

***Scleroderma citrinum* Pers. AEB 1309 (= PDD 117247)**

Collection site: private residence, Lower Hutt

Substrate: soil – shaded and weedy [especially *ground Ivy*, or *creeping Charlie* (*Glechoma hederacea*)] beneath *Acer palmatum* var. *osakazuki* but not far from a large Deodar cedar (*Cedrus deodara*), a smaller red oak (*Quercus rubra*, syn. *Quercus borealis*) and a smaller rimu (*Dacrydium cupressinum*). An ectomycorrhizal association is suggested with one of these or with a variety of other small shrubs and trees nearby.

Collection date: 26 March 2018 – first observed by Ann Bell on 17 March (Dan's microscopic photos of basidiospores & clamp connections were taken on that date).

Collector & identifier: Dan Mahoney

Voucher materials: dried herbarium material AEB 1309 (= PDD 117247) – whole and longitudinally-sectioned basidiomata – accompanied by one heated NaOH/SMF (Shear's mounting fluid) semi-permanent slide mount; Kodak 200 ASA color film – basidiomata in-situ photos (26 March 2018) scanned to a CD and edited, and several digital photos of microscopic detail (17 March 2018) with an Olympus BX51 microscope & Olympus DP25 digital camera; Dan's comments.

Comments on 17 March 2018 when Ann first brought these basidiomata to my attention: The photos taken then were from glebal tissue (mostly basidiospores) first placed in concentrated NaOH but then irrigated with SMF, heated thoroughly and sealed with nail polish). One slide prepared in this manner was selected to accompany the dried herbarium material. Phase microscopy rather than brightfield seemed best for viewing the spinose/reticulate ornamentation.

When first observed on the 17th, the gleba was more compact and purplish black (with small white mycelial patches) and the surrounding peridium had slight reddish tints. On the 26th, however, the gleba was powdery and dark 'olivaceous' brown and no reddish tints were seen. Basidiospores measured 11–13 µm (including the spinose/reticulate portions); spines measured 1.5–2 µm long.

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Worth noting are comparisons with collection AEB 1308 from the Nikau Track and another specimen from a wholly different area at the private residence in Lower Hutt, collected by Ann several days after collection AEB 1309. These, I believe, are all variations of *Scleroderma citrinum*. All were collected from soils beneath different vegetation and different environmental exposure (e.g. drainage and sun exposure). All had spinose/reticulate basidiospores of the same size and comparably-sized and shaped basidiomata. The main differences centered around 1) the yellowish-brown peridial scales, 2) the amount of yellow in the peridium surface and cross section, the glebal hyphae and the robust hypogean 'stipe' surface and sectioned view & 3) the amount of reddish bruising in the peridium and the hypogean sectioned view. These not only varied from collection to collection but from younger to older specimens in each collection. Generally, the prominent, flattened, yellow-brown peridial scales were concentrated on the apical basidiomata and there best seen with increasing age. These were more prominent over the whole peridium in the Nikau Track collection with prominent scales more restricted to the basidiomata apices in those from the Lower Hutt private residence. Scale arrangement in rosettes were noted in all mature specimens but with varying degrees of clarity. The degree of yellow coloration (variation '2' above) seemed to peak with the late collection from the private residence and generally with increasing age in all collections. The reddish bruising was very slight and not always present. Here, again, the later private residence more yellowish collection had easily observed reddish bruising in the sectioned hypogean 'stipe'.

References to *Scleroderma* identification keys: See the pdf for AEB 1308 (= PDD 117246).



