AEB 1181 (= PDD 102623)

***Rosellinia communis* L.E. Petrini with *Geniculosporium* anamorph – a good fit**

Substrate: moist, decayed, decorticated wood
Collection site: Remutaka Forest Park, Catchpool Track
Collection date: 9 February 2012
Collector & identifier: Dan Mahoney

Voucher material: Dried herbarium material [AEB 1181 (= PDD 102623)] and two semi-permanent slide mounts – one Shear's mounting fluid (SMF) of asci, ascospores & paraphyses and one aniline blue lactic acid of the *Geniculosporium* anamorph; dissecting scope projection slides of fresh in-situ teleomorph and anamorphic structures (best digitized) and digital photos of microscopic detail; Dan's brief descriptions.

Brief descriptions:
Teleomorph: Stromata (uniperitheciate) superficial with a flat base, blackish, broadly conical with concentric rings and a short papillate apex, covered overall with a whitish subiculum when young. **Paraphyses** numerous, longer than the asci, simple, septate and tapering toward their apices. **Asci** cylindrical with a medium-length stipe and a Melzer's positive blue apical ring. **Ascospores** 8 (often 4–7) arranged uniseriately overlapping, inequilateral (plano-convex) in one view and symmetrical (ellipsoidal) in the other, dark brown; in water mounts with one or two large vacuoles (and many smaller vacuoles) and a straight germ slit stretching nearly the entire length of the spore, mostly 16–19 × 8–9 µm [(15–)16–19(–23) × 8–9(–10), n=20]. With a single large deBary bubble in Melzer's reagent.

Anamorph (*Geniculosporium)*: Forming numerous low, grey 'floccose thickets' among and over the surface of the stromata. **Sporogenous** areas at the apices of the numerous, dichotomously or irregularly branching conidiophores – these forming short to longish sympodially extending areas with dry conidia produced singly (and over time regularly scattered in a geniculate fashion), visible after conidial detachment by a small circular scar in face view and the short wall edges of the central protoplasmic channel in side view. **Conidia** obovoid, hyaline, smooth, one-celled, with a basal scar similar to side views of detachment scars on the sporogenous areas, mostly 2.5-3 × 2 µm.

References:

1. Greenhalgh G.N. & Chesters C.G.C. 1968. Conidiophore morphology in some British members of the Xylariaceae. Trans. Br. Mycol. Soc. 51(1): 57–82. **2.** Petrini, L.E. 2003. *Rosellinia* and related genera in New Zealand. New Zealand Journal of Botany 41: 71–138.
(See *Rosellinia communis* from selected portions of Reference 2 on this page and the next.)

