***Peroneutypa scoparia* (Schwein.) Carmarán & A.I. Romero AEB 1295 (= PDD 117255) – closely accompanied by the 'hyperparasite' *Annellodochium ramulisporum* Deighton – both species matching their published descriptions. Renewed observations of the herbarium specimen in January 2022 revealed a few depauperate, non-sporulating examples of *Harpographium fasciculatum* also closely associated with the *P. scoparia*.**

Eutypella scoparia* = *Peroneutypa scoparia* = *Peroneutypa heteracantha

Many older records & illustrations are under the latter – as in PDD before 2011. Those following the 2006 reference 'Carmarán et al. 2006. A new phylogenetic classification in Diatrypaceae. Fungal Diversity 23: 67–87' use the middle name. However, the first name and other names not listed above often appear in the nomenclatural record (see Index Fungorum & Rappaz F. 1987. Taxonomie et nomenclature des Diatrypacees ä asques octospores. Mycol. Helvetica 2: 285-648.). Index Fungorum and most recent records use *Peroneutypa scoparia*.

Collection site: Dry Creek entrance to Belmont Regional Park (Lower Hutt); **Collection date:** 25 February 2017

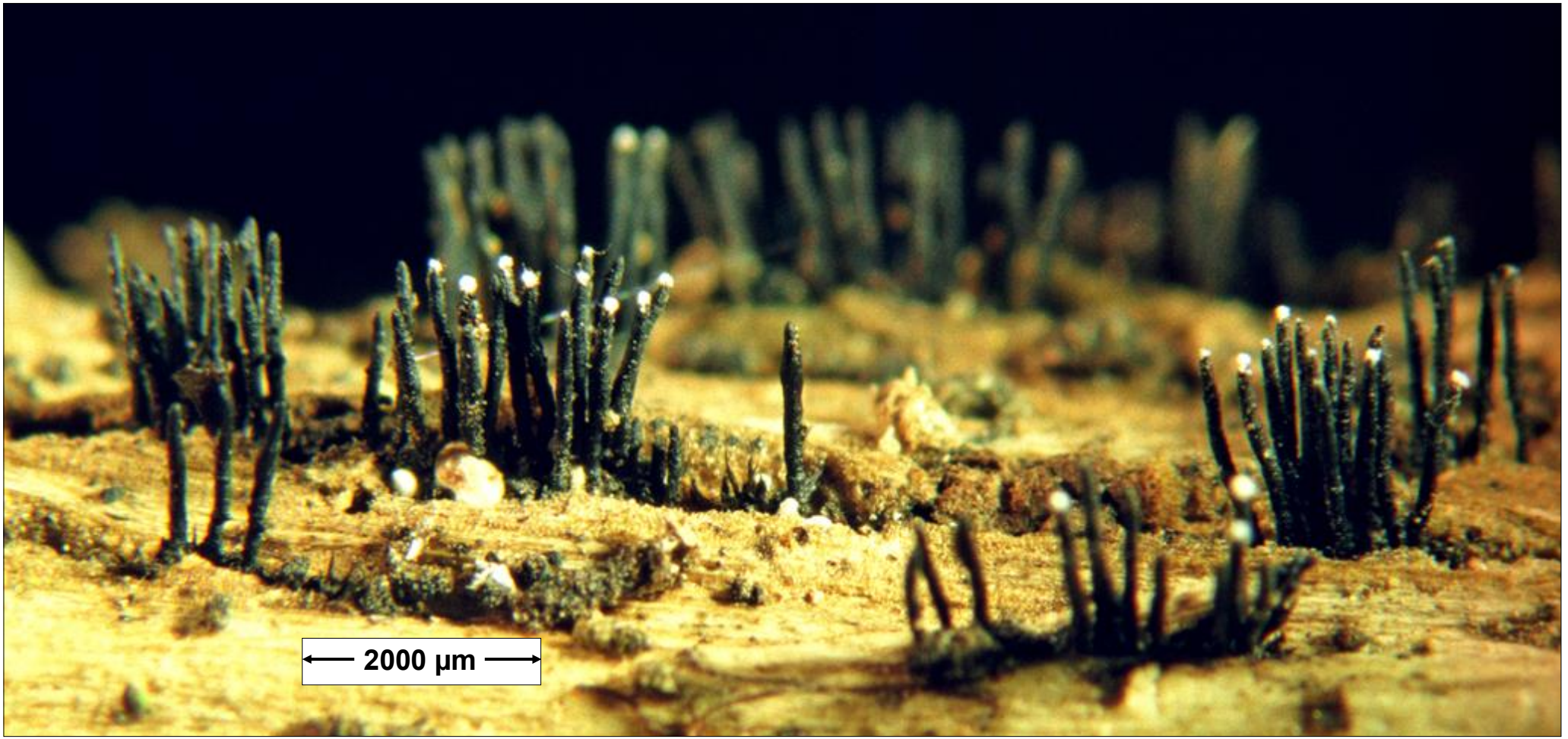
Collector: Dan Mahoney; **Identifiers:** Dan Mahoney & Ann Bell

Substrate: dead, firm, unidentified branch (approx. 1.5 cm in diam) lying on the soil surface

Voucher materials: dried herbarium material accompanied by a Shear's mounting fluid (SMF) semi-permanent microscope slide of *P. scoparia* and a SMF/aniline blue lactic acid slide of *A. ramulisporum*; Dan's in-situ dissecting scope photos and his compound scope photos of microscopic detail; Dan's brief descriptions.

***Annellodochium ramulisporum*:** This 'hyperparasite' is represented by its large superficial globular sporodochia that lie among the long necks of the *Peroneutypa scoparia* perithecia. It is summarized later in this document and is best treated in legends that accompany an in-situ dissecting scope photo and several compound scope photos of microscopic detail.

Brief description of *Peroneutypa scoparia* AEB 1295: See the many excellent Google images that show the large black necks that emerge from submerged perithecial venters. Asci and ascospores are very small but these also match the published descriptions. Asci are clavate with the 8 hyaline smooth allantoid ascospores bunched together irregularly. Asci with their long narrow stipes and the ascospores are best viewed under phase microscopy using the oil immersion objective. My hat is off to those who have successfully photographed the ascus detail. My photos are only rough likenesses. Perithecial venters were sometimes within the bark but many were seen in the surface woody tissue beneath the bark.



