***Mollisia cinerea* (Batsch) P. Karst. AEB 1351 (= PDD 120018) – a good match**

Collection date: 15 April 2022

Collection site: residential bush area, Kelson, Lower Hutt

Substrate: hard (firm), dead, decorticated stem (branch?), 4.5 cm in diameter

Collector and Identifier: Dan Mahoney

Voucher materials: dried herbarium specimen AEB 1351 (= PDD 120018) accompanied by 4 semi-permanent microscope slides (3 in lacto-Fuchsin and 1 in aniline blue lactic acid); Samsung Galaxy A70 smartphone photos of fresh apothecia taken the day of collection, Zeiss MC80 dissecting scope digitized photos of 'fresh' apothecia taken after several days in a moist chamber and Olympus BX51 (DP25 camera) compound scope digitized photos in Shear's mounting fluid (SMF), lacto-Fuchsin & aniline blue lactic acid (ABLA); Dan's brief description and comments.

Dan's brief description and comments: The **sessile 0.5–2 mm apothecia** with their grey hymenial surfaces, white receptacle rims and wavy circumference nicely matched the numerous online Google images. *Mollisia cinerea* is the TYPE species of the genus *Mollisia* and its most commonly collected lignicolous species. However, its morphological and sequenced variability may lead to future taxonomic changes (see the next page). The natural color of the present collection was best seen in its smartphone photos, with the Zeiss dissecting scope providing accurate apothecium measurements. The **white receptacle rim** consisted of filaments whose prominent, hyaline end cells were elongate/clavate. These differed from the more globose and **brown-pigmented cells that edged the ectal excipulum**. Ironically, the low, sessile apothecia didn't enable me a view of the ectal excipulum until I turned them upside-down. **Paraphyses** were longer than the asci, simple, hyaline, cylindrical, of roughly equal diameter throughout, rounded apically and usually once septate near their base. **Asci** were cylindrical, broadest a short distance behind the narrowly truncate, Melzer's-bluing apex and gradually tapering from there to the base. Asci were remarkably similar in size, mostly 60–65 × 6–7 µm, with 8 uniseriately overlapping to biseriately arranged ascospores. **Ascospores** were hyaline, smooth, narrowly elongate, straight to slightly curving with rounded ends (sometimes with one end slightly broader than the other), 1–2 celled, often with bipolar vacuoles and measuring 9–11 × 2–3 µm.

A recent publication "Tanney J.B & Seifert K.A. 2020. Mollisiaceae: An overlooked lineage of diverse endophytes. Studies in Mycology 95: 293–380" nicely summarizes the genus *Mollisia* and its difficulties on pp. 293–297. Some of those remarks are copied here:

Page 293

"*Mollisia* (Mollisiaceae, Helotiales) is a large, cosmopolitan genus comprising species that are common saprotrophs, usually observed forming greyish to bluish, discoid apothecia on decaying plant tissues, especially wood and graminoid culms and leaves. Apothecia are typically 1–3 mm in diameter, sessile, and characterized by an outer layer (ectal excipulum) composed of pigmented, rounded cells (textura globulosa), a hyaline textura intricata inner layer (medullary excipulum), cylindrical paraphyses that when alive contain refractive vacuolar bodies, and ascospores that are usually 0(−1)-septate, elliptic-fusoid to fusiform, hyaline, and borne in 8-spored amyloid asci arising from croziers.

Mycologists collecting and studying *Mollisia* invariably face a major obstacle: our current understanding of asexual and sexual morphological characters does not permit rapid identification of most *Mollisia* species in the field or even confident identification following detailed microscopic study. Despite these difficulties, or perhaps because of them, hundreds of species have been named since the inception of the genus in 1871. More than 700 *Mollisia* names exist and the status of many of these species is mostly unknown."

On page 295, they characterize some of the problems in dealing with *Mollisia* and related mollisioid discomycetes as follows:

