Catabotrys deciduus (Berk. & Broome) Seaver & Waterston
AEB 1345 (= PDD 117262) – a good fit

Collection site: Lower Hutt, Kelson, residential bush area

Substrate: dead frond of nikau palm (*Rhopalostylis sapida*)

Collection date: 24 September 2021

Collector & identifier: Dan Mahoney

Voucher material: dried herbarium material [AEB 1345 (= PDD 117262)] accompanied by several semi-permanent slides; Dan's in-situ photos of stromata and his compound-scope photos from microscope slide mounts; Dan's comments.

Dan's comments: Twenty collections of this species are recorded on the New Zealand Landcare Research PDD website – all from *Rhopalostylis sapida*. Its description and illustrations are reproduced on the next 2 pages: from **1)** F. J. Seaver & J. M. Waterston. 1946. Contributions to the mycoflora of Bermuda IV. *Mycologia* 38(2): 180–201 and **2)** J. M. Dingley. 1977. Some notes on New Zealand Pyrenomycetes. *Kew Bulletin* 31(3): 629–33.

For more on the NZ collections, control/click on the following:

New Zealand Fungi - Landcare Research
https://nzfungi2.landcareresearch.co.nz › ...

Catabotrys deciduus (Berk. ... Ascomycota subphylum: Pezizomycotina class: Sordariomycetes order: Amplistromatales family: Catabotryaceae genus: *Catabotrys* ...

See also Index Fungorum:
Current Name: **Catabotrys deciduus (Berk. & Broome) Seaver & Waterston** [as '*deciduum*'], *Mycologia* **38**(2): 184 (1946)
Synonymy:
Hypoxylon deciduum Berk. & Broome, *J. Linn. Soc.*, Bot. **14**(no. 74): 120 (1873)
Bagnisiella palmarum Pat., *Bull. Soc. mycol. Fr.* **3**(3): 176 (1887)
Catabotrys palmarum (Pat.) Theiss. & Syd., *Annls mycol.* **13**(3/4): 297 (1915)

Position in classification:
Catabotryaceae, Incertae sedis, Incertae sedis, Sordariomycetes, Ascomycota, Fungi

Synonymy Contributor(s): **Kew Mycology (2017)**

F. J. Seaver & J. M. Waterston. 1946. Contributions to the mycoflora of Bermuda IV. *Mycologia* 38(2): 180–201. Portions of pages 184–186 are reproduced here:

Catabotrys deciduum (Berk. & Br.) comb. nov. (FIG. 2)

Hypoxylon deciduum Berk. & Br. Jour. Linn. Soc . 14: 120. 1875.
Bagnisiella palmarum Pat. Bull. Soc. Myc. France 3: 176, 177. 1887.
Catabotrys palmarum (Pat.) Theiss. & Sydow, Ann. Myc. 13: 297, 298. 1915.

On fallen leaf bases of tall bananas, *Musa* sp., Devonshire; Feb. 3, 1926, *F. J. Seaver, H. H. Whetzel* & *L. Ogilvie 34897* (CU); on dead petioles of *Sabal bermudana* Bailey, on the ground, Walsingham, Jan. 20, 1922, *H. H. Whetzel 35004* (CU*).*

Previously known only from Central Provinces, India; Ceylon; Bintula, Borneo and New Caledonia. The Bermuda record is a noteworthy extension of range of this beautiful and interesting species. The writers are indebted to Dr. Julian H. Miller who examined the material on *Musa* and pronounced it identical with the type of *Hypoxylon deciduum* Berk. & Br., at Kew Herbarium.

The fungus is characterized by pulvinate stromata which rest on a subiculum and are entirely superficial (FIG. 2a). The perithecia have very long ostioles and are deeply imbedded in stromatic columns which become separated with age but remain united above. The spores are hyaline, ellipsoid and average 6–7 X 3 µm. (FIG. 2b). Paraphyses are absent. Petch (1924: 163) lists this fungus in his Xylariaceae Zeylanicae among species *Dubiae et excludendae,* and gives the spore range for Ceylon material (No. *2881)* 6–9 X 3 µm.. He notes that Cooke (1883: 123) gave the spore range 15–18 X 3 µm. and had passed it as *Hypoxylon.*

The Bermuda specimens also agree very well with published descriptions of *Bagnisiella palmarum* Pat., which was placed in the Dothideales by Patouillard (1887: 176, 177) who gave the spore range 6–7 X 3-4 µm. Theissen & Sydow (1915: *297,* 298) later erected the genus *Catabotrys* Theiss. & Sydow for Patouillard's species and gave as their spore measurements 6.5–7.5 X 3 µm. Their illustration showing a section of the stroma *(loc. cit., Pl.* 2, *fig.* 5) compares well with our illustration (FIG. 2a). Petrak (1934: 339) emended the genus *Catabotrys* and transferred it to the Hypocreales where it would rightly appear to belong. The genus is represented by a single species for which the new combination given above is proposed.

