***Diderma asteroides* (Lister & G. Lister) G. Lister SM85**

Substrate: old, dry, downed unidentified dead wood and bark in a *Nothofagus* woodland

Collection site: Rimutaka Forest Park, Five Mile Loop Track just beyond the turnoff to Grace's Stream Campsite. Nearest town, Wainuiomata.

Collection date: 22 November 2017

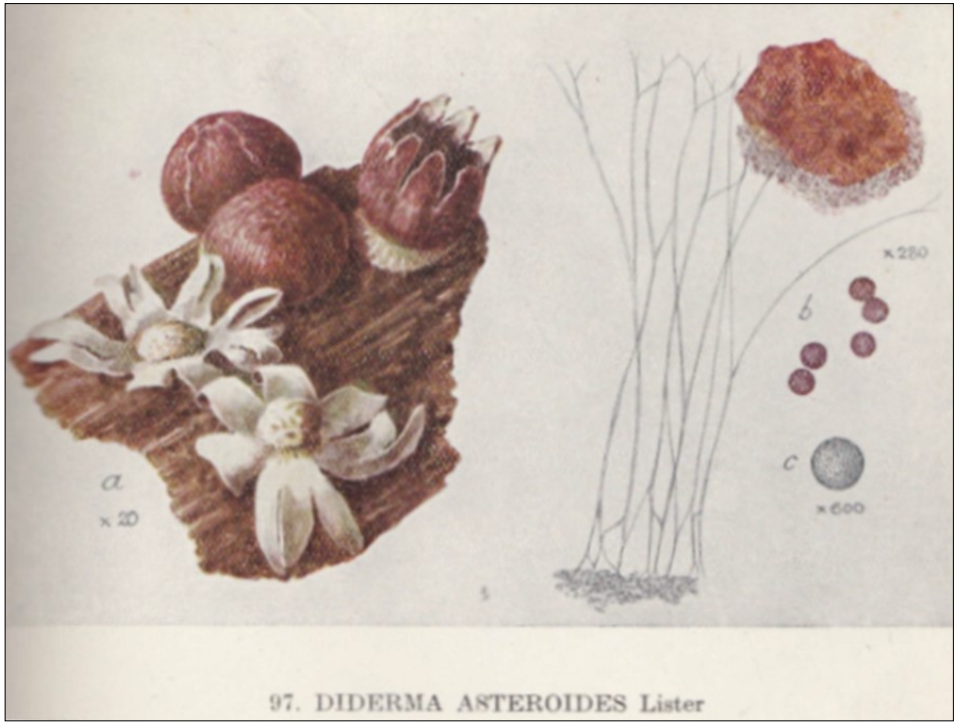
Collector & Identifier: Dan Mahoney

Voucher materials: dried herbarium material accompanied by two SMF (Shear's mounting fluid) semi-permanent slide mounts; professional Portra colored-film, in-situ photos from a Zeiss dissecting scope (best scanned) and digital photos of microscopic detail from an Olympus BX51 microscope & Olympus DP25 digital camera; Dan's comments.

Description and Dan's comments: The original description and water color illustrations by Gulielma Lister best represent the present collection. These are reproduced below from the following: Lister, G. 1925. A Monograph of the Mycetozoa. A Descriptive Catalogue of the Species in the Herbarium of the British Museum. Edn 3. 296 pp., 222 tab. London.

D. asteroides Lister Mycetozoa, ed. 2, 113 (1911) (ἀστήρ star). Plasmodium cream-yellow to bright orange. Sporangia scattered or crowded, hemispherical or somewhat conical, 0·6 to 0·8 mm. high, sessile, seldom either shortly stalked or forming plasmodiocarps, purplish-brown, bright chocolate- or pinkish-brown, often mottled with darker spots or marked with numerous darker lines radiating from near the apex to the base of the sporangium; sporangium-wall dehiscing in a stellate manner into from eight to twenty reflexed lobes, snow-white on the inner side, the outer layer brown, cartilaginous, with abundant deposits of lime on the inner side, usually connected with the membranous inner layer. Stalk stout, white, filled with lime-granules, 0·2 mm. high, often arising from a white hypothallus. Columella hemispherical, or subglobose and depressed, white or cream-coloured. Capillitium of slender simple or anastomosing colourless or purplish threads. Spores purple-brown, minutely warted, 9 to 12 μ diam.—Macbr. N. Am. Slime-Moulds, ed. 2, 143. *Chondrioderma asteroides* Lister in Journ. Bot., xl. 209, tab. 438, fig. 1 *a-c* (1902); Torrend Fl. Myx., 166.

