

***Didymium bahiense* Gottsb. SM92 (= PDD 117240)** – A good match to the description and illustrations given by Stephenson in his *Myxomycetes of New Zealand* (pp. 156-157). This species is not covered in the 1969 Martin & Alexopoulos treatment because it was first described in *Nova Hedwigia* 15: 365, in 1968. As Stephenson says, many would now treat this and related species in the superspecies complex centering around *D. iridis*.

Substrate: Pea straw and miscellaneous plant debris mulch

Collection date: 12 May 2020

Collection site: garden, Lower Hutt, New Zealand

Collectors: Ann Bell and Dan Mahoney

Identifier: Dan Mahoney

Voucher material: Two boxes of dried herbarium specimens, SM92 (= PDD 117240), accompanied by 2 Shear's mounting fluid (SMF) semi-permanent slides that emphasize the pseudocolumella characteristic of this species; Zeiss dissecting scope in-situ fruiting-body photos (from digitized Portra 160, 35 mm negatives) and Olympus compound scope (with DP25 camera) digital photos of microscopic detail; Dan's brief description and comments.

Our earlier collection of this species: SM42 (= PDD 110419). This smaller collection was made 24 April 2006 from the same substrate as the collection described herein. See its pdf in the PDD Datastore.

Brief description and comments: Collection SM92 was massive with thousands of fruiting bodies covering the substrates described above in an approximately one square meter area. It provided an opportunity to see all stages of development including plasmodia and sclerotia over a period from May 12th to June 6th and during various environmental changes. A week prior to May 12th, the area in question was dug up, mulched with miscellaneous plant debris, covered with pea straw and thoroughly watered. At this point, Lower Hutt was experiencing unseasonably warm and dry weather. During the weeks that followed, fruiting bodies were examined periodically with measurements and photos taken. Finally in late May/early June heavy rains washed away many fruiting bodies but, some remained, and many of these featured the pseudocolumellae since most (or all) of the spore mass had washed away.

This specimen, like SM42, matched the descriptions and photos of this relatively common species. The New Zealand treatment by Stephenson, 2003, in his 'Myxomycetes of New Zealand' is reproduced on the following page.

Available online under 'NZ Fungi Identification: *Didymium bahiense* - VIRTUAL MYCOTA'
Those portions in red below are my comments relating to the SM92 collection.

Article: Stephenson, S.L. (2003). Myxomycetes of New Zealand. *Fungi of New Zealand. Ngā Harore o Aotearoa* 3: xiv + 238 p. Hong Kong: Fungal Diversity Press.

Description: Fruiting body a stalked sporangium, loosely gregarious, 0.8–1.3 (–1.6) mm total height. Sporotheca sub-globose, depressed, scarcely to deeply umbilicate below, white, 0.2–0.7 (–1.0) mm in diameter. Hypothallus small, inconspicuous (reasonably large & conspicuous - usually detaching with the stalk), venulose or circular, blackish (or dark orange-brown like the lower portion of the stalk). Stalk slender (often robust near the base), subulate, noncalcareous, longitudinally striate, blackish brown below, brown to yellow-brown or yellow above. Columella absent but a columella-like structure (pseudocolumella) present, the latter flat, orbicular, white. Peridium membranous, colourless, covered with white (stellate) lime crystals, dehiscing in irregular lobes. Capillitium consisting of delicate, light to dark brown, sparsely branched, tightly sinuous (or zig-zag), sometimes (often) nodulose filaments with colourless tips, attached to the pseudocolumella and the peridium. Spores (globose) dark brown in mass, violaceous brown by transmitted light, 10–12 (10–)11 –12(–13) µm in diameter, almost smooth (none smooth) to densely and irregularly warted (or evenly warted), sometimes with clusters of warts. Plasmodium unknown (plasmodium yellow). Sclerotium orange-brown.

Habitat: Dead leaves, other types of plant debris, and the dung of herbivorous animals.

Distribution: Described originally from South America and now known from Africa, Asia, Europe, and North America (Ukkola 1998, Yamamoto 1998, Ing 1999, Stephenson et al. 2001). First reported from New Zealand by Mitchell (1992), based on specimens from the Kermadec Islands, Auckland, Coromandel, and Bay of Plenty. Also known from Rangitikei.

