

**TWO NEW AND INTERESTING WOODY DECAY ASCOMYCETES:
XENOLOPHIUM PSEUDOTRICHIOIDES SP. NOV. AND *XENOLOPHIUM*
LANUGINOSUM SP. NOV. FROM NEW ZEALAND.**

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Abstract

This paper describes two new species of the ascomycete genus *Xenolophium* H. Sydow emend. Huhndorf which were collected on bark of dead *Knightia excelsa* in New Zealand.

Key words: new species, *Melanommataceae*, *Xenolophium*, systematics, New Zealand.

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Materials and Methods

In a recent foray conducted in a local native bush reserve, the following two species were found each growing on very rotten fallen branches of *Knightia excelsa*. Their morphology and microscopic details were studied in water mounts after which a number of semi-permanent slides were made using Shear's mounting medium (Bell 2005). The ascospore size range of both species was determined by measuring at least 50 ascospores. Colour references below follow the notation of Kornerup & Wanscher (1989). Attempts at growing one of these species was successful.

Xenolophium pseudotrichioides A. Bell & D.P. Mahoney *sp. nov.* (Figures 1A-D & 2A-G).

Etymology: *pseudotrichioides* = resembling the genus *Pseudotrichia*.

Ascomata aggregata, superficialia vel semi-immersa, corticola. Ventre globosus, 1.5 mm diam., tomentum copiosum, hyphae flexuosae, septatae, brunneae. Collum curtum, robustum, ostiolum fissuratum vel orbiculatum. Centrum glutinosum. Pseudoparaphyses 2-3 µm diam. Asci cylindranei, circa 210 µm longi, brevistipitati, octospori. Ascospores

uniseriatae, uniseptatae, biconicae vel inaequales, brunneae, (29)30–36(38) x (6)7–9(10) µm, saepe rumpentes in duas cellulas. Porus germinalis subapicalis. Fungus lignicolus.

Holotypus: On dead bark of *Knightia excelsa*, Keith George Memorial Park, Upper Hutt, 10/4/2007, A. Bell (PDD 92344).

Ascomata densely clustered erumpent or semi-erumpent in bark frass. Swollen basal portions (=venters), globose, black, up to 1.5 mm diam., outer walls heavily melanized, lower portions covered by a dense reddish brown tomentum composed of septate, thick-walled branched hyphae (Figs 1A, 2A & 2B). *Ascomata* necks short, stout, some with slot-like ostioles, others bluntly conical or lobed with rounded ostioles (Fig. 2B). Sectional view through substrate shows a distinct black stroma underlying the *ascomata* (Fig. 2C). *Centrum* gelatinous. *Pseudoparaphyses* 2-3 µm diam., trabeculate (Figs 1B & 2E). *Asci* very numerous, lining the basal and lateral sides of the *ascocarps*, bitunicate, cylindrical, short-stalked, approx. 210 µm long when fully extended (Fig. 2D), each containing 8 uniseriate to overlapping ascospores (Figs 1B & 2E). Apical chamber present in mature *asci* (Fig. 2F). After

discharge, asci shorten and a lateral split is seen in the tops of the asci (Figs 1D & 2G). *Ascospores* 2-celled, biconic, brown (8F7/8F4) to blackish, symmetrical to slightly asymmetrical, filled with numerous large and small globules and readily separating into part spores even within the asci (Figs 1B, 1C, 2E & 2F). Prominent subapical germ pores frequently lie in same plane, (Figs 1B, 1C, 2E & 2F). *Ascospore* size range: (29)30–36(38) x (6)7–9(10) μm .

Discussion

Some considerable vacillation ensued before assigning this species to the genus *Xenolophium*, because several of its features cross generic boundaries as they are currently defined. The ostiolar openings show a variety of shapes. They can be bluntly conical with rounded openings or distinctly slot-like (Figs 1A, 2A & 2B). Some appear lobed (Fig. 2B). This fact caused us initially to consider this to be a new species of *Pseudotrichia* as prescribed by Barr (1984, 1987) and Huhndorf (1994), a genus which is considered to be very close to that of *Xenolophium*. The ascus stipe of our species resembles that described for species of *Pseudotrichia* insofar as it is not appreciably long stalked as are the asci of *Xenolophium* species. But in the balance of characters, our species more closely resembles the genus *Xenolophium*. *Xenolophium applanatum* (Petch) Huhndorf has ascospores of a somewhat similar size, (20–27 x 4.5–6 μm), but the ascomata lack a tomentum and the ascospores do not disarticulate (Huhndorf 1993). However the presence of a tomentum together with disarticulating ascospores are features of *X. samuelsii* and *X. pachythele* as described by Huhndorf (1993), both of which have much smaller ascospores than the species described here, (16.5–22 x 3–4.5 μm for *X. pachythele* and 19–23 x 4.5–5.5 μm for *X. samuelsii*).