Pl. 97.—*a*. sporangia (La Mortola, Italy); *b*. capillitium and spores with fragment of sporangium-wall; *c*. spore.



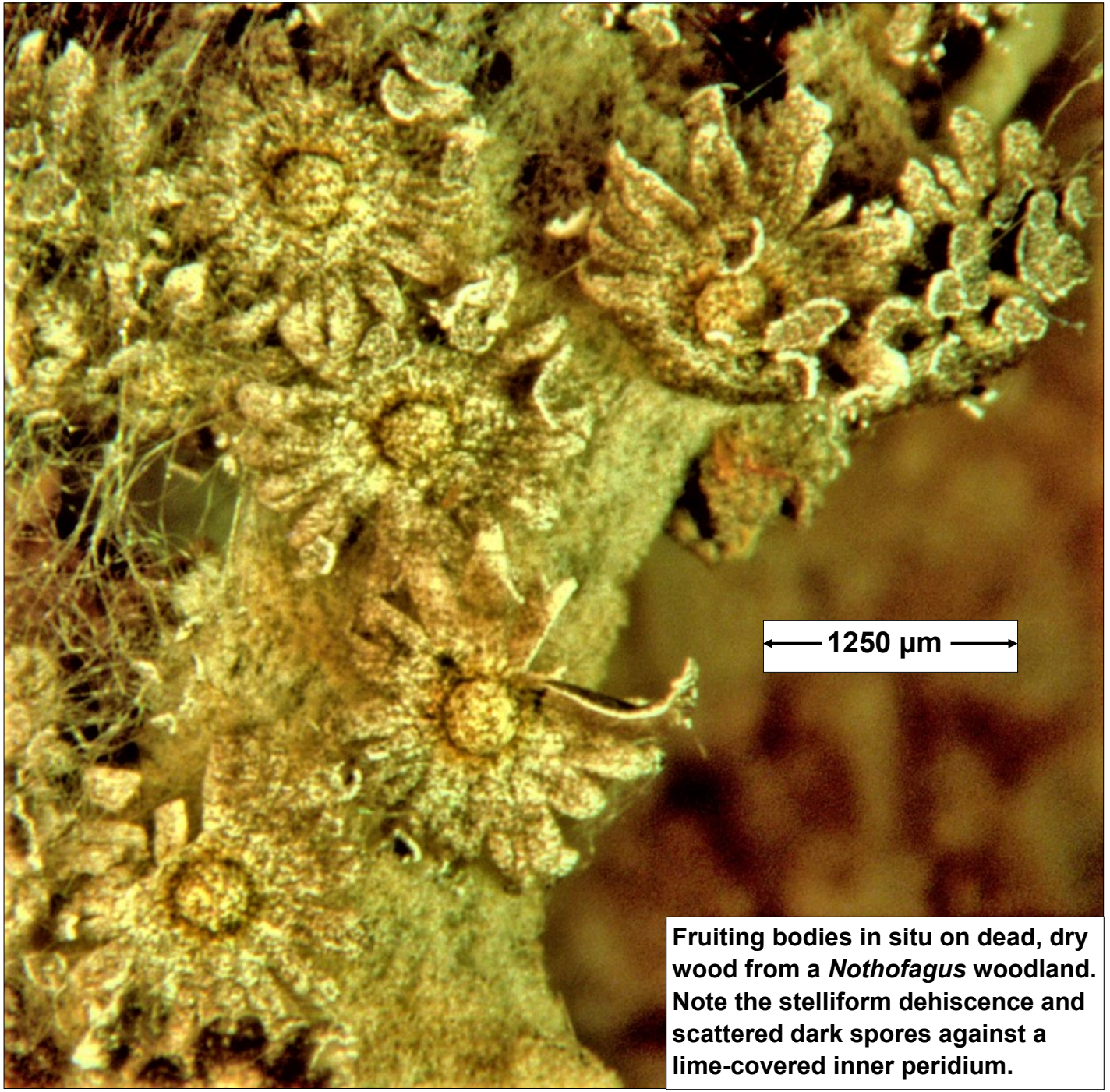
97. DIDERMA ASTEROIDES Lister

Dan's comments: The present collection represents older fruiting bodies whose sporangia have already undergone stelliform dehiscence. Most of these are sessile or nearly so although at least one exhibits a well-defined, stout stalk (see photo later in this pdf). The calcareous nature of this stalk could not be verified nor could the whitish hypothallus that she describes. What appears to be a yellowish hypothallus does seem to be present at the base of some fruiting bodies. The peridium detail is as she describes and illustrates although the 'membranous inner layer' was not seen. However, the dark cartilaginous outer layer with its inner lime-covered snow-white portion is obvious. Other descriptions