Key to species of *Rosellinia* from New Zealand

1 Germ slit of ascospores sigmoid 2
Germ slit of ascospores straight 3
2 Ascospores 20–26 µm long, germ slit reaching the spore ends ..... **2. *R. chusqueae***
Ascospores 26–36 µm long, germ slit about ⅔ of spore length ..... **4. *R. dingleyae***
3 Ascospores with two 3–4 µm long and 3 µm wide conical, cellular appendages ..... **11. *R. nothofagi***
Ascospores without such appendages 4
4 Ascospores > 30 µm long 5
Ascospores < 30 µm long 9
5 Ascospores with germ slit 8–12 µm long 6
Ascospores with germ slit running over the whole spore length 7
6 Ascospores 37–59 (mean 48) µm long ..... **1. *R. arcuata***
Ascospores 53–70 (mean 62) µm long ..... **5. *R. freycinetiae***
7 Ascospores 60–79 µm long ..... **9. *R. longispora***
Ascospores < 60 µm 8
8 Stromata > 1000 µm high and wide, embedded in a subiculum when mature ..... **14. *R. radiciperda***
Stromata < 1000 µm high, subiculum absent at maturity ..... **13. *R. palmae***
9 Ascospores > 20 µm long, or, if shorter, with a *Dematophora* anamorph 10
Ascospores < 20 µm long, never with a *Dematophora* anamorph 13
10 *Dematophora* anamorph present 11
Dematophora anamorph absent 12
11 Ascospores with short germ slit and slimy sheath ..... **16. *R. samuelsii***
Ascospores with germ slit running over the whole spore length ..... **7. *R. hughesii***
12 Ascospores with a cellular appendage, completely surrounded by a slimy sheath; stromata pear-shaped, embedded in a dark brown subiculum ..... **12. *R. novae-zelandiae***
Ascospores without a cellular appendage, surrounded by a slimy sheath at both ends and one side; stromata semiglobose to conical, subiculum light-coloured, evanescent, ... **6. *R. gisbornia***
13 Ascospore average length > 15 µm; stromata columnar to conical, on the surface often forming concentric rings, wavy in outline ..... **3. *R. communis***
Ascospore average length < 15 µm; stromata subglobose, semiglobose or cylindrical with flattened top 14
14 Ascospores 9–11.5 µm, germ slit barely visible ..... **17. *R. stenasca***
Ascospores larger, germ slit clearly visible 15
15 Ascospores regularly with a cellular appendage and with germ slit running over the whole spore length; stromata conical ..... **18. *R. victoriae***
Ascospores without or only occasionally with a cellular appendage; stromata cupulate, semiglobose or cylindrical 16
16 Ascospores with a germ slit running over the whole spore length; stromata cupulate, shiny, with rounded top and pronounced ostioles ..... **15. *R. rhopalostilicola***
Ascospores with germ slit shorter than the spore length; stromata semiglobose with poorly pronounced ostioles or cylindrical with flattened top 17
17 Ascospores (6.2)7.5 ± 0.5(9) µm wide, with germ slit about ⅔ length, situated symmetrically on the spore; stromata with rounded top ..... **10. *R. mammoidea***
Ascospores (4.8)6.2 ± 0.6(9) µm wide, with germ slit closer to one end than to the other; stromata with flattened top ..... **8. *R. johnstonii***

HOLOTYPUS (hic designatus): New Zealand, North Island, Northland: Hokianga County, on decorticated wood, 13 May 1983, *G.J. Samuels, T. Matsushima, & R.H. Petersen*, PDD 45775, anamorph on host, culture on OA examined.

Subiculum evanescent, restricted, approx. to 1 mm in extension, as white, cream patches in early stages, later light brown, felty, bearing conidiophores, subsequently reduced while stromata progressively emerge, until absent in old material. Stromata (400)687 ± 119.5(1050) µm high, (550)804 ± 131(1250) µm wide (n = 134), conical to columnar with bluntly rounded top, side walls often with concentric rings, wavy (Fig. 11E,H), dark brown, black around the ostioles, completely black when old, solitary or crowded, touching each other, sometimes 2–3 fused together, when young completely covered by the subiculum, during development gradually exposed. Ostioles finely papillate to pointed or not pronounced. Ectostroma 50–75 µm thick, black. Entostroma light brown, confined to the base. Perithecia detached and collapsed in mature material. Ascus apical rings (1.9)2.7 ± 0.5(3.8) µm high, upper width 3.3–4.8 µm, lower width 2–2.8 µm (n = 63), J+, pale blue. Ascospores (13.4)17.3 ± 1.3(21.6) µm long, (6.7)8.9 ± 0.7(11.5) µm wide (n = 710), inequilaterally ellipsoidal, dark brown, with straight germ slit, extending almost over the whole spore length. Conidia 3–4 × 2.5–3 µm.

Cultures on OA after 13 days at 20°C under diffused daylight 0.7–1 cm diam., white to pale pink, sterile, after 30 days 2.5–3 cm, flat, densely cottony, white when sterile, grey from conidial production, reverse white. Conidiophores 100–200 µm long, 3–4 µm wide, forming a continuous layer over the colony surface, mononematous, macronematous, loosely and irregularly branched, smooth, pale olivaceous. Conidiogenous cells 19–60 × 2.5–3 µm when terminal (n = 21), terminal and intercalary also bearing terminal and intercalary conidiogenous loci, geniculate with a circular refractive frill at each point of conidial dehiscence. Conidia 3–4(5) × (2)2.5–3 µm (n = 44), ovoid to subglobose with a flat, c. 1 µm wide basal frill, refractive. On CMD after 29 days at 20°C under 12 h dark and 12 h UV and fluorescent light 1.5 cm in diam., pale orange, transparent, aerial hyphae short. Conidiophores 80–160 µm high, 1.5–2 µm wide, freely branched, bearing a head of conidia at the tip of each branch, subhyaline to pale tan. Conidiogenous cells 30–55 × 2–3 µm (n = 9), terminal, sometimes intercalary, geniculate with a circular refractive frill at each point of conidial dehiscence. Conidia 3–4(5) × 2–3 µm (n = 44), subglobose to ovate with protuberant, 1 µm wide flat basal abscission scar bearing a minute frill, smooth, subhyaline. On PDA restricted, white, felty, forming concentric rings, with large grey areas bearing conidiophores.