Xenolophium lanuginosum A. Bell & D.P. Mahoney *sp. nov.* (Figures 3A–D & 4A–E).

Etymology: *lanuginosa* = woolly, referring to the tomentum around the venters.

Ascomata aggregata, superficialia, corticola. Venter globosus, 1.5 mm diam., tomentum copiosum, hyphae flexuosae, septatae,

brunneae. Collum curtum, robustum, ostiolum fissuratum. Centrum glutinosum. Pseudoparaphyses 2–3 μm diam. Asci clavati, circa 250 x 19 μm , longistipitati (= 140 μm), octospori. Ascosporeae fusiformae vel biconicae, interdum asymmetrcae, dilute brunneae, biloculares, ad septum constrictae, 22–34 x 6–8 μm . Fungus lignicolus.

Holotypus: On dead bark of *Knightia excelsa*, Keith George Memorial Park, Upper Hutt, 10/4/2007, A. Bell (PDD 92343).

Ascomata densely clustered, erumpent or semi-erumpent in bark frass. Venters globose, black, up to 1.5 mm diam., with heavily melanized exterior, when fresh covered by a dense grey tomentum composed of septate, thick-walled branched hyphae (Figs 3A, 3B & 4A). When dried, the tomentum is generally not so obvious and the outer melanized ascomatal walls appear roughened (Fig. 3B). The inner ascocarp walls show a strongly areolate pattern in surface view (Fig. 4C). Prominent, slot-like ostioles are situated on shallow domes. Sectional views through the substrate show a distinct black stroma underlying the ascomata (Fig. 4B). Centrum gelatinous. Pseudoparaphyses 2–3 μm diam., trabeculate (Figs 3C, 3D & 4D). Asci numerous, lining all inner surfaces of the venter, bitunicate, cylindrical, approx. 250 x 19 μm , the stipe constituting approx. half the ascus length (Figs 3C & 4D). *Ascospores* 2-celled, biconic to fusiform, sometimes slightly asymmetrical or with one cell curved, dilute brown (5D–E7), 3–4 vacuoles in each cell in fresh material, 22–34 x 6–8 μm (Figs 3C, 3D & 4E). After discharge, asci shorten and a lateral split is seen in the tops of the asci (Fig. 4F).

Discussion

In comparing our specimen with the 4 species described by Huhndorf (1993), none match although all are similar in general morphology. The ascospores of *X. applanatum* (Petch) Huhndorf are of similar size (20–27 x 4.5–6 μm), but the morphology of its ascocarp inner wall is altogether different from that of our species, which is clearly areolate in structure (Fig. 4C). Longitudinal sections through *X. pachythele* as illustrated by Huhndorf (1993, Figs 35 & 36), indicate that this species may