***Peroneutypa scoparia*. In-situ submerged perithecial venters, each with a long emergent neck. Note the white ascus/ascospore discharge at the neck apex.**

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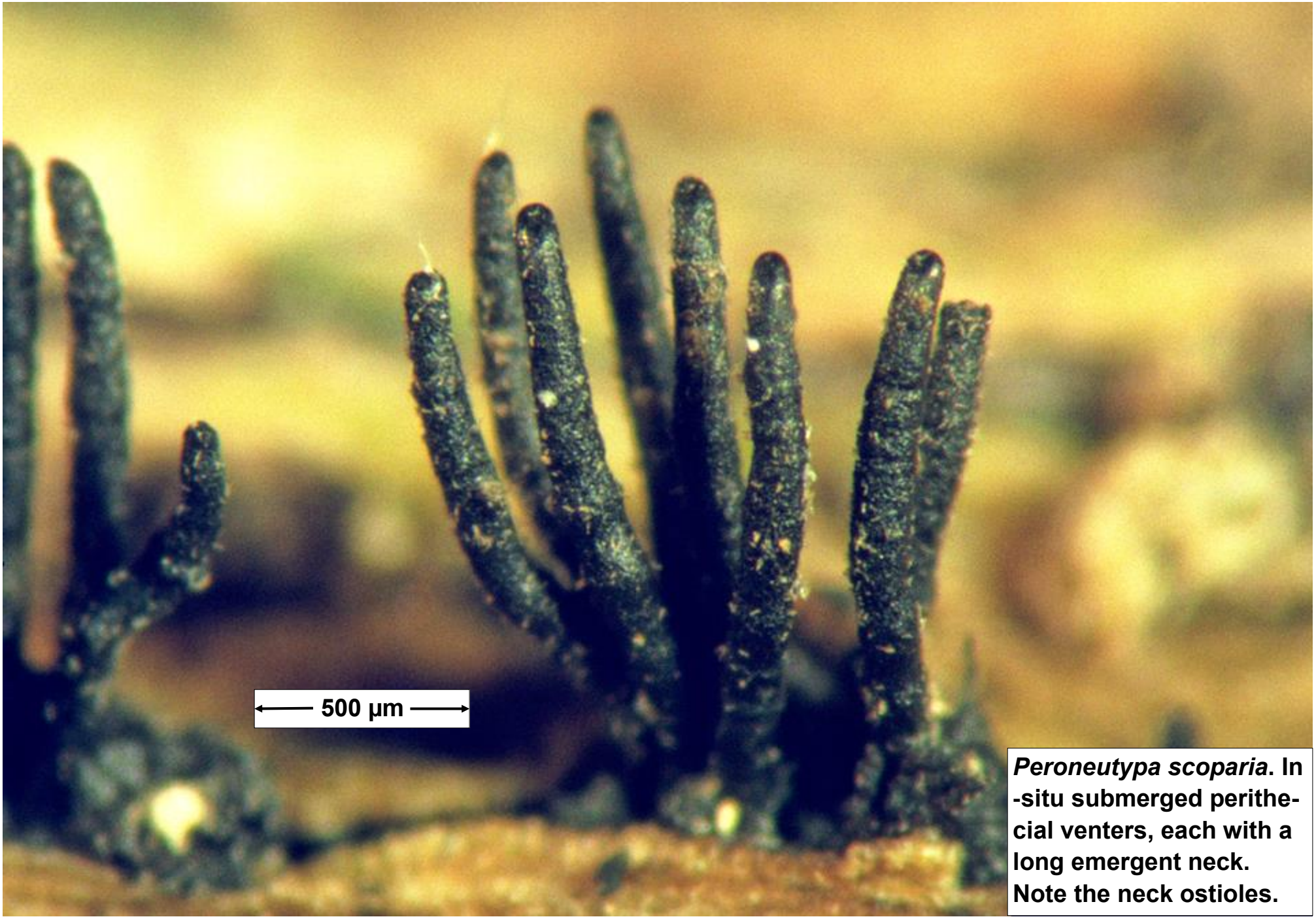
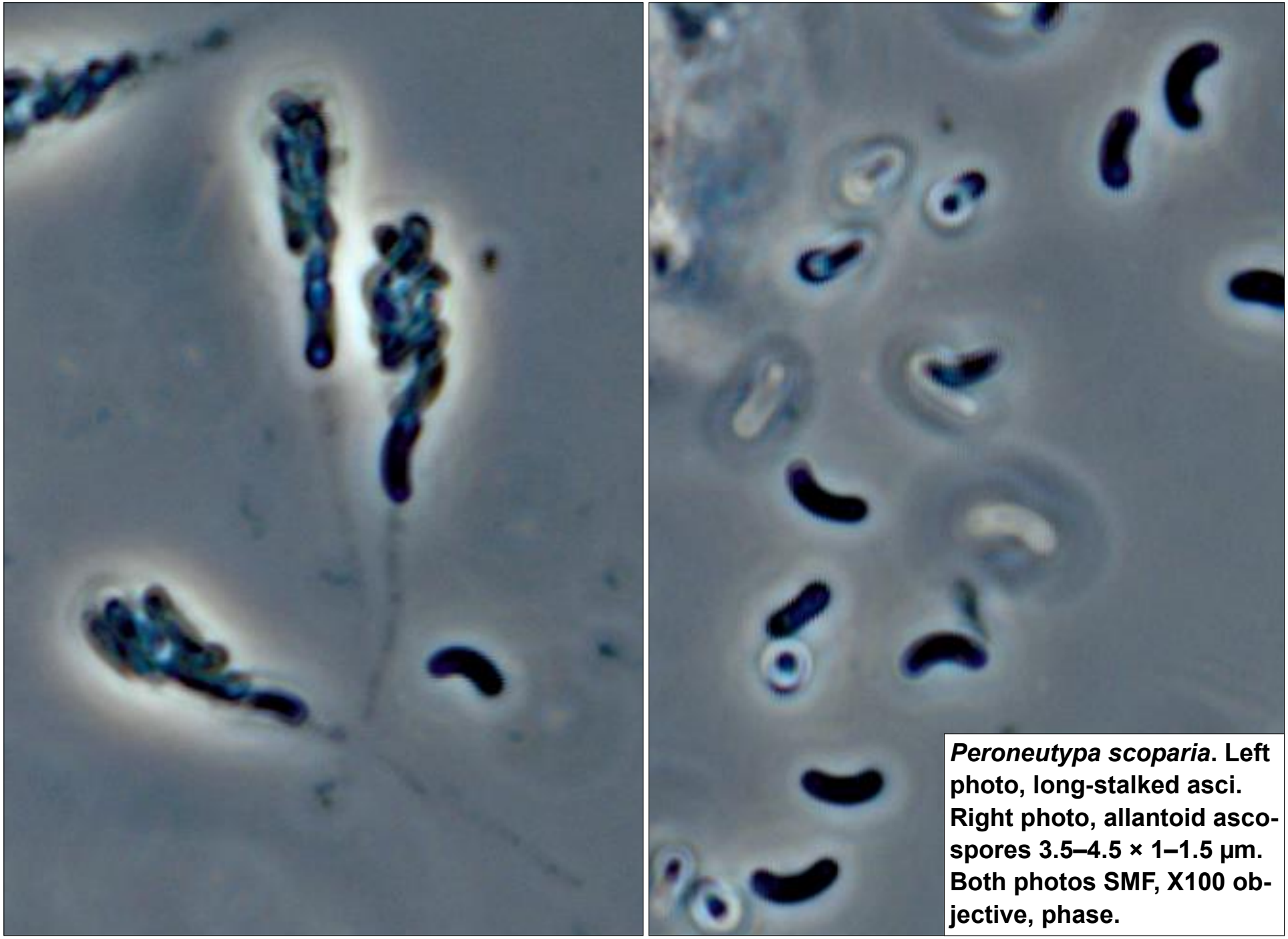
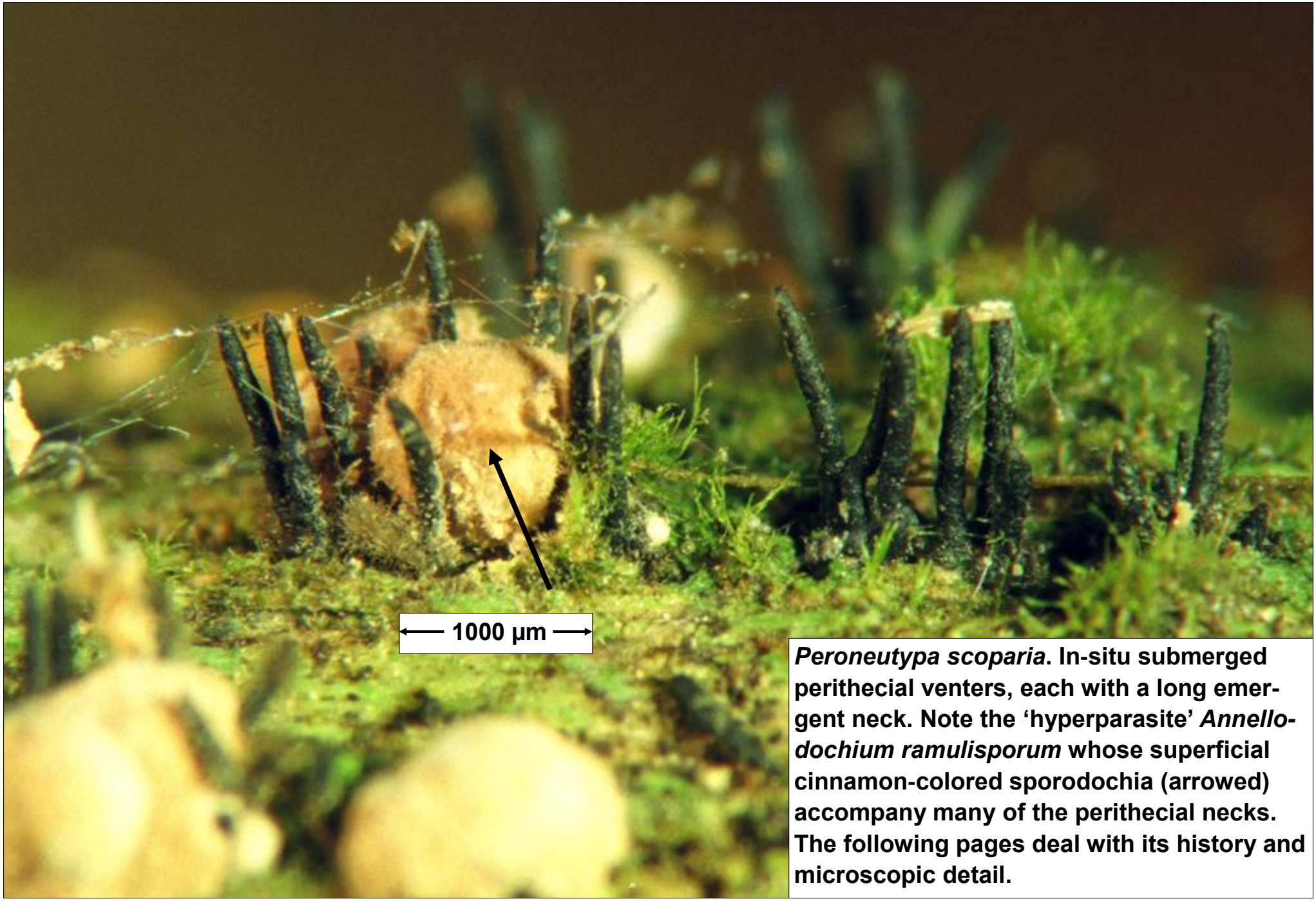


