

Dactylospora mangrovei sp. nov. (Discomycetes, Ascomycota) from mangrove wood

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A new species *Dactylospora mangrovei* is described and illustrated and compared with *D. haliotrepha* and *D. canariensis*, all marine inhabiting species. *Dactylospora haliotrepha* and *D. mangrovei* are tropical/sub-tropical mangrove species collected in Hong Kong, Malaysia, Taiwan and Thailand, while *D. canariensis* was described from temperate waters. A map of the geographical distribution of the three marine *Dactylospora* species is presented.

Key Words—Ascomycota; marine fungi; new species; taxonomy.

Few Discomycetes have been reported from the marine milieu and this may be accounted for by their general putrescent fruit bodies, size, and an exposed hymenium (Jones and Mitchell, 1996). Currently three marine Discomycetes are known: *Dactylospora haliotrepha* (Kohlm. & E. Kohlm.) Hafellner, *D. canariensis* Kohlm. & Volkm.-Kohlm. and *Gloniella clavatispora* Steinke & K. D. Hyde (Kohlmeyer, 1967; Kohlmeyer and Volkmann-Kohlmeyer, 1998; Steinke and Hyde, 1997).

During our examination of drift mangrove wood for marine fungi in Hong Kong, Malaysia, Taiwan and Thailand (Jones and Kuthubutheen, 1989; Alias, Kuthubutheen and Jones, 1994; Vrijmoed, Jones and Hyde, 1994; Whalley, Jones and Alias, 1994) an undescribed species of *Dactylospora* was encountered.

Dactylospora mangrovei E. B. G. Jones, Alias, Abdel-Wahab & S.-Y. Hsieh, sp. nov.

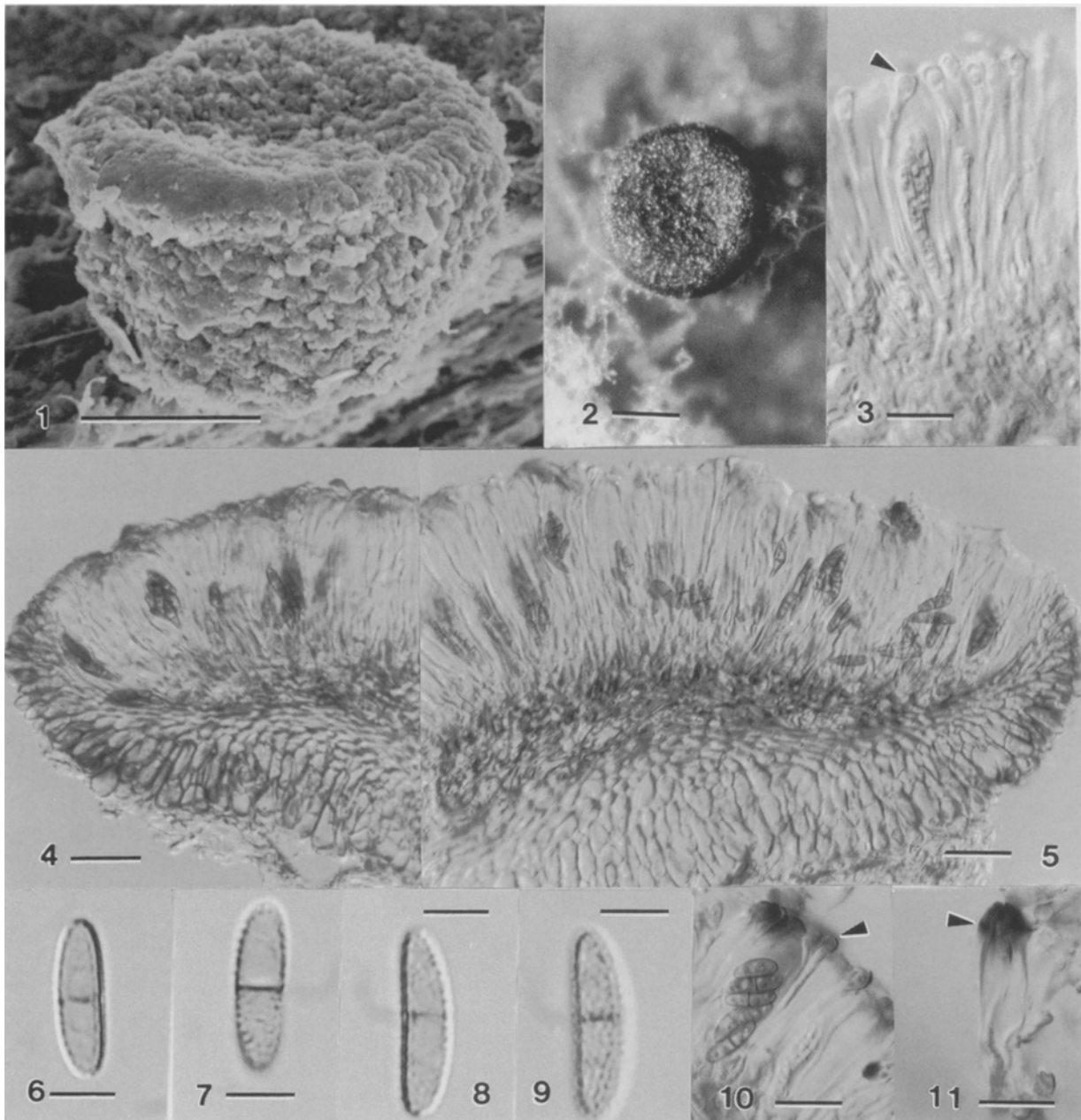
Ascomata 160–240 μm alta, 400–640 μm , diam., primo semiglobosa, deinde discoidea, apothecialia, erumpentia, denique superficialia, sessilia, carnosio-coriacea, solitaria vel gregararia. Hymenium atrobrunneum vel nigrum. Paraphyses septatae, haud furcatae, 50–80 \times 1–2 μm , cylindricae, apicaliter inflatae ad 2.5–4 μm diam., hyalinae, apice brunneae. Asci 40–63 \times 8.3–14.1 μm , octospori, clavati, breves pedunculati, unitunicati, non fissitunicati, non amyloidei, sed apice cucullo gelatinoso iodo atro-fuscescenti tecti. Ascosporae 10.9–17.2 \times 3.5–6.4 μm , oblique biseriatae, ellipsoideae, uniseptatae, non constrictae, rubicundulo-brunneae, parietem verrucosae.