HOSTS: *Beilschmiedia tawa*, *Brachyglottis repanda*, *Freycinetia baueriana* subsp. *banksii*, *Hedycarya arborea*, *Macropiper excelsum*, *Melicytus ramiflorus*, *Neopanax arboreum*, *Nothofagus solandri*, *Populus* sp., *Rhopalostylis sapida*, *Schefflera digitata*, *Sophora microphylla*.

MATRIX: Corticated or decorticated, heavily decomposed wood.

ETYMOLOGY: *communis* (common), referring to the frequent occurrence of this species.

ADDITIONAL SPECIMENS EXAMINED: NORTH ISLAND: AUCKLAND: Huia, on unknown host, Mar 1953, *J. M. Dingley*, PDD 16900; Huia, on unknown host, Jul 1953, *J. M. Dingley*, PDD 16906; Hunua Ranges, Cossey's Creek, on unknown host, 15 Mar 1958, *J. M. Dingley*, PDD 18413, anamorph on host, culture on PDA; One Tree Hill, on *Populus* sp., Oct 1955, *S. D. Baker*, PDD 16905; Orere Point, on *Neopanax arboreum*, 22 Jun 1958, *J. M. Dingley*, PDD 18414, anamorph on host; Purewa Bush, Orakei, D. W. on *Sophora microphylla*, Nov 1948, *D. W. MacKenzie*, PDD 16902; Rangitoto I., on dead wood, 3 Jun 1947, *J. M. Dingley*, PDD 5539, anamorph on host; Titirangi, on *Brachyglottis repanda*, Feb 1951, *J. M. Dingley*, PDD 16897;

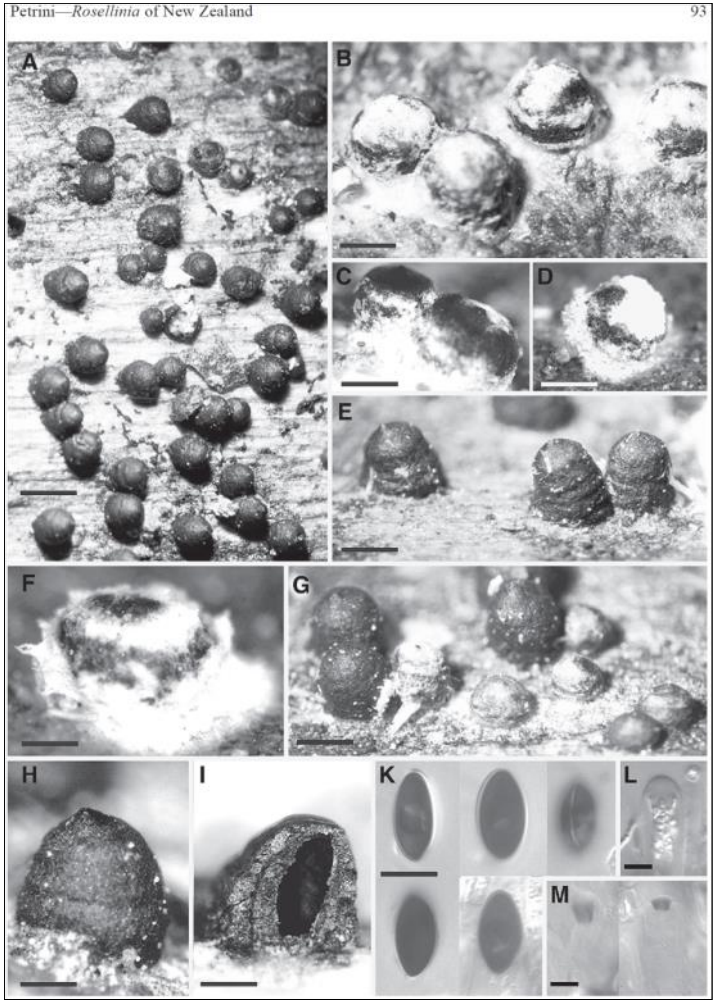
NOTES: *Rosellinia communis* is characterised by its conical to columnar, black stromata covered by a whitish cream subiculum when young. The side walls regularly show concentric rings, thus giving their surface a wavy appearance. *Rosellinia communis* can be distinguished easily from *R. johnstonii* and *R. mammoidea* by its larger, differently shaped stromata and ascospore size.