***Peroneutypa scoparia*. In -situ submerged perithecial venters, each with a long emergent neck. Note the neck ostioles.**



***Peroneutypa scoparia*. Left photo, long-stalked asci. Right photo, allantoid ascospores 3.5–4.5 × 1–1.5 µm. Both photos SMF, X100 objective, phase.**



***Peroneutypa scoparia*. In-situ submerged perithecial venters, each with a long emergent neck. Note the 'hyperparasite' *Annellodochium ramulisporum* whose superficial cinnamon-colored sporodochia (arrowed) accompany many of the perithecial necks. The following pages deal with its history and microscopic detail.**

Initial confusion over the identity of *Annellodochium ramulisporum*

Before being more persistent with the identity of this specimen, I considered it first a sporodochium unknown and then a bulbil-like unknown. Ann, having seen my initial record suggested that perhaps it was a hyperparasite of *Peroneutypa scoparia* (or its synonym). So…I started with its synonym and put '*Peroneutypa heteracantha* parasite' into a Google search. Bingo! Among the items listed was the following:

Biology of Conidial Fungi - Volume 1 - Page 210 - Google Books Result
https://books.google.co.nz/books?isbn=0323138993
Garry T. Cole - 2012 - Nature
About 80 conidial fungi are described in widespread plant-*parasitic* or ... ex Fr.) Nits. , *Eutypa flavovirens* (Pers. ex Fr.) Tul., **and *Peroneutypa heteracantha* (Sacc.)** ...
There was an illustration of my unknown – p. 210, Fig. 10A – and the rest was easy. I located records of the following and was able to better interpret its ontogeny and reported host range.
Records of interest:

1) Deighton, F.C. 1969. Microfungi. IV: Some hyperparasitic hyphomycetes, and a note on *Cercosporella uredinophila* Sacc. Mycological Papers 118: 1-41. He describes and illustrates the new genus, new species *Annellodochium ramulisporum* on an unidentified *Diatrype* [dead branch of *Chlorophora regia*, Africa (Sierra Leone)], pp. 28-30. (Copies of these pages are presented later in this pdf.)