Notes: *Didymium bahiense* is one member of a species complex that also includes two other species (*D. iridis* and *D. nigripes*) that have been reported from New Zealand as well as several others not known to occur here. All members of the complex possess a relatively long stalk bearing a more or less globose sporotheca. Clark (2000) has suggested that most of these probably represent little more than slightly different morphological expressions of a single rather variable taxonomic entity, which he has referred to as the *Didymium iridis* superspecies. However, some forms do appear to be consistently distinguishable on the basis of differences in colour, spore size and markings, and the presence/absence (and shape when present) of a columella or pseudocolumella. **The single most distinguishing feature of *D. bahiense* is the presence of a prominent, white, discoid pseudocolumella that is readily apparent in sporangia that have lost most of their spores.**



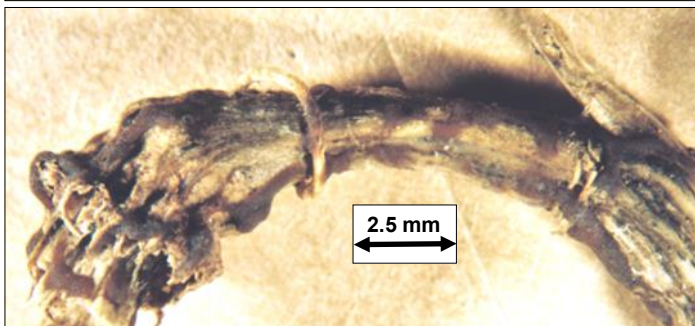
SM92. Numerous in-situ fruiting bodies, representing a small portion of a massive fruiting that covered approx. 1 square meter. Photo taken 13 May 2020 using a Samsung Galaxy A70 smartphone.



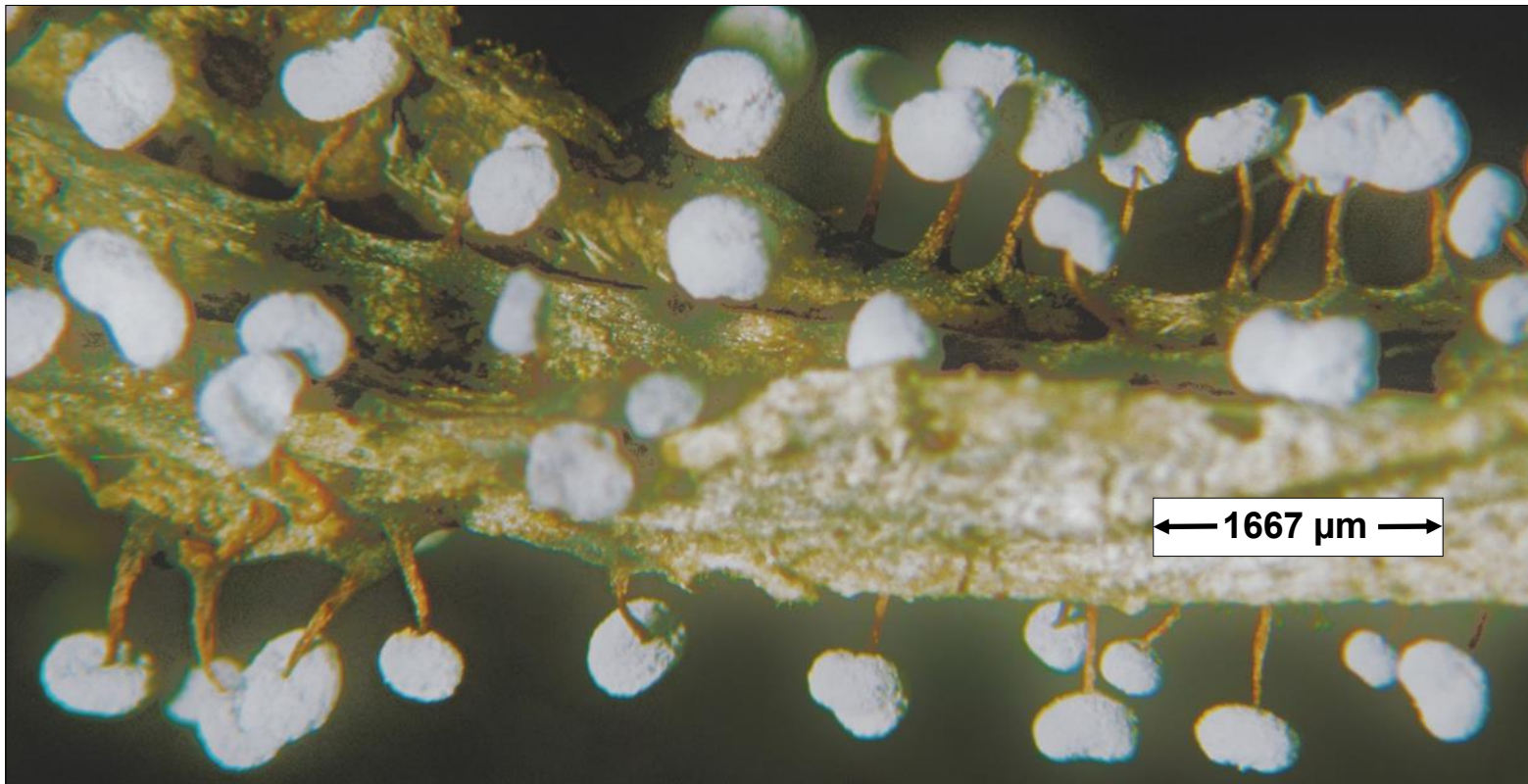
SM92. A close-up view of in-situ fruiting bodies from a massive fruiting that covered approx. 1 square meter. Photo taken 13 May 2020 using a Samsung Galaxy A70 smartphone.