refer to these as a fusion of outer and middle peridium layers. Particularly clear in the cartilaginous outer layer are the 'numerous darker lines radiating from near the apex (of each stellate arm) to the base of the sporangium'. The inner, centrally-located, hemispherical to subglobose columella is colored the same as the inner side of the peridium with the same lime covering. Capillitial threads were thin, branching and anastomosing 'purplish' brown and non-calcareous with occasional membranous nodes. Spores were globose, 'purplish' brown, warted and 12–13 µm in diameter (the Lister description and most other references record spores as 9–12 or 10–12 µm).

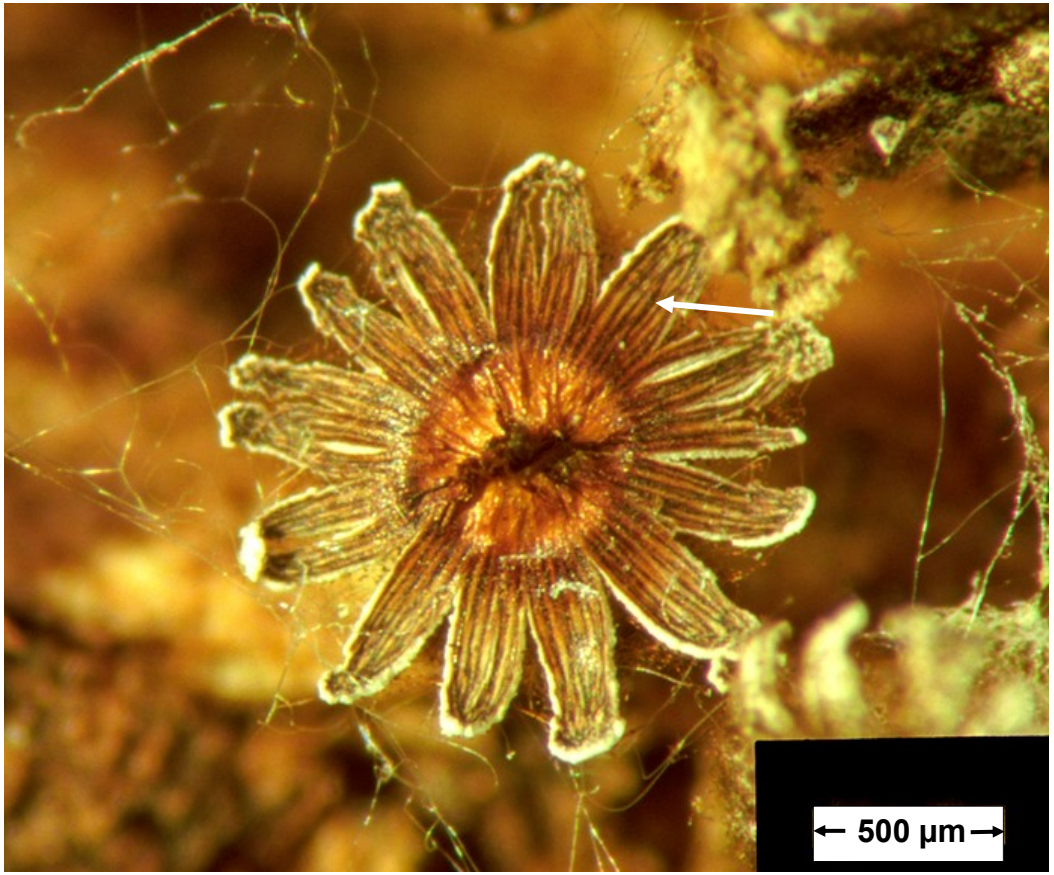
The pigmented portions of the fruiting body had some reddish-brown, violaceous-brown, purplish-brown or brownish tints depending on the lighting. It was difficult to characterize each.

