

***Nemania chestersii* (J.D. Rogers & Whalley) Pouzar – AEB 1312 (= PDD 117250)**

Collection site: Wainuiomata Recreation Area, Nikau Track

Substrate: on a small, bleached, much-decayed, decorticated, branch fragment beside the walking track – which was lined with large specimens of a kānuka (*Kunzea* sp.) tree species.

Collection date: 25 April 2018

Collector: Dan Mahoney; **Identifiers:** Dan Mahoney & Jacques Fournier (Jacques' emailed comments were invaluable and gratefully acknowledged)

Voucher materials: Dried herbarium specimen accompanied by 3 Shear's mounting fluid (SMF) and 1 SMF/aniline blue lactic acid semi-permanent slide mounts; several scanned 35 mm Portra 36 exposure color film, 160 ASA photos of in-situ stromata and a number of compound scope digital photos from water, Melzer's reagent, SMF and SMF/aniline blue lactic acid microscope slides (all from fresh material, late April–early May 2018); Dan's brief description and comments below. See also the belated photos from dried herbarium material: 1) in-situ stromata on 6 November 2020 and longitudinally striated ascospores on 15 January 2021.

Dan's brief description: Initially the ascospore size and occasional isolated uniperitheciate stroma on the wood led me to *Rosellinia stenasca* in Petrini's 2003 key to New Zealand species of *Rosellinia*. The predominance of stromatic clusters within a common ectostroma containing mounds with multiple stromatic ascomata, however, convinced me otherwise.

The following morphological features are worth noting for this (somewhat aged) collection: **Stromatic ascomata** black, solitary to usually clustered in common stromatic masses, these effused to slightly pulvinate on the decayed wood surface, with remnants of a whitish **subiculum**. **Ostioles** little differentiated (somewhat papillate, but the occasional papillate appearance often the result of a short cirrus of extruded ascospores). **Ectostroma** black, brittle, seemingly a heavily melanized shell of compacted parallel-arranged hyphae (this only seen clearly at the very edge of black fragments in squash mounts). **Ascomata peridia** (in slide mounts) seen attached to the surrounding stroma but also separated from it. The peridium clearly composed of pigmented, parallel hyphae in the outermost portion, nearly hyaline textura angularis tissue in the innermost and a bit of a mix in intermediate layers. **Asci** cylindrical with (4–)8 uniseriate to uniseriately overlapping single-celled ascospores. **Apical ring** pale blue in Melzer's reagent. **Stipe** reasonably long. **Paraphyses** longer than asci, hyaline, septate (basal cells swollen and constricted at their septa), simple, tapering apically.

Continued on the next page:

Ascospores ellipsoid to ellipsoid-fusoid or ovoid-fusoid with the apical end rounded and the basal portion tapering slightly to a narrower truncation where a small ephemeral appendage once existed (this appendage not seen), equilateral to inequilateral (depending on the rotational view), brown, longitudinally striate with 2 large guttules (especially in water mounts) and a central deBary bubble (esp. in Melzer's or SMF), (8–)9–10(–11) μm ($n \Rightarrow 50$) with an often inconspicuous straight, longitudinal germ slit – this full length but often appearing somewhat shorter than full length, depending on the depth of field available at different magnifications. The space between the large internal guttules often making the spore appear 2-celled (and, rarely, a wall seemed to form there). No slimy sheath was noted nor was any **anamorphic state** observed. Of special interest is the presence of a previously unreported germ slit.

Nomenclature

Index Fungorum (January 2021)

Current Name: *Nemania chestersii* (J.D. Rogers & Whalley) Pouzar, *Česká Mykol.* 39(1): 24 (1985)

Synonymy:

***Hypoxylon chestersii* J.D. Rogers & Whalley, *Can. J. Bot.* 56(11): 1346 (1978)**

***Hypoxylon chestersii* var. *microsporum* J.D. Rogers & Samuels, in Rogers & Samuels, *Mycotaxon* 22(2): 370 (1985)**

***Nemania chestersii* var. *microspora* (J.D. Rogers & Samuels) Y.M. Ju & J.D. Rogers, *Nova Hedwigia* 74(1-2): 91 (2002)**

***Nemania chestersii* var. *submicrospora* J.D. Rogers, Y.M. Ju & I. López, *Mycologia* 97(2): 563 (2005)**

***Xylaria nodulosa* var. *microspora* J.D. Rogers & Samuels, in Rogers, Callan, Rossman & Samuels, *Mycotaxon* 31(1): 139 (1988)**

Synonymy Contributor(s): Ju & Rogers (2013)

Comments on the Index Fungorum nomenclature: As indicated above, *Nemania chestersii* was originally described in the genus *Hypoxylon*. However, in 1985, Pouzar (Pouzar Z. 1985. Reassessment of *Hypoxylon serpens*-complex I., *Česká Mykologie* 39 (1), 15–25.) discussed the historical treatment and morphological detail that distinguished *Nemania* species s.s. from those in *Hypoxylon*, *Xylaria*, *Rosellinia* and others. Without adding further descriptive detail or illustrations to '*Hypoxylon chestersii* J.D. Rogers & Whalley, *Can. J. Bot.* 56(11): 1346 (1978)', he recorded it in *Nemania* as a comb. nov. [*Nemania chestersii* (J. Rogers et Whalley) Pouz. comb. nov.; basionym: *Hypoxylon chestersii* J. Rogers et Whalley, *Canad. J. Bot.*, Ottawa, 56: 1346, 1978.]. Likewise, *Hypoxylon chestersii* var. *microsporum* J.D. Rogers & Samuels (1985) was transferred to *Nemania* as '*Nemania chestersii* var. *microspora* (J.D. Rogers & Samuels) Y.M. Ju & J.D. Rogers' in 2002. A third variant of *Nemania chestersii* (var. *submicrospora*) was added in 2005. The Commentary on p. 563 of that article summarizes the varieties. **See the next page for that Commentary.**

“*Commentary*. This represents the third variety of *N. chestersii*. The typical variety was described from Wales (as *Hypoxylon*) (Rogers and Whalley 1978) and var. *microspora* from Brazil (as *Hypoxylon*) (Rogers and Samuels 1985). *Nemania chestersii* in its three varieties represent the only taxa (in *Nemania*) with raised ribs on the ascospores. They seem extremely similar except for ascospore sizes. As in most, if not all, *Nemania* species, the immature ascospore of the present fungus has a cellular appendage on one end. However, it should be noted that the disappearance of the appendage in the present fungus frequently leaves a truncated end on the mature ascospores.”

Since 2005, the synonymy contributors Ju & Rogers (2013) on Index Fungorum no longer recognize the smaller-ascospored variants and treat these as only naturally-occurring representatives within a single variable species. **The present specimen (AEB 1312) represents the ascospore size most similar to what was earlier described as *Nemania chestersii* var. *submicrospora*.**

Those published descriptions with illustrations that I consulted:

1. Rogers J.D. & Whalley A.J.S. 1978. A new *Hypoxylon* species from Wales. *Can J Bot* 56(11), 1346–1348.
2. Rogers J.D. & Samuels G.J. 1985. New taxa of *Hypoxylon*. *Mycotaxon* 22: 367–373.
3. Ju Y.-M., Rogers J.D. & Hsieh H.-M. 2005. New *Hypoxylon* and *Nemania* species from Costa Rica and Taiwan. *Mycologia* 97(2), 562–567.
4. Granmo A., Læssøe T. & Schumacher T. 1999. The genus *Nemania* s.l. (*Xylariaceae*) in Norden. *Sommerfeltia* 27, 96 pp. Fourteen species of *Nemania* s. str. were found in the Nordic countries: Norway, Sweden, Finland and Denmark. A dichotomous key has been prepared and the species are reviewed alphabetically with comments on taxonomy, ecology and chorology. All species have been drawn, photographed and mapped.
5. Rogers J.D., Callan B.E., Rossman A.Y. & Samuels G.J. 1988. *Xylaria* (Sphaeriales, Xylariaceae) from Cerro De La Neblina, Venezuela. *Mycotaxon* 31(1): 103–153. Only *Xylaria nodulosa* var. *microspora* J.D. Rogers & Samuels (a seemingly questionable synonym, see previous page) reports a germ slit.