Ascomata 160–240 μm high, 400–640 μm diameter, dark brown to black, at first subglobose, becoming semiglobose or discoid, flat or convex, apothecial-

like, superficial, sessile, attached to the substratum by an obconical foot, fleshy-leathery, solitary or gregarious (Figs. 1, 2). Exciple composed of thick-walled, subglobose to polygonal cells with large lumina, diverging from the center in parallel rows, merging into the schlerenchymatous foot, forming a textura angularis, barely arching over hymenium (Figs. 4, 5). Hypothecia composed of thin-walled cells, forming a textura angularis, alrecoloured, merging basally into the hyaline foot. Epithecia brownish, crumbling, finally exposing the hymenium (Figs. 4, 5). Paraphyses 50–80 \times 1–2 μm at the base, hyaline, apically swollen (2.5–4 μm) and staining dark brown to black (Figs. 3, 10) with iodine. Asci eight-spored, clavate, short pedunculate, thick-walled, apically thicker but thinner toward the base, without an apical apparatus (Figs. 3–5, 10, 11). Asci measure 40–63 \times 8.3–14.1 μm , and open by a split in the apical region (Fig. 11) and the apex often staining black with iodine. Ascospores 10.9–17.2 \times 3.5–6.4 μm , obliquely one to biseriata, ellipsoidal or obovoid, 1-septate, becoming reddish-brown, and spore wall verrucose (Figs. 6–9). At the scanning electron microscope level the spore wall is composed of convoluted ridges (Figs. 12, 13) with mucilage between the ridges (Fig. 14).

Holotype: IMI 379751 on *Kandelia candel* (L.) Druce wood, Ting Kok mangrove, Hong Kong, 29 August, 1998, collected by M. A. Abdel-Wahab.

Material examined: Test block of *Bruguiera parviflora* Wight & Arnold, ex. Griffith exposed 64 weeks at Kula Selangor mangrove, Malaysia; on *Bruguiera* twig, May, 1993, Malaysia; mangrove wood, Puli (PL0404-10), Chuwei (CW 0104, CW 1116-10), Taiwan; various collections on *Kandelia candel* and *Avicennia marina* (Forssk.) Vierh., Mai Po mangrove, New Territories, Hong



Figs. 1–11. *Dactylospora mangrovei* sp. nov.

1. Scanning electron micrograph. Young ascoma with intact epithecium.

2–11. Light microscope micrographs.