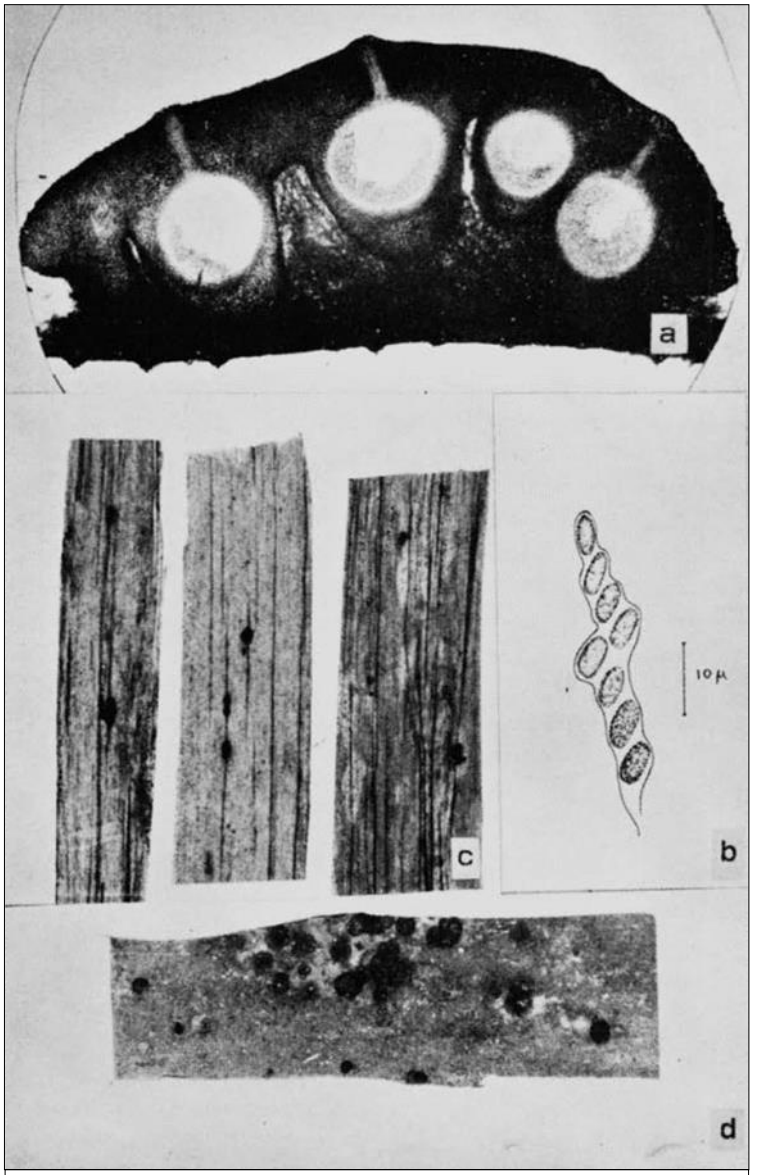
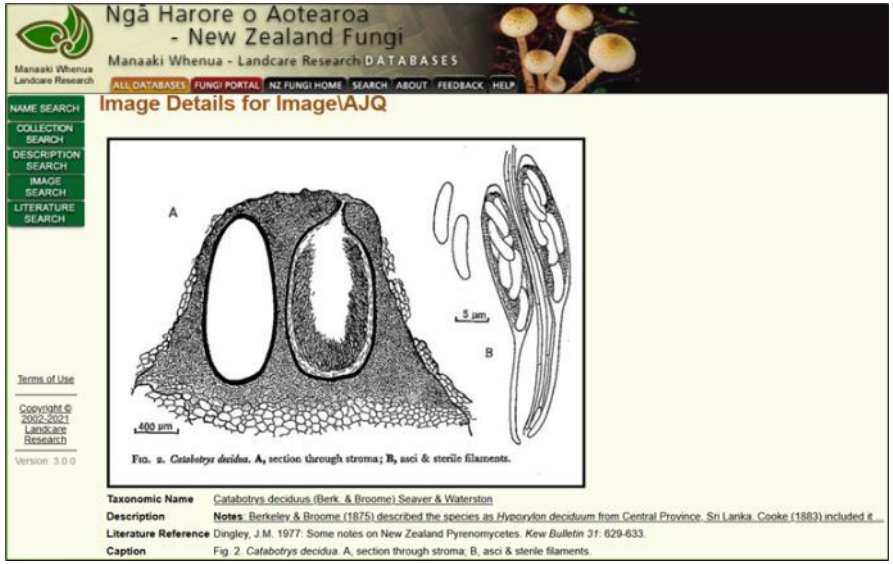


FIG. 2. *Catabotrys deciduum*: (a) transverse section of stroma and subiculum removed from substrate (*Musa* sp.), showing location of perithecia X 50; (b) single ascus with spores; (c) stromata on fallen petiole of *Musa* sp. X l; (d) stromata on fallen petiole of Sabal bermudana X 1.

J. M. Dingley. 1977. Some notes on New Zealand Pyrenomycetes. *Kew Bulletin* 31(3): 629–633.



Notes: Berkeley & Broome (1875) described the species as *Hypoxylon deciduum* from Central Province, Sri Lanka. Cooke (1883) included it in his list of Hypoxylon species under the section III '*Sphaeroxylon*'. Patouillard (1887) described this same fungus from New Caledonia as a new species, *Bagnisiella palmarum* and regarded it as a dothidiaceous rather than a sphaeriaceous fungus. Theissen & Sydow (1915) commented on Patouillard's fungus, noting that perithecia were formed in separate loculi at the base of a stroma, and placed the species in a new genus, *Catabotrys*.

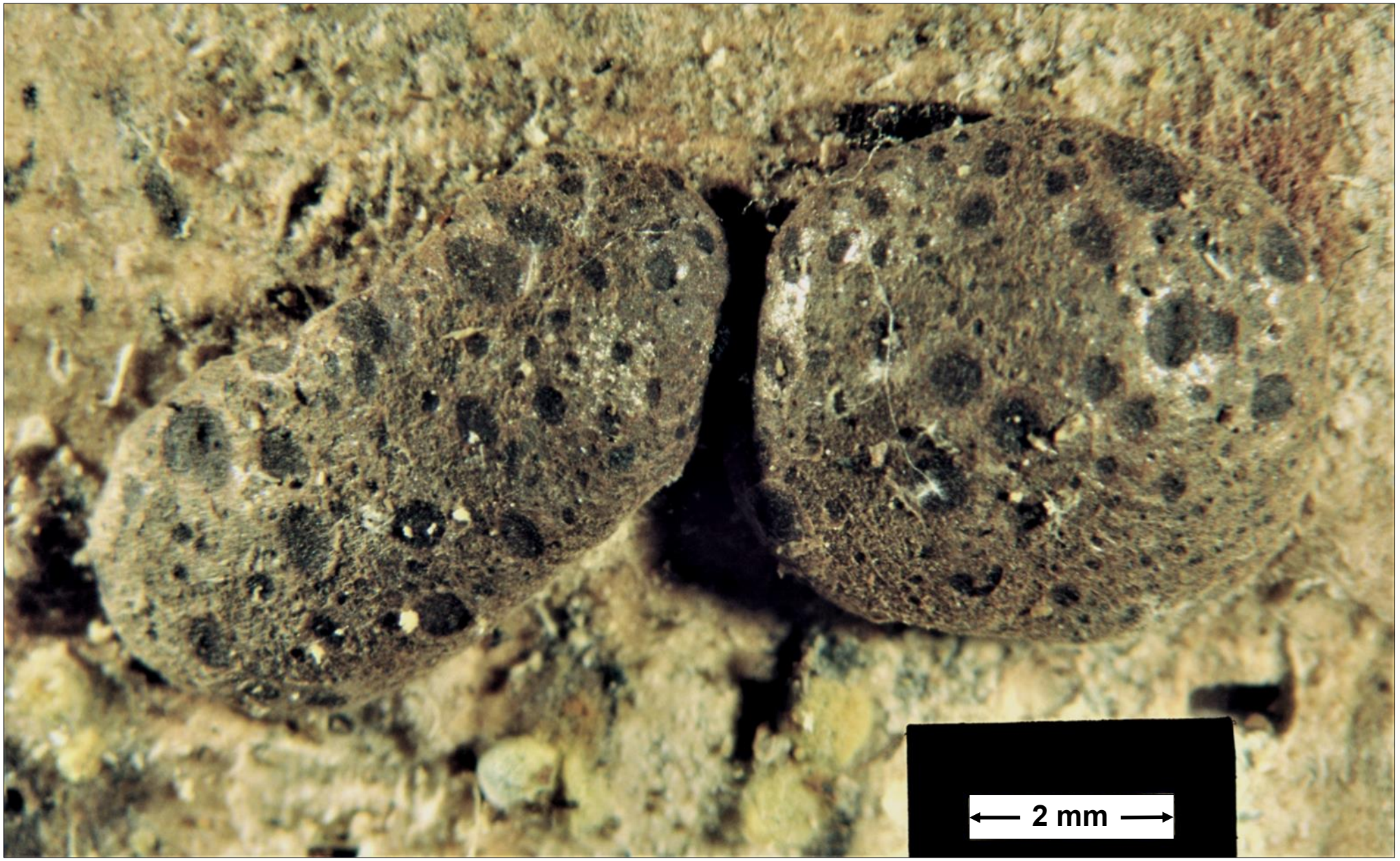
Petch (1924) noted that although he had collected *Hypoxylon deciduum* on several occasions in Sri Lanka it was never in a condition in which he could comment on the true nature of the fungus. In the Kew Herbarium there are two collections from Petch from Peradeniya (20 July 1909 and Nov. 1913), neither appears to be mature.

