Frullania knightbridgei

COMMON NAME
Liverwort

FAMILY
Frullaniaceae

AUTHORITY
Frullania knightbridgei von Konrat et de Lange

FLORA CATEGORY
Non-vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Liverworts

CURRENT CONSERVATION STATUS
2009 | At Risk – Naturally Uncommon | Qualifiers: RR

DISTRIBUTION
Endemic. New Zealand: Stewart and Auckland Islands

HABITAT
Coastal - corticolous on the branches of trees and shrubs in exposed sites close to the high tide mark (plants are likely to be at least partially salt tolerant because the sites in which they have been collected would be immersed from time to time during spring and king tides as well as during storms).

DETAILED DESCRIPTION

Plants corticolous, forming olive-green, copper-brown, to black patches. Leading stem 15–25 mm long, to 90µm diameter, 6–9 cells wide, little differentiation between cortical cells and medullary cells, lumen irregularly shaped. Branching regularly pinnate, occasionally bipinnate or tripinnate, branches with progressively smaller leaves; Frullania-type branching. Stem leaves of main branch flat, slightly imbricate to contiguous, suborbicular to broadly ovate, to 375 × 350 µm, distal margins incurved, dorsal margins extending beyond the farther edge of the stem, apices rounded, non-auriculate and ± subtruncate at the base, margins entire, dorsal surface smooth. Lobules remote from the stem, often bicoloured, basal 2–5 cells hyaline to subhyaline, otherwise olive-green to brown; cylindrically helmet-shaped; lobules ± medium, 110–200 × 60–100 µm (up to 12–14 cells high × 6–8 cells wide); ± equally initiated throughout, opening wide; mouth nearest stylus, truncate at base, mouth becoming crenulate-sinuate; lobule hyaline near mouth, lobule apex obtuse, surface smooth. Stylus medium in size (1/3–2/3× lobule length), ± triangular, up to 60 × 50 µm, 4–7 cells wide at base, 10–30 cells in total. Underleaves of leading stems bilobed, obovate to rotundate, contiguous to distant from each other, usually as long as wide, occasionally slightly longer than wide, 2–4× the stem in width, to 100–175 × 100–150 µm, broadest at middle, free lateral margins entire; apex bilobed to 1/3–1/2 its length, lobes separated by a V-shaped sinus, each lobe 9–14 cells wide at base with blunt to subacute or rounded apices. Rhizoid initial area present near base of underleaf, rhizoids conspicuous, subhyaline, in bundles, to 400 µm long. Lobules of secondary stems ± similar size to main stem. Leaf-lobe: to 20 × 35 cells; with a band of 10–12 enlarged cells at lobe base and extending out towards the apex, up to 6 cells wide at the widest region. Lobe marginal cells ± rectangular to subquadrate, to 8 × 6 µm, walls hyaline, subequally thickened, cell cavities brownish red. Cells of the middle region of the lobe ± dimorphic; Type 1: 4–6 rows of median cells, to 30.0 × 22.5 µm, similar in size to basal cells; Type Two: cells gradually becoming reduced in size (median cells to 15 × 10 µm). Both cell types pentagonal or hexagonal, hyaline walls subequally thickened, intermediate thickening absent, wall thickness to 2.75 µm wide, median cell cavities brownish red. Cavities of basal cells to 40 × 25 µm; walls semi-straight with indistinct trigones lacking intermediate thickenings, brownish red. Median cells of underleaves variable, with heavily equally-thickened walls, hyaline trigones, intermediate thickenings indistinct. Median cells of lobule mostly as long as wide, cell cavities to 14 × 9 µm; cells near lobule mouth, irregular in shape with flexuose walls, trigones indistinct, occasionally with nodulose intermediate thickenings; towards apex cells gradually becoming regular in shape, quadrate to rectangular with cell walls becoming semi-straight. Oil bodies of lobe median cells dimorphic.Type 1: 1-3 per cell, large,2–9 µm diameter, 5–13 × 4–12 µm, ovoid, ellipsoidal or spherical, finely granular, these occupying 3/4 to almost the entire cell lumen. Type 1 oil bodies larger than chloroplasts. Type 2: 2–4 oil bodies per cell, 1–5 µm diameter, 2-6 × 1-4 µm, spherical, ovoid or ellipsoidal, subhyaline, appearing homogeneous. Oil bodies of lobule and underleaf of Type One. Asexual reproduction unknown. Plants dioecious. Androecia subspherical to spicate, bracts terminal, in 2-6 pairs, on short-stalked branches arising from main stem. Gynoecia terminal on main or leading stem bearing a subfloral innovation arising 3–4 bract-pair cycles back from the perianth or gynoecia. Archegonia 1 per gynoecium. Perianth 900 × 500 µm, plicate, surface smooth, oblong-ovate, apex tapering to a short cylindrical beak. Spores globose, 35–45 µm.

SIMILAR TAXA

Frullania knightbridgei is similar to F. rostrata s.s, from which it differs by the presence of large oil bodies that occupy almost the entire lumen of the basal and median cells of the leaf lobe, and the often bicoloured lobules, which usually lie almost parallel to the stem. The leaf lobule cell walls of F. knightbridgei are distinctly semi-straight toward the lobule apex whereas in F. rostrata the cell walls are distinctly flexuose toward the lobule apex. Frullania knightbridgei is also distinguished from other members of the F. rostrata complex by its DNA sequences (based on multiple cpDNA and nrDNA markers)

FLOWERING

Insufficient Data

FRUITING

Insufficient Data

THREATS

Known only from four coastal gatherings (two from Stewart island, two from Auckland Island. Frullania knightbridgei is part of the F. rostrata complex which is widespread, common and the segregate species of which are difficult to recognise in the field. Based on the limited information available it seems likely that F. knightbridgei will be found in similar coastal habitats elsewhere on Stewart and the Auckland Islands, as well as the southern South Island, and possibly Campbell and Antipodes Islands so it is probably not threatened. Glenny et al. (2010) listing this species as Frullania sp. (CHR 587424; Stewart Island) rated it "Naturally Uncommon". However, based on available information a rating of "Data Deficient" would have been more appropriate.

ATTRIBUTION

Fact Sheet Prepared for NZPCN by: P.J. de Lange (28 December 2011). Description adapted from von Konrat et al (2012).

REFERENCES AND FURTHER READING

Glenny, D.; Fife, A.J.; Brownsey, P.J.; Renner, M.A.M.; Braggins, J.E.; Beever, J.E.; Hitchmough, R. 2011: Threatened and uncommon bryophytes of New Zealand (2010 Revision). New Zealand Journal of Botany 49: 305-327.
von Konrat, M.; de Lange, P.J.; Greif, M; Strozier. L.; Hentschel, J.; Heinrichs, J. 2012. Frullania knightbridgei, a new liverwort (Marchantiophyta) species from the deep south of Aotearoa-New Zealand based on an integrated evidence-based approach. Phytokeys 8: 13–36.
This paper can be downloaded free of charge at:
http://www.pensoft.net/journals/phytokeys/article/2496/abstract/frullania-knightbridgei-a-new-liverwort-frullaniaceae-marchantiophyta-species-from-the-deep-south-of-aotearoa-new-zealan,

NZPCN FACT SHEET CITATION

Please cite as: de Lange, P.J. (Year at time of access): Frullania knightbridgei Fact Sheet (content continuously updated). New Zealand Plant Conservation Network.
https://www.nzpcn.org.nz/flora/species/frullania-knightbridgei/ (Date website was queried)

MORE INFORMATION

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