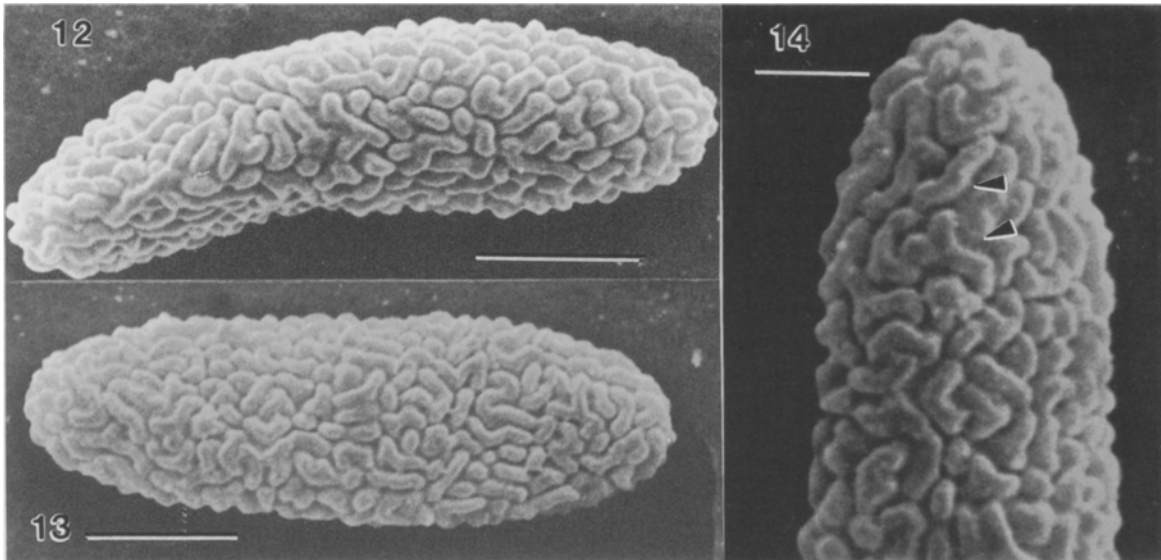
2. Ascoma on wood; 3, 10. Hyaline paraphyses, swollen at the apex, often staining blue-black (Fig. 10) with iodine and asci; 4, 5. Longitudinal section of an apothecium with the exposed hymenium and exciple; 6–9. One-septate, pale brown ascospores with a verrucose spore wall; 11. Dehiscent ascus with a split at the apex after the release of the ascospores and staining blue black with iodine.

Scale bars: Figs. 1, 2 = 200 μm ; Fig. 3 = 20 μm ; Figs. 4, 5 = 25 μm ; Figs. 6–9 = 5 μm ; Figs. 10, 11 = 20 μm .

Kong; various collections on mangrove wood Thailand.

Dactylospora is a widespread genus with some 30 species occurring on lichens, mosses and on terrestrial and intertidal wood with three marine species. *Dactylospora mangrovei* differs markedly from *D. haliotrepha* in the smaller ascomata, asci and ascospores (Table 1).

Both species occur in the same localities but are easily distinguished by the smaller and narrower ascospores in *D. mangrovei*. In *D. haliotrepha* the ascospores have longitudinal striations and at the ultrastructure level the areas between the ridges contain mucilage (Au et al., 1996). In *D. mangrovei* the ascospore wall appears



Figs. 12–14. *Dactylospora mangrovei*. Scanning electron micrographs. Ascospores. 12, 13. Convoluted ridges of the ascospore wall; 14. Higher magnification to show mucilage between the convoluted ridges on the ascospore wall. Scale bars: Figs. 12, 13=4 μm ; Fig. 14=2 μm .

Table 1. Comparison of marine species of *Dactylospora* (all measurements in μm).

	Ascomata	Asci	Ascospore
<i>D. canariensis</i>	140–180 high 240–460 diam.	55–85 \times 15–20	17–23 \times 7–9 Appendaged
<i>D. haliotrepha</i>	200–320 high 360–1000 diam.	70–100 \times 17.5–20	(15–)18–28(–31.5) \times 8–11.5(–14.5)
<i>D. mangrovei</i>	160–240 high 400–640 diam.	40–63 \times 8.3–14.1	10.9–17.2 \times 3.5–6.4