Petrak (1934) examined Patouillard's specimens of *Catabotrys palmarum* and amended the description, placing importance on both structure and form of stroma and perithecia; he suggested that the genus should be placed in the Hypocreaceae. Seaver & Waterston (1946) recorded the fungus from Bermuda on banana {*Musa* sp.). They also showed that *Catabotrys palmarum* was synonymous with *Hypoxylon deciduum* and agreed with Petrak that probably it should be disposed in the Hypocreaceae. Arx & Muller (1954) commented that *Catabotrys decidua* was typically sphaeriaceous. Petrak (1954) amended his earlier views and, noting the diaporthiaceous nature of fructifications, suggested that perhaps a new family Catabotrydaceae should be erected to contain the genus within the Sphaeriales.

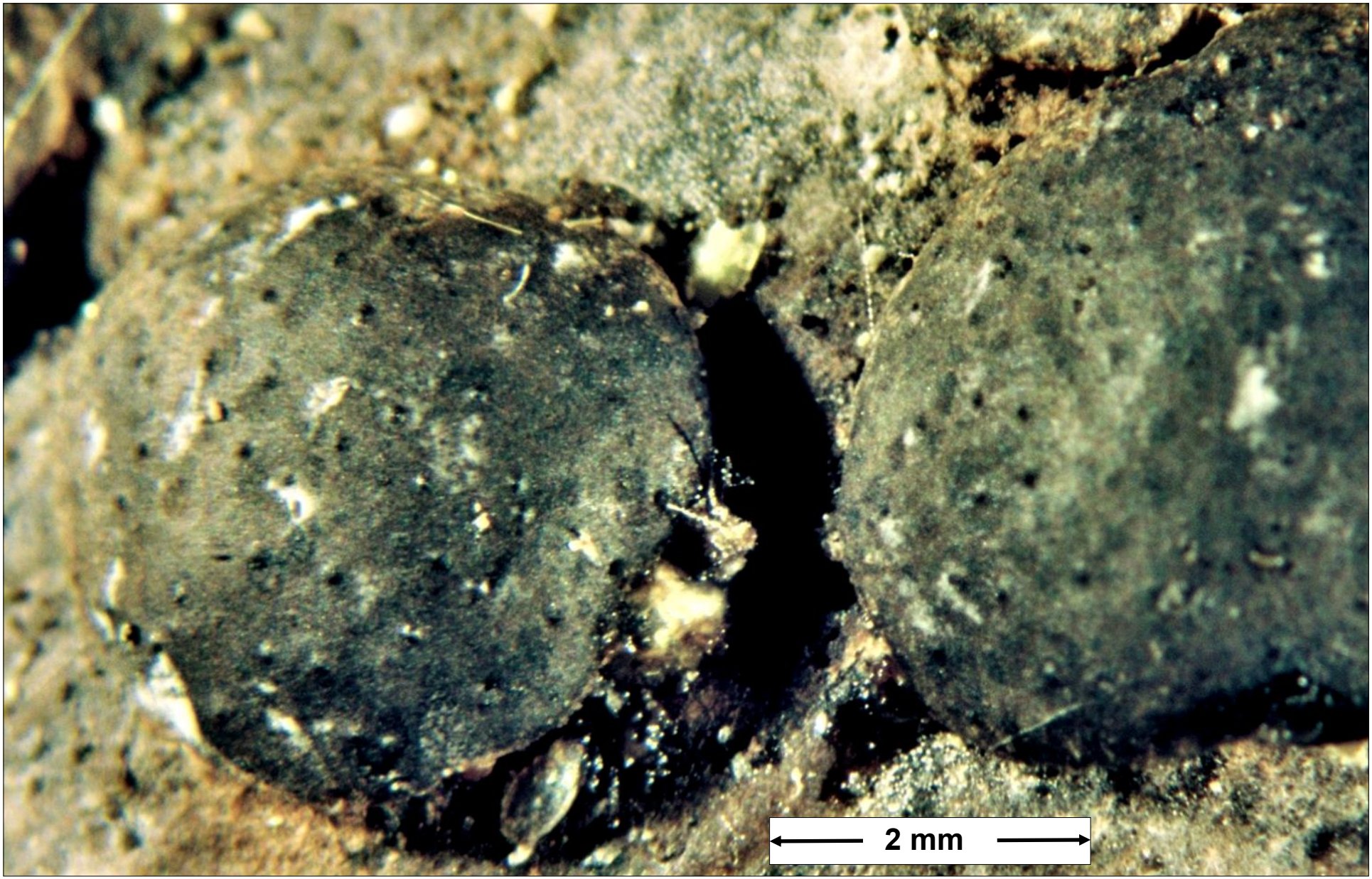
Up to the present, observations on this fungus have been made only on a few collections in herbaria. Field studies show that stromata take several months to mature. Unfortunately the species is difficult to culture, but observations suggest that a conidial form similar to *Nodulisporium* Preuss could be associated with it. Perithecial structure certainly shows that the fungus belongs to the Hymenoascomycetes rather than Loculoascomycetes. Ascal pore apparatus and perithecial structure are in some ways characteristic of a diatrypaceous fungus, but the ascospores are distinctly different and perhaps more typical of Xylariaceae. No doubt studies in the perithecial development and life history will elucidate the true relationships of this species.