PDD Landcare New Zealand website records: Presently, there are no records of *Nemania chestersii*. However, in re-visiting *Rosellinia stenasca* AEB 1032 (= PDD 94210), I found that it was also *N. chestersii* and have corrected that. It is highly possible that among the many *Nemania* and *Hypoxylon* records at PDD, others may also represent *N. chestersii*. My experience with AEB 1312 has shown that the ascospore longitudinal striations are often difficult to see except with careful focusing at higher magnifications. Also, the ascospore narrow-basal truncation can be missed and, as I found, the appendage has often disappeared (I saw none).

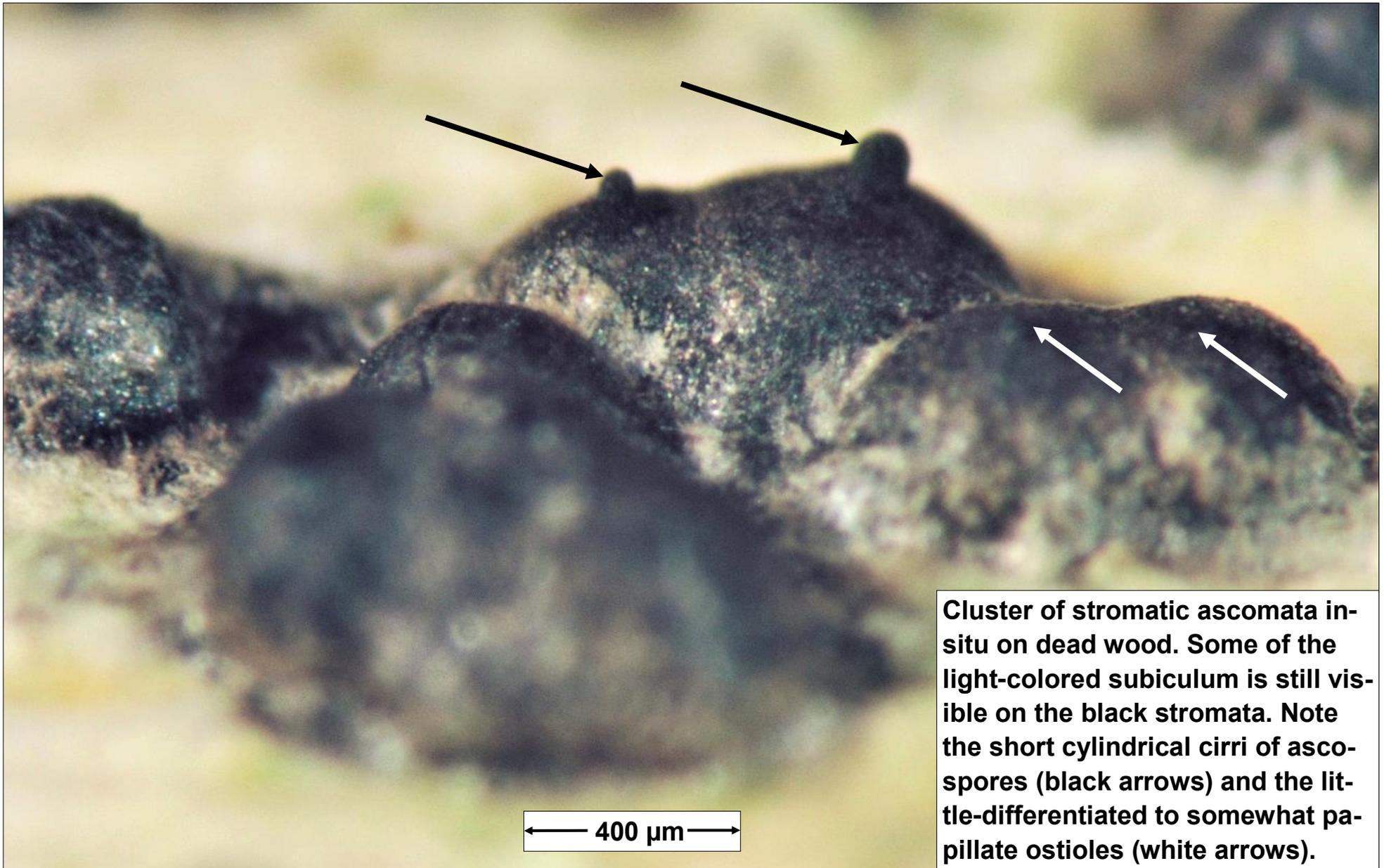


← 500 μm →

Cluster of stromatic ascomata in-situ on dead wood. Some of the light-colored subiculum is still visible on the black stromatic mounds.