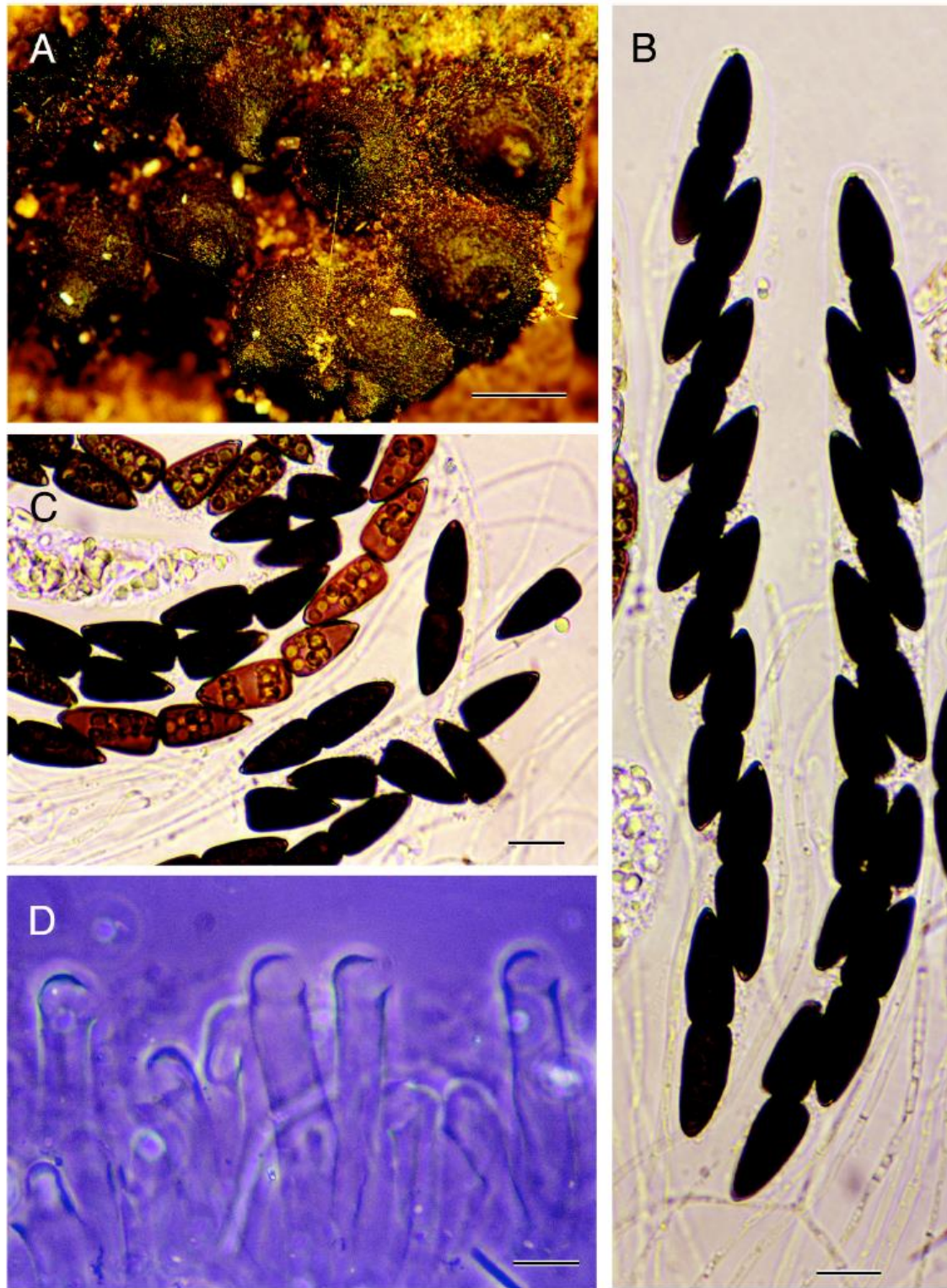


Figure 1. *Xenolophium pseudotrichioides*. (A) In situ view of fresh ascomata on dead bark. Bar = 800 μ m. (B) Asci, ascospores and pseudoparaphyses. (C) Ascospores, intact and disarticulated, in various stages of pigmentation. (D) Phase contrast view of ascus tips after ascospore discharge. (B-D) water mounts. Bars = 10 μ m.