SM92 (13 May 2020). In-situ view of an active plasmodium and the fruiting bodies to which it gave rise. Portra 160 film using a Zeiss dissecting microscope.



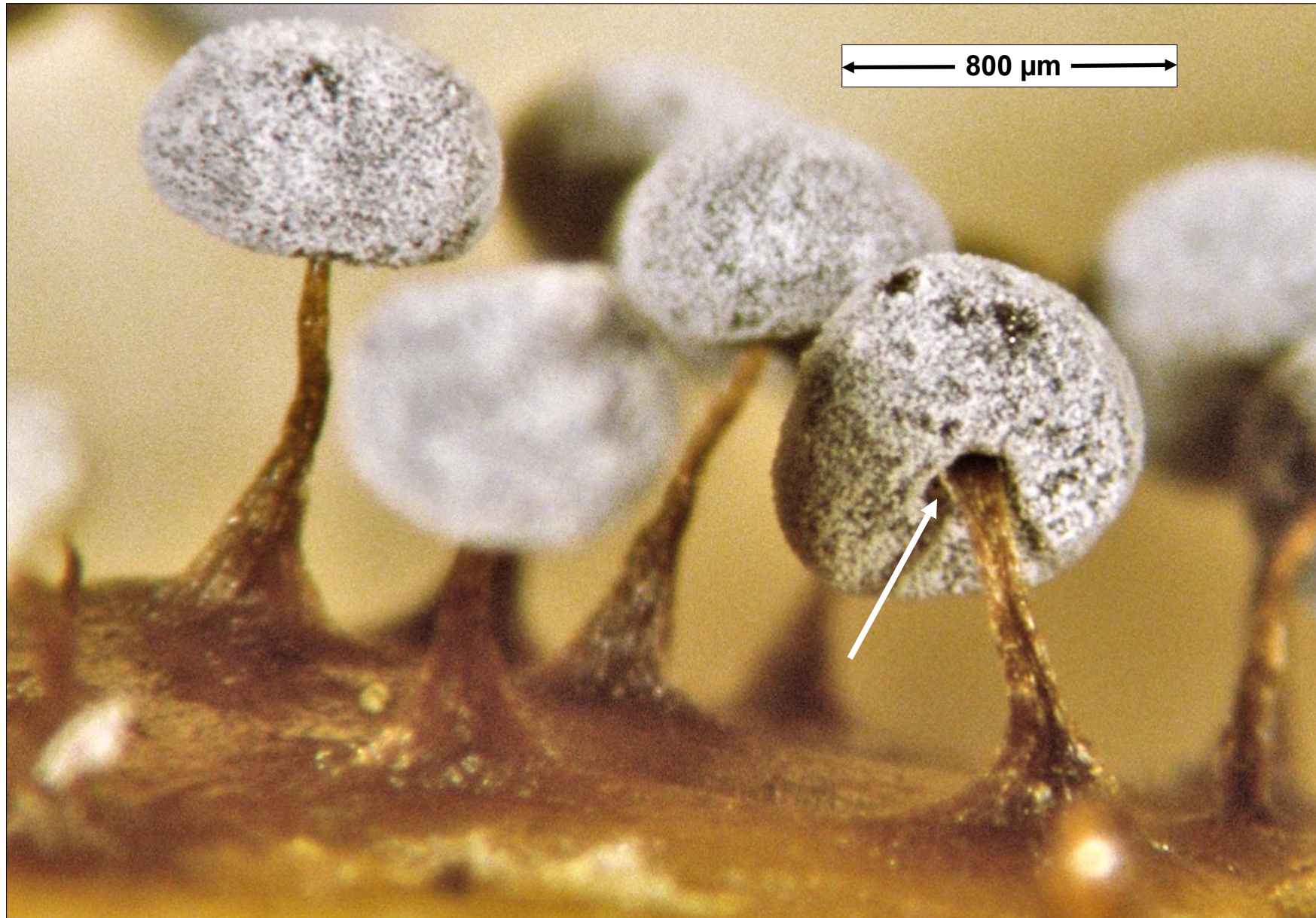
SM92 (22 May 2020). In-situ view of sclerotia. Occasionally seen, following an unseasonably dry and warm period in Lower Hutt, on plant fragments within the massive fruiting. Portra 160 film using a Zeiss dissecting microscope.