Description: Fructifications stromatic scattered, sometimes gregarious, entirely superficial, on superficial, byssoid, vinaceous brown mycelium. Stroma pulvinate, almost circular, up to 5 mm diam., 2 mm thick, when mature brown-black, more or less carbonaceous, punctate with slightly sunken ostiolar openings; when immature pruinose and velvety; undersurface loculate, each loculus representing a single perithecium: stroma tissue united at level of ostiolar canal; uniform, pseudoparenchymatous, compacted in outer zone, hyphal walls pigmented brown and thickened. Perithecia few but usually over twenty in a stroma, monostichous, globose 200-350 µm diam. never crowded, sunken in separate loculi, ostiolar canal 300-400 µm long, 15 µm diam. lined with paraphyses, opening not papillate. Perithecial wall poorly defined, hyaline, but subhymenial layer of hyaline, thin walled, pseudoparenchymatous hyphae, well developed. Asci and sterile hyphae form a hymenial layer lining perithecial cavity. Asci unitunicate, clavate, with small apical ring, staining blue with iodine, an ill defined apical plug also present; 42-50 X 7-8-5 µm, 8 spored, spores biseriately arranged. Pseudoparaphyses numerous, thin-walled, septate 4-5 µm wide and of indefinite length. Spores one celled, broadly elliptical, 7-9.5 X 3-3.5 µm, occasionally lightly pigmented. (Fig. 2A-B.)

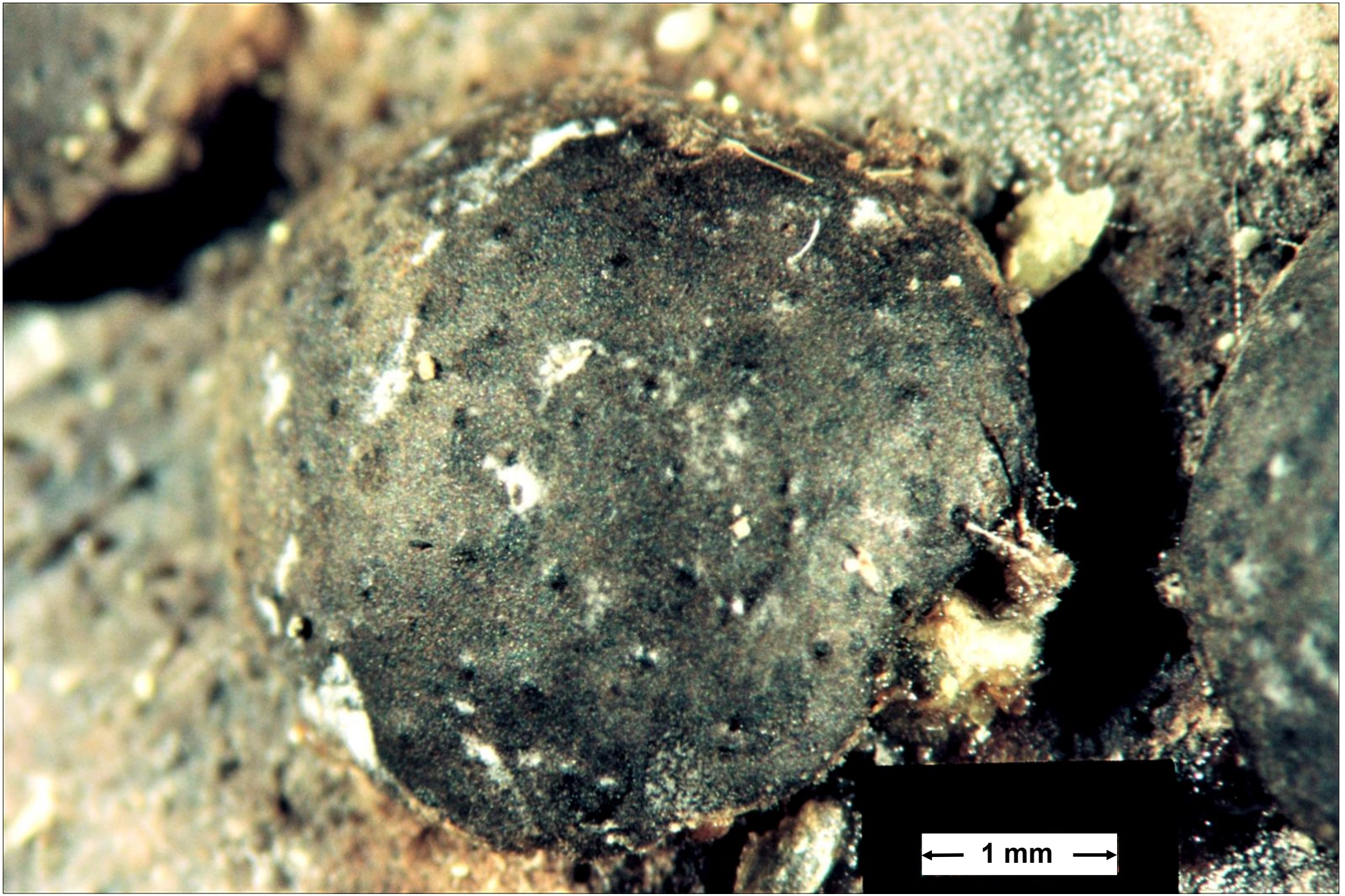
Collections Examined: Material examined. Sri Lanka: Central Province, on palm leaves, Dec. 1868, Thwaites 172 (K, holotype).
New Zealand (all collections on dead leaf-axes and stems of Rhopalostylis sapida H. Wendl. & Drude (Palmae)): Auckland, Waitakere Ra. (PDD 16427, 16428, 18515, 18326 & 20995); Cuvier Is. (PDD 23527); Little Barrier Is. (PDD 18326).



AEB 1345. In-situ view of two fresh mottled superficial stromata on a dead nikau palm frond. Sectioned views of these revealed perithecial positions beneath the large black spots, but these were without ascus development.