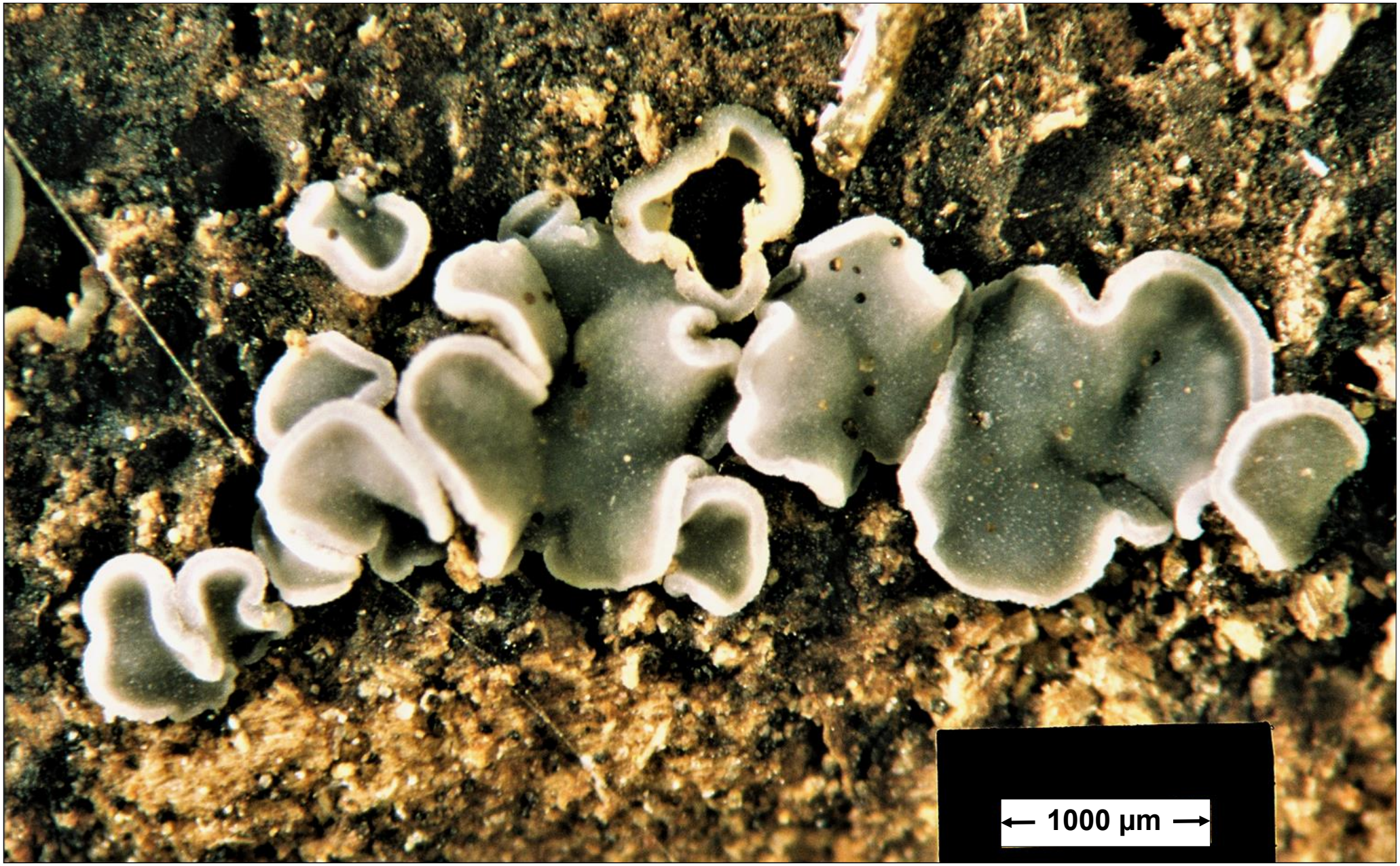
"The major obstacles hindering the progress of taxonomic and phylogenetic studies of *Mollisia* include: **(1)** an absence of authenticated reference sequences; **(2)** a dearth of ex-type cultures; **(3)** difficulties identifying or sequencing exsiccatae because of the absence of vital characters, poor condition, or loss; **(4)** difficulty identifying field and herbarium specimens based on indistinct morphological characters; and **(5)** the absence of a usable taxonomic treatment with identification keys. These obstacles have effectively deterred any concerted effort to confront *Mollisia*, and the shortage of traditional taxonomists and a growing dependence on working with previously identified specimens or sequences, sometimes of questionable accuracy, compounds the problem."