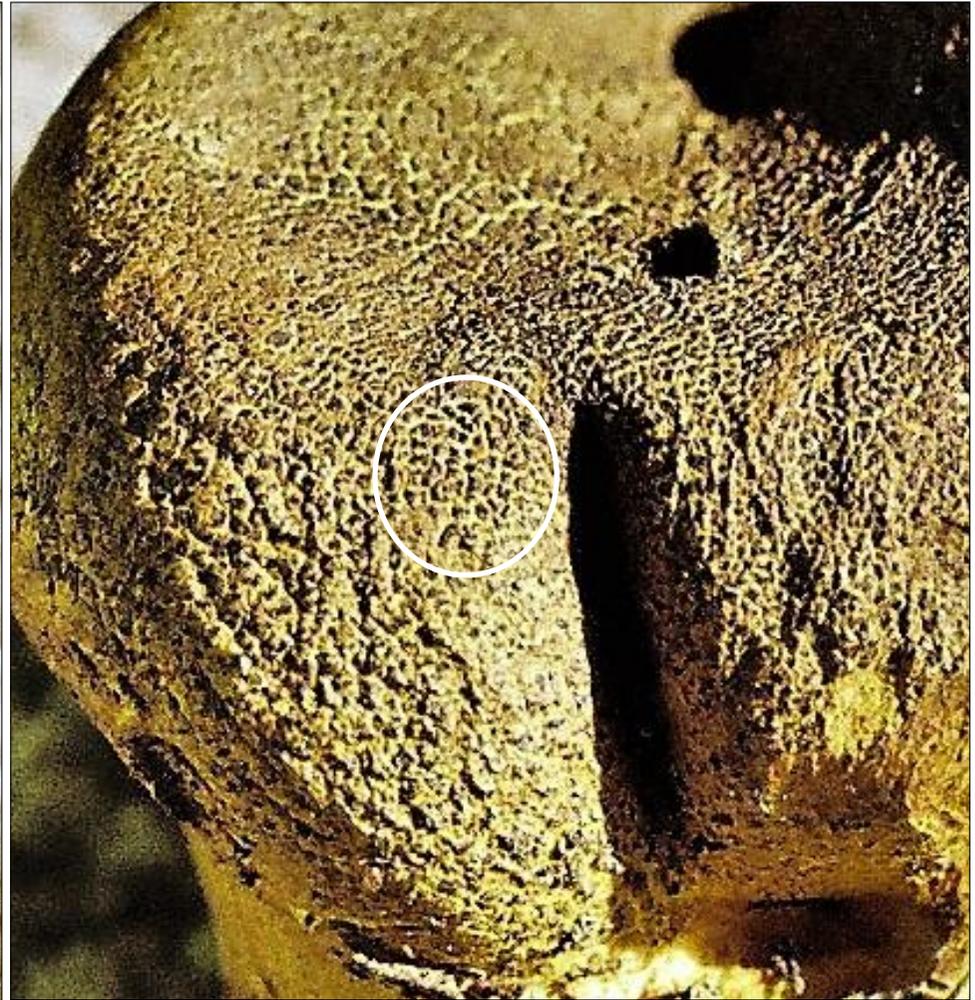
Three fresh basidiomata (in partial side views) just removed from the ground beneath the Japanese maple. Peridial scales were better formed on the middle basidioma (upper portion) which is beginning to split open irregularly. Basidiomata measurements: left, epigeal portion 2.5 cm diameter \times 2.25 cm high; center, epigeal portion 4.5 cm diam \times 2.5 cm high (robust hypogean portion 2 cm long \times 1.5 cm wide + rhizomorphic fuzz); right, epigeal portion 3.5 cm diam \times 3 cm high. All basidiomata are slightly flattened apically and their true measurements are not always obvious in their photographic arrangement. Other unphotographed basidiomata measured 5 \times 3 cm & 5 \times 2.5 cm. Both of these were also apically flattened and sinking somewhat. The herbarium collection has 5 basidiomata including these two.



The middle basidioma from the previous page. Note the flattened yellow brown scales in upper portions. The white circled area represents the arrangement of scales in a rosette—a feature of this species.

Median longitudinal sections of two basidiomata seen whole on the page before last). Note the large, central, olive-brown, glebal masses seen here.