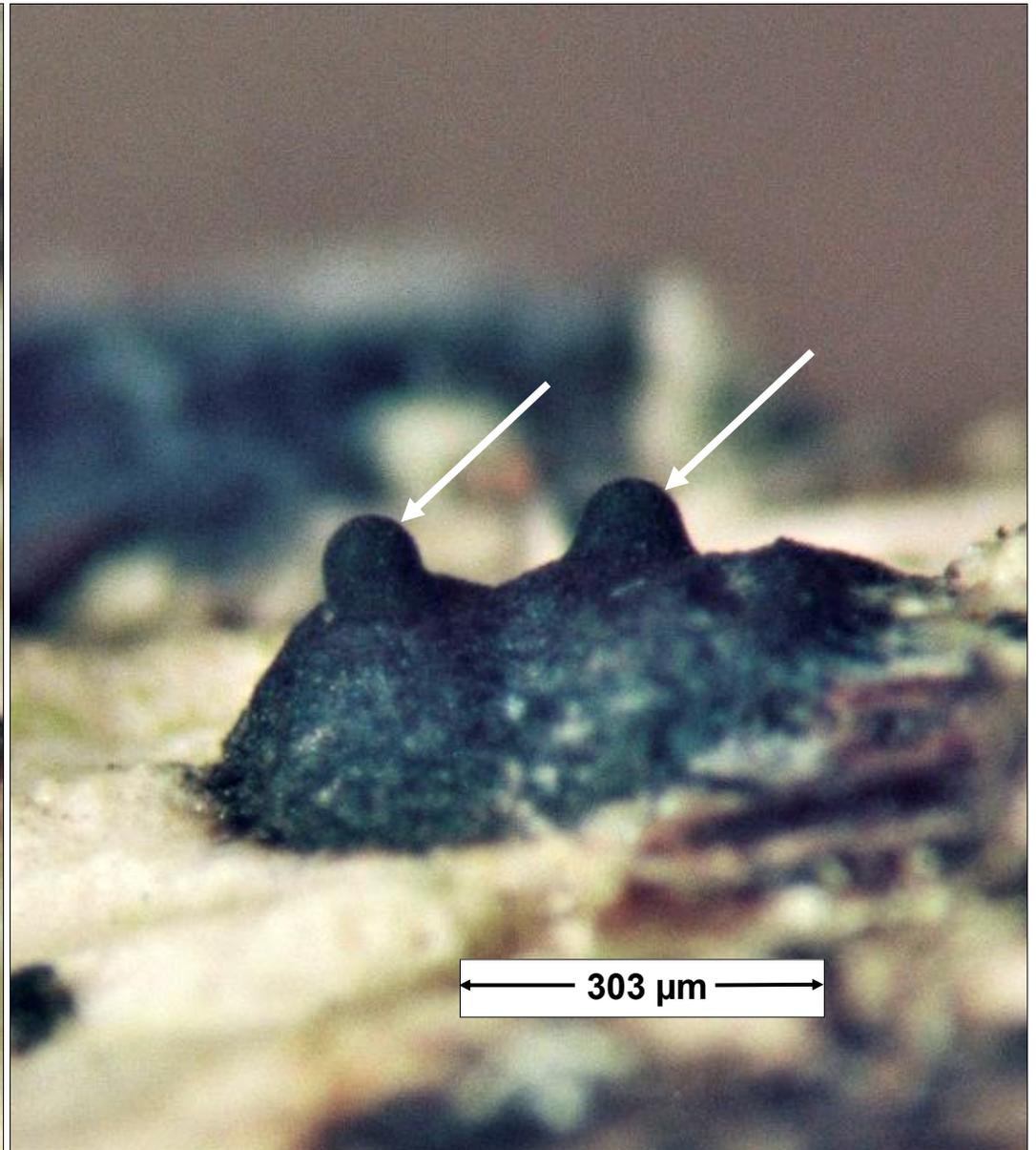
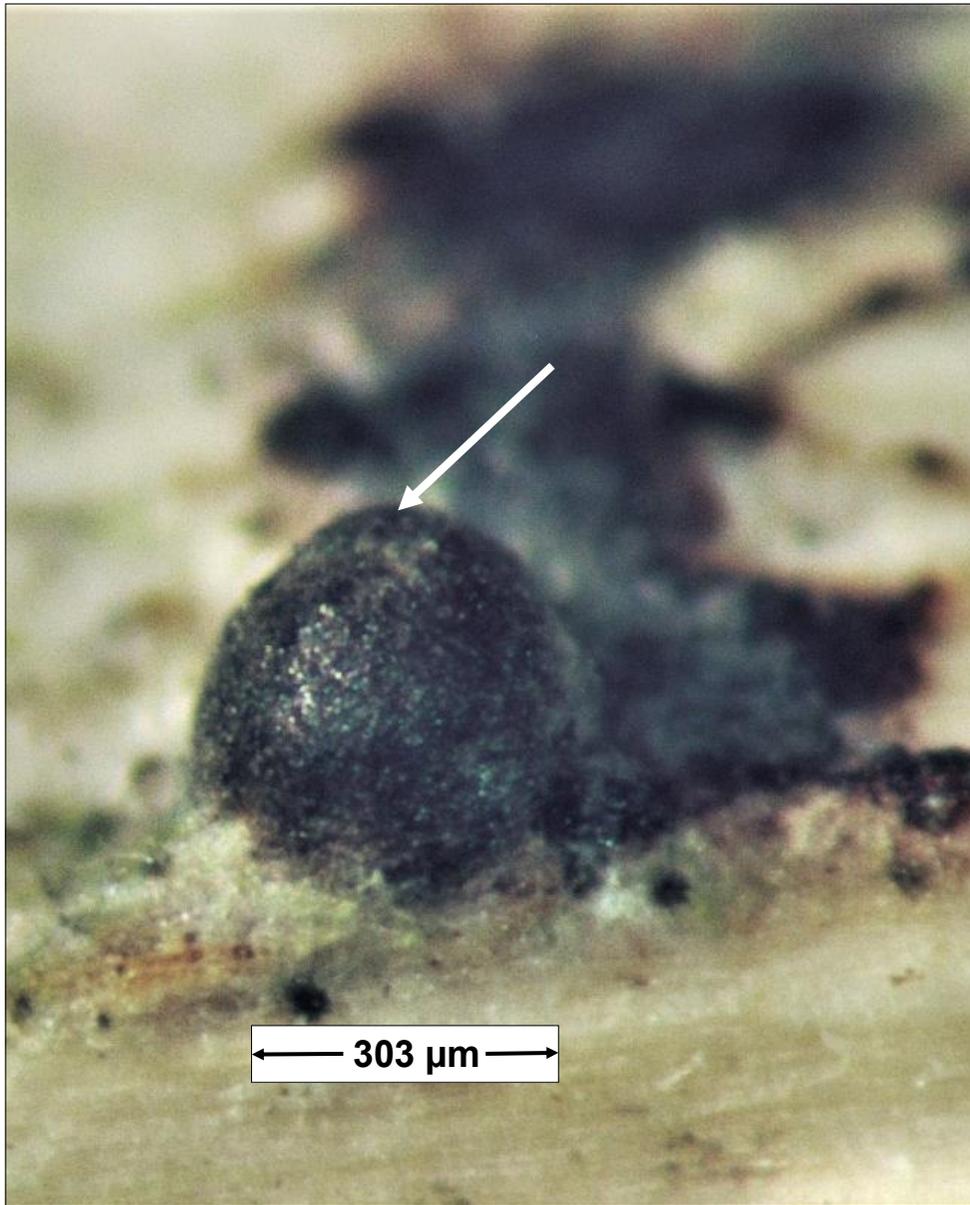


Crowded stromatic ascomata viewed with reflected lighting from a fiber-optic Illuminator directed onto dried herbarium material beneath the X2 objective of an Olympus BX51 microscope with a DP25 camera. This view is, I believe, that seen on the previous page beneath a Zeiss dissecting scope although differing in orientation, photographic technique and the time of photography (previous page, fresh specimen 1 May 2018; this photo 6 November 2020). Note the crowded stromatic ascomata, their frequent adherence and often with the presence of more than one ascoma in the same stromatic mound (arrowed). Note also the common ectostroma within which all stromatic ascomatal mounds are embedded.

