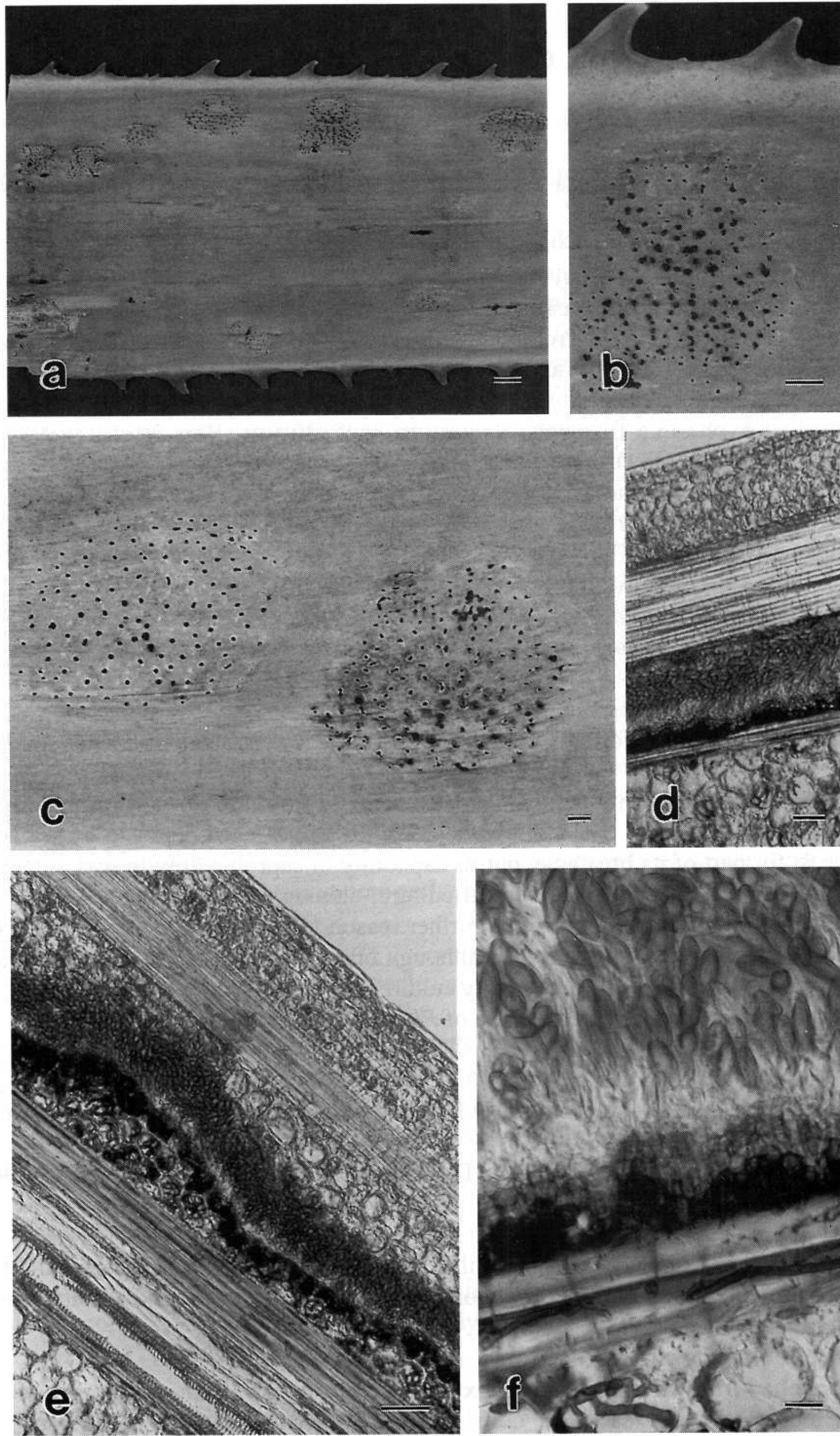
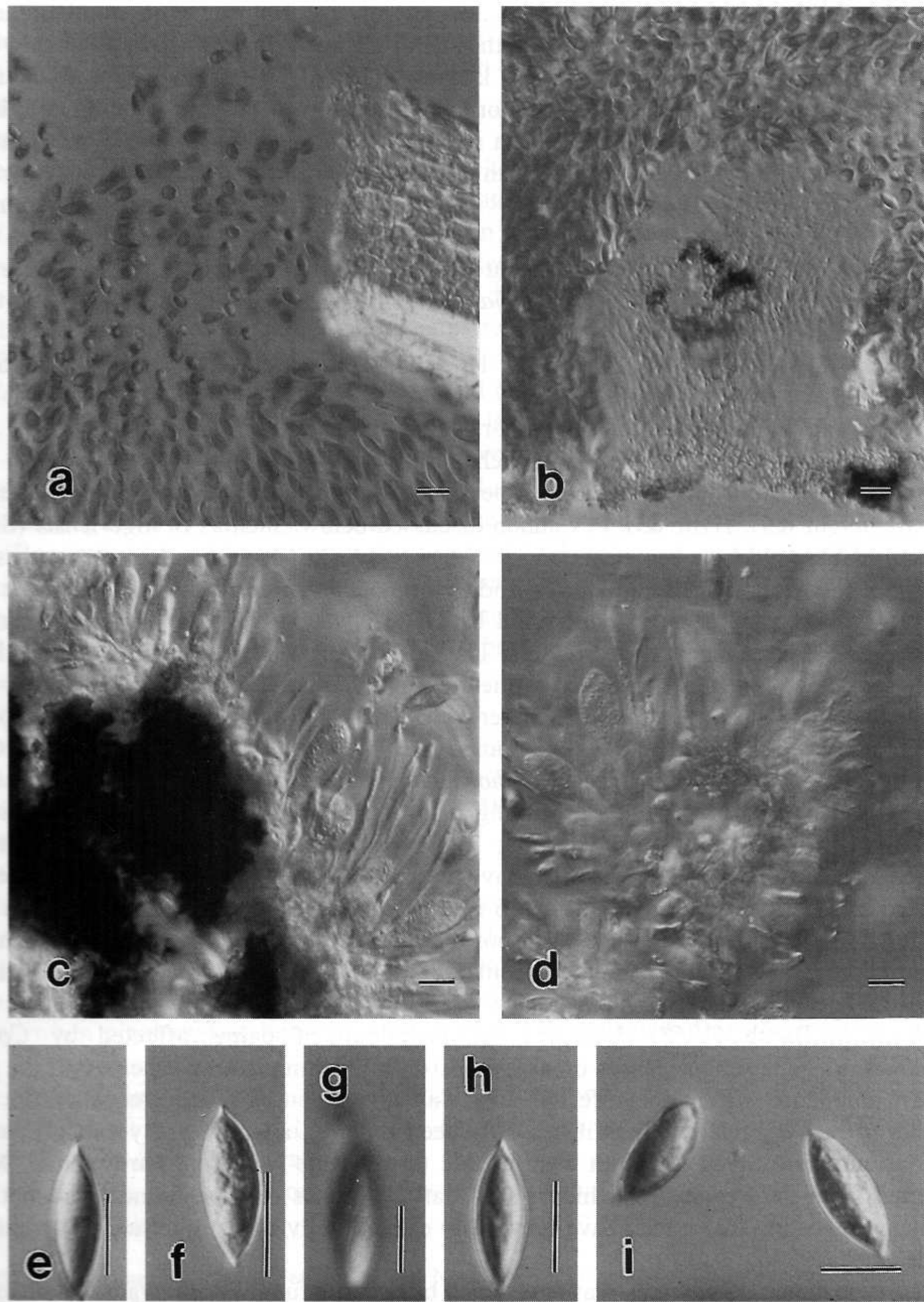


Fig. 2. *Coccoicola californica* (holotype). **a-c**, external views of stroma on host surface (**a** & **c**, bar = 20 μm ; **b**, bar = 10 μm); **d-f**, vertical sections of stromata; note the stromatic tissue in **e** and **f** (**d** & **e**, bar = 50 μm ; **f**, bar = 10 μm).

Fig. 3. C
cells at ba
e-i, ascos



Coccoicola
 Coccoicola
 → 100 μm

region near ostiole (bar = 20 μm); b, columns of hyaline cells at base of stroma (bar = 20 μm); c & d, squash mounts of asci and interascal tissue (bar = 20 μm); e-i, ascospores with acute ends (bar = 10 μm).

Fig. 3. *Coccoicola californica* (holotype). **a**, region near ostiole (bar = 20 μm); **b**, columns of hyaline cells at base of stroma (bar = 20 μm); **c** & **d**, squash mounts of asci and interascal tissue (bar = 20 μm); **e-i**, ascospores with acute ends (bar = 10 μm).