Many specimens of *R. communis* were assigned to *R. mammoidea*, as the spore size erroneously published for the latter by Cooke (1879) corresponds to that of *R. communis* ascospores. Cooke (1879) gave 16–18 × 8 µm for the Travers collection (the type of *R. mammoidea*), whereas the spores of this specimen actually measure 11–14 × 7–8 µm (see *R. mammoidea* below).

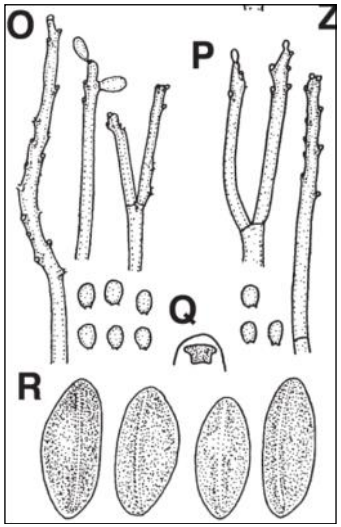
The closest species is *R. picta* (Berk.) Cooke described from Sri Lanka. The type material has regular, conical to semiglobose stromata lacking wavy side walls and ascospores with pinched ends. The stroma and ascospore size, however, do not differ among the two species as revealed by analysis of variance and discriminant analysis, respectively (results not shown).

The type material of *R. griseo-cincta* Starbäck, *R. indica* Thind, and *R. rickii* Bres. show roughly the same shape for stromata and ascospores; the stromata, however, are larger and lack the wavy surface and the ascospores are smaller (L. E. Petrini unpubl. data). *Rosellinia communis* differs from *R. subiculata* by stroma shape, size, and subiculum colour as well as much larger ascospores (Petrini 1993).