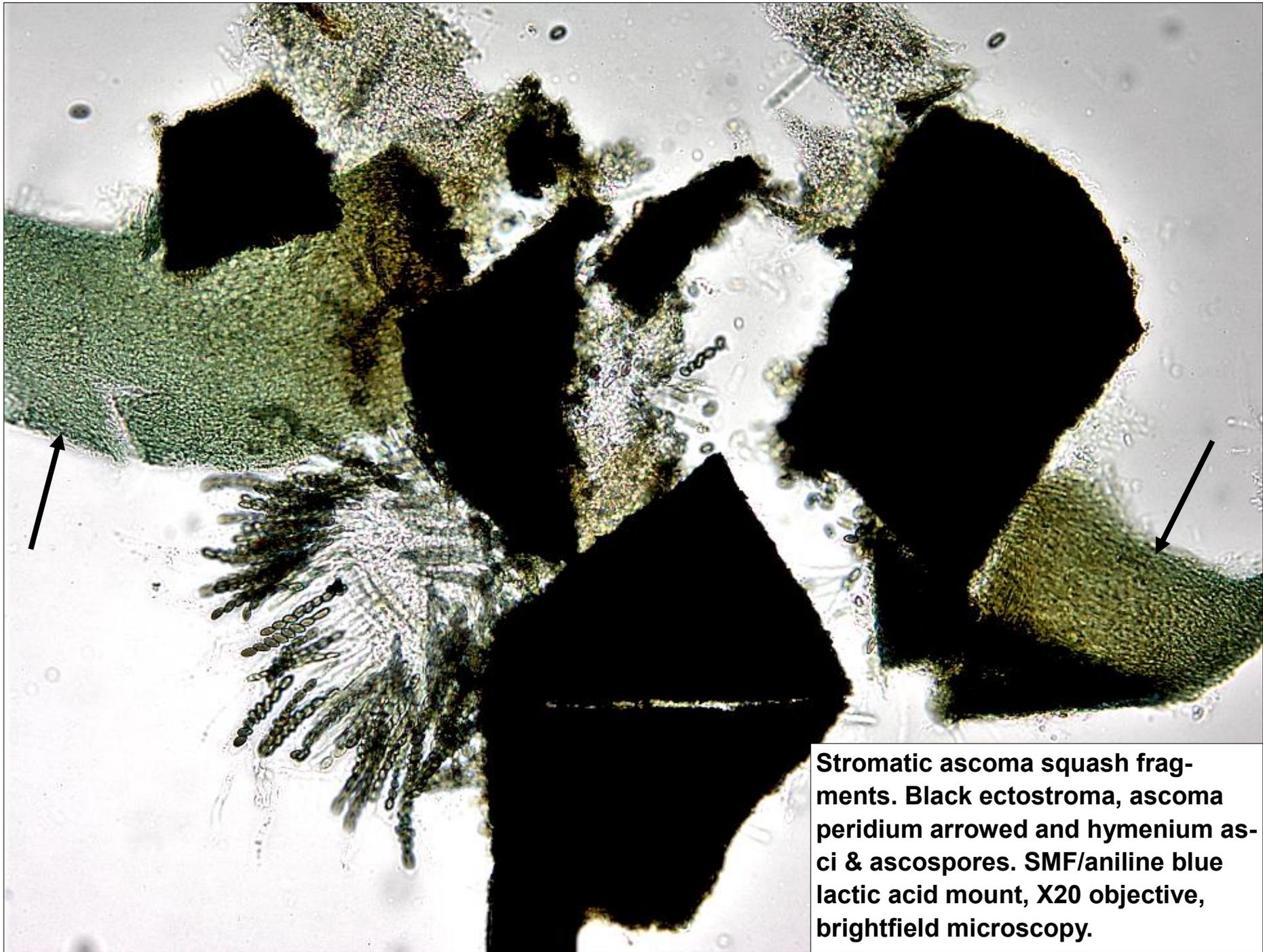


Cluster of stromatic ascomata in-situ on dead wood. Some of the light-colored subiculum is still visible on the black stromata. Note the short cylindrical cirri of ascospores (black arrows) and the little-differentiated to somewhat papillate ostioles (white arrows).