The following, **at the close of page 295 which continues on pages 296 & 297**, further discusses the goals of the publication and future efforts:

"One of the original goals of this study was to generate phylogenetic data and make taxonomic changes accordingly, promoting taxonomic stability and practicality in this lineage. It soon became evident that such actions would be premature and likely initiate a turbulent taxonomic phase marked by ephemeral name changes and more confusion for taxonomists and users alike. In this respect, this study may serve as a prodromus for the impending and necessary revision of Mollisiaceae. Sampling is presently too inadequate to enable wide sweeping and stable taxonomic changes. While previous workers depending solely on morphological characters could not make enough progress because of confounding characters, DNA sequence-based methods now facilitate rapid species delineation, identification, and phylogenetic reconstruction. Molecular phylogenetic methods combined with detailed phenotypic and ecological studies will provide robust and cohesive taxonomic concepts for this notoriously difficult family. The future of *Mollisia* taxonomy is finally encouraging."

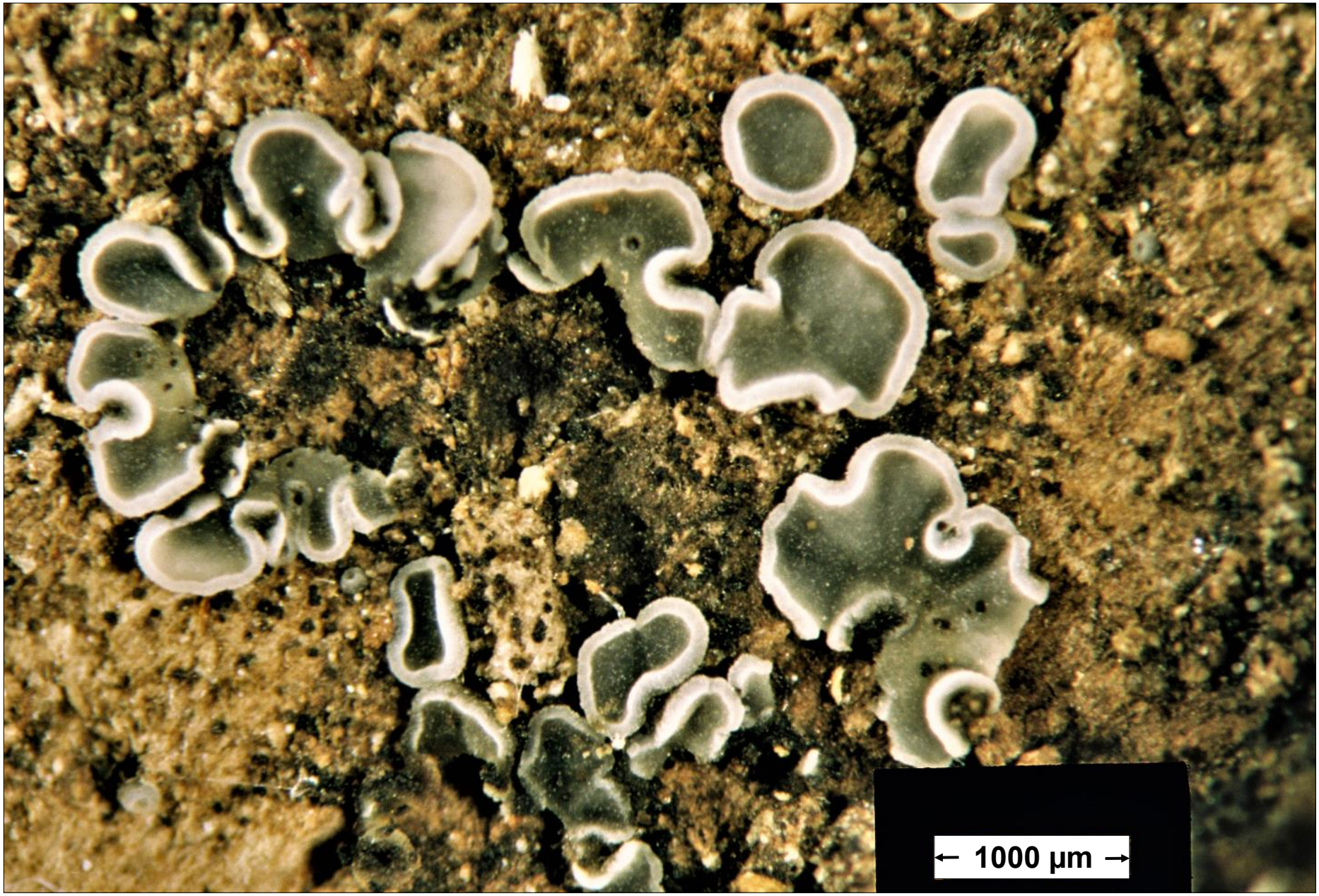
AEB 1351. In-situ smartphone camera view of fresh *Mollisia cinerea* apothecia on 15 April 2022. All of the apothecia were located in a moist, more decayed, swallow cavity of the firm dead branch.