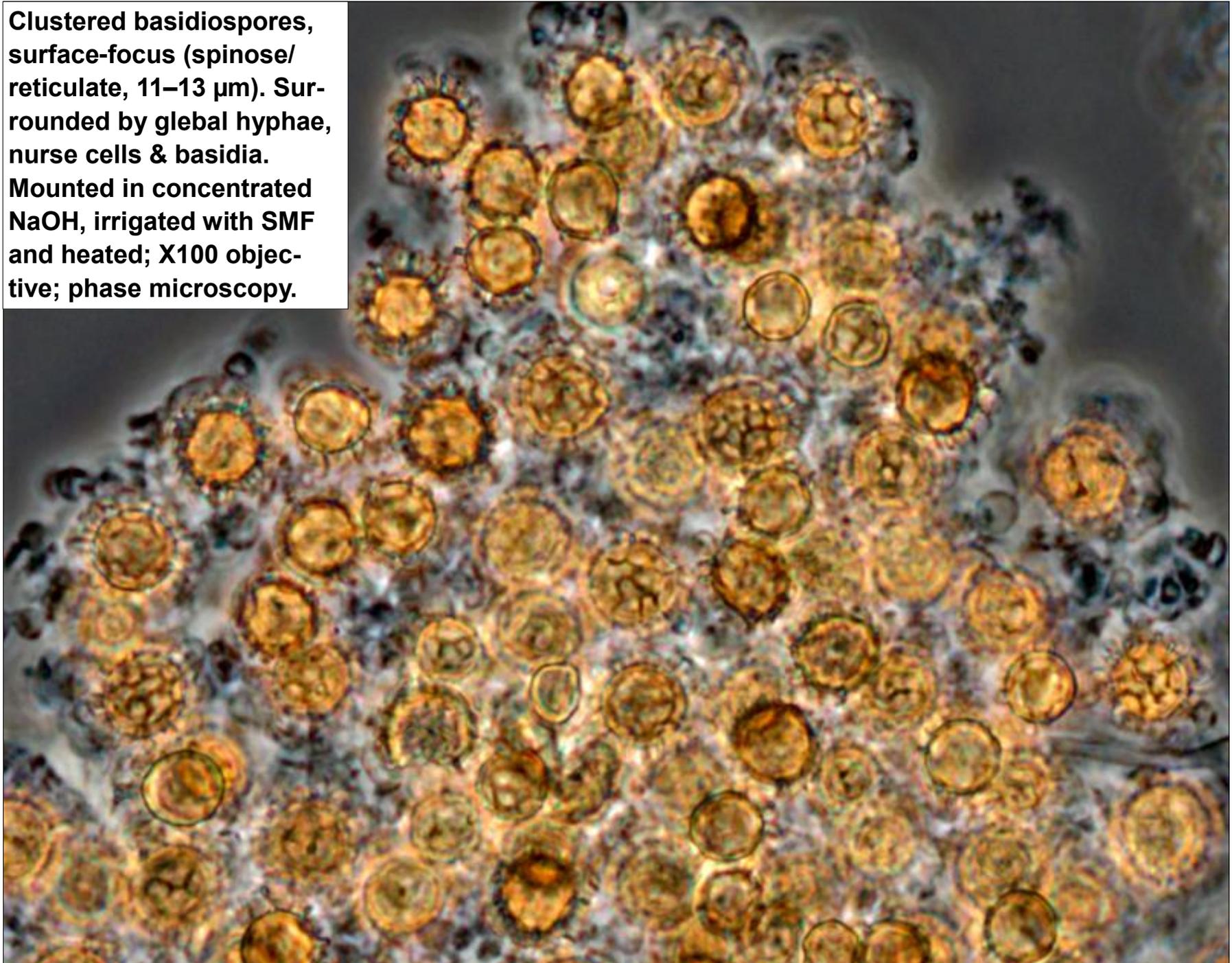


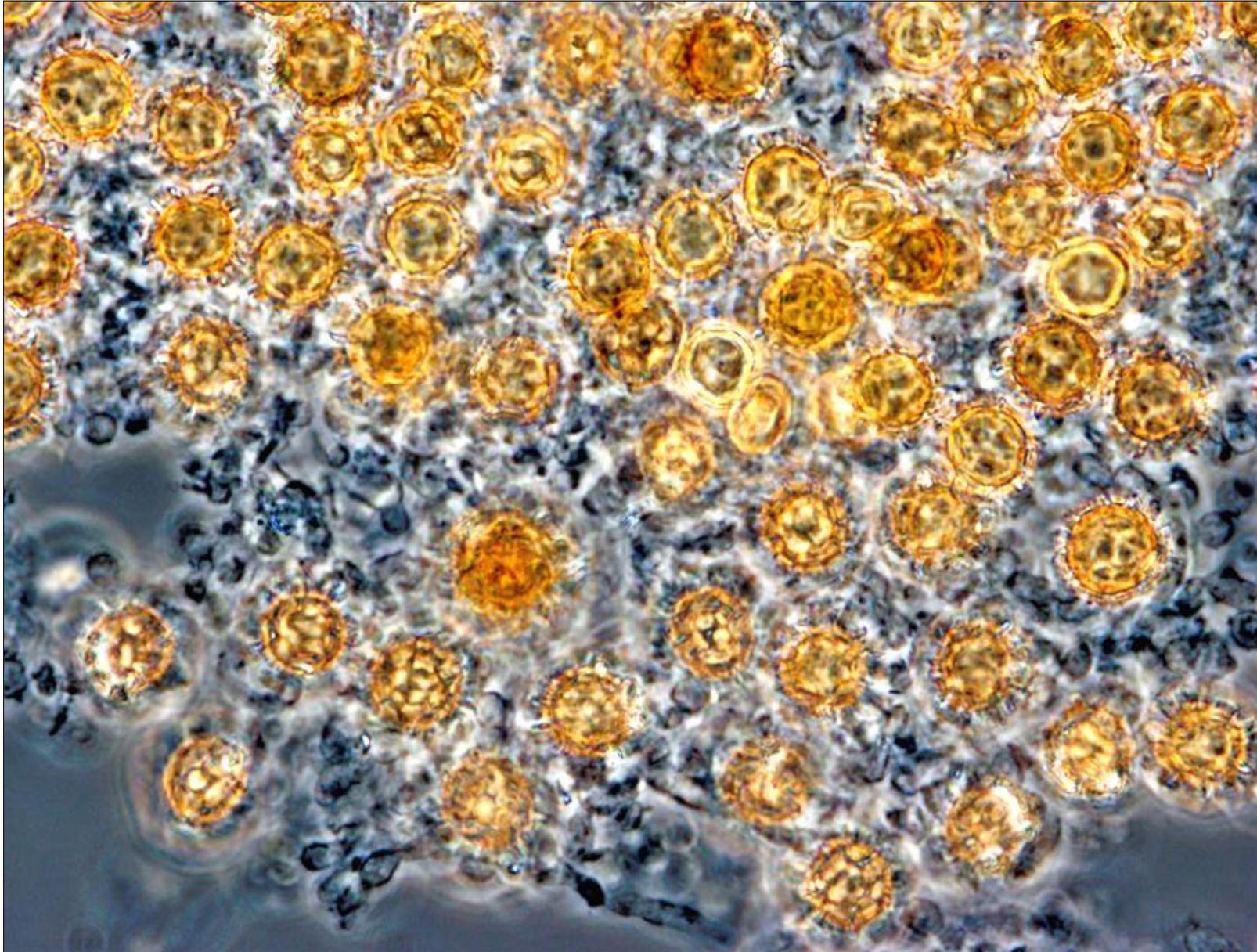
A basidioma (epigeal portion, 4 cm wide and 3.5 cm high) not included in the AEB 1309 collection but collected by Ann several days later from a wholly different area at the private residence in Lower Hutt. It represents the same species but here the hypogean stipe is larger (3 cm long & 2 cm wide) and conspicuously yellow as are the areas between scales on the epigeal portion. The right photo is an enlargement of the left photo with the white circles representing scales in a rosette pattern. Not shown is a median longitudinal section where red bruising is obvious in the hypogean stipe. Red bruising was not apparent in the AEB 1309 collection.



