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SQUAMANITA SQARRULOSA, A NEW SPECIES FROM NEW ZEALAND

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Squamanita squarrulosa, spec. nov., is described from New Zealand. This is the only species of *Squamanita* to combine both a fleshy outer universal veil forming a volva limb, with an inner universal veil forming squamules on the pileus and stipe.

Over two consecutive years an unknown species of *Squamanita* Imbach was collected from under *Nothofagus truncata* (Col.) Ckn. In total four basidiocarps were collected, of these three were immature and partially decomposed. Despite their condition, publication is justified as the collections exhibited characteristics intermediate between *S. odorata* (Cool) Bas and *S. tropica* Bas nom. prov.

Bas (1965) recognised in *S. odorata* both an outer and an inner universal veil. According to this author the outer universal veil is continuous with the protocarpic tuber and consists of a thin layer of hyphae, which gelatinises and disappears early in development. Occasionally it leaves a faint limb. The inner universal veil covers the primordial cap, and is attached to the base of the stipe. In the mature basidiocarp the remnant of this inner universal veil forms the squamules on the pileus and stipe.

In contrast, *S. tropica* possesses a fleshy outer universal veil forming in the mature basidiocarp a substantial volval limb. The inner universal veil consists of a tawny yellow layer sheathing the pileus and stipe. Its remnant forms appressed, membranous scales on the pileus, and the arachnoid ring on the stipe.

Squamanita squarrulosa Ridley, *spec. nov.* — Fig. 1

Basidiocarpia sola. Pileus 4–9 mm latus, conicus, senatus-umbrinus, squarrosus. Lamellae adnexae, albae. Stipes 25 × 5 mm, solidus, pileo concolor, cum squamulis erectis. Bulbus subglobsus vel elongatus, 16–19 × 20–26 mm, albidus cum colore subvinoso vel vinoso, superatus a volva carnosa. Sporae 7.5–8.5 × 4.5–6 μm, ellipsoideae vel elongato-ellipsoideae, hyalinae, inamyloideae. Cystidia nulla. Trama lamellarum regulare. Basidia 37–50 × 8.5–10.5 μm, clavata, cum fibulis in fundamento. Holotypus: PDD49071, in umbria *Nothofagi truncatae*, Novazelandia.

Basidiocarps solitary. Pileus 4–9 mm wide, conical, sienna-umber (Rayner 8–9), dry squarrose, in immature basidiocarps pileus and upper part of stipe sheathed by a buff (Rayner 45) tissue layer beneath the pileal squamules that disappears with maturation. Lamellae adnexed, moderately crowded, white, intercalated with lamellulae; edge concolorous, entire. Stipe 25 × 5 mm, narrowing slightly at apex, solid, concolorous with pileus, squamulose; squamules narrow and erect, particularly crowded between base of

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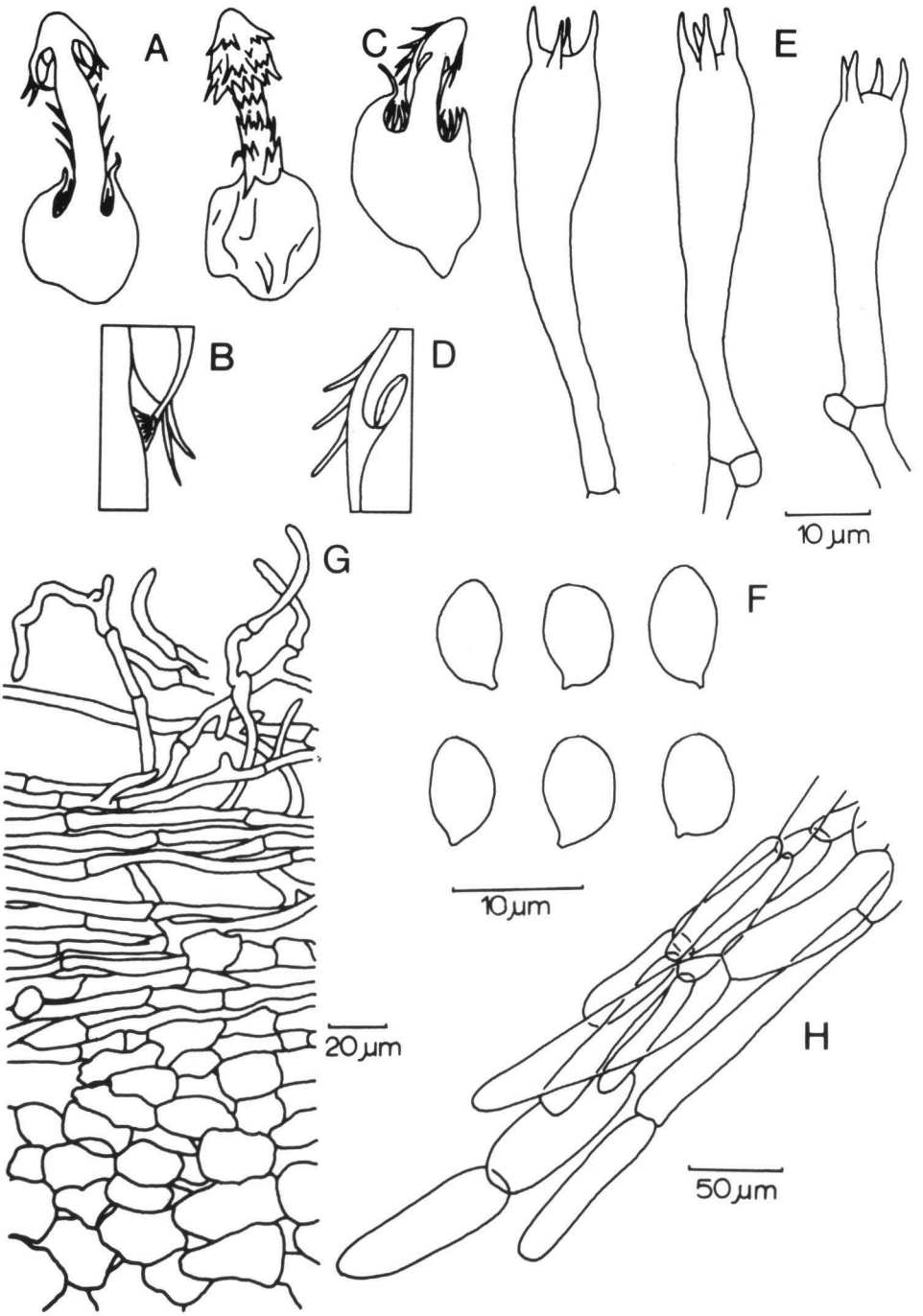
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stipe and volval limb. Protocarpic tuber 16–19 mm wide and 20–26 mm high, whitish with pale vinaceous to vinaceous flush (Rayner 85 to 57), smooth, firm, partially buried in humus, surmounted by a fleshy, sheathing volva, tearing irregularly and forming a 4–5 mm deep cup. Context of pileus white, 4 mm thick at centre, firm, fibrillose. Context of tuber pithy, white with some vinaceous stains (Rayner 57), distinct from the fibrillose context of stipe.