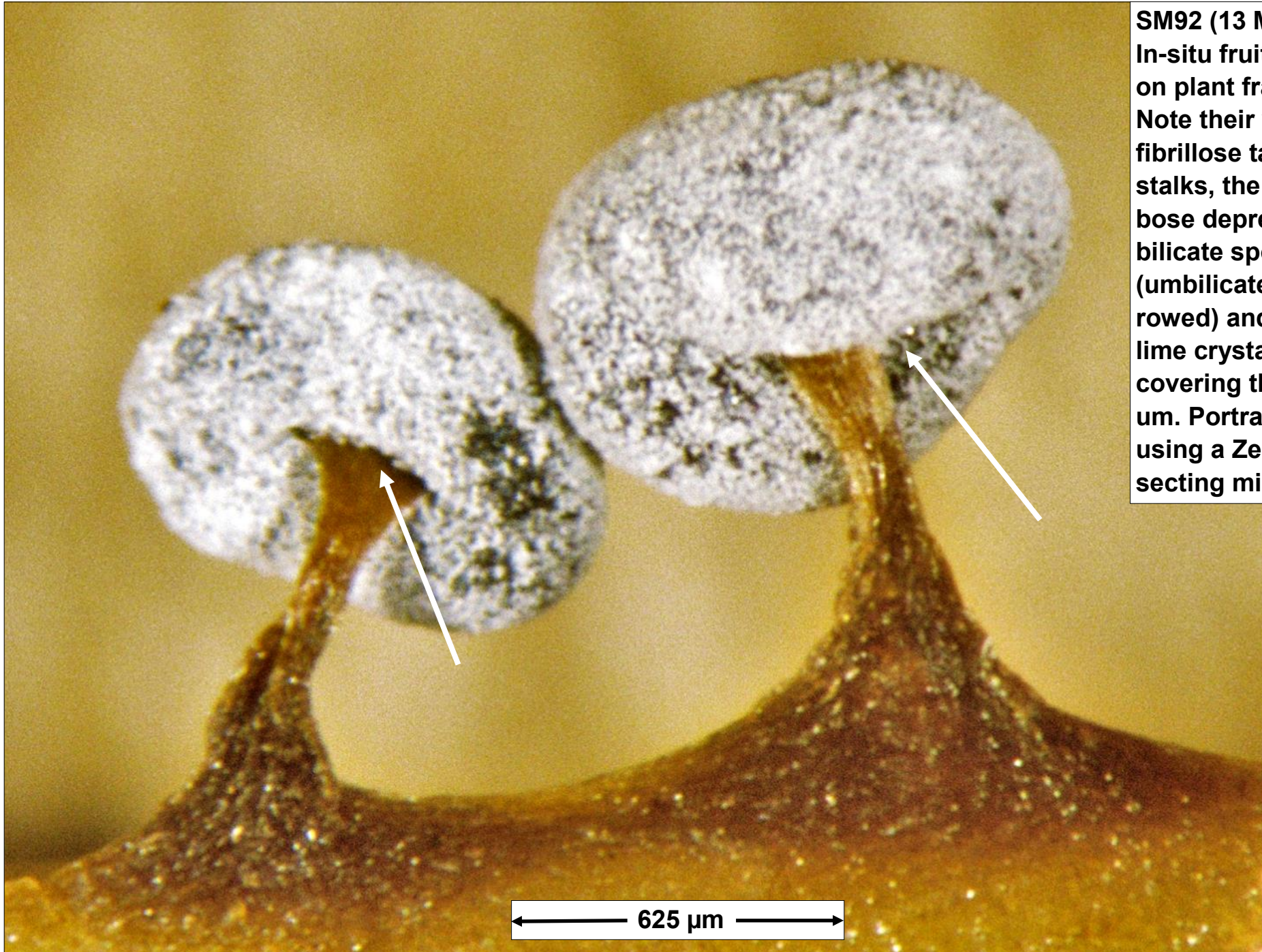
SM92 (upper photo 13 May 2020, lower photo 22 May). In-situ fruiting bodies on plant fragments. Portra 160 film using a Zeiss dissecting microscope.



SM92 (13 May 2020). In-situ fruiting bodies on plant fragments. Portra 160 film using a Zeiss dissecting microscope. Note the white lime crystals densely covering the sporotheca peridium.