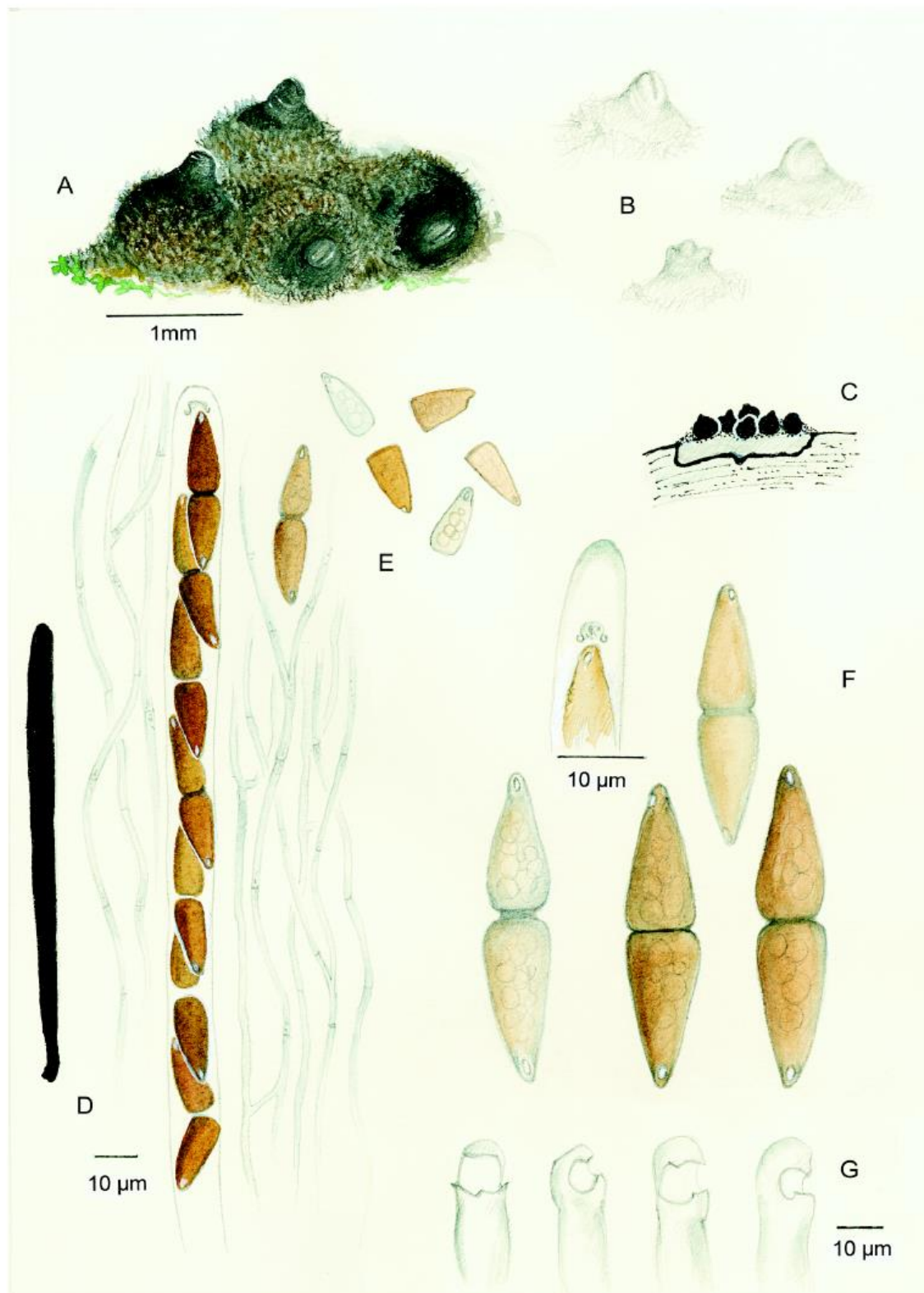


Figure 2. *Xenolophium pseudotrichioides* (A) Ascomata on bark. (B) Details of ostiolar regions. (C) Diagram showing stroma in wood beneath ascomata. (D) Silhouette of mature ascus. (E) Mature ascus, ascospores and pseudoparaphyses. (F) Mature ascospores and ascus tip. (G) ascus tips after ascospore discharge.