Other New Zealand records of *Diderma asteroides*: The first report of this species from New Zealand was by Rawson (1937) from Dunedin (see Stephenson, S.L. 2003. The Fungi of New Zealand Volume 3: Myxomycetes of New Zealand. Fungal Diversity Research Series 11: 1-238.) However, according to the present Landcare PDD Systematics Collection data online and Stephenson (2003), only one herbarium collection is recorded - PDD 16701 from the Auckland area in 1956. It is unclear whether the Dunedin collection still exists.

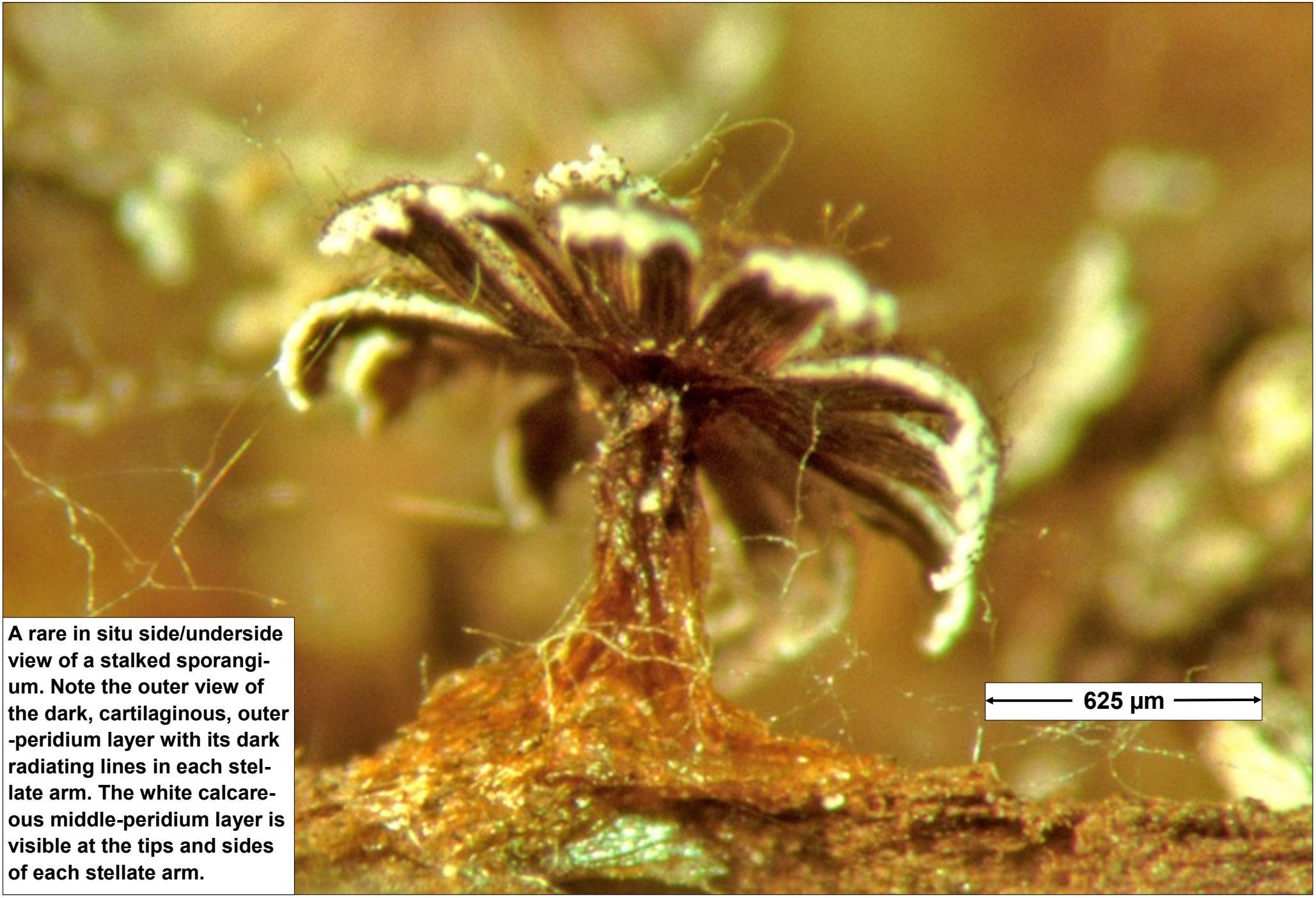
This species appears to be widespread but infrequently collected. In Australia it has been collected near Perth (see **Diderma asteroides (Lister & G.Lister) - FloraBase**).