2) CRANE, J.L. & K.P. DUMONT. 1975. Hyphomycetes from the West Indies and Venezuela. Can. J. Bot. 53: 843-851. *Annellodochium ramulisporum* is described and illustrated on pp. 849–851 (Copies of these pages are presented later in this pdf.).
However, no mention is made of its parasitic association with anything. They report 3 collections from Venezuela – all on unidentified bark and wood. Despite warty rather than smooth conidia and no mention of parasitism, their illustrations seem very much like *A. ramulisporum*.

3) ELLIS, M.B. 1976. More Dematiaceous Hyphomycetes. Commonwealth Mycological Institute: Kew. Pp. 137–138 description & illustrations.

Continued on the next page

4) Seifert K, Morgan-Jones G, Gams W, Kendrick B. 2011. The Genera of Hyphomycetes. CBS Biodiversity Series no. 9: 1 –997. CBS-KNAW Fungal Biodiversity Centre, Utrecht, Netherlands. Brief description and illustrations – Pp. 82 & 782 plate 300B.

5) Miscellaneous on Google:

a) Annellodochium/Peziza - Forum ASCOFrance
www.ascofrance.com/forum/19709/annellodochium-peziza
This notation illustrates *Annellodochium ramulisporum* on dead wood but, like the 3 Venezuelan collections in Crane & Dumont (1975) noted earlier (and a few others on Google images), was, seemingly, not associated with a diatripaceous host.

b) Sun, J.-Z., Liu, X., McKenzie, E.H.C., Jeewon, R., Liu, J.-K. (Jack), Zhang, X.-L., Zhao, Q. & Hyde, K.D. 2019. Fungicolous fungi: Terminology, diversity, distribution, evolution, and species checklist. Fungal Divers. 95, 337–430.
Annellodochium ramulisporum is among the many fungicolous fungi included here.

c) Vujanovic V., Kim S.H., Latinovic J. & Latinovic N. 2020. Natural fungicolous regulators of *Biscogniauxia destructiva* sp. nov. that causes beech bark tarcrust in southern European (*Fagus sylvatica*) forests. Microorganisms 8(12), 1–19.
This article keys in on fungicolous fungi (like *Annellodochium ramulisporum*) that have been reported on xylariaceous hosts and may help discourage that host (*B. destructiva* in this case).

The emphasis above, except for '5a', and on the previous page has been the possibility that *Annellodochium ramulisporum* is a hyperparasite on its diatrypaceous host. Yet the only collections to date that record that possibility are Deighton's original collection (1969) and the collection described herein for AEB 1295. Some special relationship 'may' be the case but its appearance elsewhere, without any diatrypaceous association, would also indicate its possible role as a hyphomycetous saprophyte (or something else). The possibility remains that its association with a diatrypaceous host is simply happening by chance rather than intention. More collections and experimental work are required before its role can be proven.

It should also be noted that its diatrypaceous host in AEB 1295 (*Peroneutypa scoparia*) is very common and yet there is no other record of an association between *P. scoparia* and *Annellodochium ramulisporum* in the literature. Also other AEB collections of *Peroneutypa scoparia* (AEB 1267, AEB 1298 & AEB 1349 have no such association.

Deighton, F.C. 1969. Microfungi. IV: Some hyperparasitic hyphomycetes, and a note on *Cercosporella uredinophila* Sacc. Mycological Papers 118: 1–41.

Annellodochium Deighton, gen. nov. (*Annellus*, a little ring; *docheion*, a receptacle.)

Fungi Imperfecti, Hyphomycetes, hyperparasitici. *Sporodochia* pulvinata, ex hyphis ramosis e centro basis marginem versus radiantibus et strato peripherali valliformi ex conidiophoris parallelis circumdata. *Conidiophora* cylindrica, pallide brunnea, parietibus tenuibus, annellata, conidia (blastosporas) terminaliter gerentia et per cicatricem vetam proliferantia (percurrentia). *Conidia* pallide brunnea, parietibus tenuibus, catenulata, 1 septata, cellula apicali parva, conidium secundum e cellula apicali lateraliter gerentia.

Species typica: *Annellodochium ramulisporum* Deighton.

Hyperparasitic. *Sporodochia* pulvinate, stromatic, composed of branched hyphae radiating from the centre of the base towards the margin and surrounded by a peripheral palisade-like layer of parallel conidiophores. *Conidiophores* cylindric, pale brown, thin-walled, annellate, bearing conidia (blastospores) terminally and proliferating through the old apical scars (percurrent). *Conidia* pale brown, thin-walled, catenulate, 1 septate, the apical cell small and bearing the second conidium as a lateral branch.

Annellodochium ramulisporum Deighton, spec. nov. (Fig. 16.)

Sporodochia erumpentia, pulvinata, irregulariter subhemisphaerica, albida, plerumque 480–870µ lata et 270–540µ alta, interdum minora vel usque 1·5 mm. lata, stromatica, ex hyphis dilutissime olivaceis, dense aggregatis, septatis, ramosis, 3–5µ latis, ex centro basis marginem versus radiantibus, composita, strato peripherali valliformi 25–50µ crasso ex conidiophoris parallelis, arcte contiguis, circumdata. *Conidiophora* ex ramulis distalibus hypharum internarum terminaliter oriunda, dilutissime olivacea, laevia, cylindrica, 25–50µ