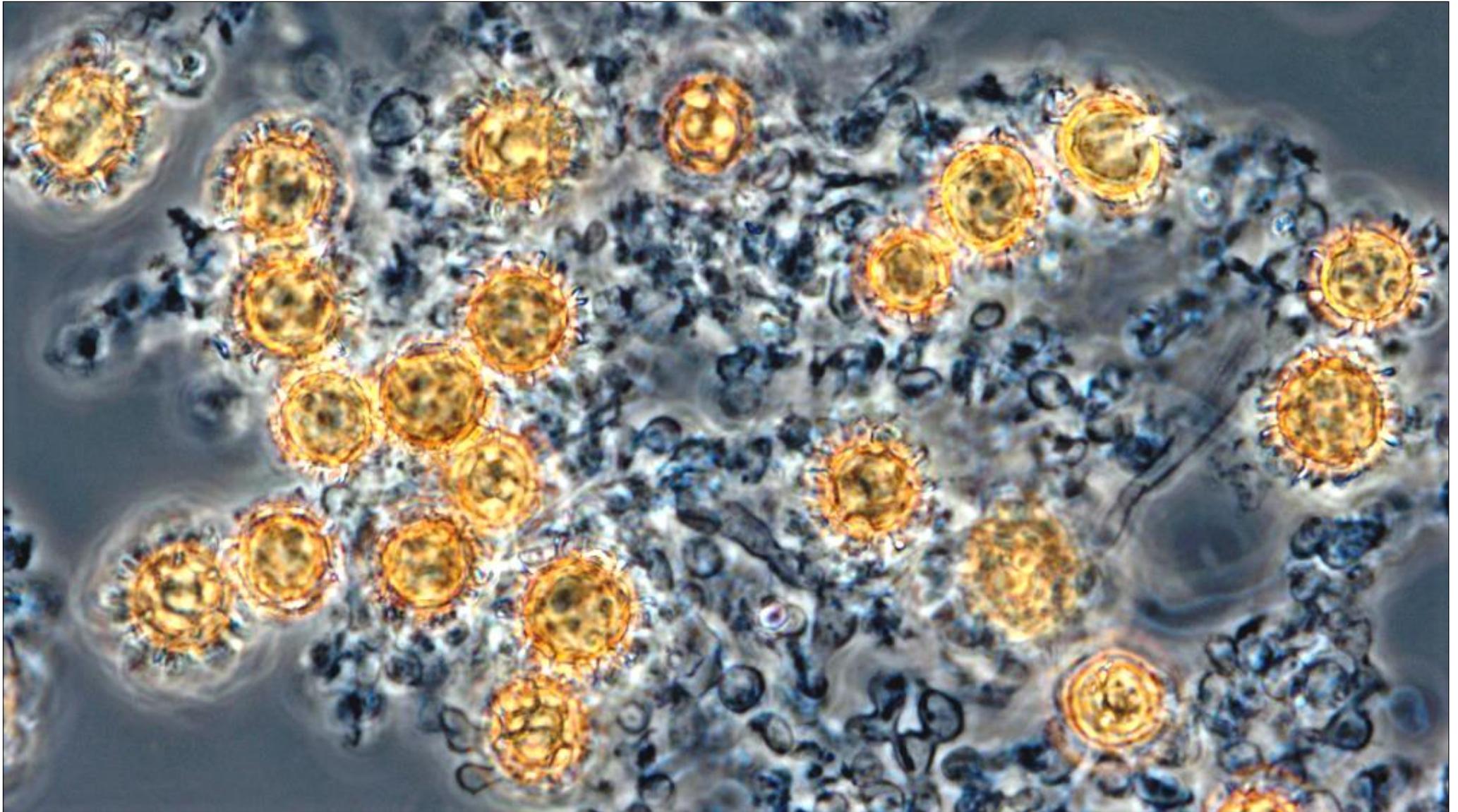
Gleba tramal hyphae with clamp connections. Clamp connections arrowed. Mounted in concentrated NaOH, irrigated with SMF and heated; X100 objective; phase microscopy.

Clustered basidiospores, surface-focus (spinose/reticulate, 11–13 μm). Surrounded by glebal hyphae, nurse cells & basidia. Mounted in concentrated NaOH, irrigated with SMF and heated; X100 objective; phase microscopy.





Clustered basidiospores, surface-focus (spinose/reticulate, 11–13 μm). Surrounded by glebal hyphae, nurse cells & basidia. Mounted in concentrated NaOH, irrigated with SMF and heated; X100 objective; phase microscopy.



Basidiospores, surface-focus (spinose/reticulate, 11–13 μm). Surrounded by glebal hyphae, nurse cells & basidia. Mounted in concentrated NaOH, irrigated with SMF and heated; X100 objective; phase microscopy.