SM92 (13 May 2020). In-situ fruiting bodies on plant fragment. Note their vertically fibrillose tapering stalks, the subglobose depressed umbilicate sporothecae (an umbilicate example arrowed) and the white lime crystals densely covering the peridium. Portra 160 film using a Zeiss dissecting microscope.

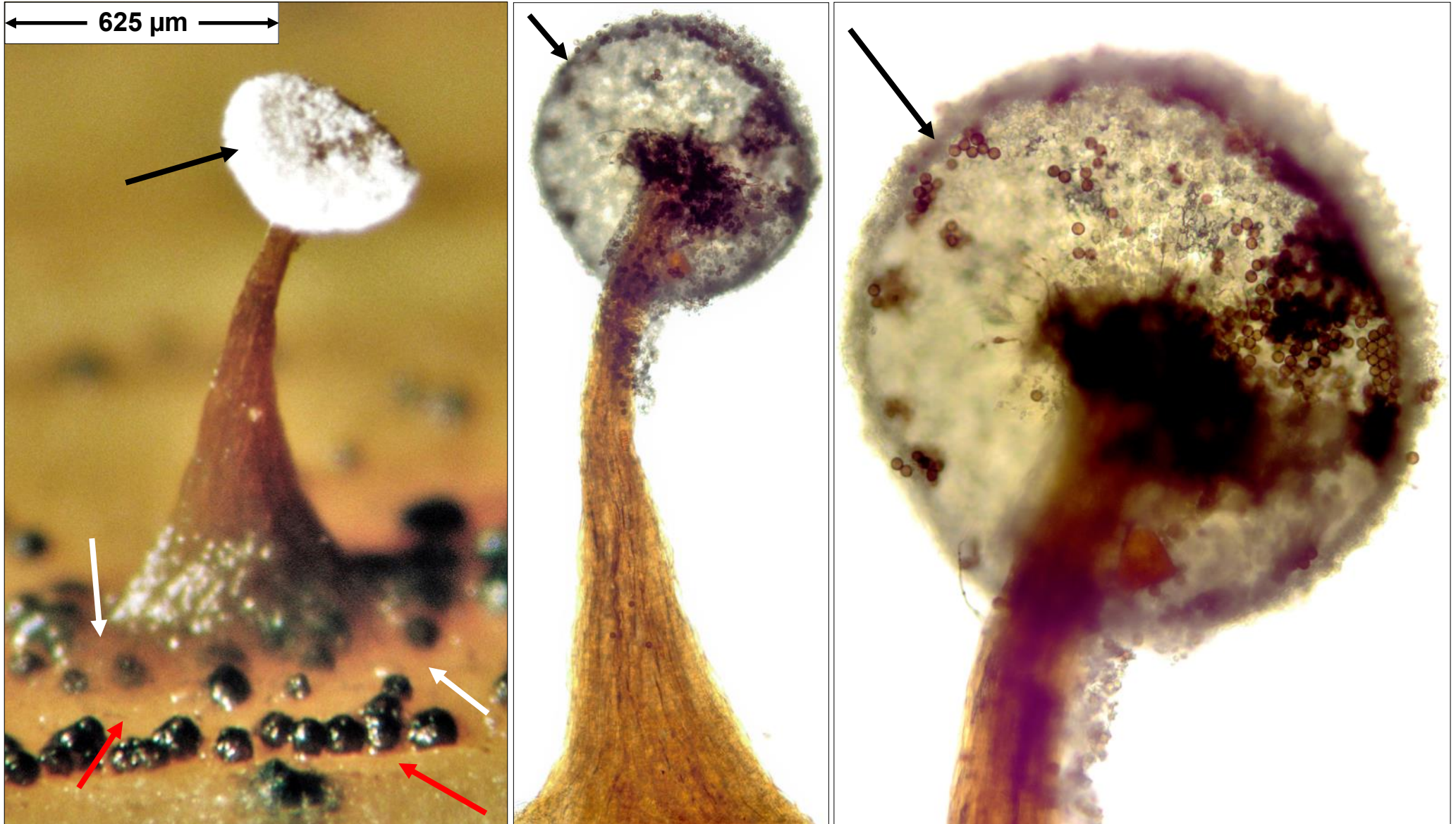