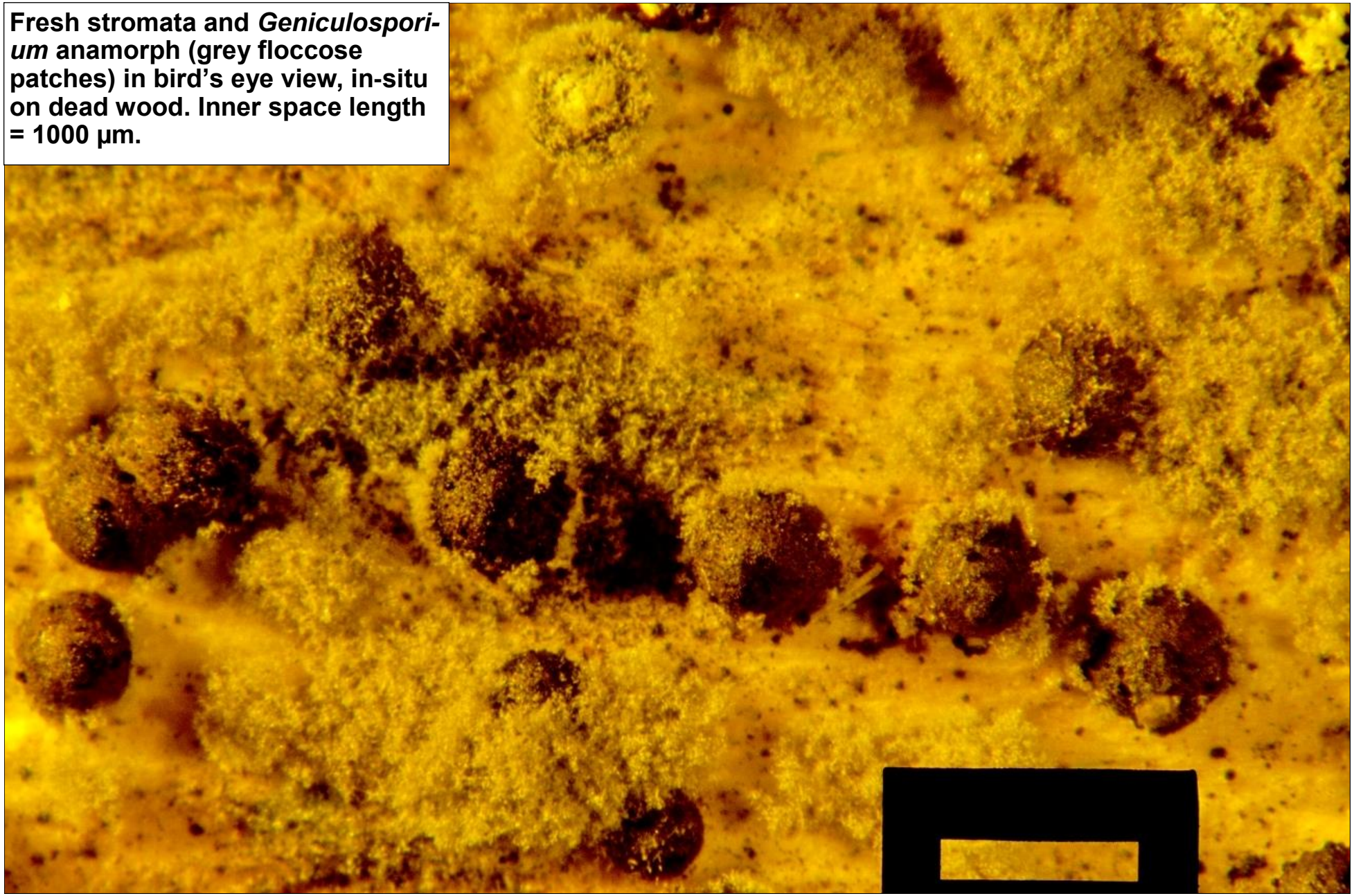
***Rosellinia communis* teleomorph Fig. 11:** A–H, Stromata, B–D, F, showing subiculum, E, concentric rings on surface; I, Vertical section of stroma, outer shell stroma, inner perithecium; K, Ascospores, 3rd showing germ slit; L, Ascus apical ring shown by Nomarski contrast; M, Ascus apical rings in Melzer's reagent. Type, PDD 45775; PDD 16903: second picture of M. Scale bars: A = 1 mm; B–E, G = 0.5 mm; F, H, I = 0.25 mm; K = 10 µm; L, M = 5 µm.



Geniculosporium anamorph Fig. 12 O–R: O, Conidiophores and conidia from the host (PDD 16903); P, Conidiophores and conidia on PDA; Q, Ascus apical ring; R, Ascospores



Fresh stromata and *Geniculosporium* anamorph (grey floccose patches) in bird's eye view, in-situ on dead wood. Inner space length = 1000 µm.