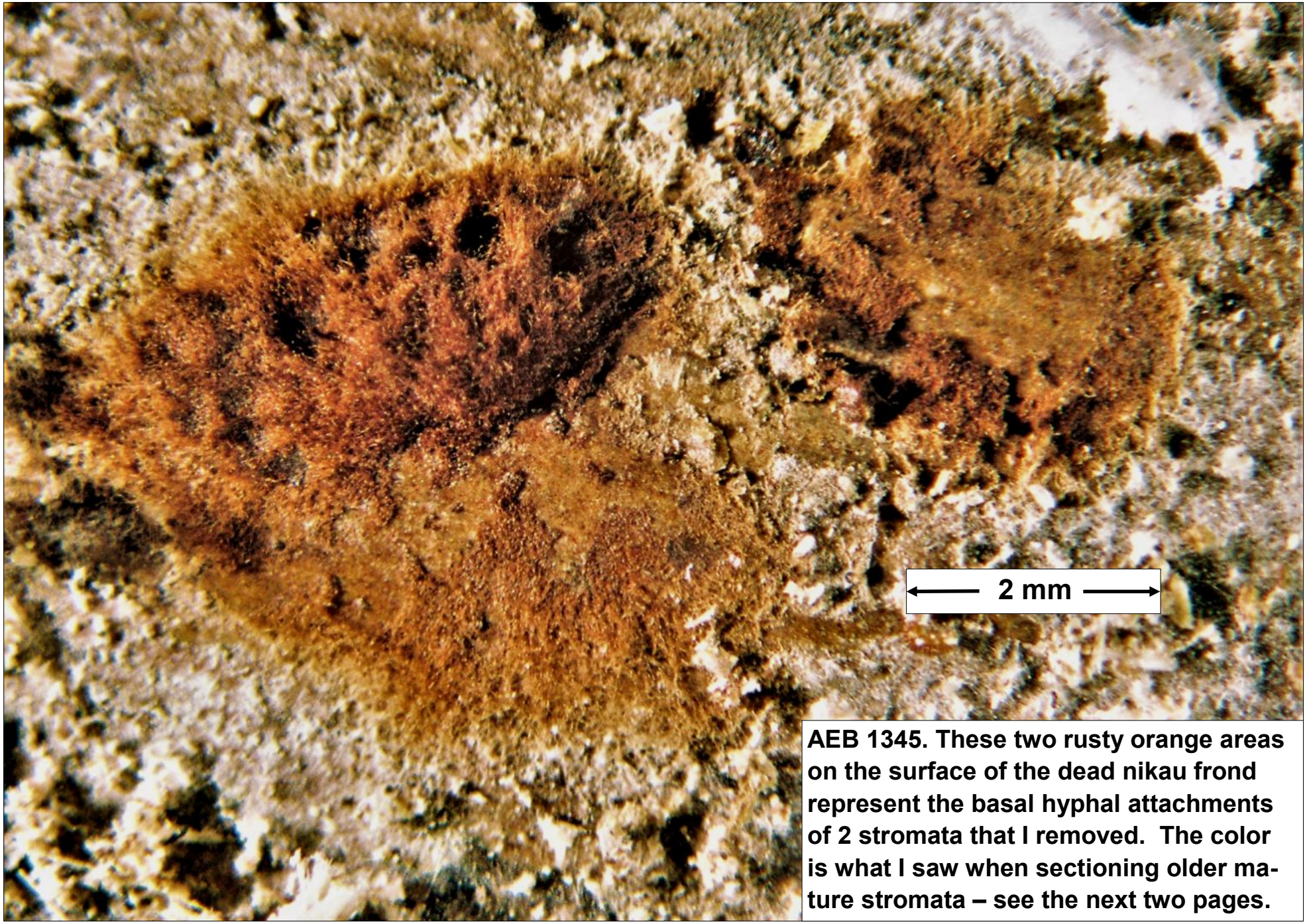


AEB 1345. In-situ view of two fresh mature stromata with a single fertile perithecium beneath each black surface papilla (the latter rusty orange in sectioned view of older mature stromata). Note that the stroma surface, although still faintly mottled, is less 'felty', darker and more shiny than seen in immature stromata on the previous page.



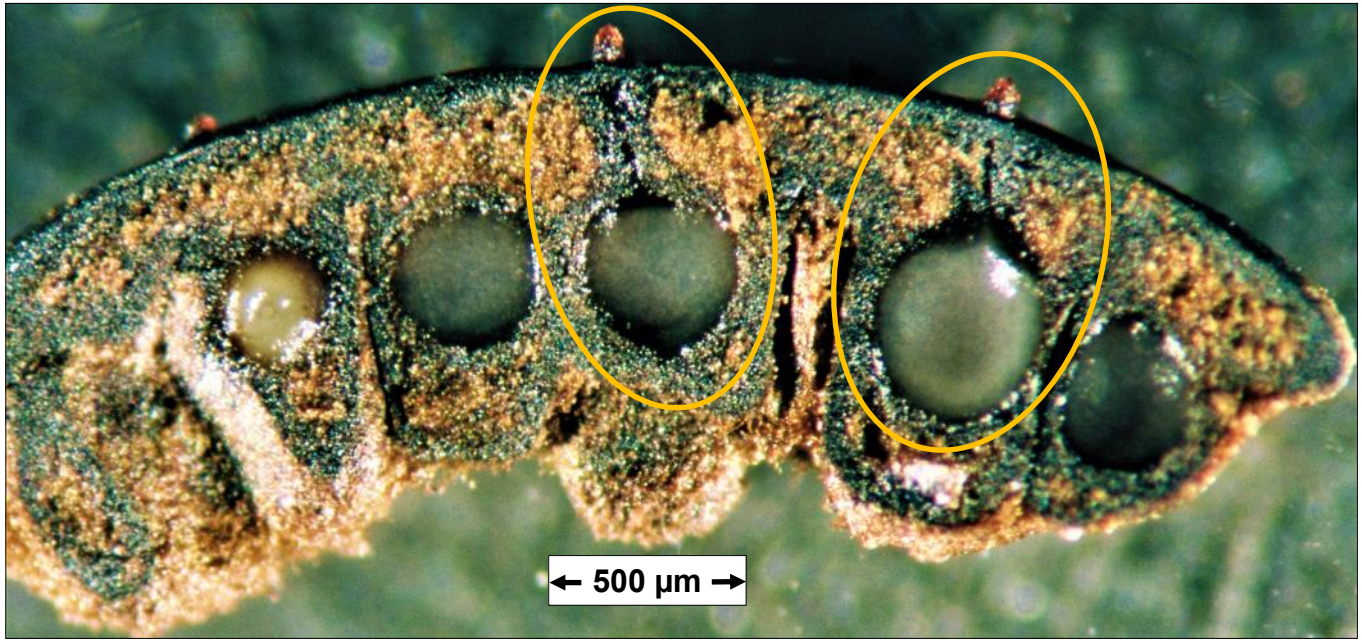
AEB 1345. Closeup view of left-hand stroma on previous page.

