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NATS truffle and truffle-like fungi 10: *Pachyphloeus thysellii* sp. nov. (*Pezizaceae*, Pezizomycotina)

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Abstract—An undescribed truffle found on the Fort Lewis Military Reservation near Olympia, Washington, is described as *Pachyphloeus thysellii*. This new species, associated with *Pseudotsuga menziesii*, closely resembles *Pachyphloeus prieguensis* from southern Europe. It differs from the latter in having yellow veins and patches showing among the minute, brown warts on the peridial surface, smaller asci, and a different mycorrhizal host.

Introduction

Integrated research on ecosystem functions in forests of 55 to 65-yr-old *Pseudotsuga menziesii* (Mirb.) Franco at Fort Lewis Military Reservation near Olympia, Washington includes studies of the small mammals that feed on fungi. As hypogeous fungi are a major food base for the small mammals, standing crops of those fungi were monitored at 6-week intervals for nearly 3 years (Colgan et al., 1999). During this time, the genus *Pachyphloeus* was represented by one undescribed species, for which we propose the name *Pachyphloeus thysellii*.

Methods

At each collecting time, 10 plots of $4m^2$ each were raked into mineral soil along each of 16 transects. All specimens found in plots were collected, identified and dried for estimation of standing crops and for herbarium deposit (Colgan et al., 1999). Colors of fresh specimens are in general terms of the author. Specimens were dried with a forced air dehydrator at 49°C (120°F). Microscopic characters were determined from hand sections mounted in 5% KOH, Melzer's reagent, or cotton blue, as indicated. Spore dimensions are based on at least 50 randomly selected spores and do not include ornamentation. Light photomicrographs are from sections mounted in 5% KOH unless

otherwise indicated. For electron microscopy, dried spores were mounted on pegs with double sided tape, coated with gold and examined with an Amray 3000 scanning electron microscope. The holotype and paratypes have been accessioned into the Mycological Herbarium of Oregon State University (OSC).

Taxonomy

Pachyphloeus thysellii sp. nov.
FIGURE 1

Species haec ab Pachyphloeus prieguensis, P. melanoxanthus *et* P. virescens *ob peridio verrucoso-reticulato, brunneo vel fulvo, venis et maculis luteis, et ascis ellipsoideis vel subglobosis. Holotypus hic designatus: OSC 80960.*

Etymology: "thysellii" in honor of the collector of the type specimen, David Thysell, a research botanist with the USDA Forest Service and cooperator on the Forest Ecosystem Project at Fort Lewis

Ascomata subglobose to irregular, 0.8-2 cm in diameter, minutely warty, brown to tawny with yellow veins and patches showing among the warts; texture rubbery, odor mild to slightly onion like, taste not recorded, hard when dried. **Gleba** off-white to yellowish translucent, with white and yellowish alternating veins radiating from a central cavity containing cottony hyphae.

Excipulum (peridium) 200-300 μm thick, with two layers: **ectal excipulum** 150-250 μm thick, brown to pale yellow, compactly arranged, of inflated, brown-walled polygonal cells 35-45 μm broad, the walls ca. 1μm thick; ental **excipulum** 40-60 μm thick, hyaline, of tightly interwoven hyphae 6-8 μm broad, with many cells inflated up to 10 μm, the walls ca. 1μm thick. **Medullary excipulum** (gleba) of hyaline, interwoven, branched hyphae 6-10μm in diam. **Asci** 8-spored, elliptical to reniform or subglobose, 80-110 x 40-60 μm including a short to prominent stem 10-60 x 8-15 μm, hyaline, the walls 1 μm thick, not amyloid, weakly cyanophilic in cotton blue, the spores biseriate or clustered in the asci.

Spores predominantly globose, 12-17 μm broad excluding ornamentation, the walls $\pm$ 1 μm thick and hyaline in KOH and Melzers reagent but strongly cyanophilic in cotton blue. **Ornamentation** of symmetrical rods $\geq$2 x 0.7-1 μm tall, cyanophilic; spore wall $\pm$1 μm thick. **Episporium** hyaline, inconspicuous, adherent to the tips of the ornamentation.

Habit, habitat and season – Hypogeous; at 400 ft elevation in 55-65-yr.-old thinned stands of *Pseudotsuga menziesii* (Mirb.) Franco on glacial till, August.