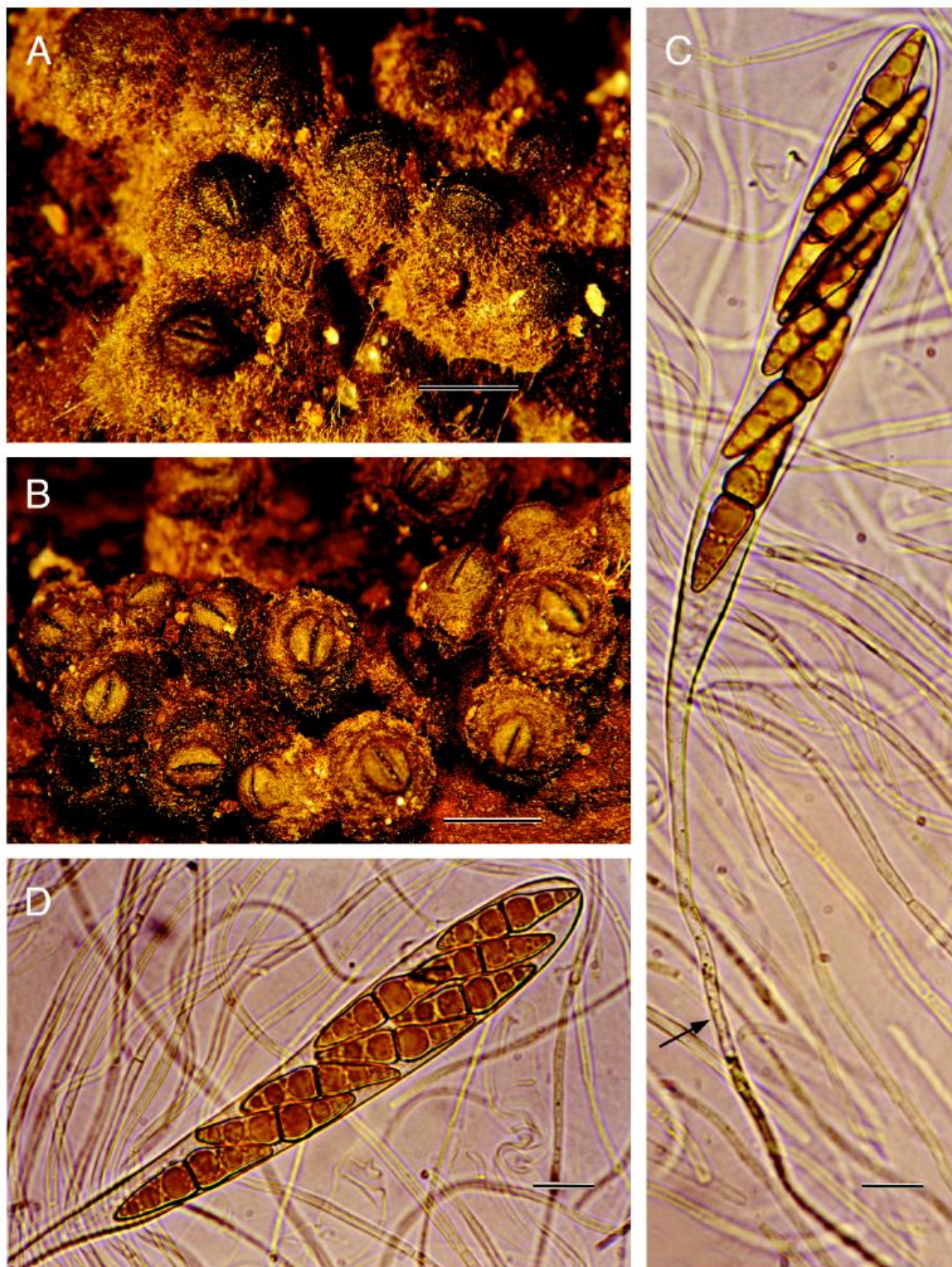


Figure 3. *Xenolophium lanuginosum* (A-B) In situ views of fresh ascomata on dead bark. Bars = 800 μ m. (A) Younger ascomata with an abundant lanose tomentum. (B) older ascomata with a dried collapsed tomentum. (C-D) Asci, ascospores and pseudoparaphyses. Water mounts. Bars = 10 μ m. (C) Arrow indicates a long narrow ascus stipe.