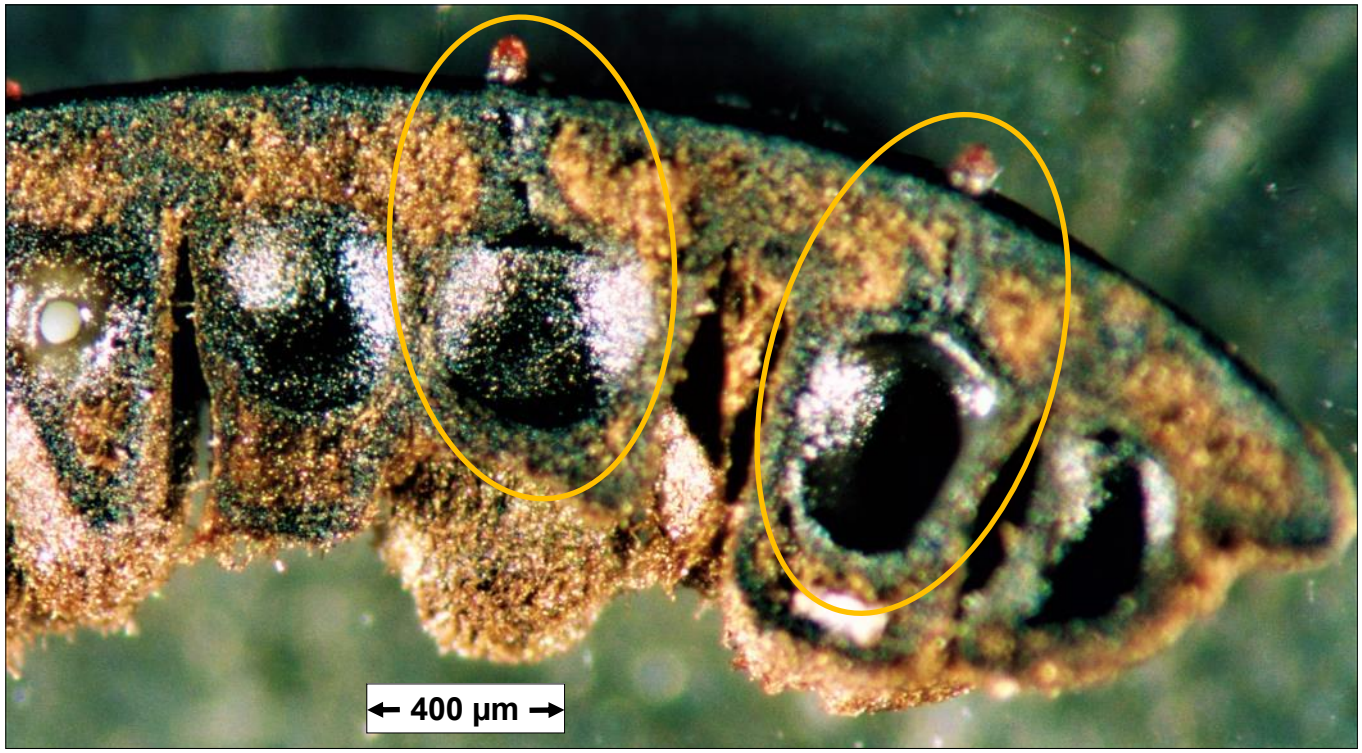
AEB 1345. In-situ view of an older fresh mature stroma. Note the raised papillate ostioles (arrowed) and faint rusty orange areas.



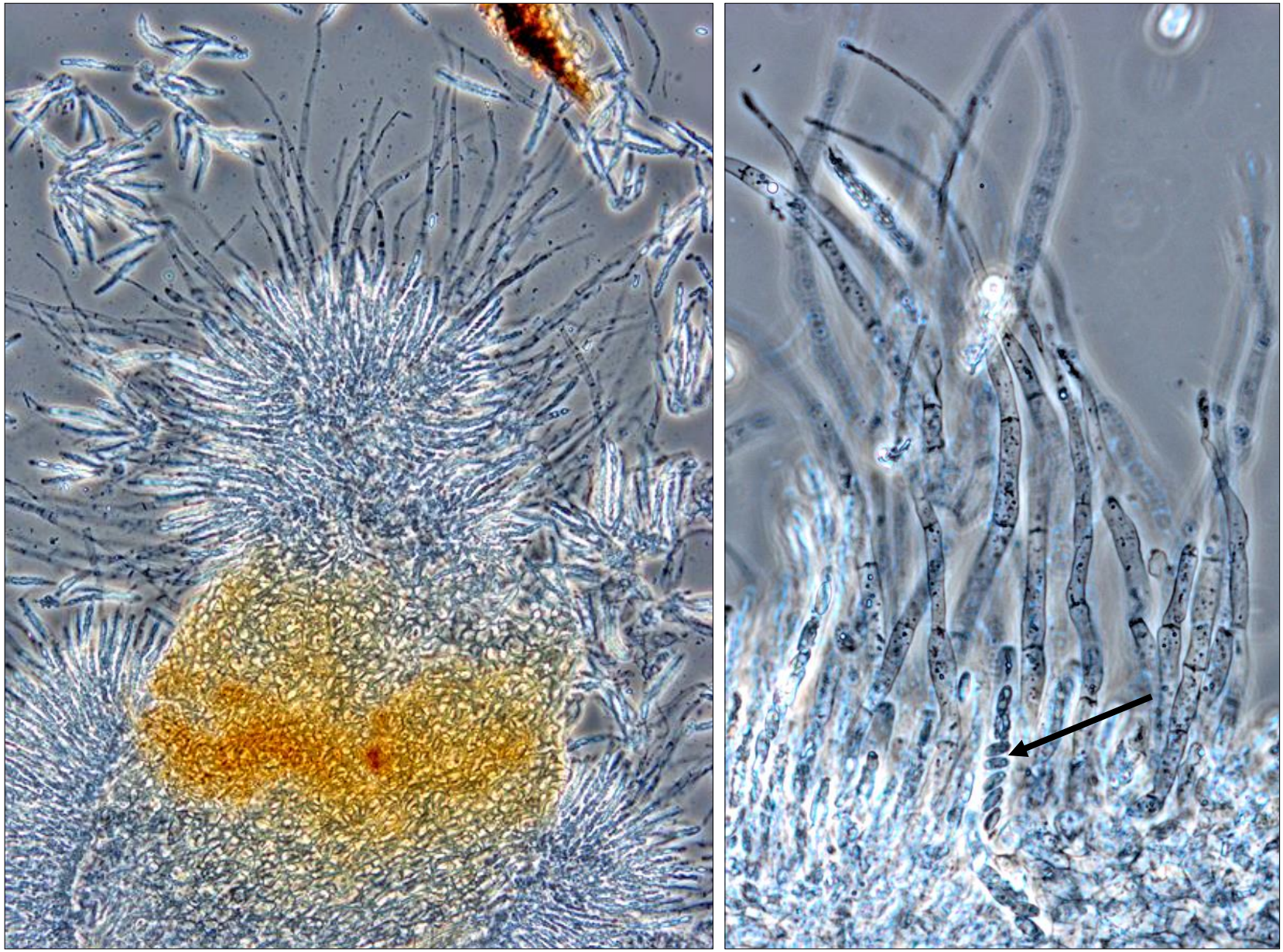
AEB 1345. These two rusty orange areas on the surface of the dead nikau frond represent the basal hyphal attachments of 2 stromata that I removed. The color is what I saw when sectioning older mature stromata – see the next two pages.