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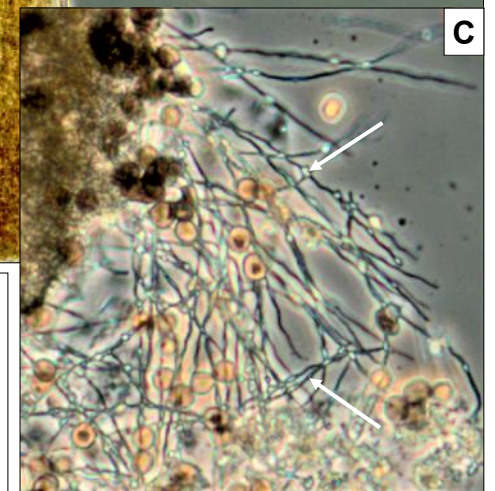
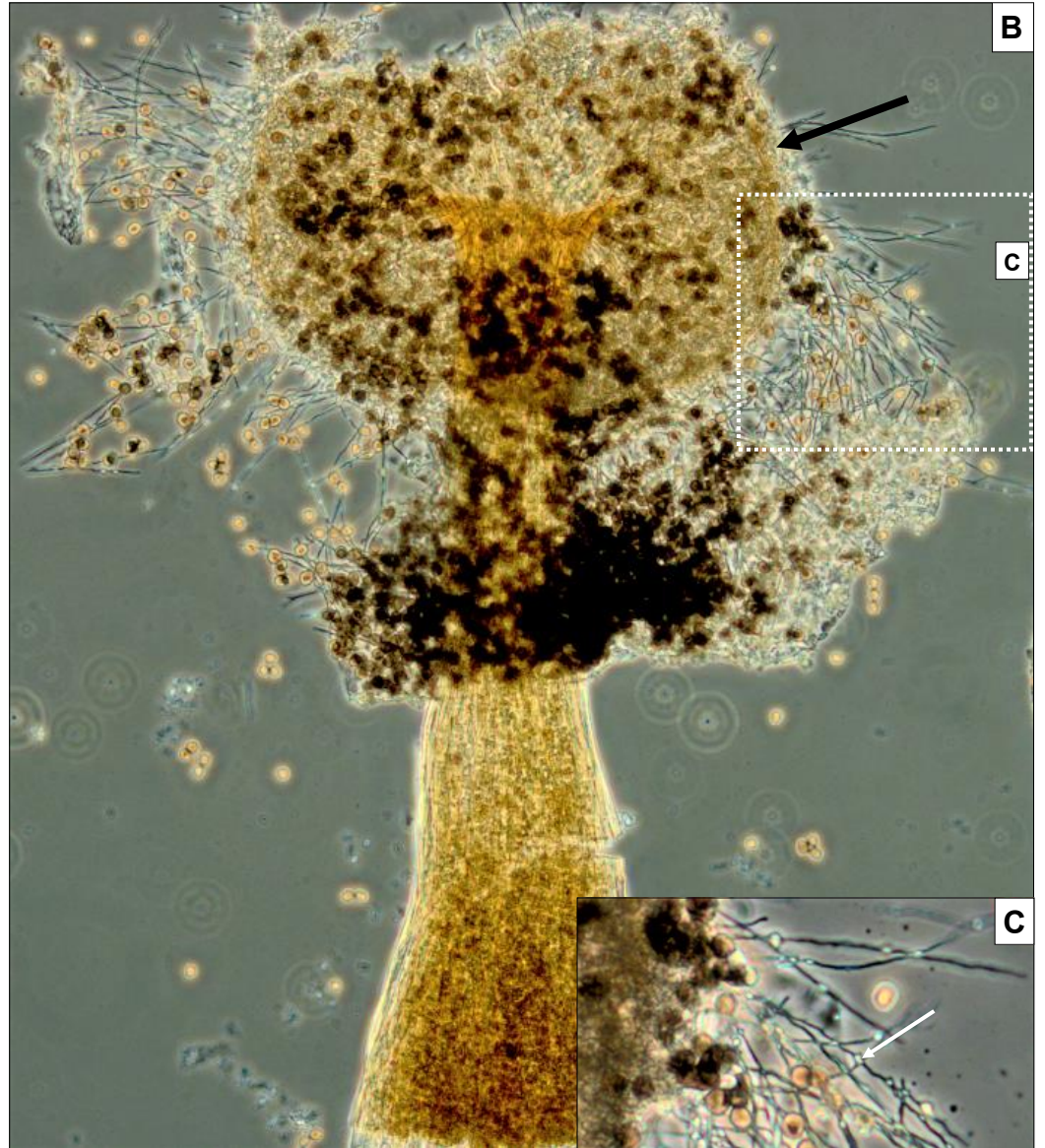
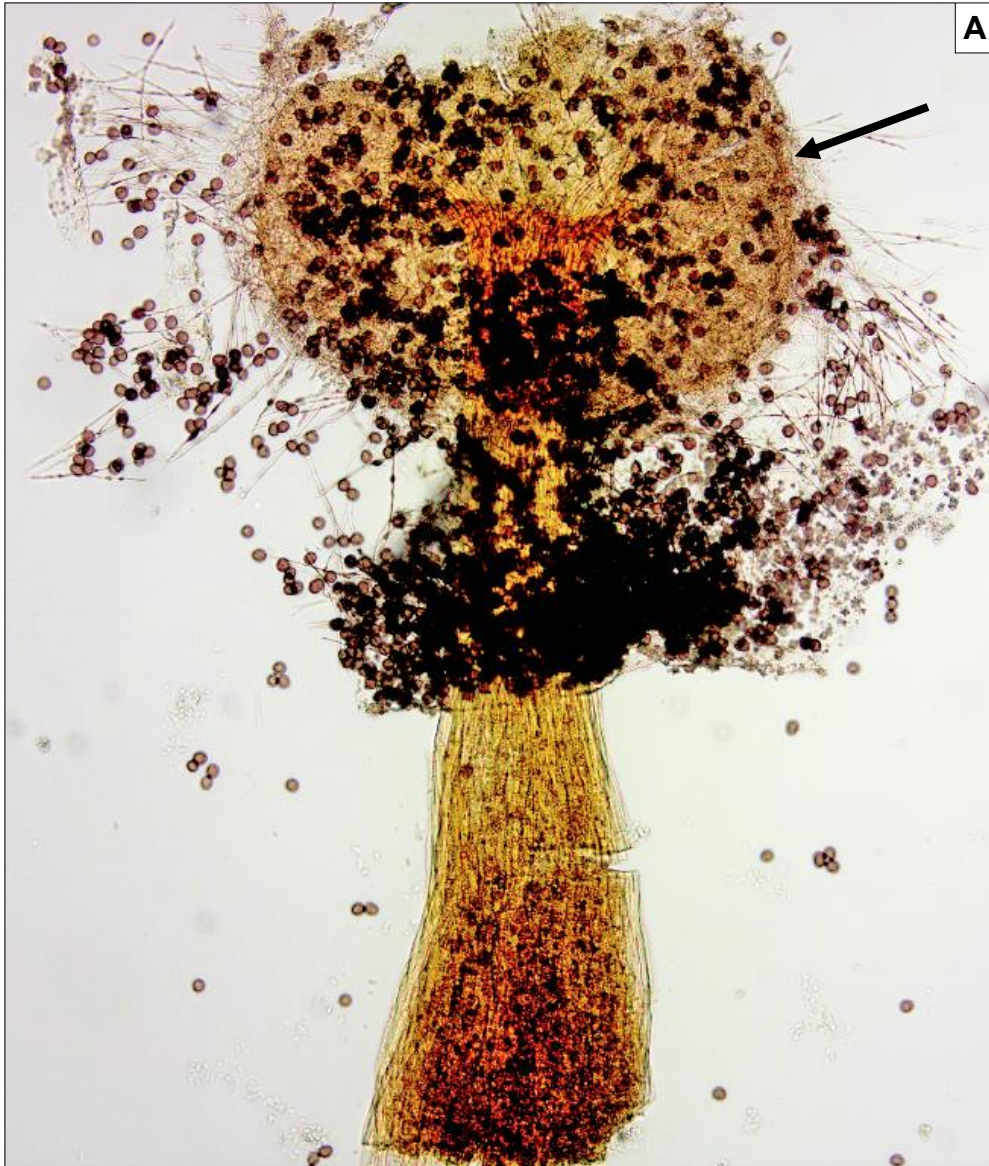
625 μm