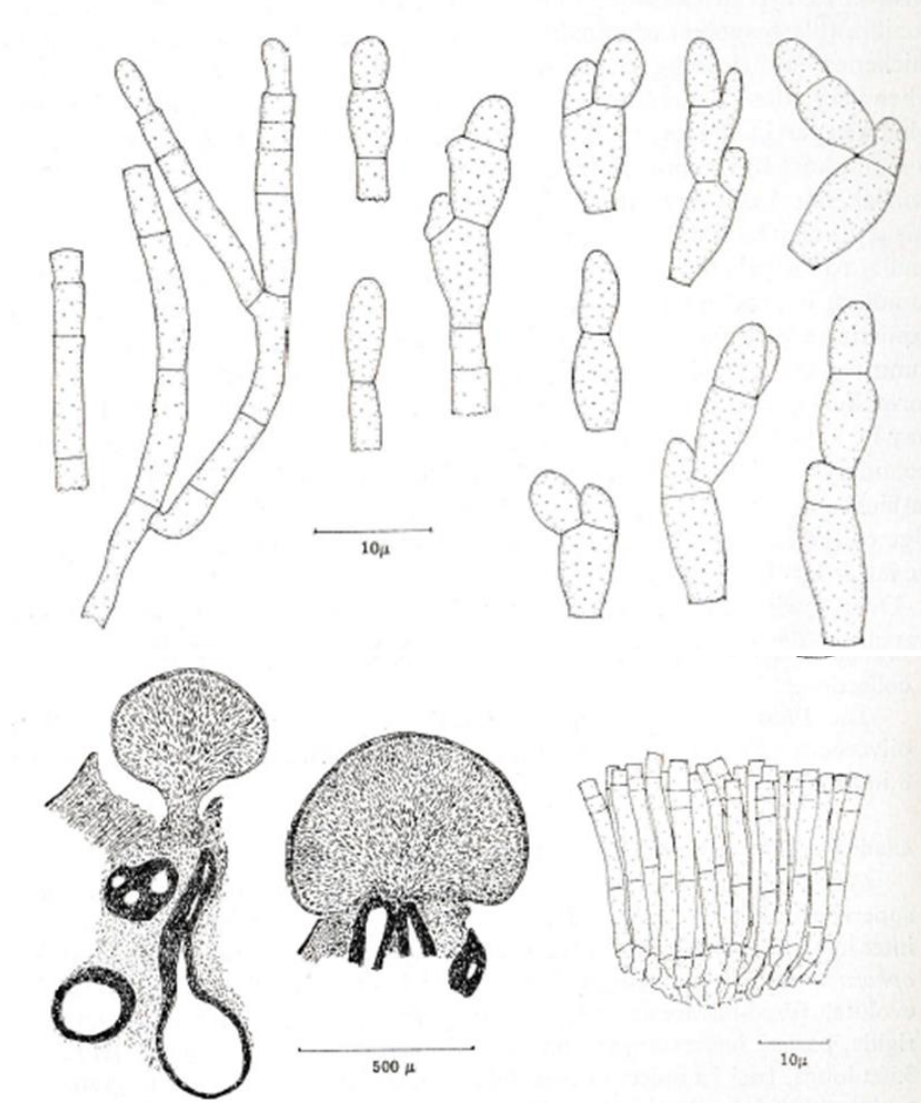


FIG. 16. *Annellodochium ramulisporum*. From the type (38261a).

Habitat in *Diatrype* sp. in ramulis emortuis *Chlorophorae regiae* A. Chev., Sierra Leone: Njala (Kori), 29.viii.1949, leg. F. C. Deighton, M3020 (Herb. IMI 38261a, typus).

Deighton, F.C. 1969. Microfungi. IV: Some hyperparasitic hyphomycetes, and a note on *Cercosporella uredinophila* Sacc. Mycological Papers 118: 1–41. Continued

Sporodochia erumpent, pulvinate, irregularly subhemispheric, whitish, mostly 480–870µ wide and 270–540µ high, sometimes smaller but sometimes up to 1·5 mm wide, consisting of an inner stroma of very dilute olivaceous branched, septate hyphae, 3·5–5·5µ wide, densely packed, radiating in a general direction from the centre of the base towards the margin, and surrounded by a marginal palisade-like layer, 25–50µ thick, of densely packed, more or less parallel conidiophores. *Conidiophores* terminal branches of the internal hyphae, dilute olivaceous, cylindric, 25–50µ long, 2·5–3·5µ wide, thin-walled, smooth, bearing conidia (blastospores) terminally and proliferating through the old apical unthickened scar leaving conspicuous annellations. *Conidia* pale olivaceous, when very young concolorous with the conidiophore but soon becoming somewhat deeper in colour, at first ellipsoid, soon becoming separated from the conidiophore by a septum and soon after that developing a septum cutting off a smaller apical cell from the body of the conidium. From a point just below this septum, a lateral bud normally appears and develops into another conidium similar to the primary conidium. The process may then be repeated and a third conidium is produced: further proliferation may occur. Chains of 2 conidia (sometimes with the primary conidium still attached to the conidiophore) are common, and occasionally chains of 3 conidia were observed, but the conidia normally separate from each other readily. Occasionally the lateral bud cell may be suppressed and the apical cell of the conidium itself develops into the secondary conidium. Conidia (11)12–16µ long, 4·5–5(5·5)µ wide. Hilum unthickened, slightly convex, 2·5–3·5µ wide. A small frill is observable at the edge of the scar on the conidiophore and of the hilum of the conidium, after the latter has been shed.

Overgrowing and probably parasitizing a species of *Diatrype* on a dead branch of *Chlorophora regia* in Sierra Leone. Only known from the type collection.

The *Diatrype* has not yet been identified. Its ascospores are very dilute olivaceous, allantoid with rounded ends, continuous, 5·5–6·5 × 1–1·5µ, borne 8 in an ascus.

CRANE, J.L., et K.P. DUMONT. 1975. Hyphomycetes from the West Indies and Venezuela. Can. J. Bot. 53: 843-851.

Annellodochium ramulisporum Deighton, Mycol. Pap. C.M.I. 118: 28. 1969. Figs. 9, 12-14

Sporodochia tan to light brown, punciform, scattered 450-700 um wide, 150-520 um high. Conidiophores macronematous, mononematous, hyaline, subhyaline, cylindrical, branching dichotomously, arising as terminal branches of the sporodochial hyphae, 90.6-171 um x 3.3-4.9 um. Conidiogenous cells integrated, monoblastic, terminal, cylindrical with one to eight percurrent proliferations. Conidia catenulate, mitten-shaped, dry, acrogenous, light brown, verruculose, one-septate, (10-)12.2-23(-25.4) x 3.3-4.4(-5.5) um, tapering to 2.2 um at base. MATERIAL EXAMINED: On decorticated unidentified wood. Between Refugio "No TeApures" and Quebrada Los Palos Grandes, south-facing slope of La Silla, Parq. Nac. El Avila, Edo Miranda, Venezuela. K. P. DumontVE-3764 (NY), ILLS 35653. On unidentified bark. About 9 km N of El Rincon on Carupano - El Pilar Road, Edo. Sucre, Venezuela. Dumont-VE-4030 (NY), ILLS 35654. On unidentified wood. About 10 km above Maracay, on the Maracay-Choroni Road, Parq. Nac. Henry Pittier, Edo Aragua, Venezuela. Dumont-VE-2001, ILLS 35655. The Venezuelan collections of *A. ramulisporum* agree well with the type description and represent the first South American record of this species. The most significant difference is the verruculose nature of the conidia in the South American material (Figs. 13, 14).