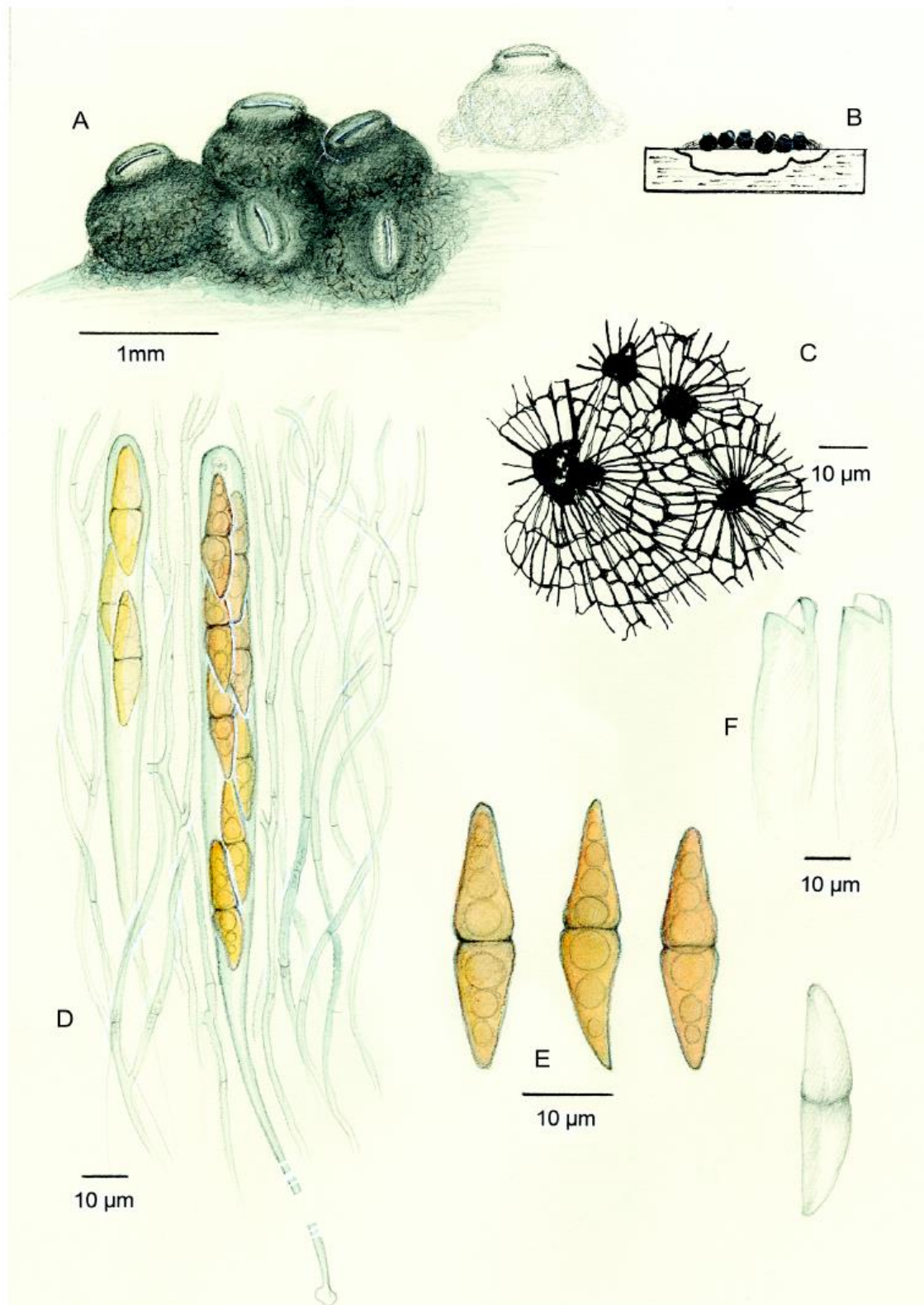


Figure 4. *Xenolophium lanuginosum* (A) Ascomata on bark. (B) Diagram showing stroma in wood beneath ascomata. (C) Areolate pattern of inner ascoma wall. (D) Mature asci, ascospores and pseudoparaphyses. (E) Mature ascospores. (F) ascus tips after ascospore discharge.

also have areolate inner layers to the ascocarps, but the ascospores of that species are much smaller than our *X. lanuginosum* and our species does not exhibit disarticulating ascospores. *Xenolophium samuelsii* S.M. Huhndorf is described as having an abundant tomentum, but the ascospores of that species are smaller, its two cells disarticulate and its ostiole is tripartite. The method of ascus dehiscence is unrecorded in *Xenolophium* by Huhndorf, but in the two new species described here empty asci consistently exhibited lateral tears just below the apices (Figs 1D, 2G & 4F). This feature was especially clear under phase contrast.

Subsequent to submitting this paper for publication, a second collection of *X. lanuginosum* was made from unidentified dead wood in a bush gully of a suburban garden in Lower Hutt. This time we were successful in germinating the ascospores confirming that germination occurs from laterally situated germ pores from both ascospore cells. Thus in this species the germ pores are in a similar position on the ascospores as they are in *X. pseudotrichioides*, but due to the paler ascospores of *X. lanuginosum* they are not readily visible in the ungerminated state. Germination took place on weak potato carrot agar (PCA) after approx. 18 hours incubation at 25°C. Growth is extremely slow. If cultures are successful, one will be deposited at the Centraalbureau voor Schimmelcultures, Utrecht, the Netherlands.

Xenolophium is described as being from tropical countries. The lower end of the North

Island of New Zealand resides in latitude 41° S. and the area in which these fungi were found is described as a temperate rainforest. The substrate upon which these two fungi were found is *Knightia excelsa* an endemic tree species belonging to the *Proteaceae*, a family of some 50 genera mostly found in Australia and S. Africa (Allan 1961). To date we have not seen these species on other substrates.

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