AEB 1351. A close-up in-situ view of fresh *Mollisia cinerea* apothecia from the previous page.

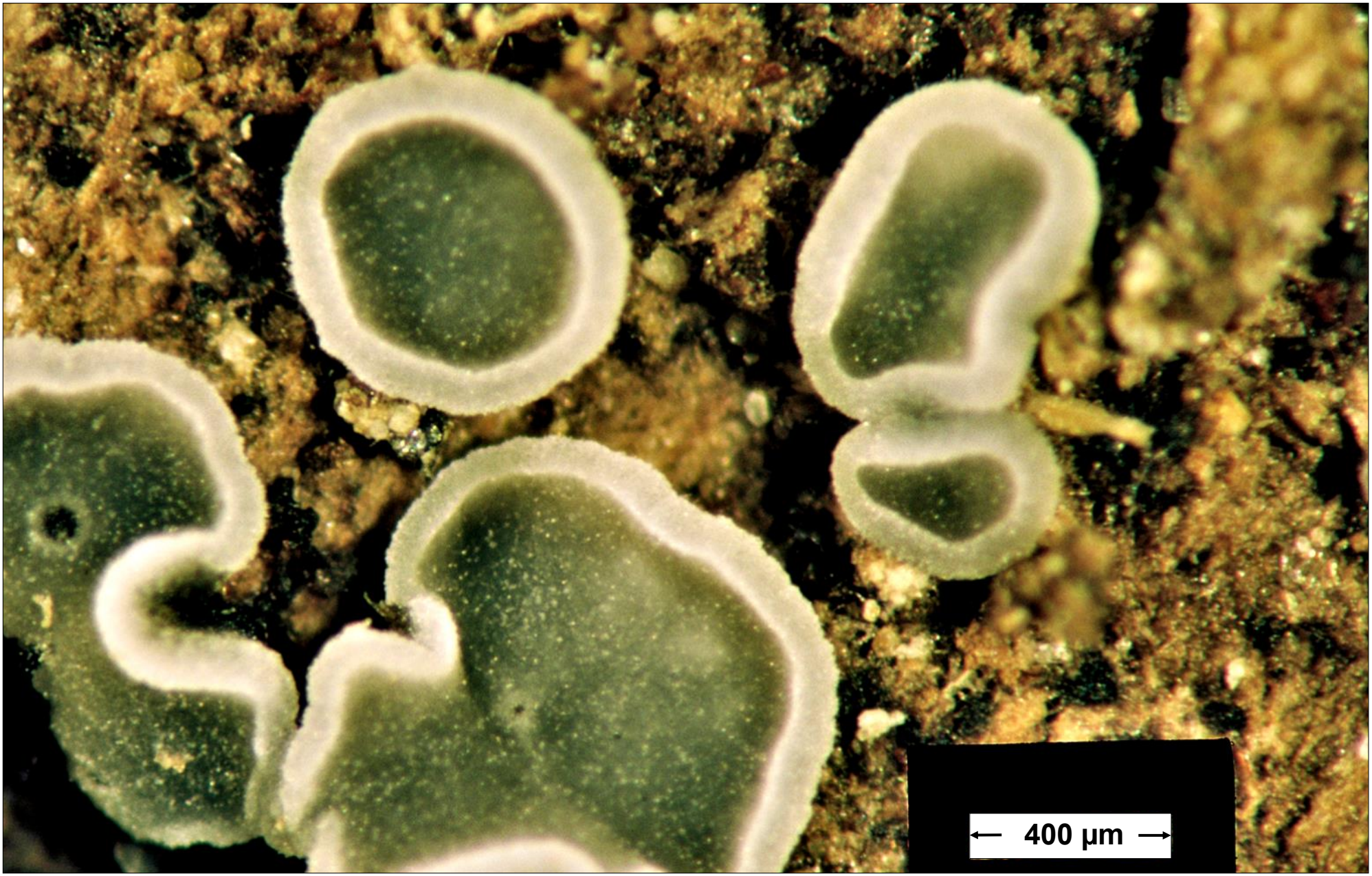


AEB 1351. In-situ dissecting scope photo of ‘fresh’ sessile apothecia in an overhead view, taken after several days in a moist chamber. Note the grey hymenium surface and the white receptacle rim.