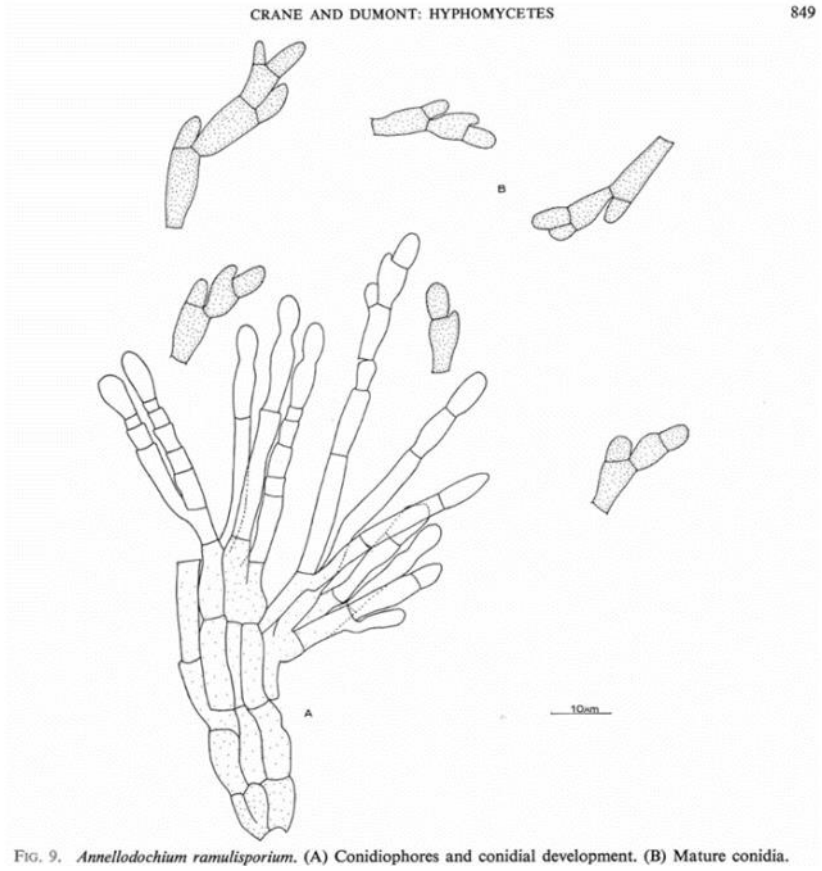
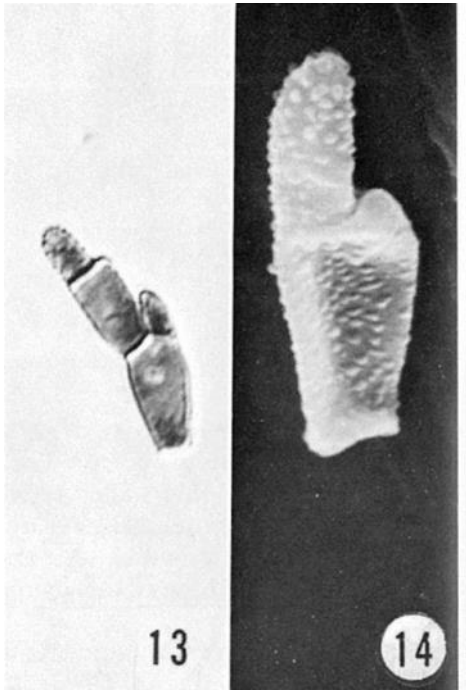
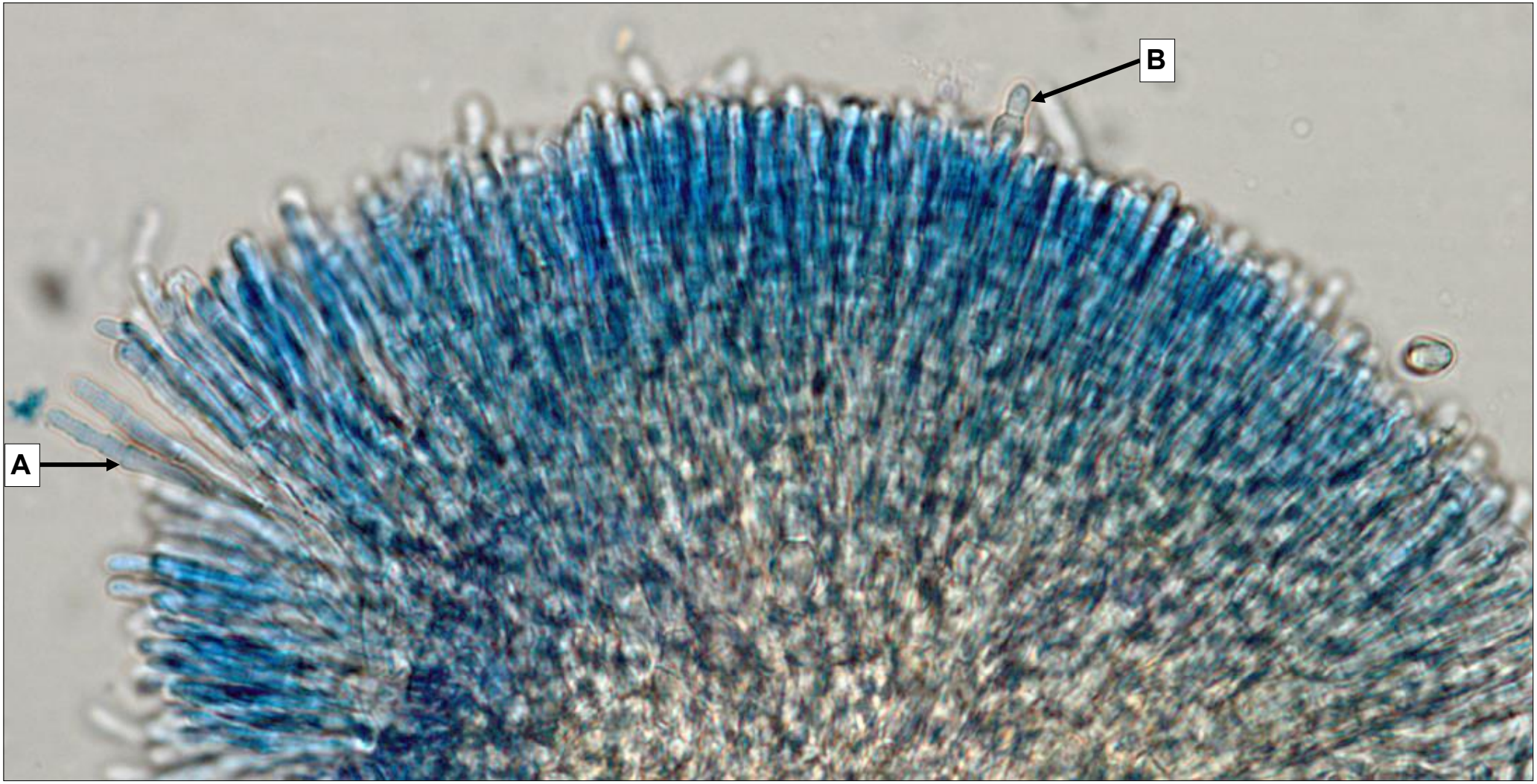