SM92 (4 June 2020). In-situ fruiting bodies on plant fragment. Rain that followed the dry, warm weather resulted in spore dispersal, resulting in some sporothecae with only their pseudocolumella remaining atop the stalk (arrowed). Portra 160 film using a Zeiss dissecting microscope.



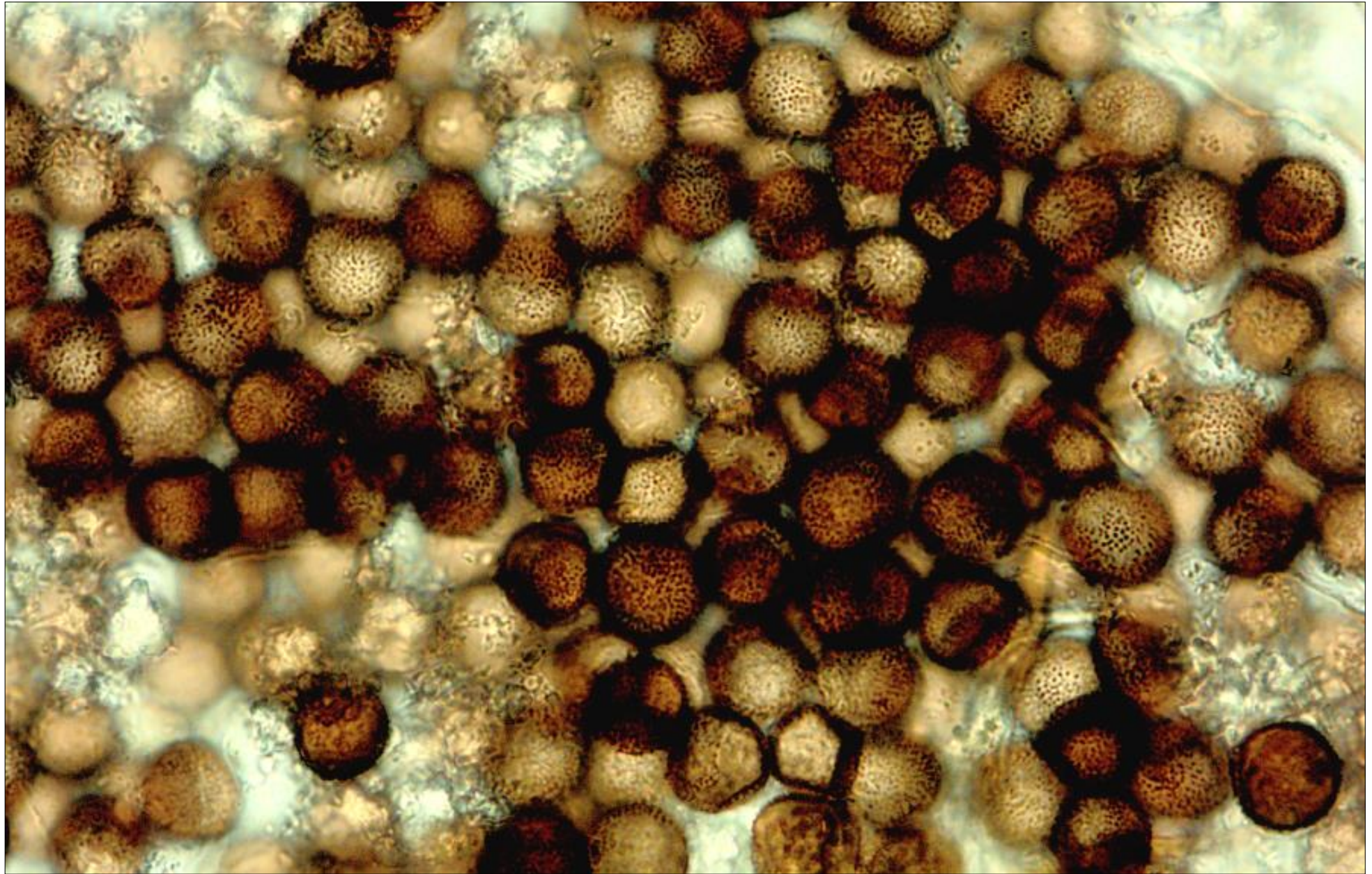
SM92 (4 June 2020). All photos same fruiting body following the rain, with pseudocolumella (arrowed in black). Left, in-situ (Portra 160 film & Zeiss dissecting); other two SMF mount, X10 & X20 objectives resp. (Olympus compound with DP25 camera), brightfield microscopy. Left photo: Note the yellow remnant of the plasmodium (red arrows) and the orange-brown hypothallus (white arrows). Luckily, I was able to remove the entire fruiting body, hypothallus included, and mount it without damage.



SM92 (photo 18 May 2020). A–C same fruiting body mounted in SMF and photographed under the X10 objective. A. brightfield. B. phase. C. Outlined in 'B' and enlarged in 'C'. A,B. Stalk ($850 \times 250 \mu\text{m}$ basal width $\times 150 \mu\text{m}$ apical width), pseudocolumella (black arrows) $500 \mu\text{m}$ across. C. Emphasis sinuous capillitial threads with nodes (white arrows)



SM92 (18 May 2020). Verrucose spores, white stellate lime crystals and transparent peridium (the latter arrowed). Mounted in 70% EtOH and photographed under the X100 objective using brightfield microscopy.



SM92 (18 May 2020). Verrucose spores and scattered white stellate lime crystals. Mounted in 70% EtOH and photographed under the X100 objective using brightfield microscopy.



SM92 (13 May 2020). Verrucose spores mounted in 70% EtOH and photographed under the X100 objective using brightfield microscopy.