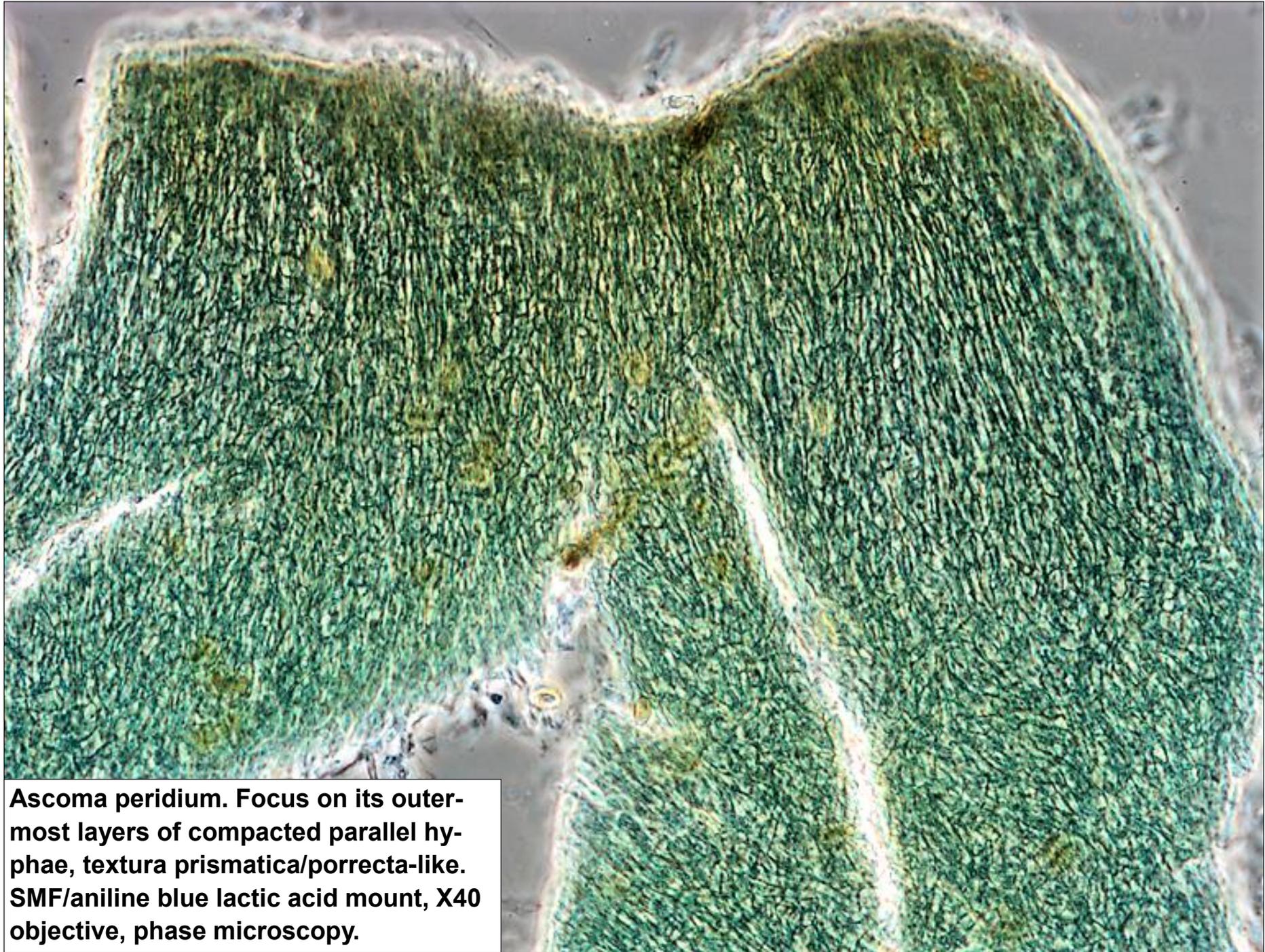
← 400 μm →



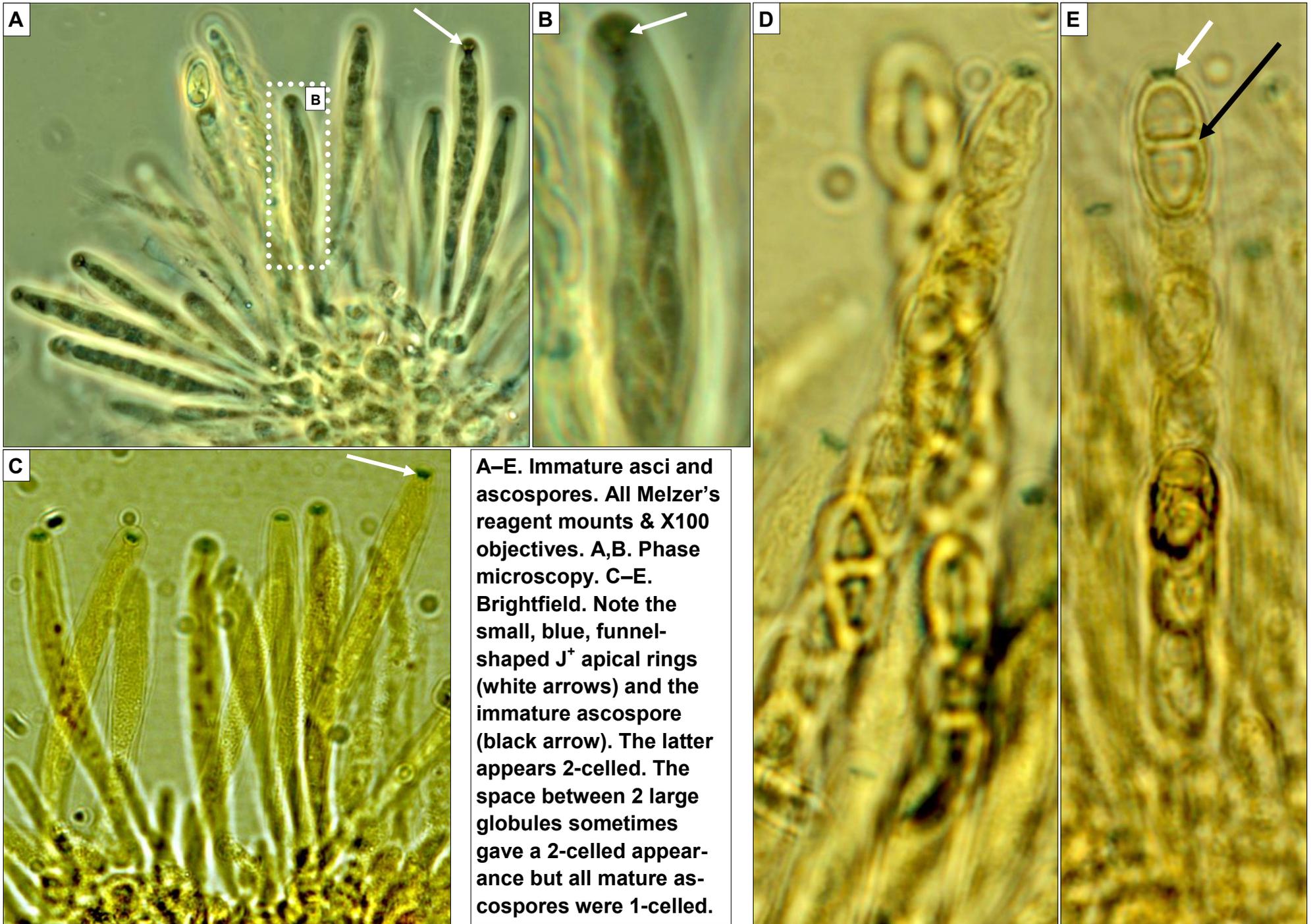
Stromatic ascomata in-situ on dead wood. Left photo, a single conical stroma with a small ostiole at the very apex (arrowed). Right photo, a cluster of two stromata – each with a short cylindrical to conical cirrus of ascospores (arrowed).

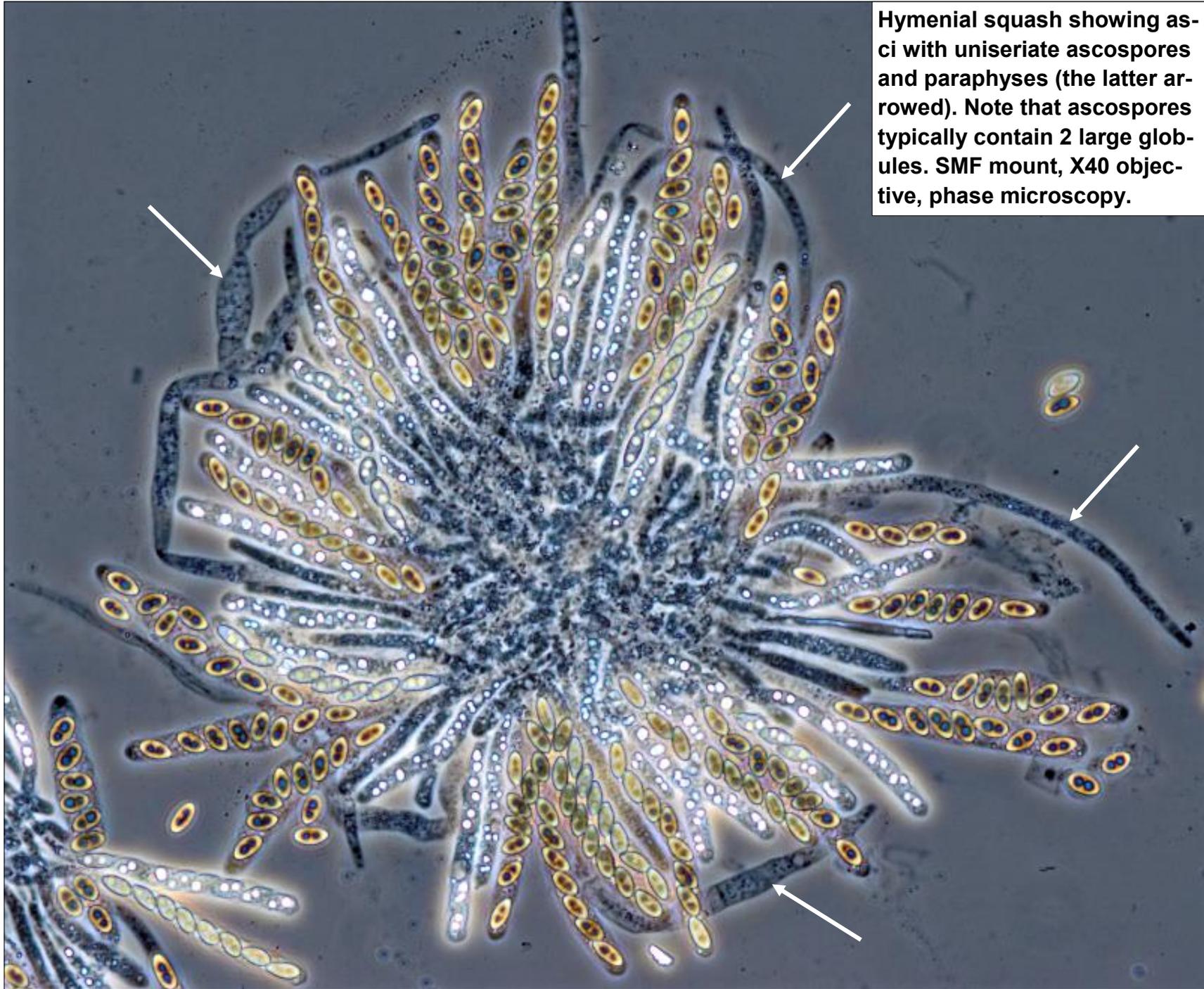


Stromatic ascoma squash fragments. Black ectostroma, ascoma peridium arrowed and hymenium asci & ascospores. SMF/aniline blue lactic acid mount, X20 objective, brightfield microscopy.



Ascoma peridium. Focus on its outermost layers of compacted parallel hyphae, textura prismatica/porrecta-like. SMF/aniline blue lactic acid mount, X40 objective, phase microscopy.