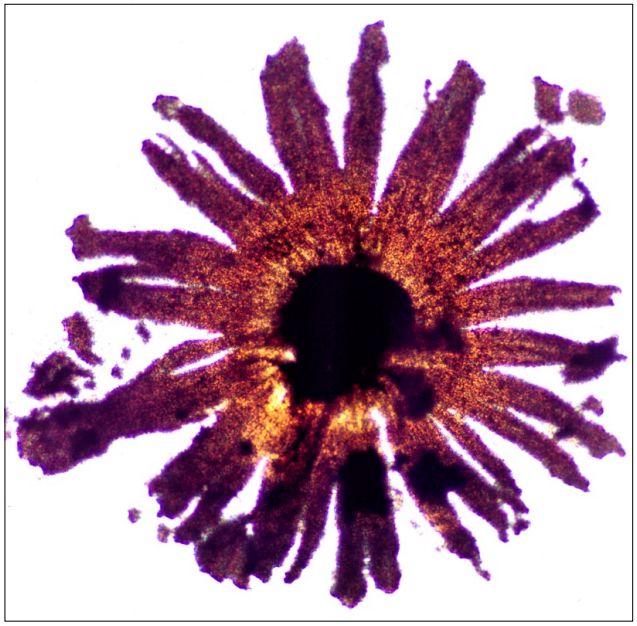
Fruiting bodies in situ on dead, dry wood from a *Nothofagus* woodland. Note the stelliform dehiscence and scattered dark spores against a lime-covered inner peridium.

