

THE AERO-AQUATIC FUNGUS *CANCELLIDIUM APPLANATUM* K. TUBAKI IN QUEENSLAND.

DOROTHY E. SHAW

Plant Protection Unit, Department of Primary Industries, Meiers Road, Indooroopilly, Q 4068, Australia

Tubaki (1975) erected the genus *Cancellidium* based on a new aero-aquatic species, *C. applanatum*, obtained on a balsa-wood test block submerged for 6 months in a lake in Japan. The conidia were dark brown, multicellular, large (120–278 μm long, 80–130 μm wide and 24–40 μm thick) and floated. They germinated readily and in agar culture sporulated best on oat meal, although excellent sporulation was obtained on sterilised pieces of banana-leaf placed on the surface of corn meal agar. The interior of the mature conidium was stated to be hollow, with no distinct system of branches present. The top of the conidium was somewhat closed by the growing upper cells of the lengthwise mycelial strands, and in addition, 'monilioid' chains of small cells developed in culture, although these were not described. They were later illustrated from Tubaki's material by Carmichael *et al.* (1980).

The same fungus was later recovered as an aero-aquatic from submerged leaves of various trees from a wide range of localities near Kuala Lumpur, Malaysia (Webster & Davey, 1980). Cultures were also established from the large propagules (Tubaki's 'conidia'), although they did not sporulate on agar. However, propagules developed within 5 days on sterilised disks of beech leaves after special treatment. The 'monilioid' chains of small cells were not mentioned.

Queensland material

Unidentified decaying leaves were collected from puddles in a mainly non-running stream during a dry period in a reserve rainforest area about 80 km in direct line northwest of Brisbane (c. 152°E longitude and 26°30'S latitude) on 11 November 1990. The next day they were placed in Petri dishes with tap water and examined intermittently during the following few months, with water being occasionally added. On 21 March

1991 the dishes were again examined and under the dissecting microscope many small glistening bodies were noted floating on the surface of the water. The bodies appeared whitish if viewed over the dark leaf remains, but black over a light background. The illustrations presented in this paper greatly extend those hitherto available.

Under the light microscope (LM) the propagules were olivaceous but slightly darker at the base because of the concentration of hyphae in that area. They were spindle- or goblet-shaped or nearly round in outline but flattened on both sides (Fig 1a), and floated with the flattened sides parallel to the water surface. If a slight pressure were applied to the coverslip, air bubbles emerged from the distal end. When all the air was dispelled, the propagules were seen to consist of vertical olivaceous hyphae radiating vertically from their basal point of attachment, joined laterally throughout their length, and with cross walls (Fig 1a, b, c). The propagules were 96–192 μm long by 96–128 μm wide. The vertical hyphae, which could only be separated from each other with pressure, were from 2 μm wide at the base, enlarging to 4.8–6.1 μm wide. The cross walls delimited fairly regular cells from 7.6–10.5 μm long. At the base of each propagule a hyphal butt (arrowed in Fig 1a) was usually present. In a few cases olivaceous, septate hyphae were growing out from the distal tip (Fig 1a, second propagule), while in other cases hyphae were still attached at the base.

By focussing through the hyphal casing of the propagules, some contents were apparent. Further pressure revealed (Fig 1b) or expelled (Fig 1c) branched chains of almost hyaline but faintly olivaceous cells which did not stain in lacto-fuchsin, arising from the interior base of the propagule. In the chains they measured 6.4–13.3 μm long by 3.8–5.6 μm wide while loose spores

were 9.6–11.4 μm long by 5.7–9.5 μm wide. Each conidium had a slightly bulbous centre portion, narrowing to strongly marked septa on each side (Fig. 1d).

Discussion

The Queensland fungus (DS Q889), not reported from Australia before, agrees with the description of *C. applanatum* by Tubaki (1975) and Webster & Davey (1980) but in the local fungus the branched chains of small nearly hyaline conidia were also found *within* propagules in water culture.