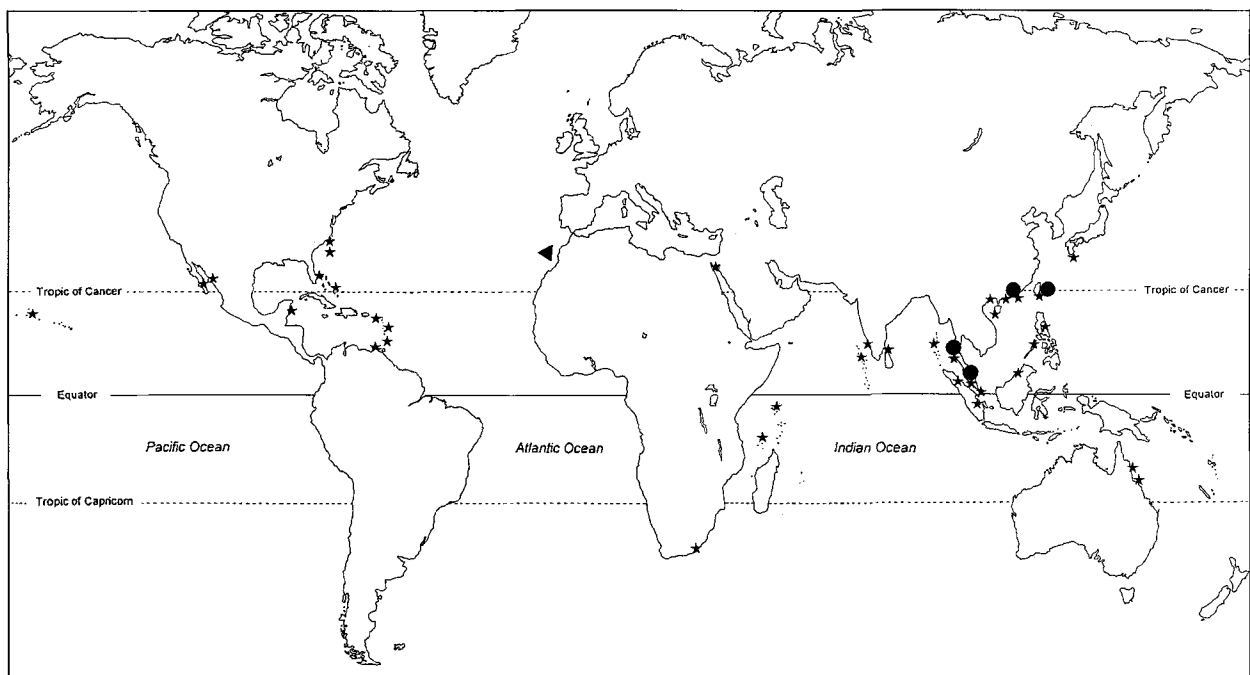


Fig. 15. Geographical distribution of marine *Dactylospora* species ★ *Dactylospora haliotrepha*; ● *Dactylospora mangrovei*; ▲ *Dactylospora canariensis*.

verrucose (Figs. 6–9) and at the SEM level these consist of convoluted ridges (Figs. 12–14). As in *D. haliotrepha* mucilage appears between the ridges. Au et al. (1996) have shown that at the transmission electron microscope level the ascospore wall of *D. haliotrepha* comprises a mesosporium, an outgrowth of which gives rise to the ridges; an electron-dense episporium, and an exosporial layer which fragments to release mucilaginous material present between the spore wall ridges. They did not attribute any function to the released mucilage. Both species differ from *D. canariensis* in that they lack appendaged ascospores. In *D. canariensis* the ascospores are larger than *D. mangrovei*, they are hyaline to light brown, with 4–6 polar, radiating, bristle-like, deciduous setae up to 14 μm long (Kohlmeyer and Volkmann-Kohlmeyer, 1998). *Dactylospora canariensis* has not been examined at the SEM level.

A number of terrestrial *Dactylospora* species have ascospore measurements similar to *D. mangrovei* (Hafellner, 1979): *D. parasitica* (Florke ex Sprengel) Zopf has 3-septate ascospores (9–14.5 \times 4–7 μm) and is common on lichens; *D. protothalina* (Anzi) Hafellner (9–15 \times 4.5–7.5 μm) and *D. saxatilis* (Schaerer) Hafellner (9–15 \times 4.5–7.5 μm) also occur on lichens; while *D. athalline* (Mull. Ag.) Hafellner (9–14.5 \times 4–7 μm) and *D. imperfecta* (Ellis) Hafellner (10–15 \times 3–5 μm) occur on *Baeomyces* and *Zea mays* respectively, thus differ in occurring on different substrata to *D. mangrovei* which has only been found on mangrove wood. *Dactylospora bloxamii* (Berk.) Hafellner (10–15 \times 5–7.7 μm) and *D. caledonica* Hafellner (11–15 \times 5.5–7.5 μm) occur on wood/bark in terrestrial habitats, but *D. mangrovei* has slightly longer and narrower ascospores with a verrucose spore wall that is a series of convoluted ridges when viewed at the SEM level.

Of the three marine *Dactylospora* species, two are tropical/subtropical in distribution (Fig. 15) while *D. canariensis* is a temperate species. *Dactylospora haliotrepha* is the most commonly collected species (Jones and Hyde, 1988; Au, Jones and Vrijmoed, 1996), however it can be easily confused with the new species described here and great care in checking ascospore measurements is recommended.

Dactylospora mangrovei is referred to the Dactylosporaceae Hafellner, until molecular studies are undertaken to determine if the marine species of the genus are correctly assigned.

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