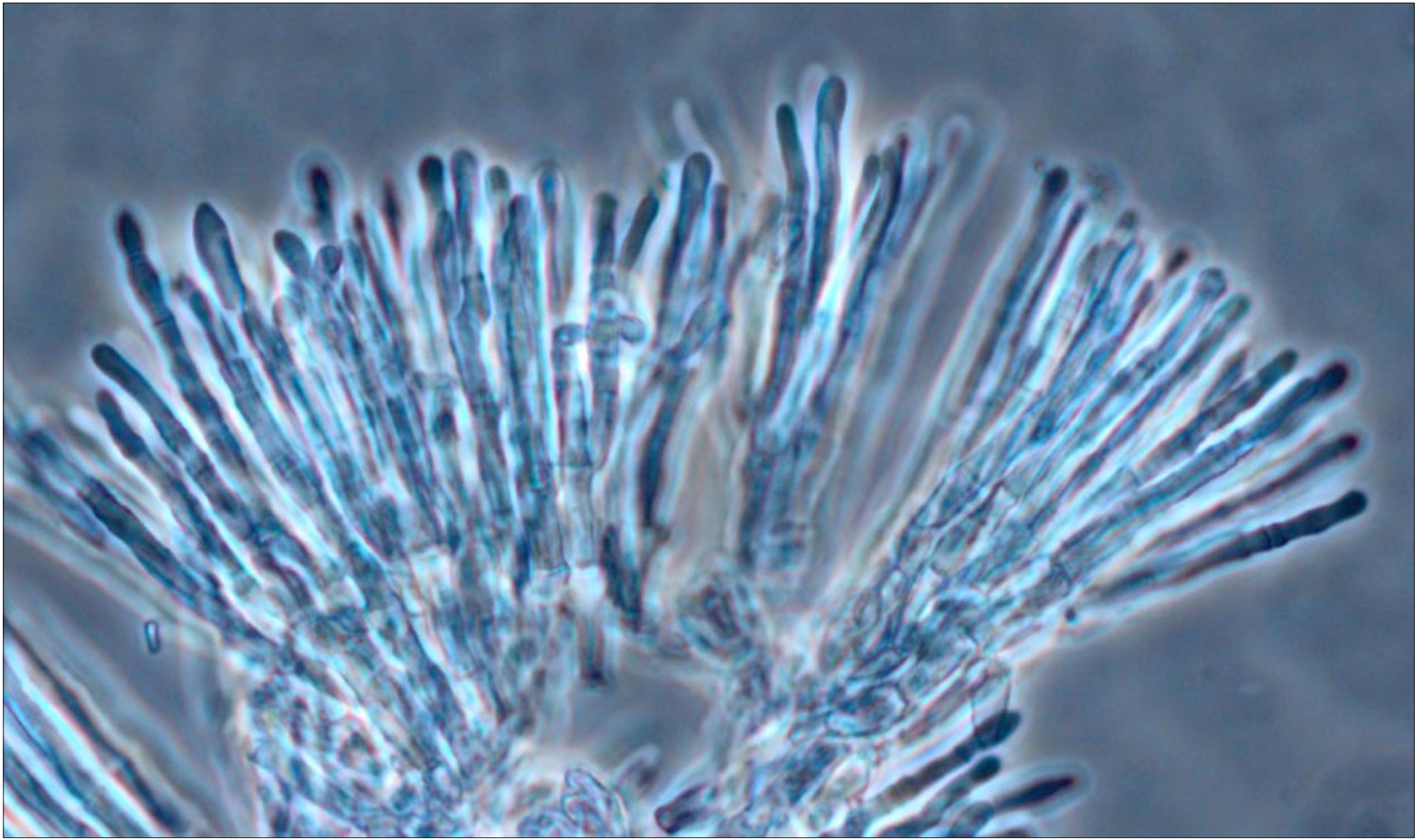
FIG. 9. *Annellodochium ramulisporium*. (A) Conidiophores and conidial development. (B) Mature conidia.



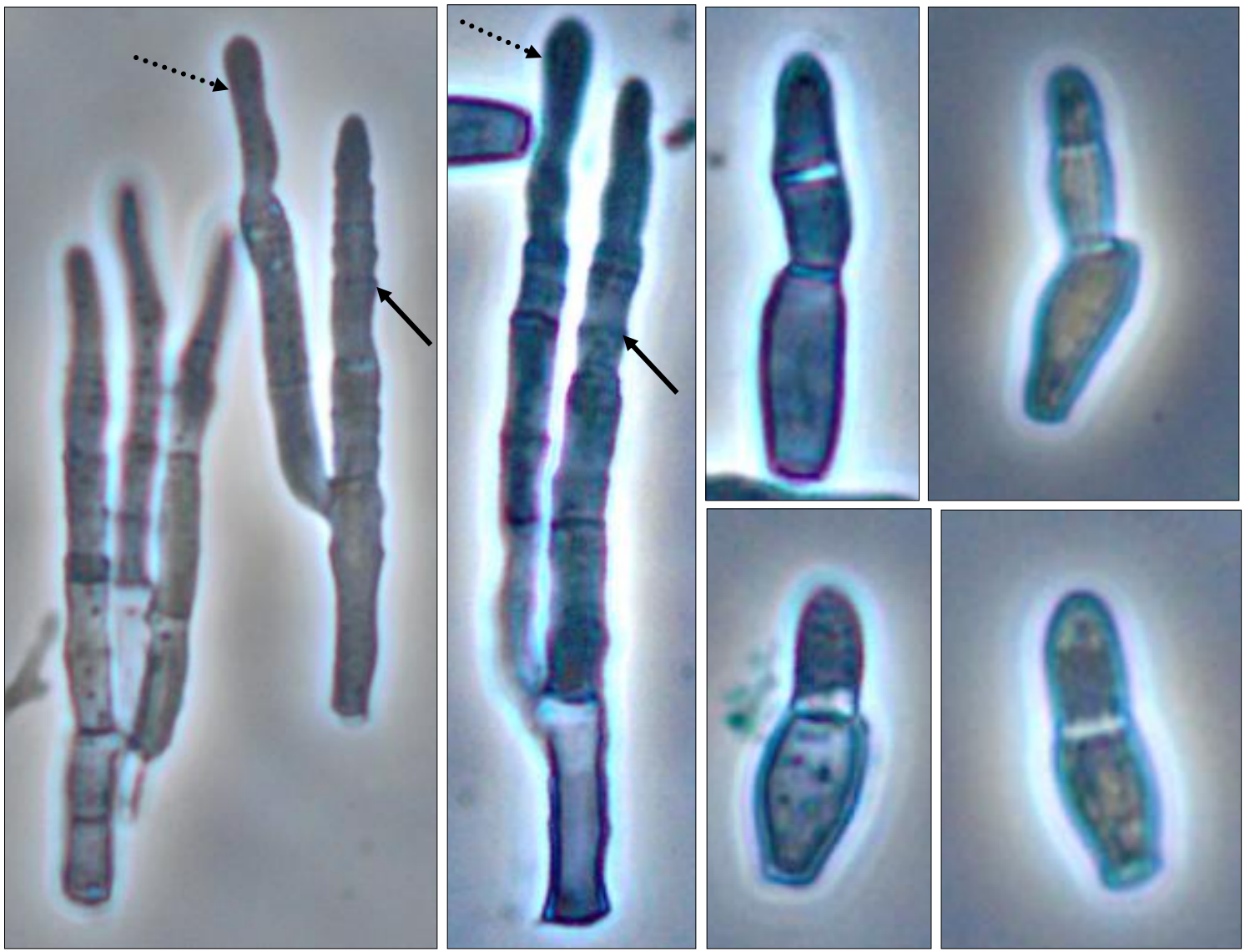
Annellodochium ramulisporum. Figs. 13, 14. Mature conidia. Fig. 13. x 1505. Fig. 14. x 4335