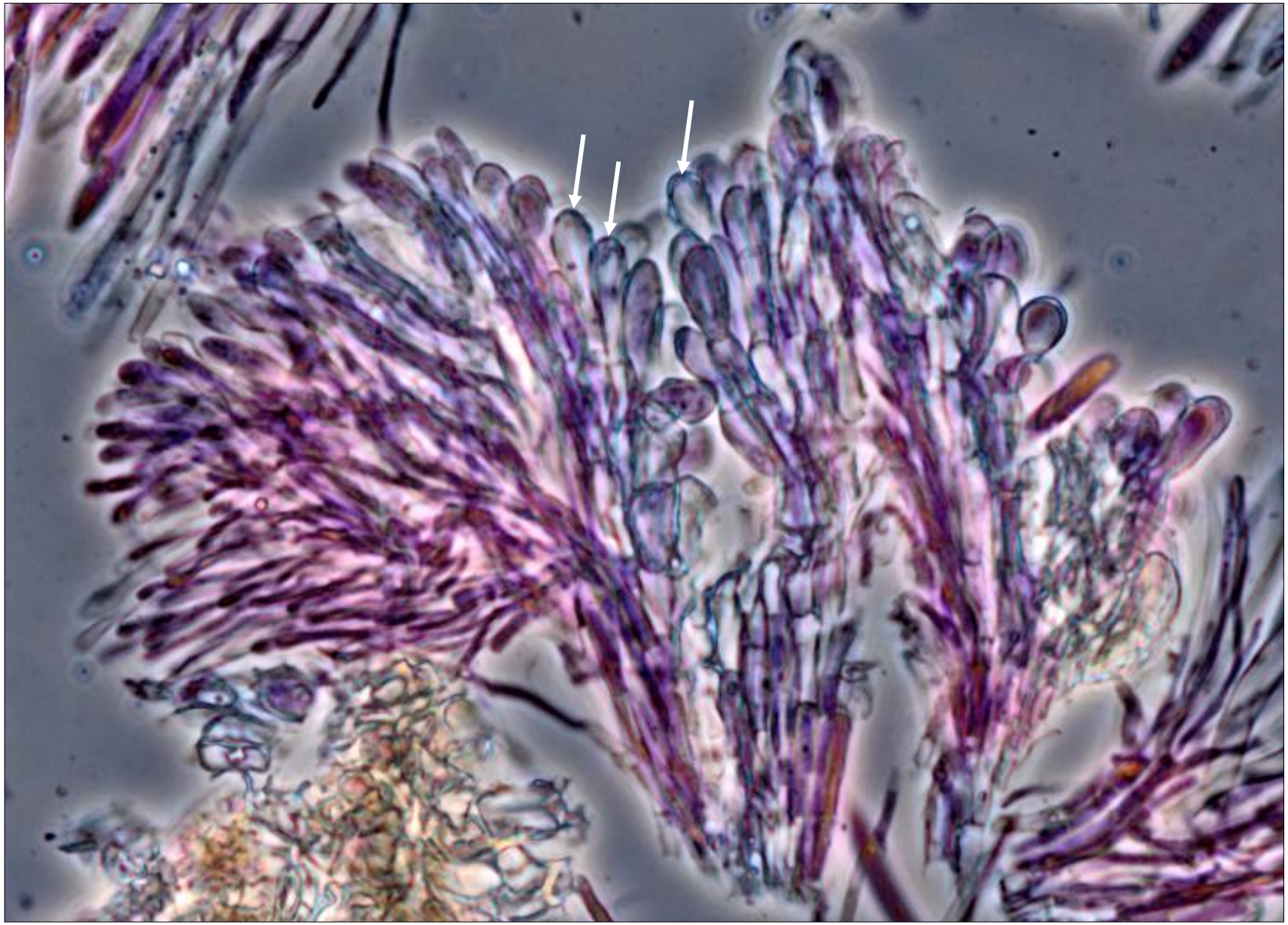
AEB 1351. In-situ dissecting scope photo of apothecia taken after several days in a moist chamber. This is a close-up view of apothecia from the previous page (re-oriented to show as much of a side view as possible).