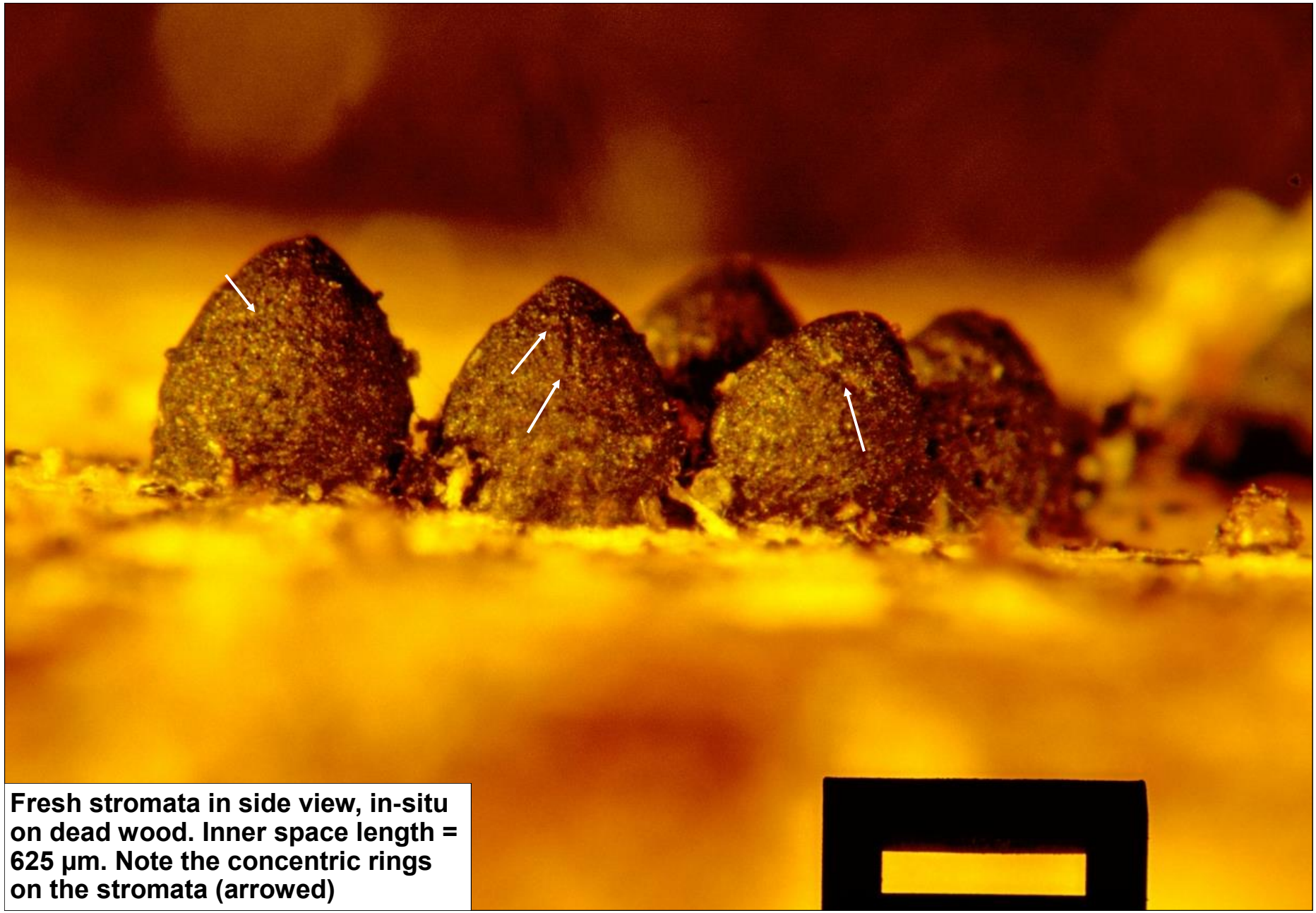


Fresh stromata and *Geniculosporium* anamorph (grey floccose patches) in bird's eye view, in-situ on dead wood. Inner space length = 1000 µm.

