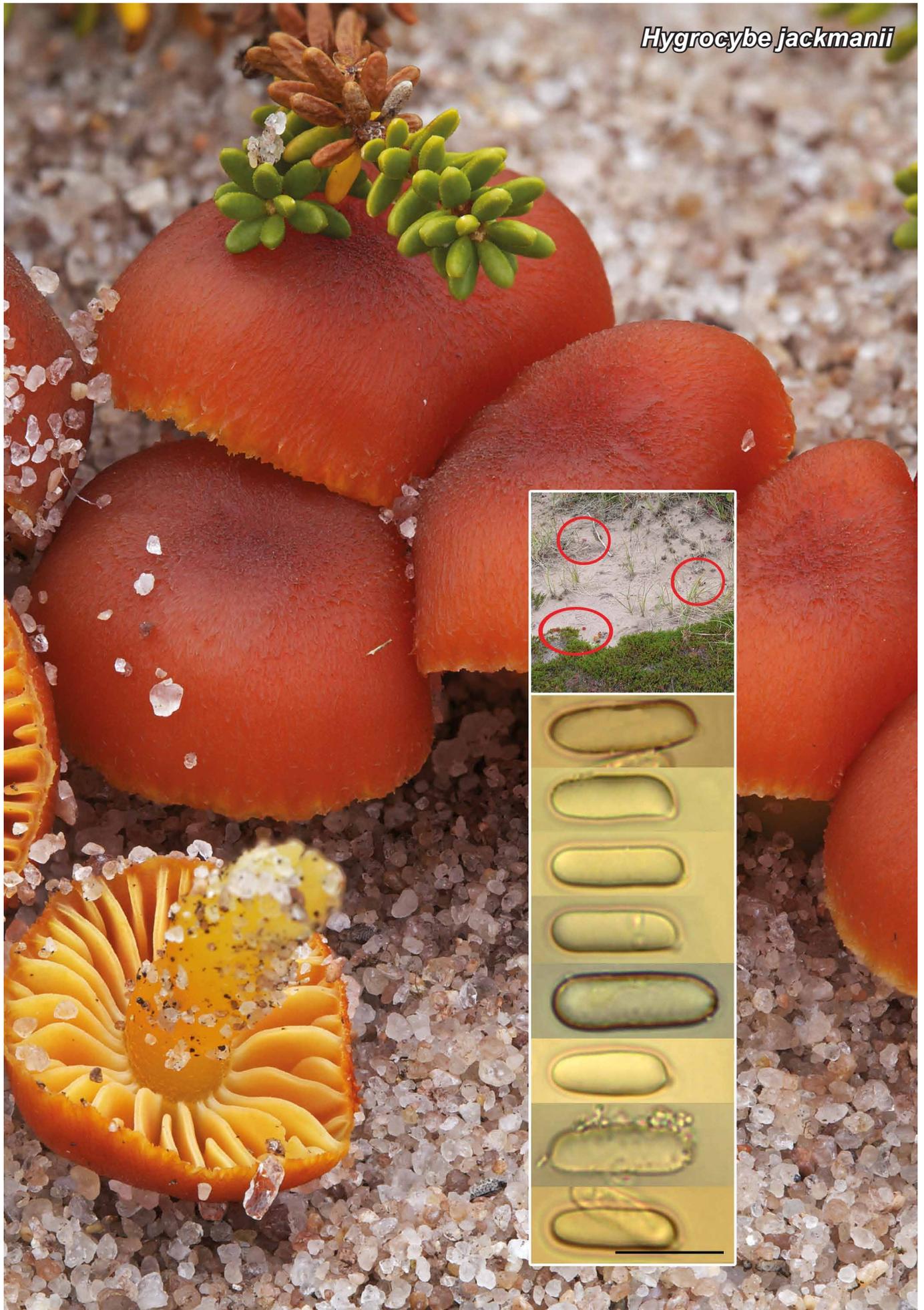


Hygrocybe jackmanii



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***Hygrocybe jackmanii* Lebeuf, Thorn, Boertm. & Voitk, sp. nov.**

Etymology. Name is a tribute to Captain William Jackman, who swam back and forth from shore 27 times to save 27 persons from a storm-grounded ship. *Hygrocybe jackmanii* fruits during the same stormy early October on the same Labrador shores where Jackman's heroic feat took place.

Classification — *Hygrophoraceae*, *Agaricales*, *Agaricomycetes*.

Macroscopic: *Pileus* 10–40 mm diam, convex, decurved margin, plane with age, centre plane to depressed, margin slightly crenulate; radially adpressed fibrillose approaching squamulose in the centre; opaque, only edge of margin slightly translucent; orange-red, central squamules brown-grey, margin fringed with yellow fibrils. *Lamellae*: distant to moderately spaced, up to 3 mm wide; sinuous, adnate; yellow, turning orange with maturity; lamellulae 0–3. *Stipe*: 12–45 × 3–6 mm; even; smooth with sparse yellow flocculation at apex; ringless; solid to pithy; apex orange-yellow, lighter toward base, no staining; usually half-buried in sand. Context: yellow; smell nonspecific; taste nonspecific. *Sporeprint* white. Entire fruitbody slightly waxy to sticky.