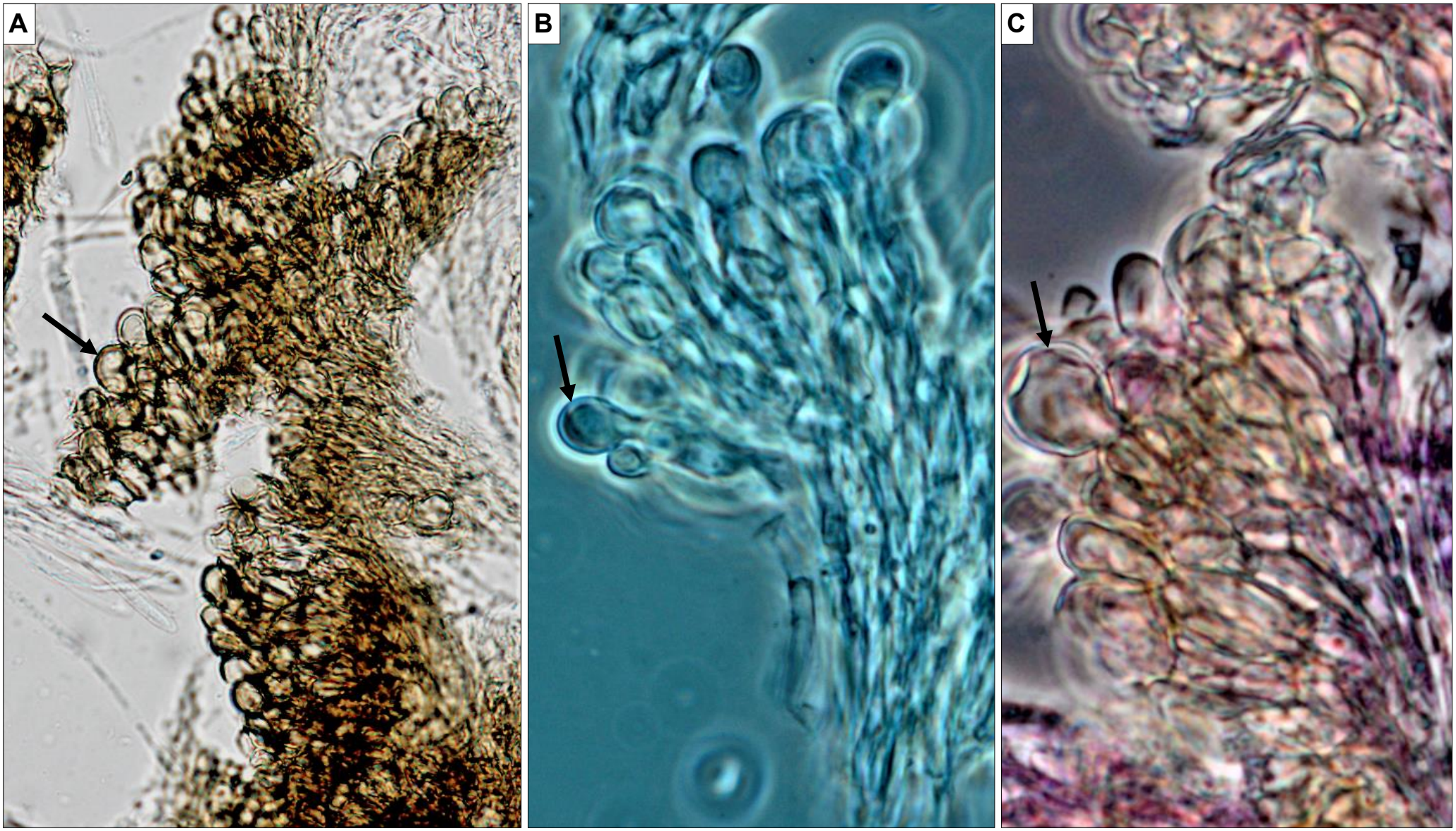
AEB 1351. In-situ dissecting scope photo of ‘fresh’ sessile apothecia in an overhead view, taken after several days in a moist chamber. Missing ‘bits’ of the apothecia may have been dinner for collembola seen on the moist wood.