Spores 7.5–8.5 × 4.5–6 μm, ellipsoid to elongate-ellipsoid, with small apiculus, thin-walled, smooth, hyaline, inamyloid, not metachromatic in Cresyl Blue, not accumulating Congo Red. Basidia 4-spored, 37–50 × 8.5–10.5 μm, clavate, with basal clamp. Cystidia absent. Trama of lamellae regular, made up of hyphae 8–12 μm wide, narrowing in subhymenium to 3–6 μm wide, hyaline, walls appearing very finely verrucose; clamps abundant. Squamules on pileus and stipe consisting of hyphae 10–25 μm wide and up to 120 μm long, sienna (Rayner 8), constricted at septa, with indistinctly verrucose walls. Pileipellis structure similar to that of squamules. Protocarpic tuber: suprapellis composed of loosely intertwinted hyphae 2.5–6 μm wide, hyaline, often with subseptal swelling, no clamps observed: subpellis similar to suprapellis but hyphae repent and parallel; trama cellular; cells up to 45 μm diam. and hyaline.

Habitat & distribution. — Under *Nothofagus truncata*, known only from type locality, southern North Island, New Zealand.

Collections examined. — NEW ZEALAND: southern North Island, Rimutaka Forest Park, Orongorongo track, 4 Sept. 1986, *G. S. Ridley 234* (holotype; PDD 49071) & 8 July 1987, *G. S. Ridley 554* (PDD 49072).

Squamanita squarrulosa possesses a distinct, fleshy, outer universal veil which is continuous with the protocarpic tuber, and forms the pronounced limbate volva when ruptured. The pileus and upper stipe are covered by squamules subtended by a buff tissue layer (Fig. 1D). Before stipe elongation this buff layer may be connected to the protocarpic tuber. As the pileus expands this tissue becomes confined to it, and finally disappears. In the angle between the outer universal veil and the stipe are a number of erect squamules, which as the stipe elongates, become distributed along its length. Thus the inner universal veil can be interpreted as consisting of two parts. The first part is the outer squarrose layer, which becomes distributed over the mature pileus and stipe. The second part consists of the inner buff layer covering the basidiocarp primordium, which in the expanding basidiocarp, becomes indiscernible. The two layers combined are interpreted as homologous with the tawny yellow layer of *S. tropica* (Bas, 1965).

In the most mature basidiocarp the margin of the pileus is connected to the stipe by a small amount of fibrous tissue (Fig. 1B). Whether this can be interpreted as an independent partial veil or merely a remnant of the inner universal veil is not clear.

Fig. 1 *Squamanita squarrulosa*. — PDD 49071: A. Habit and longitudinal section (× 1); B. Detail of pileus margin (× 5); E. Basidia; F. Spores; G. Section through pellis of tuber; H. Hyphae from squamule on pileus. — PDD 49072: C. Longitudinal section of basidiocarp (× 1); D. Detailed diagram of inner universal veil (× 3).

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