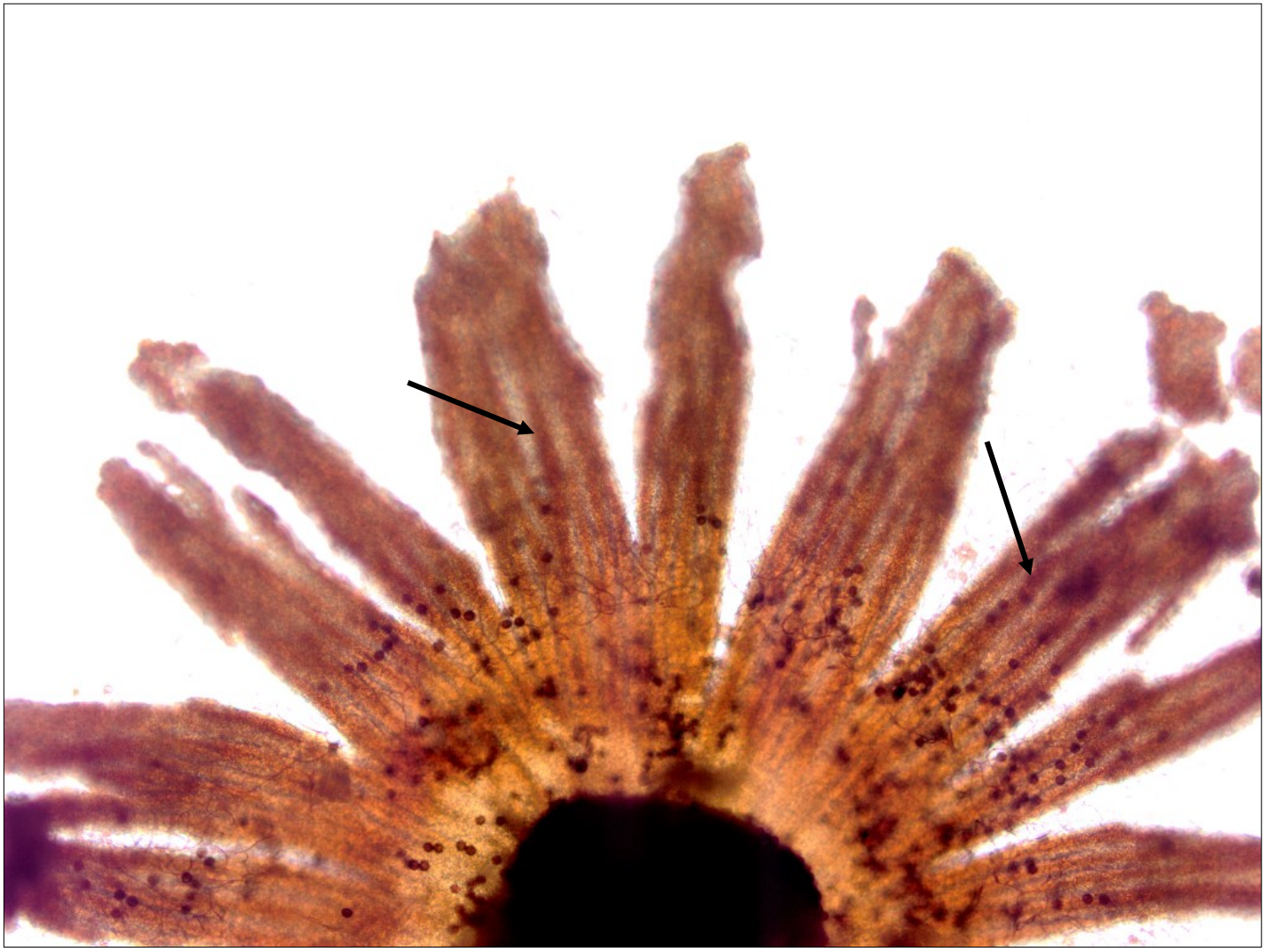


Overhead views of in situ fruiting bodies on the dead wood substrate. Left photo: typical of many views of the stelliform dehiscent sporangia in this collection. Note the white, middle-peridium layer with its granular lime. The prominent hemispherical columella (arrowed) lies centermost with most of the dark spores & capillitium dispersed, although remnants of these are still present. Right photo: rarely seen but informative. Here, the calcified middle-peridium layer & the columella have eroded away, leaving only an inner view of the dark, cartilaginous, outer-peridium layer. Note the numerous dark lines radiating from the apex of each stellate arm to the very center (arrowed) – even beneath the now absent columella . For an outer view of these radiating lines, see the next page.

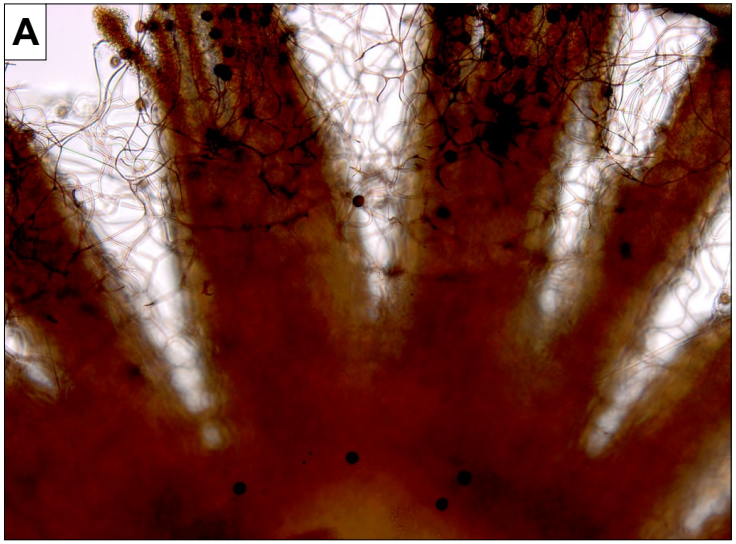


A rare in situ side/underside view of a stalked sporangium. Note the outer view of the dark, cartilaginous, outer-peridium layer with its dark radiating lines in each stellate arm. The white calcareous middle-peridium layer is visible at the tips and sides of each stellate arm.