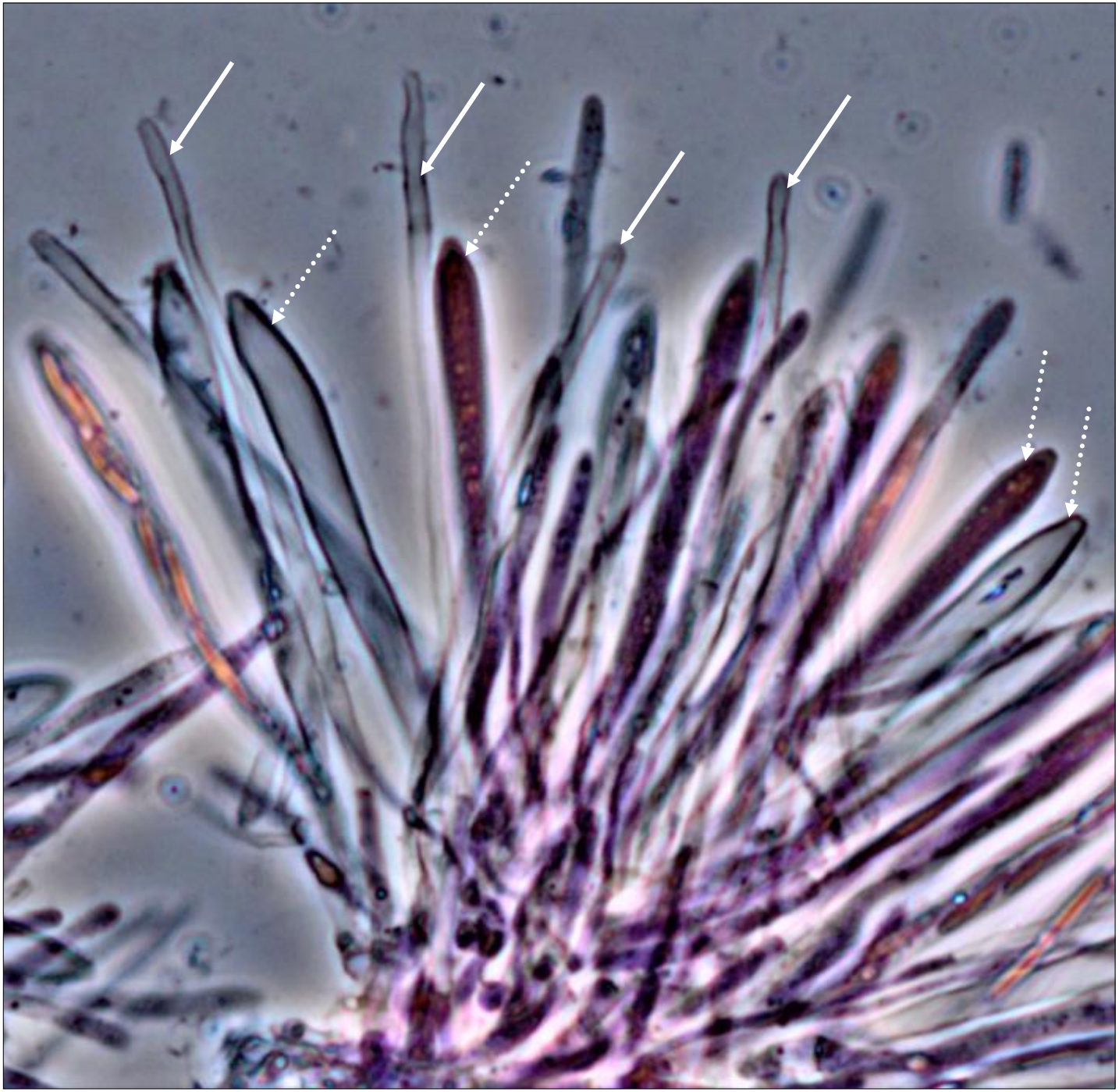
AEB 1351. A close-up view of apothecia from the previous page.