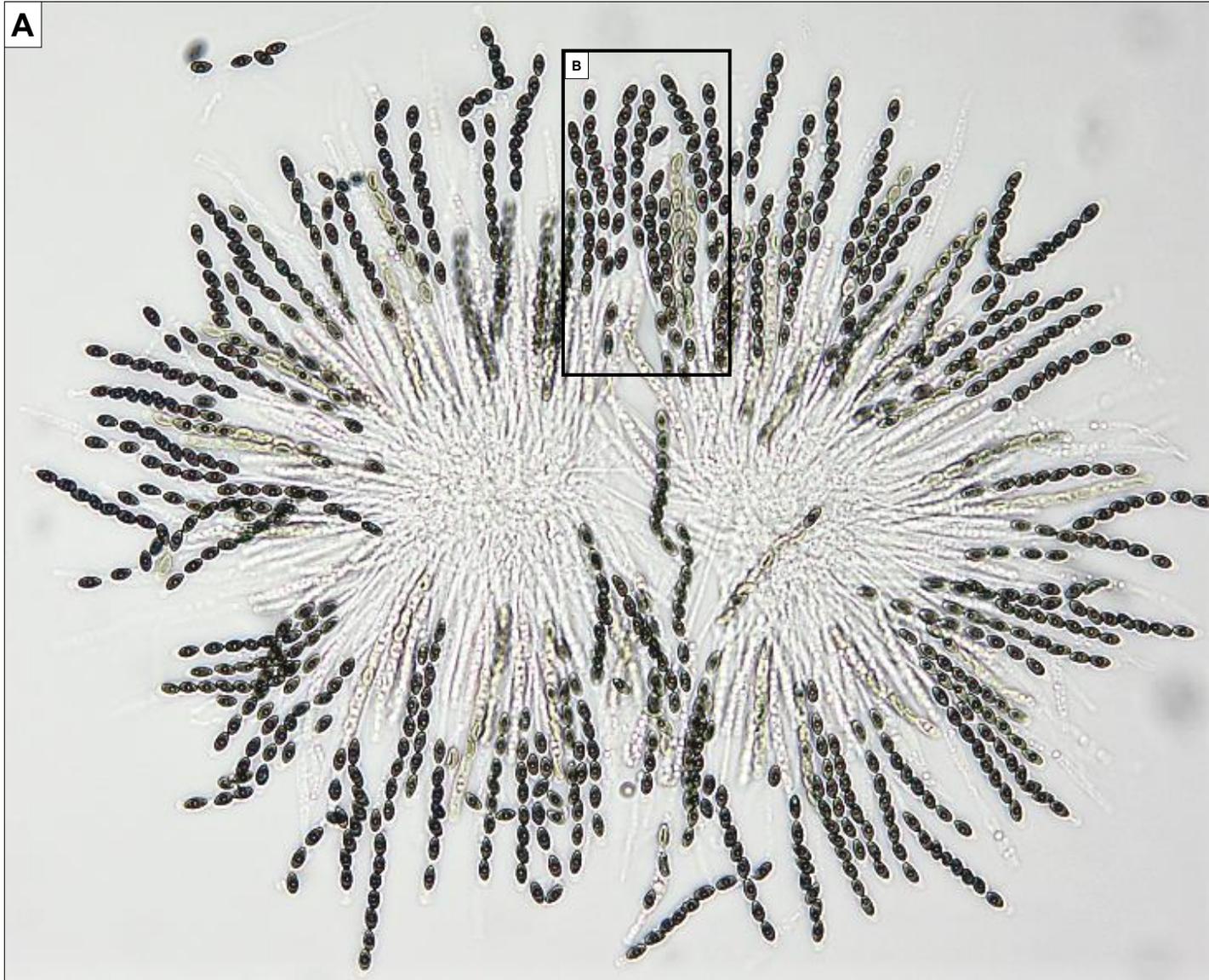




Hymenial squash showing asci with uniseriate ascospores and paraphyses (the latter arrowed). Note that ascospores typically contain 2 large globules. SMF mount, X40 objective, phase microscopy.



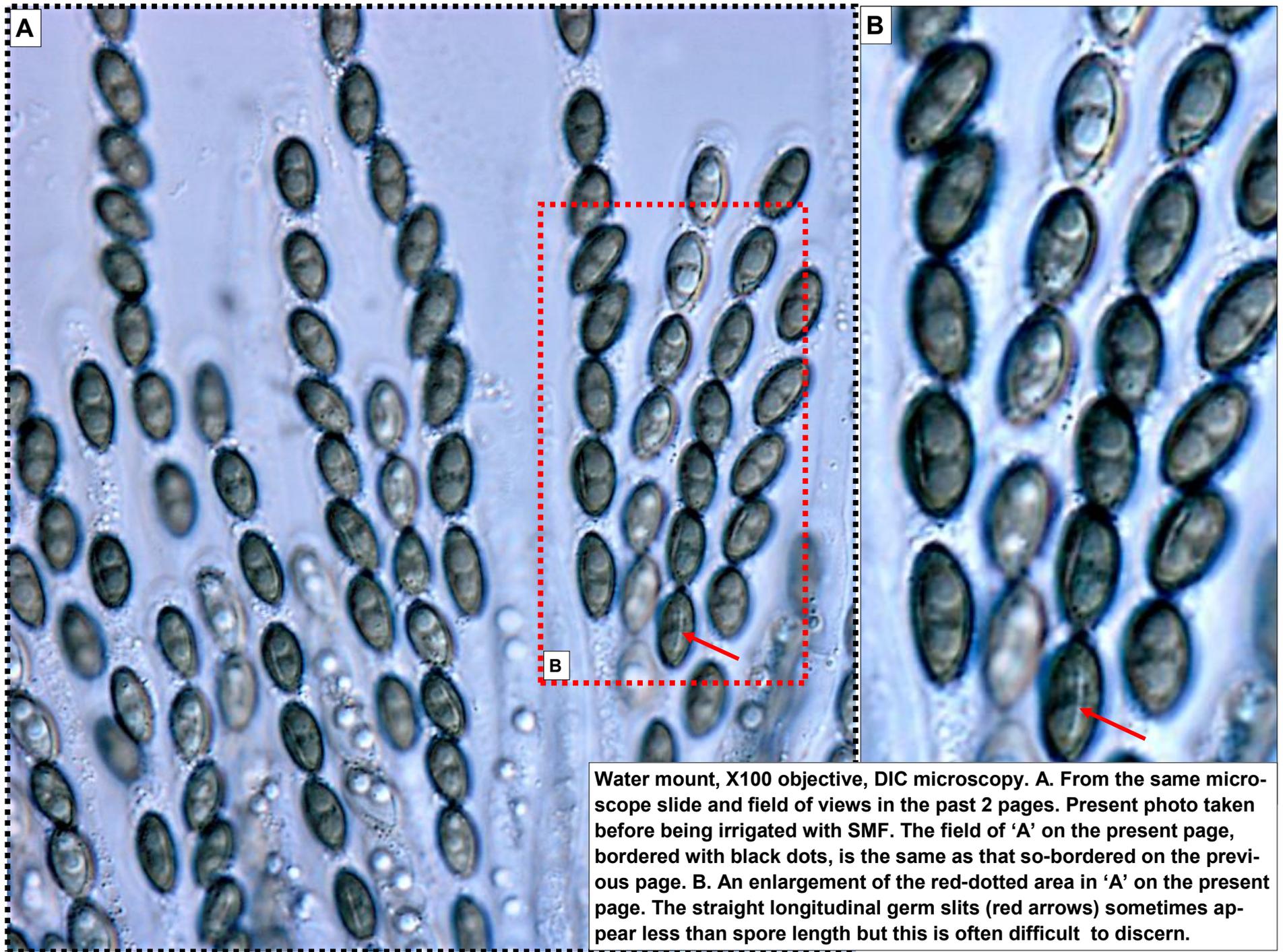
The same hymenial squash as seen on the previous page but using DIC microscopy. Here, the ascus contents and the large ascospore globules are even more apparent.