Collection examined – HOLOTYPE here designated: Washington, Thurston Co. Fort Lewis Military Reservation, Hill block, stand 3, in root-rot treatment area, below an excavated wasp nest, Col. D. Thysell. 24 Aug. 1994 (OSC 80960). **PARATYPE:** Washington, Thurston Co. Fort Lewis Military Reservation, Stellar block, stand 1, heavily thinned treatment, Col. Wes Colgan III, 18 Aug. 1993 (OSC 80959)

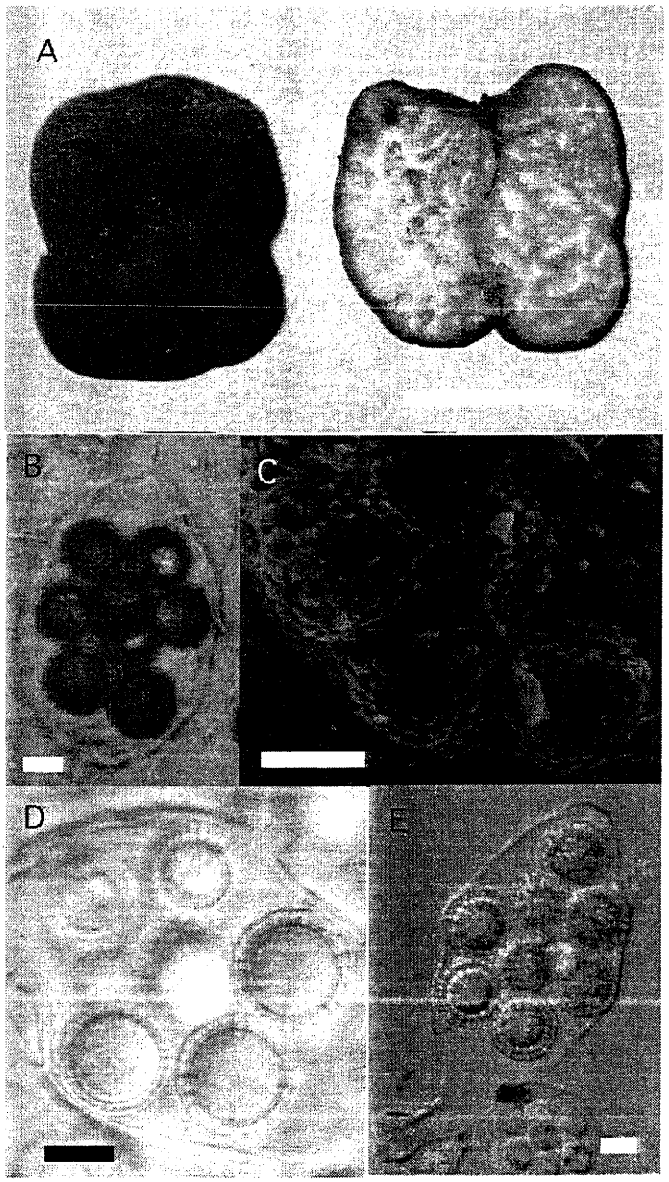

Fig. 1. *Pachyphloeus thysellii*. A. Sporocarp shown in cross-section showing external surface (left) and gleba (right). Scale bar 1cm (OSC 80960). B. Light micrograph of spores and ascus stained with cotton blue. Scale bar 10μm (OSC 80959). C. Scanning electron micrograph of spores. Scale bar 10μm (OSC 80959). D & E. Light micrographs (Nomarski optics) of spores and asci Scale bar 10μm (D, OSC 80960; E, OSC 80959).

Discussion

Pachyphloeus thysellii is closest to *P. prieguensis* Moreno-Arroyo, J. Gomez & Calonge from southern Europe. That species, however, lacks the yellow veins and patches between the peridial warts, has larger asci, is associated with deciduous trees and occurs in calcareous soils. *P. virescens* Gilkey differs in peridial coloration and structure. *P. thysellii* possesses darkly pigmented angular warts similar to *P. melanoxanthus* (Tul.) Tul. & C. Tul, but the space between the peridial warts is brown rather than yellow and it is associated with deciduous trees.

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Literature Cited

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