AEB 1345. Dissecting scope view of a razor section from a fresh older mature stroma. The section, seen here in a drop of water against a white background, shows four prominent dark perithecia with milky-colored contents. Two of these (outlined) reveal long dark ostiolar necks that extend to the stroma surface where their orangish papillae provide openings for ascus/ascospore discharge. See the next page for black-background views of this section.

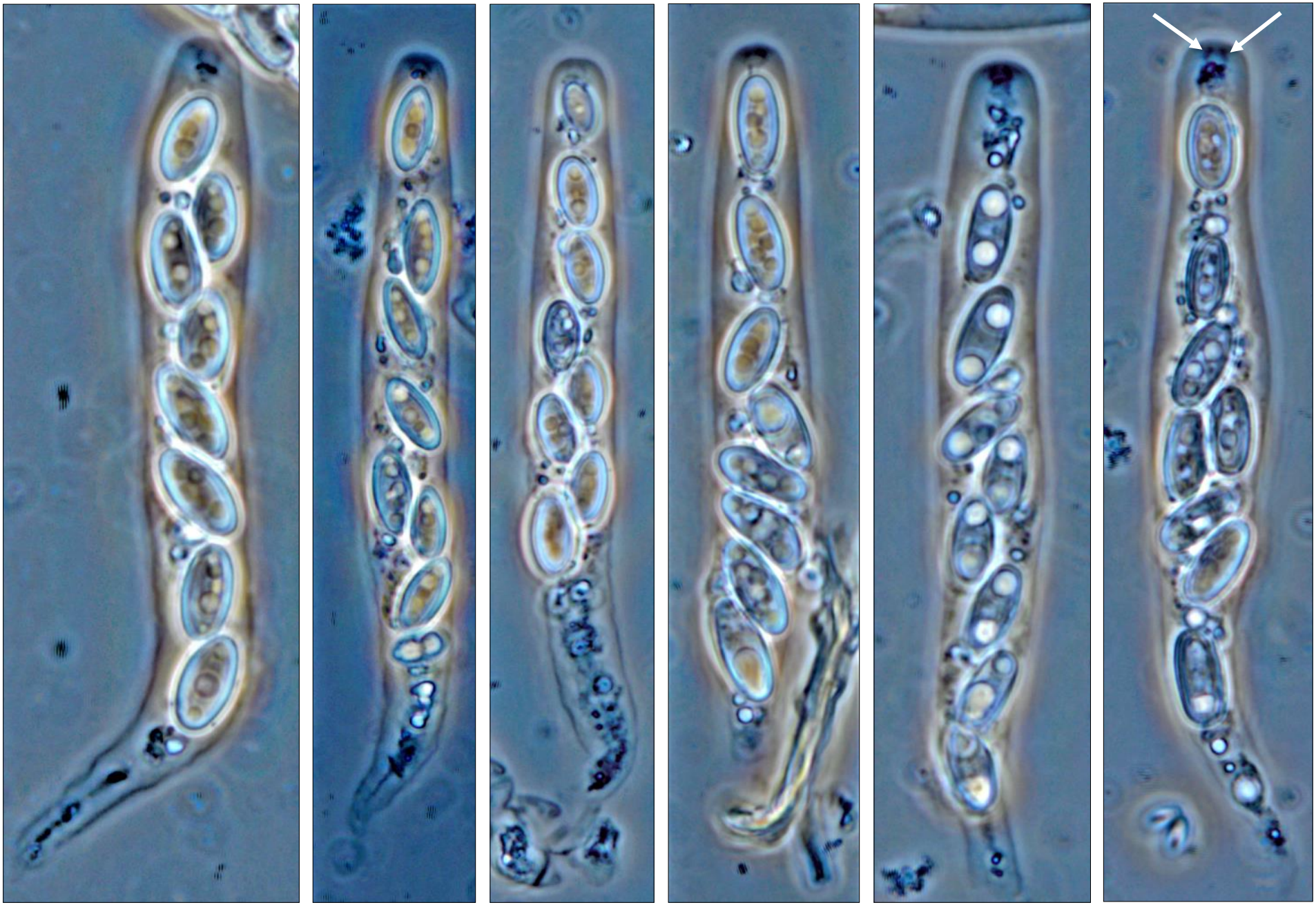




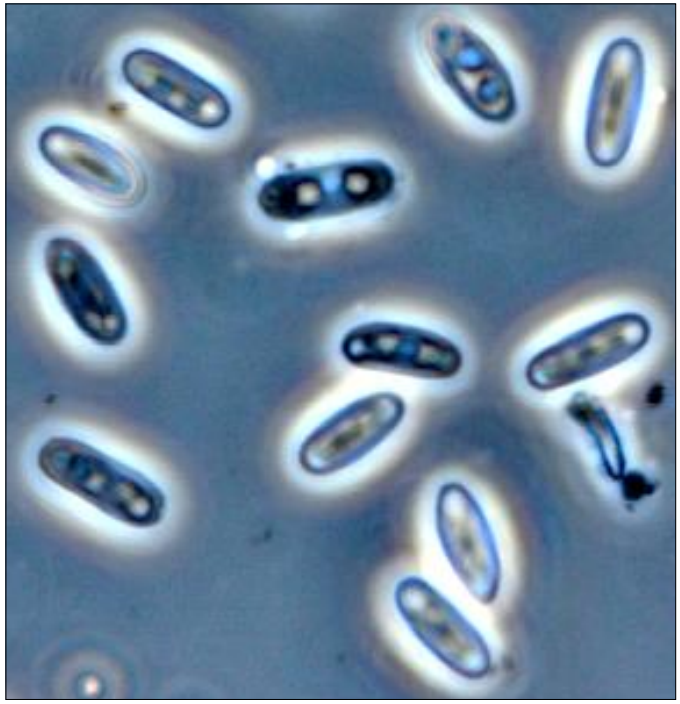
AEB 1345. Two more views of the same stroma razor section seen on the previous page. Here, however, the photos have a black background and show the section as it gradually dries out (bottom photo driest view). The milky contents of perithecia are still visible in the top photo but disappear in the bottom photo. The same two perithecia (outlined on the previous page) are here outlined again, but the lighting/drying changes allow us a clearer view of the ostiolar channel that culminates in the orangish papilla at the stroma surface. Also more visible is the rusty-orange coloration of inner stromatic tissues. The same coloration was seen earlier in a photo of two rusty orange areas on the surface of the dead nikau frond that represented the basal hyphal attachments of 2 stromata that I had removed.