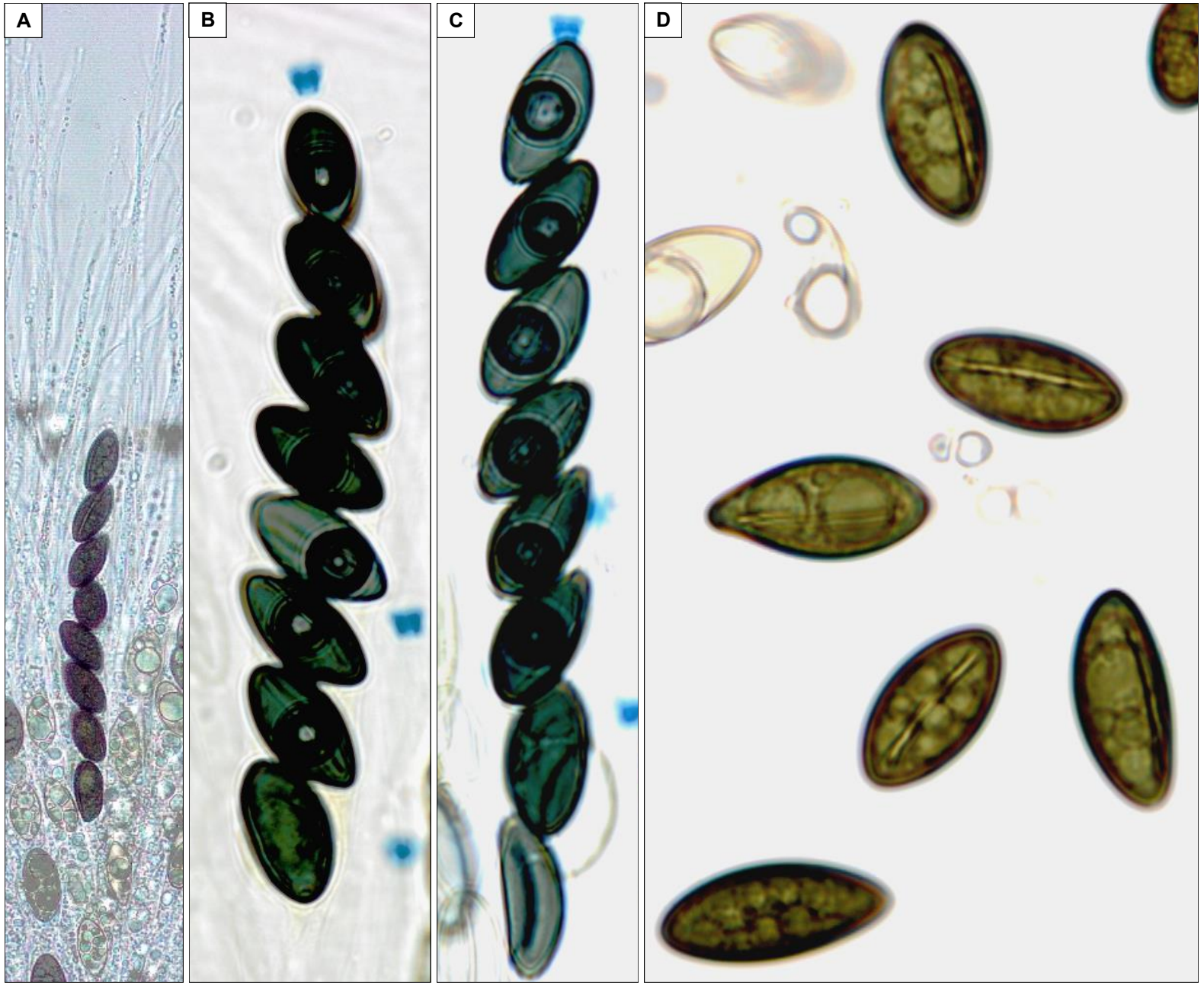
Fresh stromata in side view, in-situ on dead wood. Inner space length = 1000 µm. Note the scattered small black patches of ascospores and the green algae on the wood surface.

Fresh stroma in side view, in-situ on dead wood. Inner space length = 500 µm. Note the scattered small black patches of ascospores and the green algae on the wood surface.

Fresh stromata and *Geniculosporium* anamorph (grey floccose patch) in side view, in-situ on dead wood. Inner space length = 500 µm. Note the scattered small black patches of ascospores and the green algae on the wood surface.



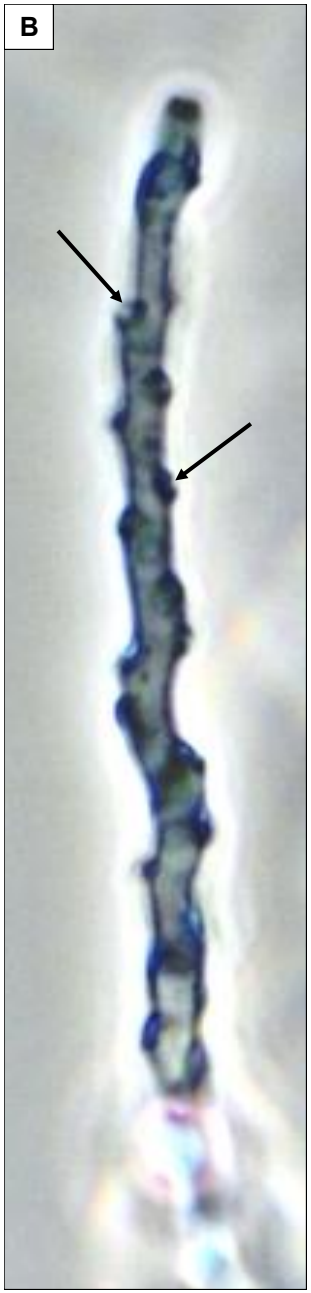
Fresh stromata in side view, in-situ on dead wood. Inner space length = 625 µm. Note the concentric rings on the stromata (arrowed)

