

**On *Prionolejeunea grollei*,
a new species from the West Indies
(Lejeuneaceae, Hepaticae)**

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In memoriam Dr. Riclef Grolle

Abstract – A new species of Lejeuneaceae collected in Guadeloupe and Dominica, *Prionolejeunea grollei*, is described and illustrated. The main diagnostic characteristic of the species is the obconical perianth with cristate keels formed by long ciliae and laciniae restricted to the apex. Additionally, it is recognized by asymmetrical-ovate leaves with acute to acuminate apex, large median leaf lobe cells and leaf margins usually slightly crenulate. The new species is morphologically related to *P. decora* (Taylor) Steph. and *P. guadalupensis* (Lindenb.) Steph.; a comparison between the three taxa is presented.

Liverwort / Hepaticae / Jungermanniopsida / Lejeuneaceae / *Prionolejeunea* / West Indies / Dominica / Guadeloupe / new species / taxonomy

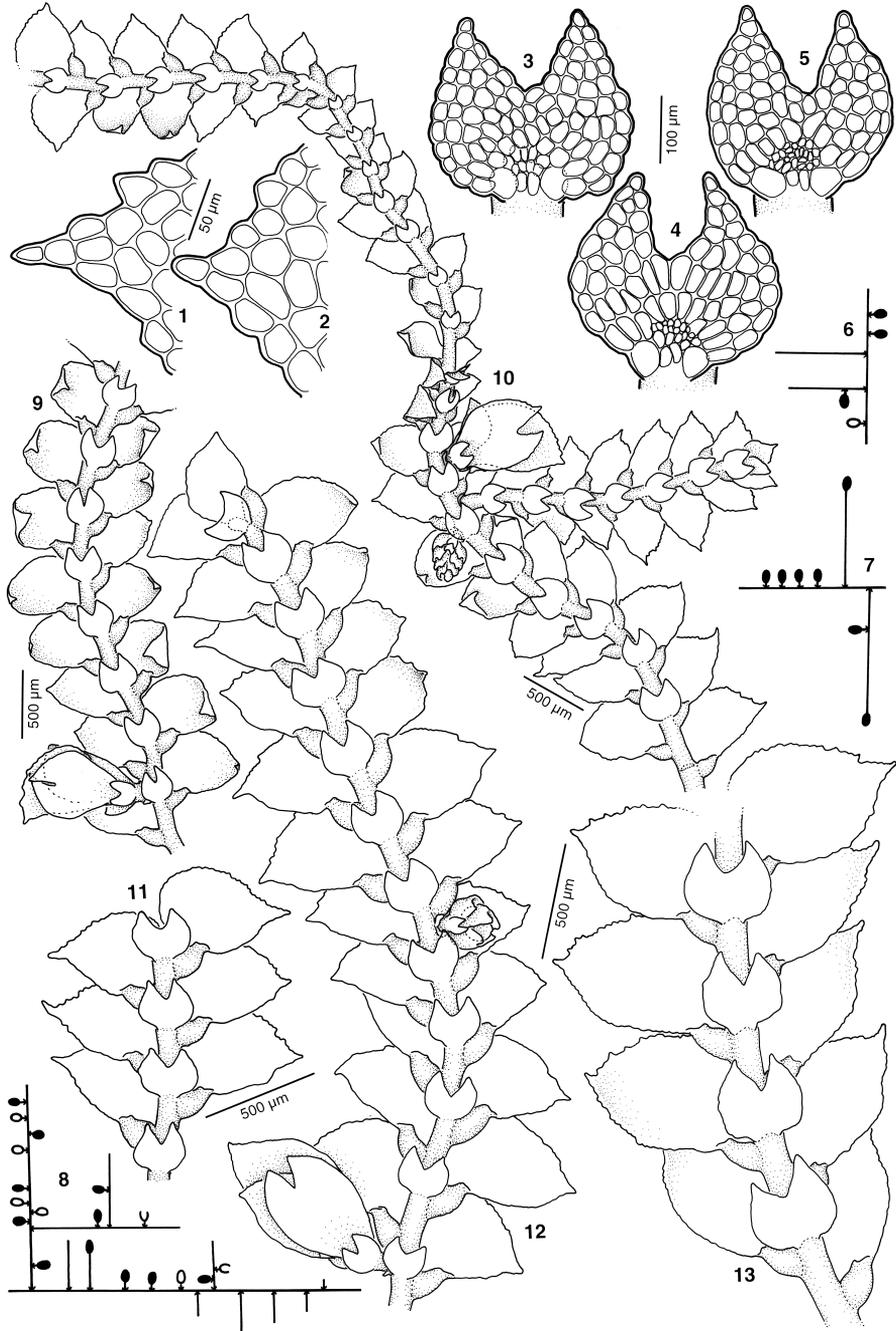
INTRODUCTION

During the revision of the genus *Prionolejeunea* (Spruce) Schiffn. (Ilkiu-Borges, in prep.), a new species was discovered in collections from Guadeloupe and Dominica made by the second author and his wife. The new species differs from all other taxa of the genus by the cristate perianth keels. Leaf shape, leaf cell size and morphology of leaf margins are further diagnostic characteristics and separate the new species from *P. decora* (Taylor) Steph. and *P. guadalupensis* (Lindenb.) Steph., which are most closely related.

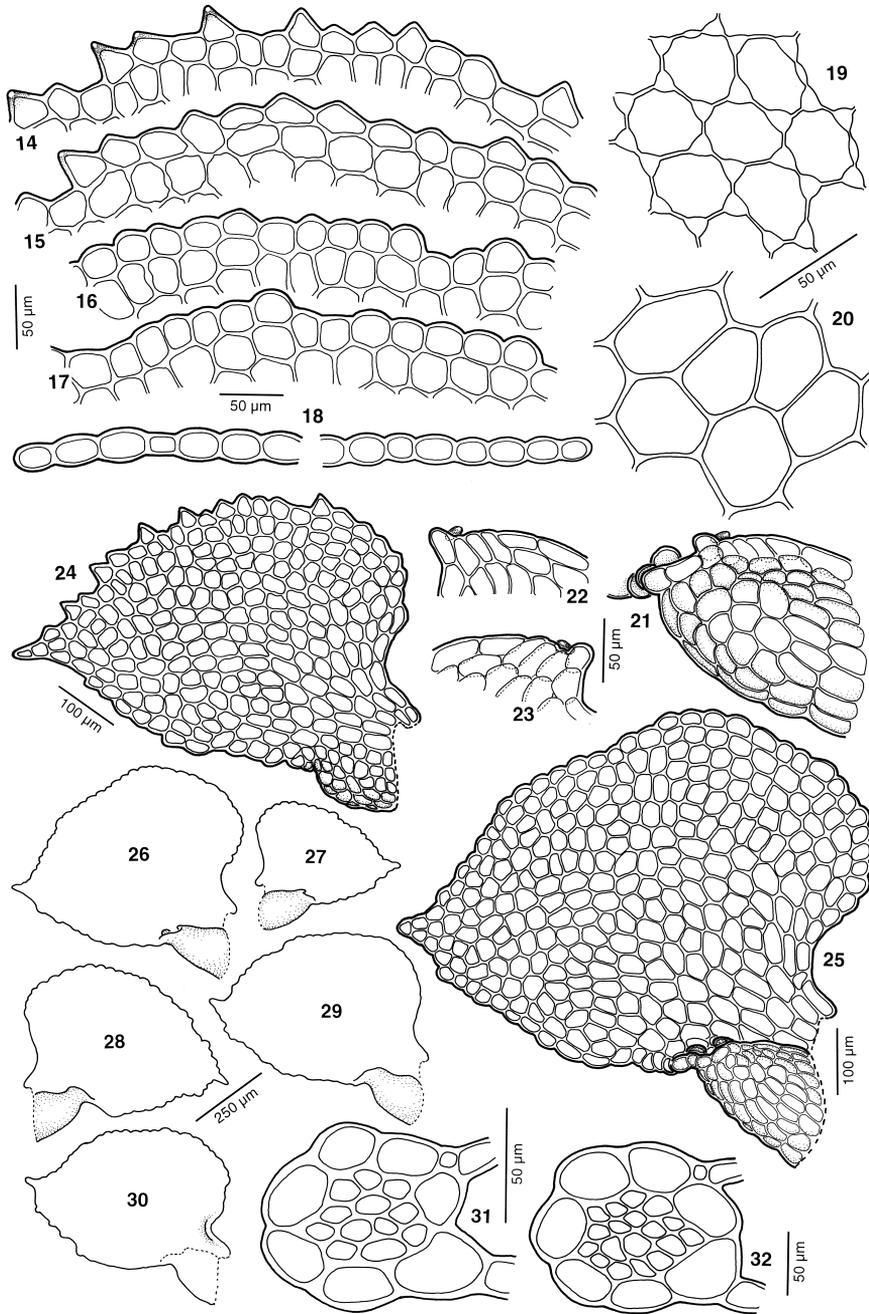
DESCRIPTION

Prionolejeunea grollei Ilkiu-Borges & Schäfer-Verwimp **sp. nov.** (Figs 1-43)
Autoica. Planta viridis vel albido-viridis. Caulis cum foliis 0.8-1.5 mm latus, 12-18 cellulis medullois in sectione transversali. Folia asymmetrico-ovata, 410-650 µm