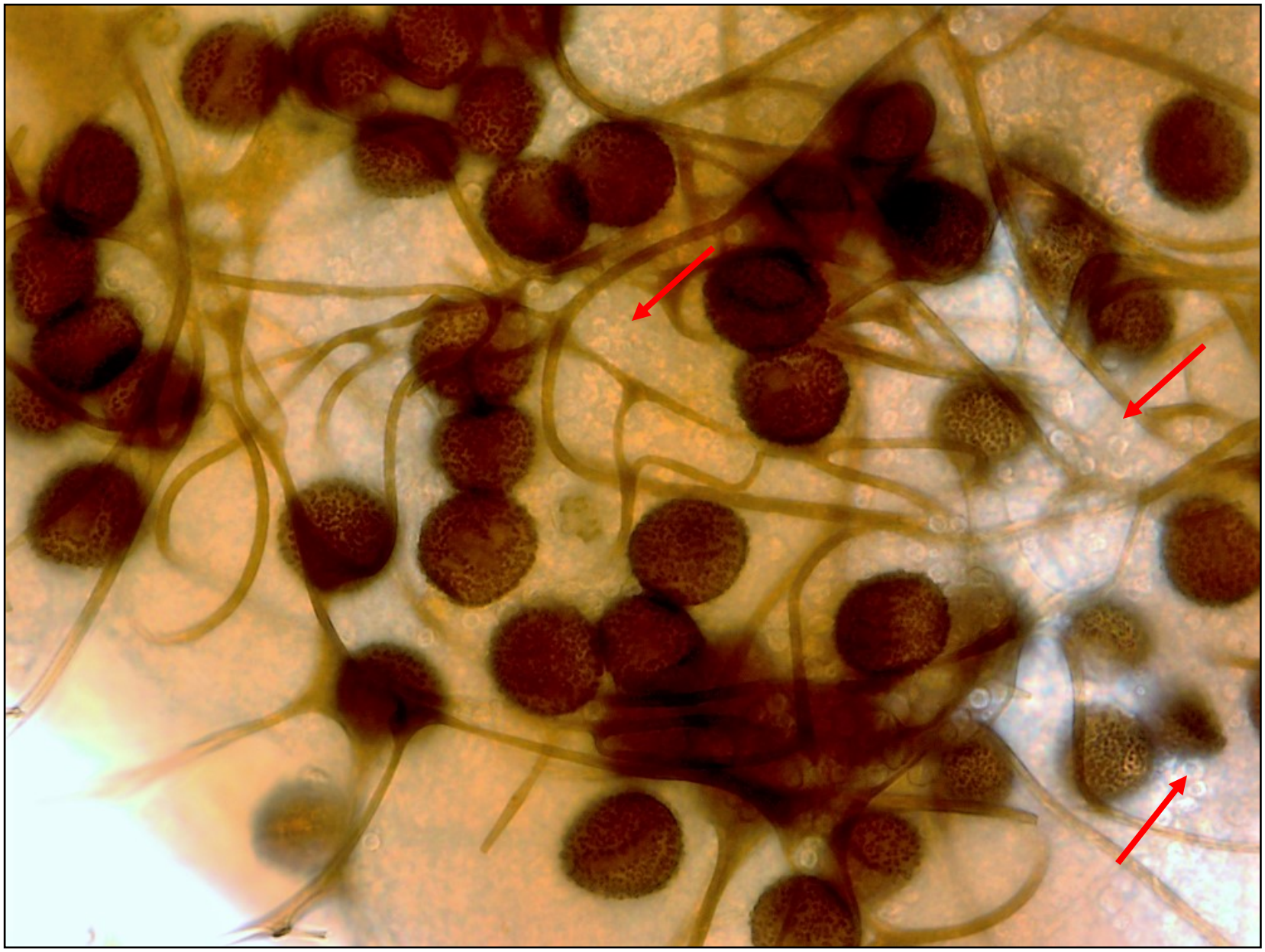




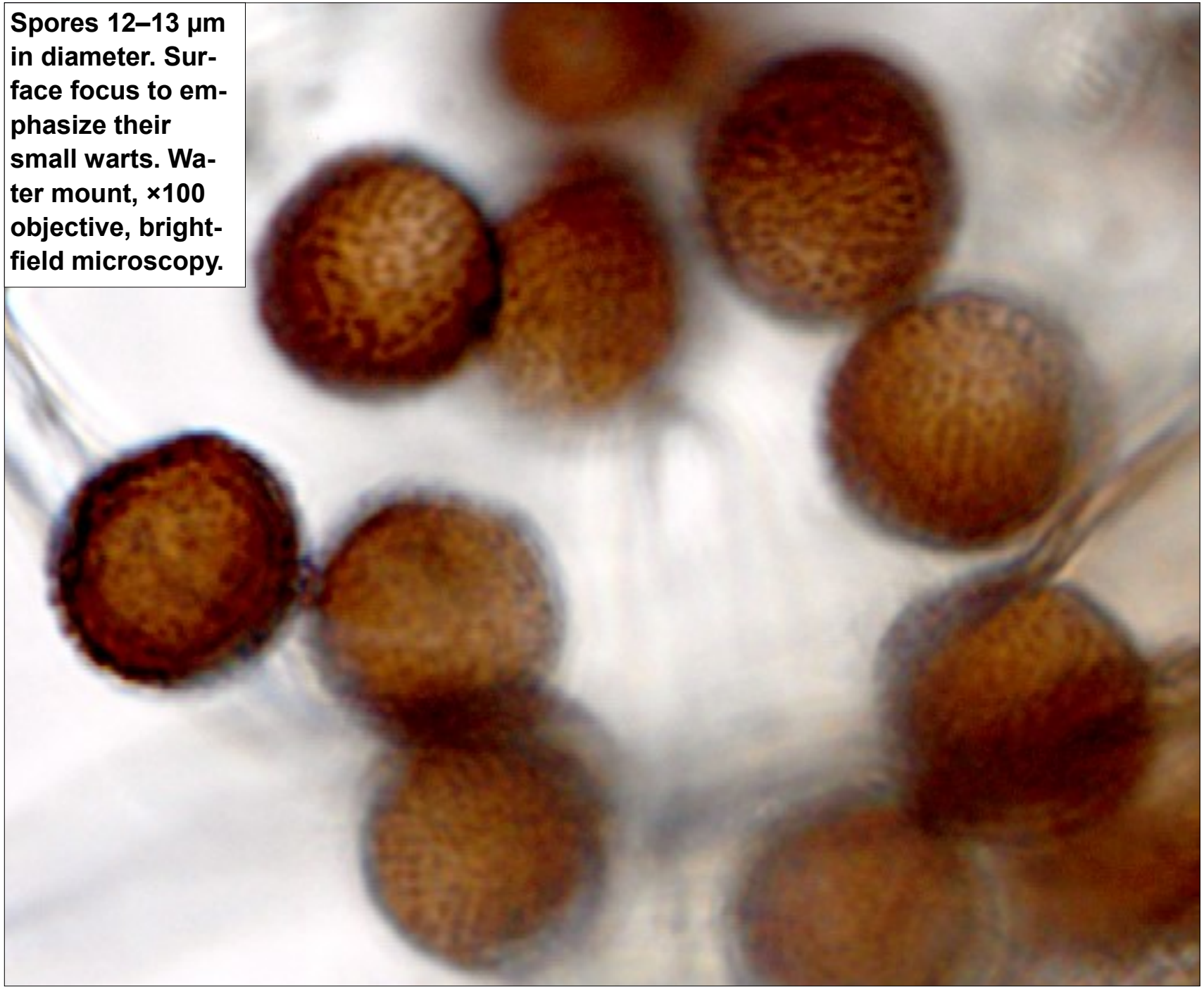
Slightly overexposed views of the same, squashed, inner sporangium. Only inner views of the dark carti-laginous outer peridium are seen. Note where the central columella once was and the remnants of dark capillitial threads & spores. Dark radiating lines in each stellate arm are arrowed. SMF mount, ×4 & ×10 objectives, brightfield microscopy.



A–C. Emphasis dark, branching-anastomosing, capillitial threads. A, B. Inner sporangial views with capillitial threads between the stellate arms. SMF, ×20 & ×40 objectives, bright-field. C. Water, ×40 obj., brightfield. Note non-calcareous capillitial nodes (blue arrows) & lime granules (red arrows).



Inner view of stellate arm fragments with spores (note surface view of warts), capillitial threads and, in the background, small globular white lime granules (red arrows). SMF, X100 obj., brightfield overexposed.



Spores 12–13 µm in diameter. Surface focus to emphasize their small warts. Water mount, ×100 objective, bright-field microscopy.