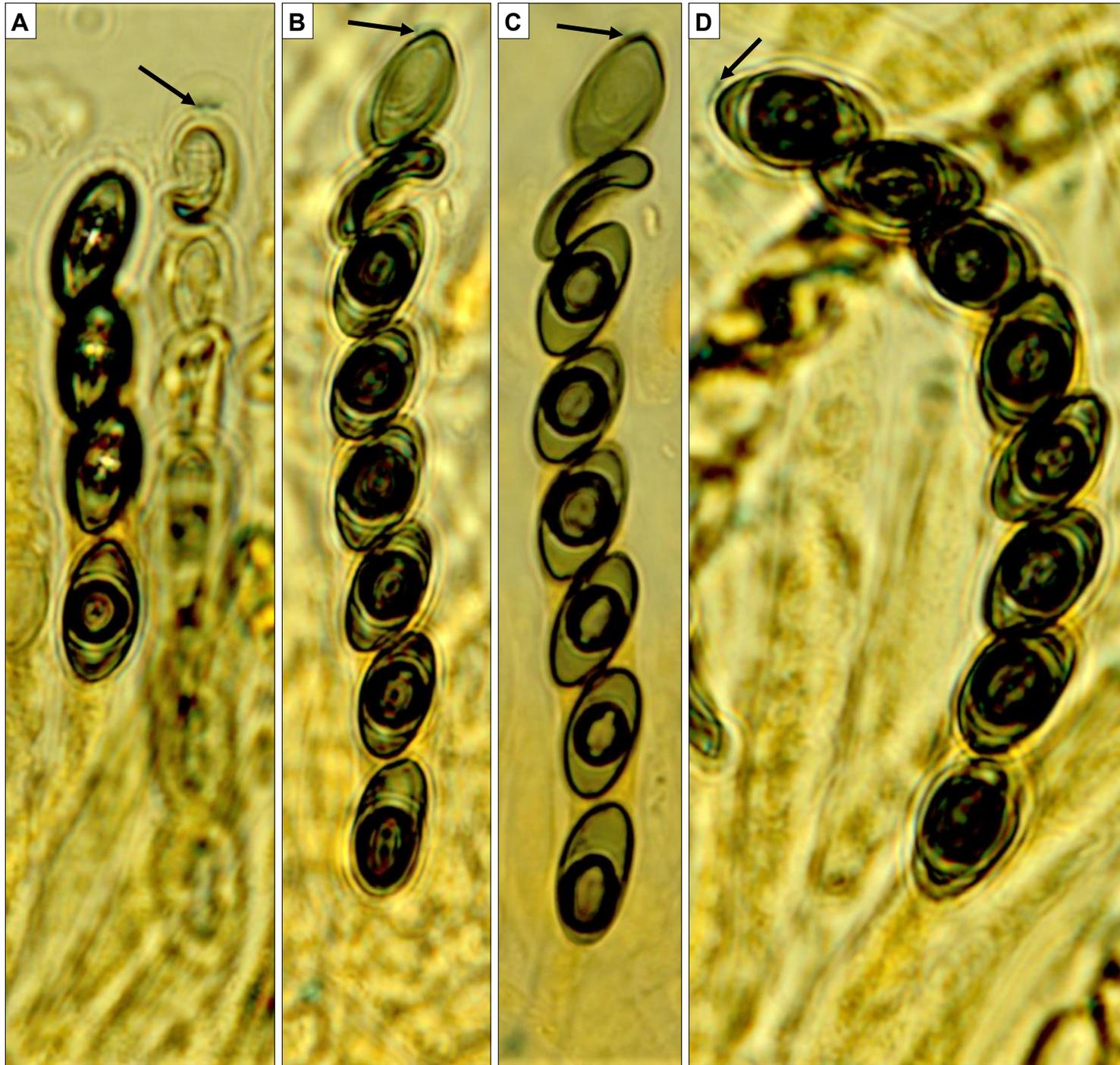
A, B. Hymenial squash showing asci with uniseriate ascospores and faint paraphyses. SMF mount. A. X20 objective, brightfield microscopy. B. Phase microscopy and enlarged (from the 'B' rectangle in 'A') to better demonstrate the prominent deBary bubble in each ascospore. Note also the ascospore basal truncation (arrowed). Upper portions of 'A' are shown on the next 2 pages to emphasize ascospore features under higher magnifications, a delay of 2 days from photo to photo (same slide), different lighting and a different mounting medium.



Hymenium squash, upper portion from the previous page. Same SMF slide but photo 2 days later using the X40 objective & brightfield microscopy after slight heating (note the slight color change & loss of deBary bubbles). The black-dotted rectangle (labelled, 'A' next page) represents that portion of this photo repeated at a higher magnification by the black-dotted 'A' on the next page.