In the case of the Japanese, the Malaysian and now the Queensland fungus, the olivaceous multicellular bodies were undoubtedly propagules, as they initiated cultures, floated in water and would be easily distributed. Whether the small conidia are eventually released from the propagules, either from the distal end or by disintegration of the propagule walls, and whether such release would be of the chains or singly after abscission at the septa (as seems most likely) remains to be determined. It does seem as if they could constitute a second spore form and may require a specific designation.

Webster & Davey (1980) suggested that as the fungus occurred in Japan and Malaysia, it may have a wide distribution in suitable tropical habitats. That would seem to be confirmed and even extended, with the present record of the fungus from the Temperate Zone in Queensland, on a different continent from the previous records in Asia.

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References

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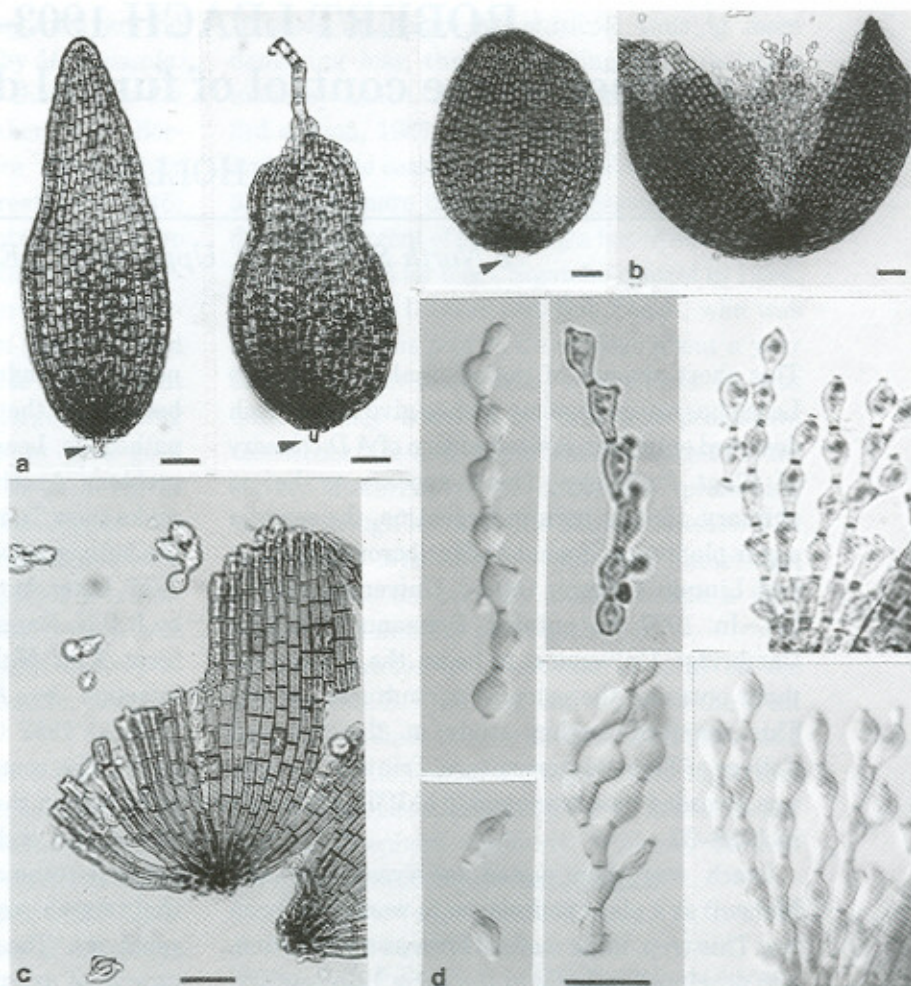


Fig 1 *Cancellidium applanatum*; all bars = 20 μm . 1a: three propagules, basal hyphal stubs arrowed. 1b: Propagule split under pressure of the coverslip, showing the internal mass of branched chains of conidia. 1c: Piece of propagule wall and released conidia. 1d: Branched chains and two single conidia.

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