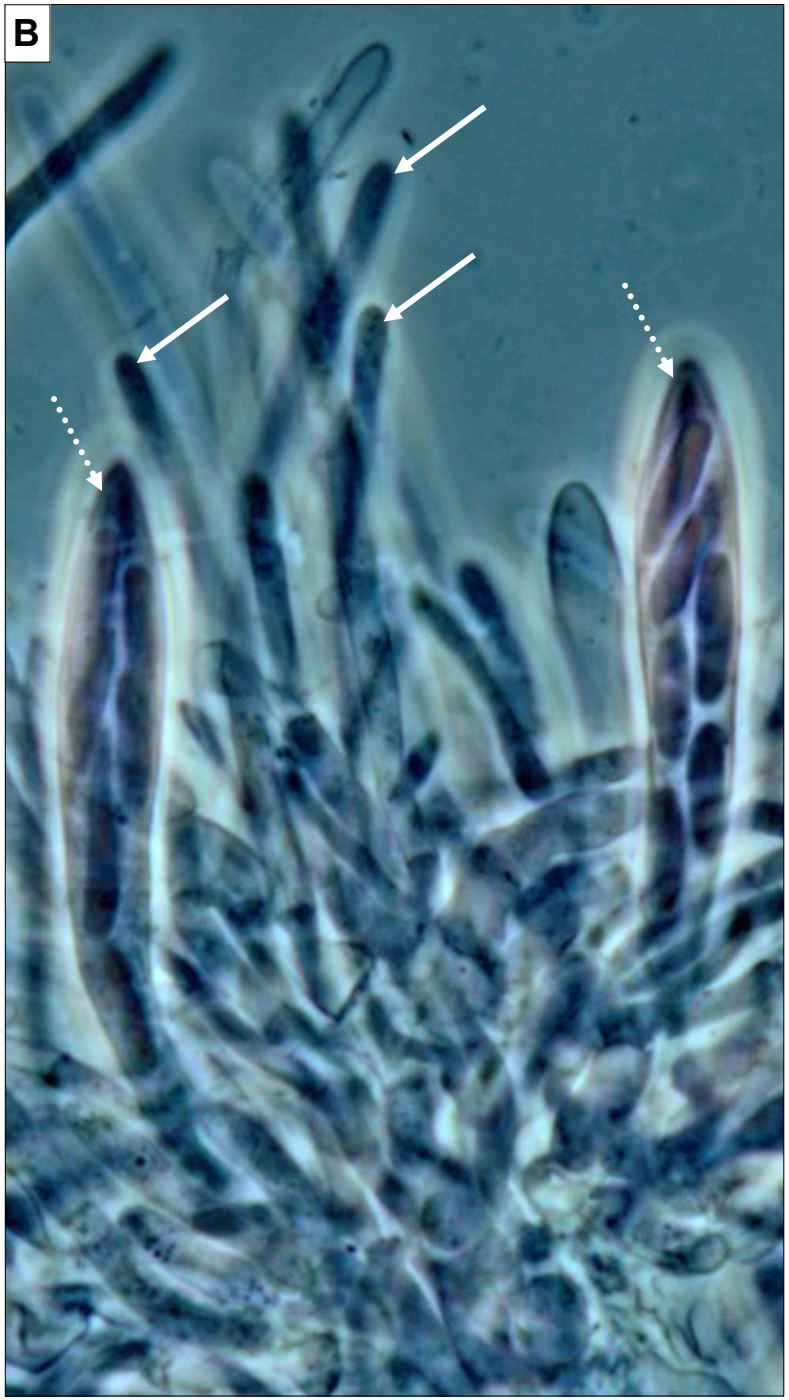
AEB 1351. Elongate, club-shaped, prominent colorless cells (arrowed) along the receptacle rim. From a lacto-Fuchsin microscope slide using the X40 objective and phase microscopy.

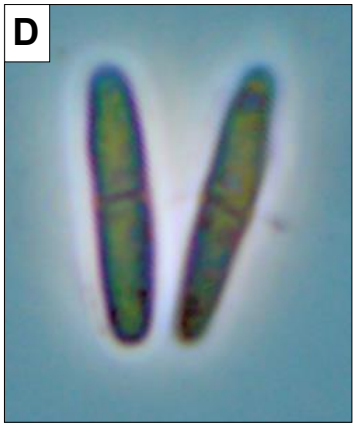


AEB 1351. A–C (variously enlarged to fit the plate). All photos illustrate the prominent pigmented globular cells (arrowed) at the edge of the ectal excipulum. Aside from being pigmented, these cells are not as elongate or club-shaped as those along the receptacle rim. A. SMF slide using X40 objective & brighfield microscopy. B. ABLA slide, X100 obj., phase. C. Lacto-Fuchsin slide, X40 obj., phase.



AEB 1351. Hymenial squash in a lacto-Fuchsin slide mount using the X40 objective and phase microscopy. Emphasizing the cylindrical paraphyses (solid-arrowed) and the empty or immature asci. Note the ascus shapes and truncate apices (dotted-arrows).





AEB 1351. A–D. Asci, paraphyses & asco-spores. All photo-graphed using the X100 objective and phase (except A which uses brightfield). A. Two asci in a Melzer's reagent mount. Note the bluing at their truncate apices. B. Two asci containing 8 ascospores (dotted-arrows) and paraphy-ses (solid-arrows). A lacto-Fuchsin mount. C. Ascus (63 × 7 µm) with 8 non-septate as-cospores (note their bipolar vacuoles – arrowed). An ABLA mount. D. Two 1-septate ascospores, each 11 × 2 µm. A lacto-Fuchsin mount.