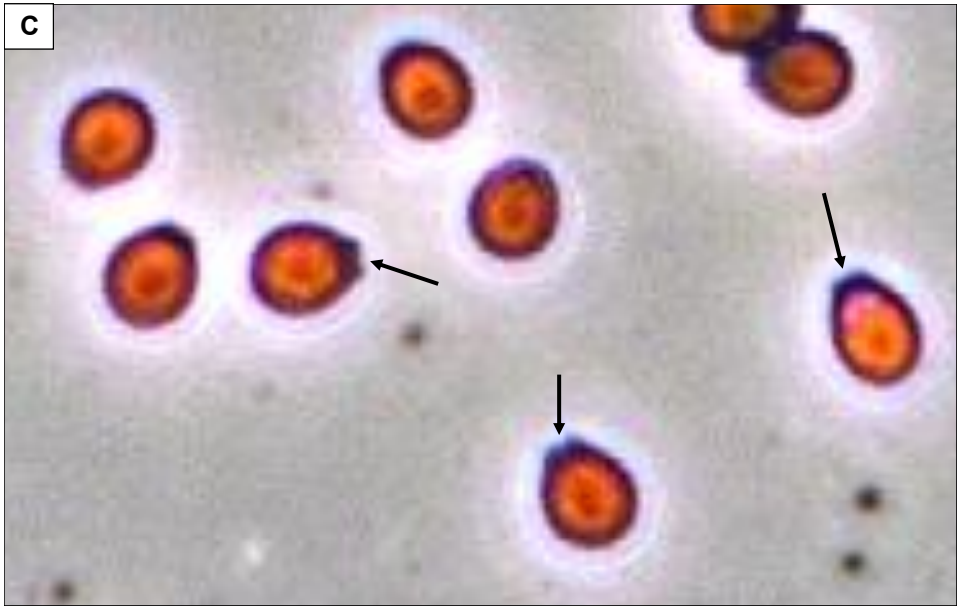


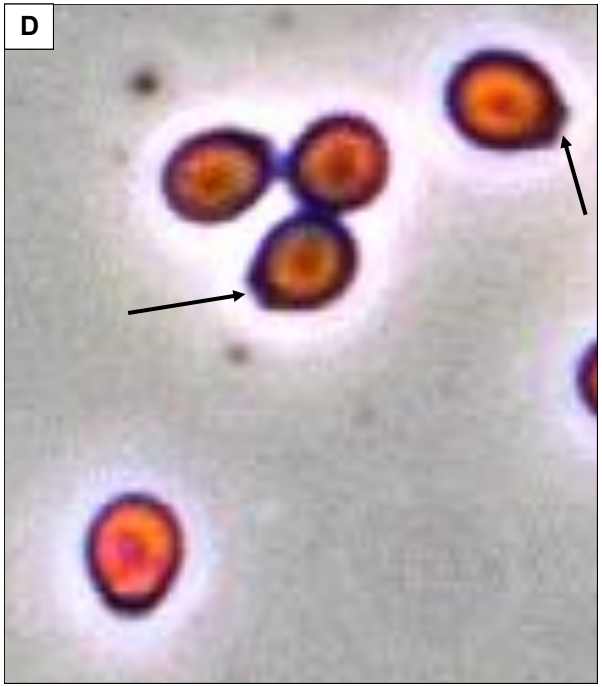
A. Asci & paraphyses. Water mount, X40 obj., brightfield. B,C. Ascus with positive amyloid reaction at apex. Melzers mount, X100 obj., brightfield. D. Ascospores. Water mount, X100 obj., brightfield. Note the straight germ slits that stretch nearly the entire length of the spore.

Ascus. 140 × 11 µm. SMF mt., X40 obj. cropped & enlarged. Left, brightfield; right phase

Fresh floccose grey patches of the *Geniculosporium* anamorph growing over and among the stromata. Inner space length = 1000 µm. Note also the whitish subiculum still covering some stromata (arrowed).







A,B. *Geniculosporium* conidiophore sporogenous areas. Aniline blue lactic acid mt., X100 obj., phase. Note the conidium detachment scars (arrowed). C,D. *Geniculosporium* conidia. Aniline blue lactic acid mt., X100 obj., cropped & enlarged, phase. Note the basal truncate & frilled detachment scars (arrowed).