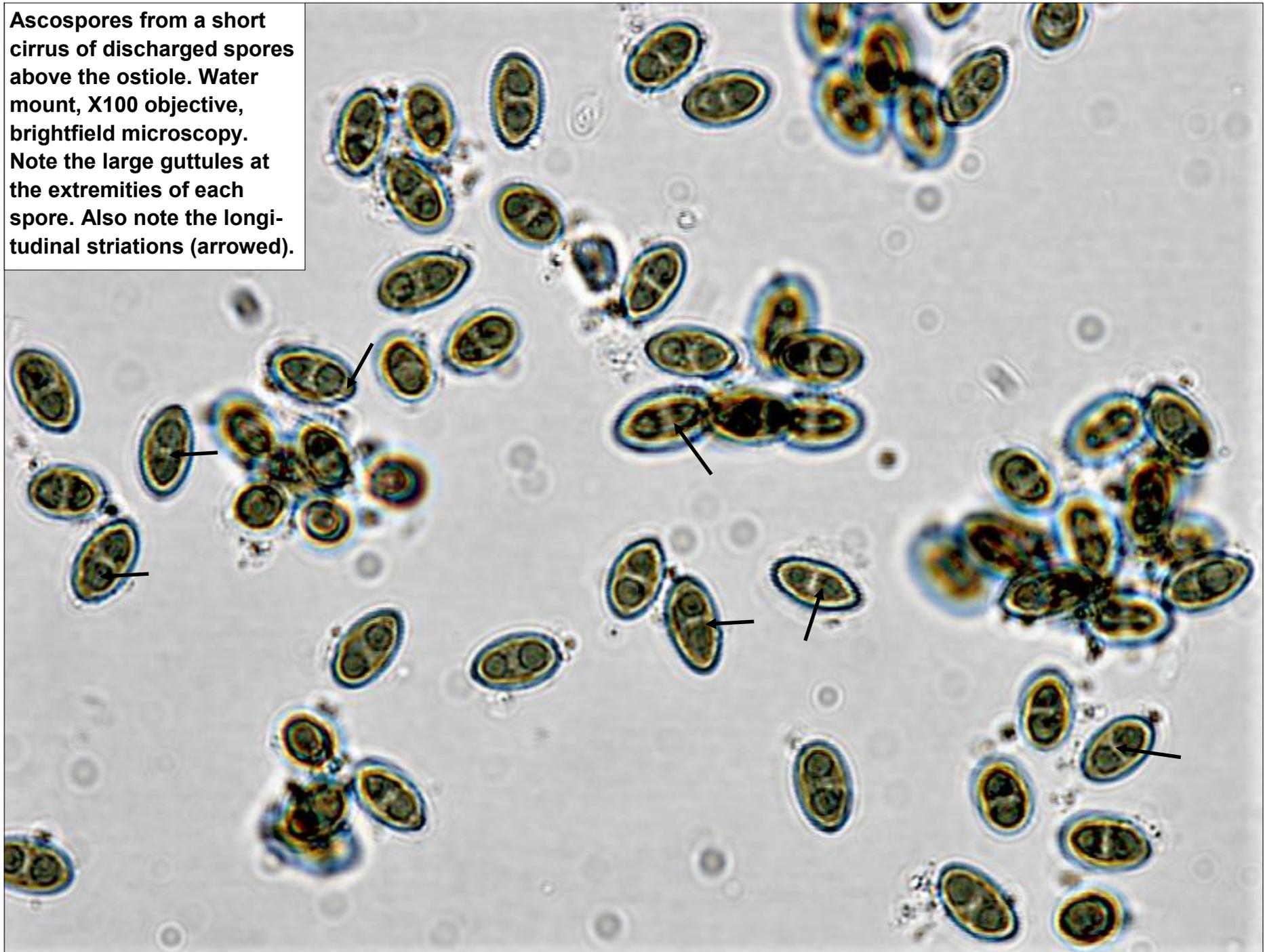


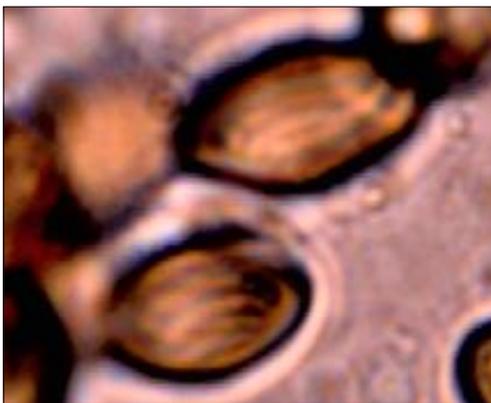
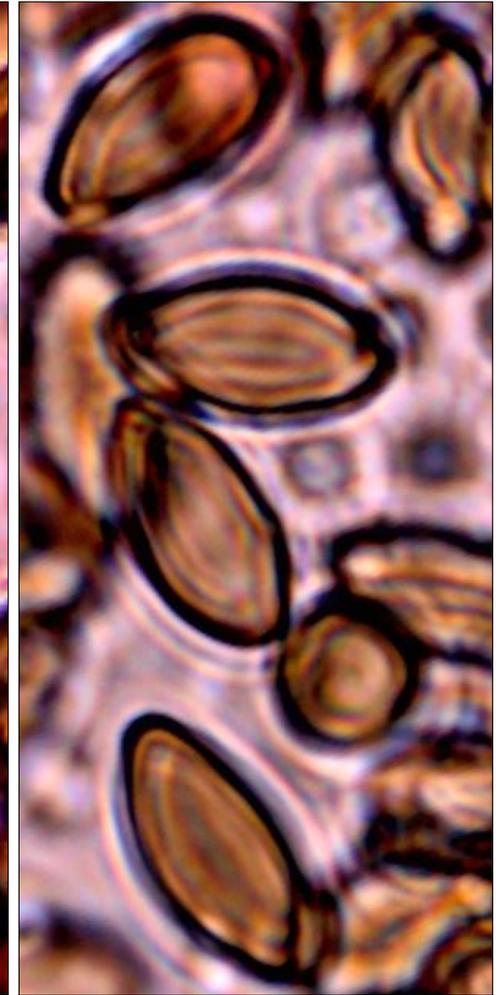
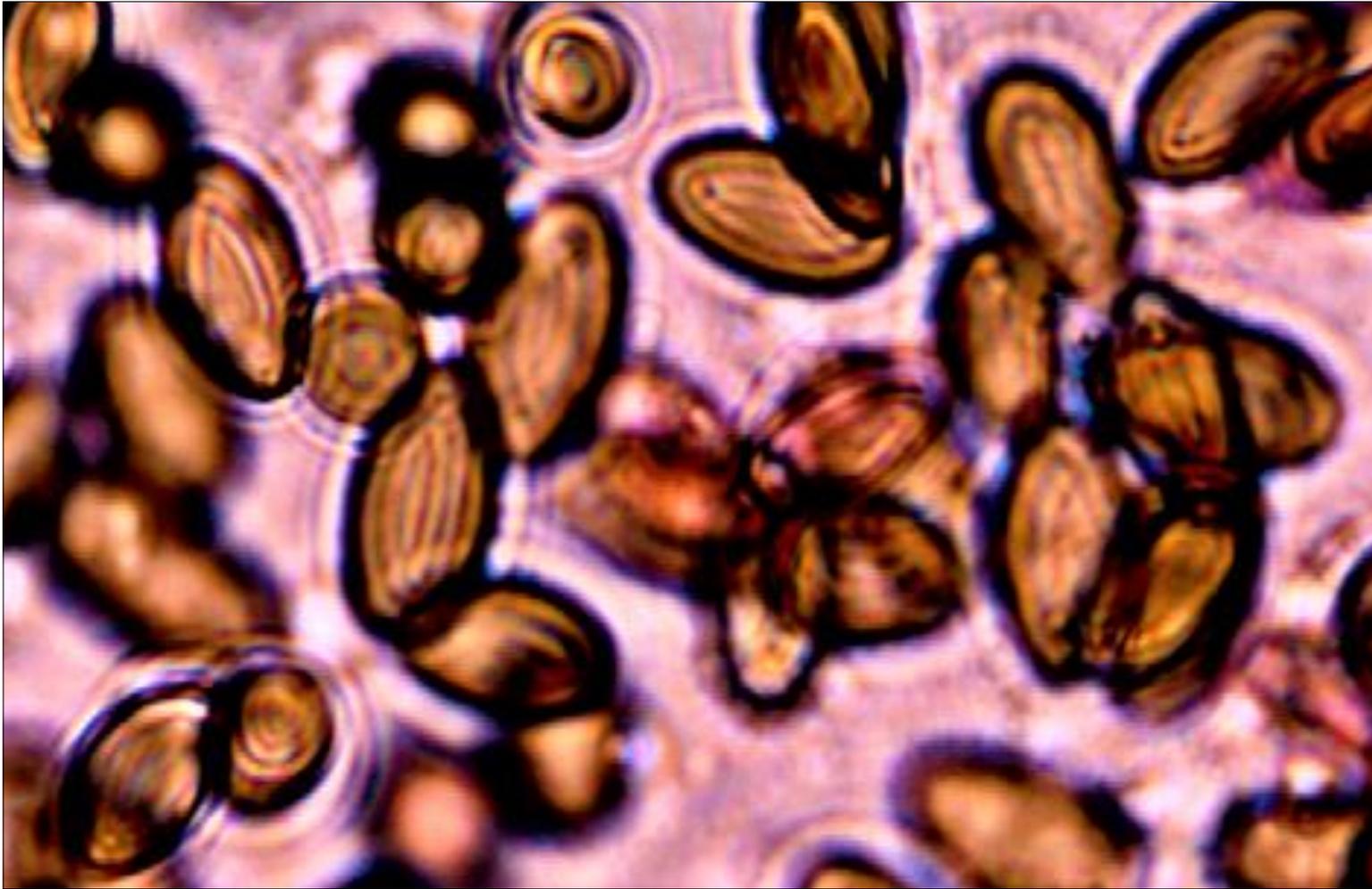
Water mite, X100 objective, DIC microscopy. A. From the same microscope slide and field of views in the past 2 pages. Present photo taken before being irrigated with SMF. The field of 'A' on the present page, bordered with black dots, is the same as that so-bordered on the previous page. B. An enlargement of the red-dotted area in 'A' on the present page. The straight longitudinal germ slits (red arrows) sometimes appear less than spore length but this is often difficult to discern.



A–D. Mature asci and ascospores in Melzer’s reagent, X100 objectives, brightfield microscopy. Note the obscure, light-blue, ascus apical ring atop the uppermost spore in the ascus (arrowed) and the single large, dark deBary bubble in each ascospore. A. The occasional 4-spored ascus. B–D. Typical cylindrical 8-spored asci with obliquely overlapping, uniseriate ascospores.

Ascospores from a short cirrus of discharged spores above the ostiole. Water mount, X100 objective, brightfield microscopy. Note the large guttules at the extremities of each spore. Also note the longitudinal striations (arrowed).





Photos from dried herbarium material of AEB 1312 taken on 15 January 2021. Longitudinally striate ascospores mounted in hydrogen peroxide/lacto-fuchsin and viewed under the X100 objective using brightfield microscopy.