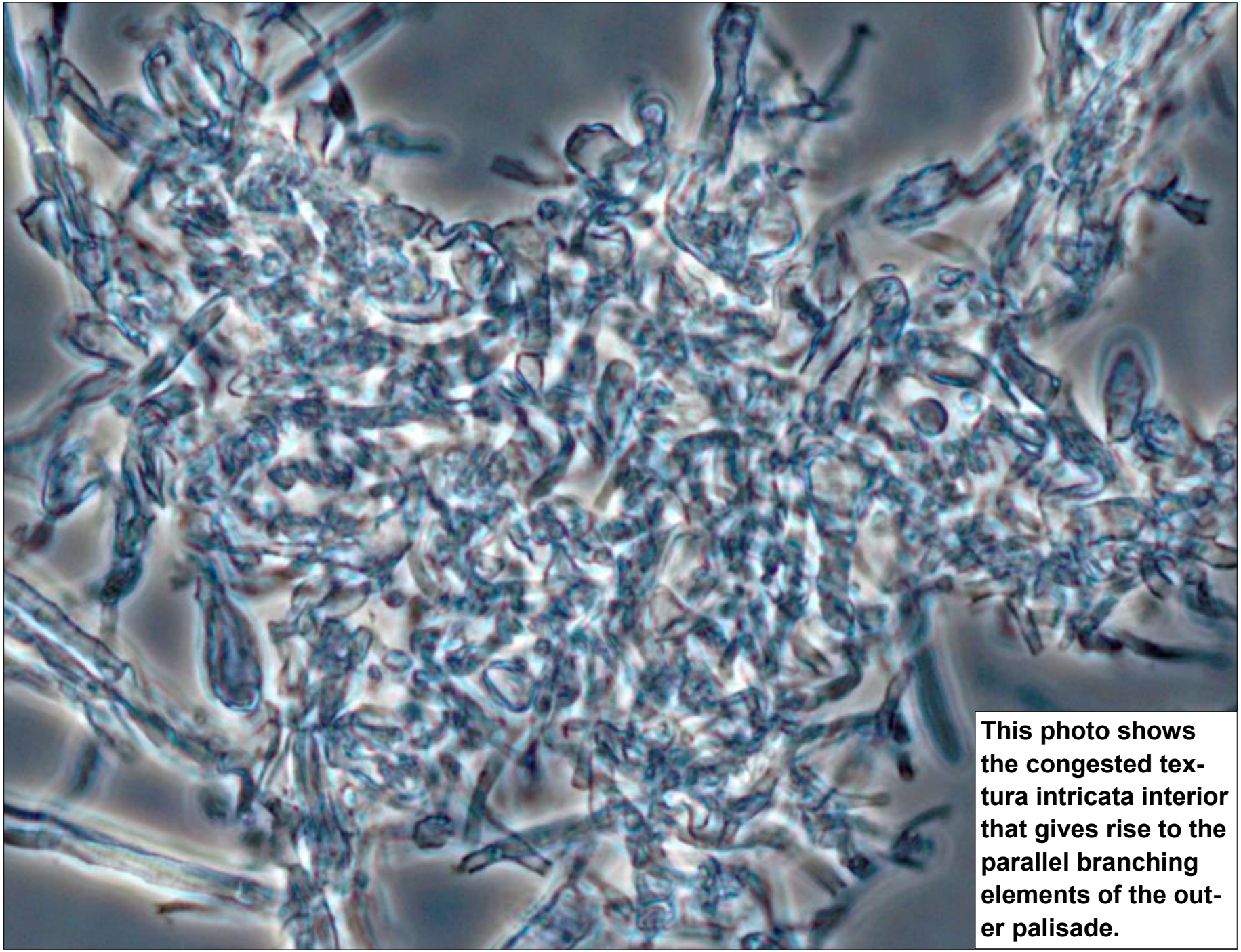
A peripheral portion of the symmetrical hyphal system that characterized the sporodochia of *Annellodochium ramulisporum* photographed earlier. Label 'A' represents an annellated conidiophore at the outermost edge of the highly branched palisade hyphae that encircle a core of compressed textura intricata like tissue (this and other features detailed on next 3 pages). Label 'B' (at the outer boundary) represents a blastic conidium. These conidia were not numerous but wet weather preceded the collection so detached conidia may have been washed away. Aniline blue lactic acid mount, X40 objective and brightfield microscopy.



This photo and those on the next 2 pages result from pressing the coverslip to separate larger components of the sporodochium seen on the previous page. Here the photo emphasizes the repeated compact parallel branching of hyphal elements that compose the palisade outer layer of the sporodochium.



These photos show a closeup of sporogenous conidiophores in the sporodochium outer palisade (left 2 photos; see label 'A' in the original unsquashed palisade fragment, 2 pages back) and detached conidia (right 4 photos; see label 'B', 2 pages back). Noteworthy are 1) the percurrent growth - closely septate portions - of conidiophores in the outermost palisade (solid arrows) and 2) the terminal cells that become conidia (dotted arrows).



This photo shows the congested textura intricata interior that gives rise to the parallel branching elements of the outer palisade.