Microscopic: *Spores* (type collection, 3 sporocarps, n = 96) (10.4–)11.8–15.1(–18) × (3.6–)4.2–5.5(–6.2) μm (mean = 13.5 × 4.8), Q = (2.1–)2.5–3.1(–3.5) (mean 2.8); evenly cylindrical, at times slightly constricted with concave side and occasionally distally swollen; walls smooth, thin, inamyloid; contents amorphous. *Basidia* 51–65 × 7–9 μm, 4-spored, basidioles numerous, some segmented with short basal cells. *Cystidia* none seen. *Clamp-connections* present in all tissues, with medallion-clamps on some basidia and basidioles. *Lamellar trama* subregular, of non-inflated cells with perpendicular cross walls, 55–172 × 5–8 μm. *Pileipellis* a trichoderm in young fruitbodies, in older a cutis, end cells 28–96 × 7–10 μm, some with grey-brown content.

Habitat — In groups in shifting sand adjacent to heath or vascular plants, but not among them; of nearby moss, dune grass, *Alnus viridis* ssp. *crispa*, and *Empetrum nigrum* nearby, *E. nigrum* seems the most consistent; fruits together with *Alpova cinnamomea* and *Sabuloglossum arenarium*.

Distribution — Currently only known from the type location.

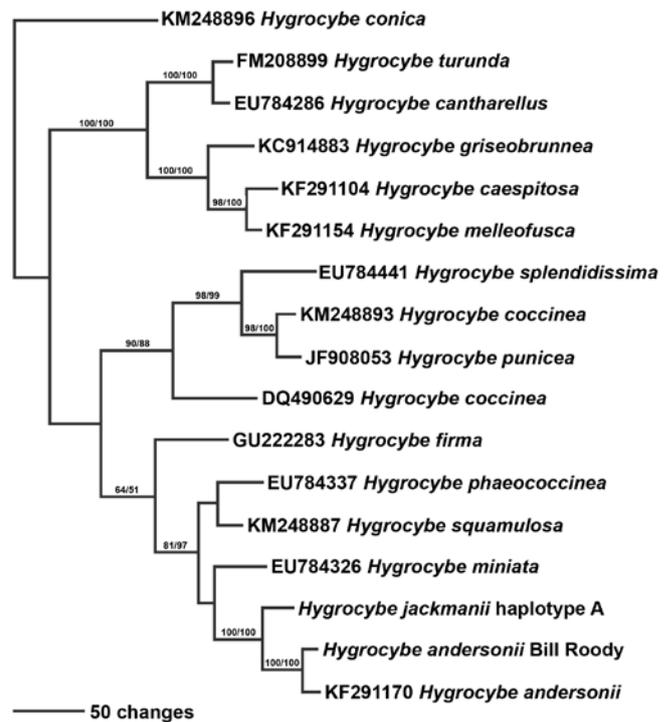
Phylogeny — The ITS sequence of the holotype collection (amplified with primers ITS8-F and ITS6-R) was heterozygotic, with one haplotype having two insertions totalling 3 bases in ITS1 plus a single heterozygous site (C/T) early in ITS2. In contrast, the sequence of our material of *H. andersonii* lacked indels but had two separate C/T heterozygosities in the 5.8S and ITS2 regions. Neighbour-joining and maximum parsimony analyses placed both haplotypes of *H. jackmanii* as sister to the two available sequences of *H. andersonii*, but differing sufficiently (12.7 %) to consider *H. jackmanii* as a separate species. Both species were placed in subg. *Pseudohygrocybe*, sect.

Colour illustrations. *Hygrocybe jackmanii* in situ in Labrador sand dune. Upper insert shows characteristic growth in sand, on the border of heath, but not in the heath. Close to moss, dune grass, alder and crowberry; the last (*Empetrum nigrum*) is the most consistent close potential partner. Lower insert shows elongated spores, 11.8–15.1 μm in length. Among red species of *Hygrocybe* with a dark disc, only *H. andersonii* as longer spores. Scale bar = 10 μm.

Firmae, in a clade with *H. miniata*. However, sect. *Coccineae* and its subsect. *Squamulosae* were not resolved as monophyletic by these ITS data, so a conclusive placement of *H. andersonii* and *H. jackmanii* awaits further sequence data.

Typus. CANADA, Forteau, Labrador, Newfoundland and Labrador, in littoral sand dunes, 2 Oct. 2011, A. Voitk (holotype DAOM 574886, ITS sequence GenBank KT207630 (haplotype A) and KT207631 (haplotype B), alignment in TreeBASE S17881; MycoBank MB812924); isotypes *Renée Lebeuf* HRL1060, UWO-F1, *David Boertmann* 11.10.02 (av 15).

Notes — Long, cylindrical spores set *Hygrocybe jackmanii* apart from all other species of *Hygrocybe* with dark squamules on the disc, except the recently described *H. andersonii*. The latter is a southern species growing along the US Gulf Coast with *Ceratiola ericodes*. That plant is not known north of southern South Carolina. In contrast, *H. jackmanii* is a northern fungus, seemingly associated with *Empetrum nigrum*, an ericaceous inhabitant of northern sand dunes. Phylogeny has shown these two fungal species to be distinct. Segmented basidioles are an unusual character found in sect. *Firmae*. For an additional description of *H. jackmanii*, see Lebeuf et al. (2016).



A Muscle alignment of 50 *Hygrocybe* sequences selected from GenBank based on Lodge et al. (2014), with *Hygroaster nodulisporus* and *Hygroaster albellus* as outgroups, was analysed in PAUP v. 4.0b10 using both maximum parsimony and BioNJ algorithms, then pared down to the monophyletic group containing members of sections *Firmae* and *Coccineae*. The single most parsimonious tree is shown; numbers at nodes represent bootstrap support from a bootstrapped heuristic maximum parsimony analysis with 100 random additions of taxa (first number) and from BioNJ (second number).

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