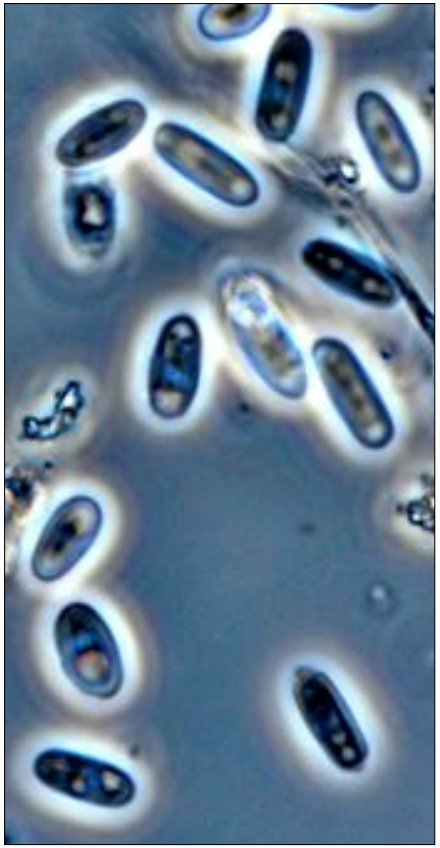


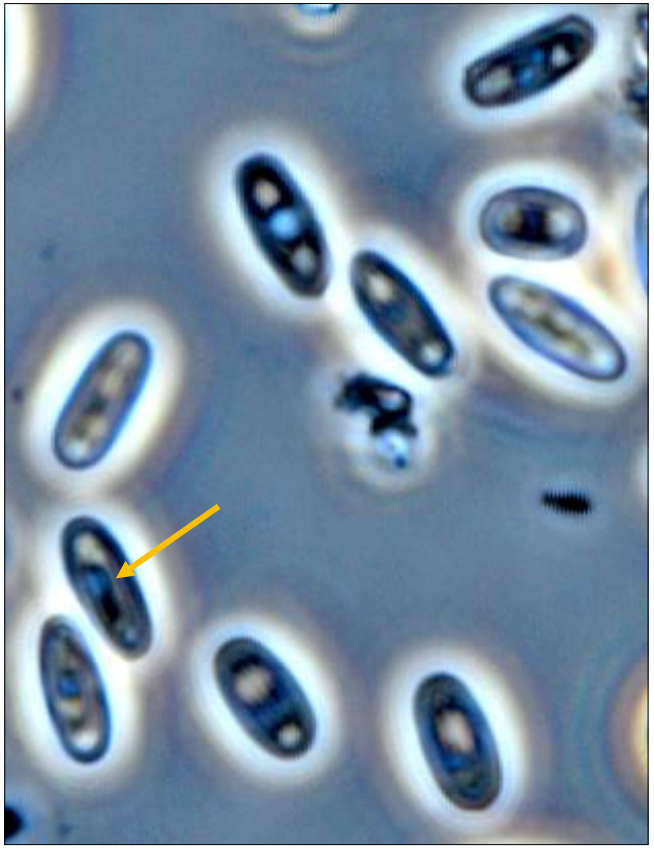
AEB 1345. Stroma/perithecium squash, emphasizing paraphyses but also showing some stroma/perithecium-peridium hyphal detail and the orangish coloration seen on previous pages. Photos from Shear's mounting fluid mounts using phase microscopy – left, X20 objective; right, X40 obj. Note ascus size (arrowed) compared to that of the large tapering septate paraphyses.

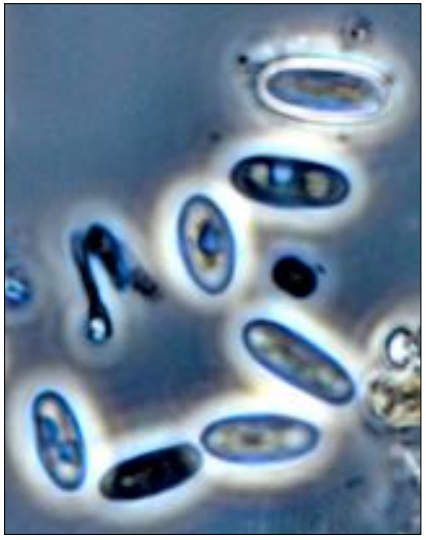


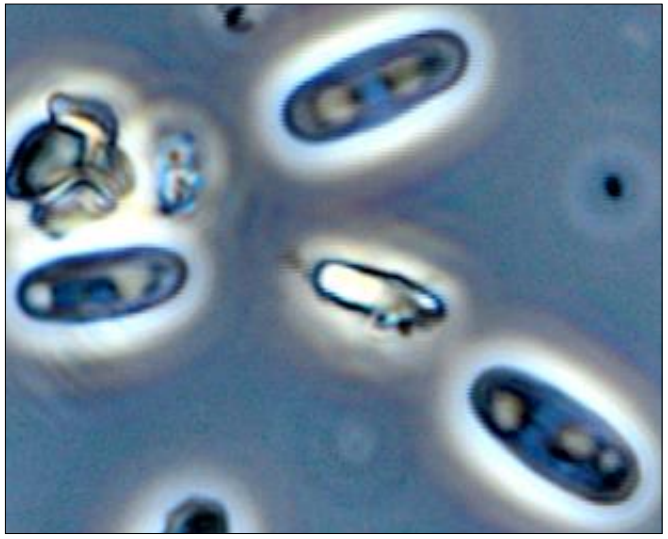
AEB 1345. Mature asci and ascospores. All photos in water mounts, X100 objectives and seen under phase microscopy. Note ascospore arrangements, shapes, wall thicknesses and internal guttules. Ascus tips (far right arrowed) not clearly bluing in Melzer's. Ascus bases unclear so ascus sizes difficult to determine.











AEB 1345. Ascospores. All photos in Shear's mounting fluid, X100 objectives, using phase microscopy. Spores measured 7–9 × 3–4 µm (n = 50). Note the shapes and internal guttules. Straight longitudinal germ slits (arrowed) seem to be present although earlier descriptions don't mention these. See the next page.

AEB 1345. Ascospores. All photos in Shear's mounting fluid, X100 objectives, using DIC microscopy. Spores measured 7–9 × 3–4 µm (n = 50). Note the shapes & internal guttules. Straight longitudinal germ slits (arrowed) seem to be present although earlier descriptions don't mention these.