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Figs 1-13. *Prionolejeunea grollei* Ilkiu-Borges & Schäfer-Verwimp. 1-2. Leaf apex. 3-5. Underleaves. 6-8. Cladographs of fertile plants, solid ellipse = androecia, open ellipse = gynoecia with perianth, U = gynoecia without perianth. 9-13. Sector of stem, ventral view. (1, 6, 7, 9, 11, 12 from Schäfer-Verwimp & Verwimp 22612; 2, 4 from Schäfer-Verwimp & Verwimp 17890/A; 3, 8, 10, 13 from Schäfer-Verwimp & Verwimp 22355; 5 from the holotype).



Figs 14-32. *Prionolejeunea grollei* Ilkiu-Borges & Schäfer-Verwimp. 14-17. Leaf margin. 18. Cross sections of leaves. 19-20. Median cells. 21. Lobule. 22-23. Free margin of lobules. 24-29. Leaves, ventral view. 30. Leaf, dorsal view. 31-32. Cross section of stem. (14, 15, 18, 19, 24, 31 from Schäfer-Verwimp & Verwimp 22612; 16, 17, 20, 25, 26, 28-30 from the holotype; 21-23, 27 from Schäfer-Verwimp & Verwimp 17890/A; 32 from Schäfer-Verwimp & Verwimp 22355).



Figs 33–43. *Prionolejeunea grollei* Ilkiu-Borges & Schäfer-Verwimp. 33–35. Perianths. 36–37. Perianth apex. 38. Androecia. 39. Sporophyte. 40–41. Valve with 6 elaters. 42. Valve with 5 elaters and 2 elateroids. 43. Spores. (33, 36 from Schäfer-Verwimp & Verwimp 17890/A; 34, 35, 37 from Schäfer-Verwimp & Verwimp 22612; 38–43 from the holotype).

lata, 500-850 μm longa, cellulae centrales 25-45 μm diam., apice acuto vel acuminato, plano vel incurvato, margine irregulari, debili-crenulata vel denticulata. Perianthia obconica, compressa, 2-carinata, margine superne longissimis ciliis et laciniis cristata.

Type: Dominica, Roseau Valley, trail Laudat-Valley of Desolation, 700 m, 24.V.1996, Schäfer-Verwimp & Verwimp 17859/A (holotype, GOET; isotypes, JE, hb. S.-V., NY, MG); idem, 730 m, 24.V.1996, Schäfer-Verwimp & Verwimp 17890/A (paratypes, hb. S.-V., GOET, MG). Guadeloupe, Basse-Terre, La Soufrière, Trace Victor Hugues between Matouba and Savane aux Ananas, 1200 m, 31.III.2002, Schäfer-Verwimp & Verwimp 22355 (paratypes, GOET, hb. S.-V.); trail Les Bains Jaunes-Chute du Galion, 820 m, 5.IV.2002, Schäfer-Verwimp & Verwimp 22612 (paratypes, GOET, hb. S.-V.).

Autoicous. **Plants** 0.8-1.5 mm wide, dull, pale green to green. Stems in cross section with 7 thick-walled epidermal cells surrounding 12-18 smaller, thick-walled medullary cells. **Leaves** widely spreading, distant to imbricate, concave, asymmetrical-ovate to ovate, with a narrow base dilated to distal portions, sometimes revolute at base, 410-650 μm wide, 500-850 μm long, apex acute to acuminate, plane to incurved, margins usually irregular, slightly crenulate to denticulate, marginal cells plane, projected outward, when denticulate the cells are sometimes tipped by a small papilla, dorsal and ventral surface of the lobe smooth or nearly so (due to convex cells); basal cells elongate, 25-30 \times 40-70 μm , median cells isodiametrical, 25-45 μm diam., trigones small to large sized, 0-1 intermediate thickening. **Lobules** ovate, 1/3-1/4 of the lobe length, 110-130 μm wide, 170-200 μm long, rarely reduced, inflated throughout, surface smooth, keel entire to \pm crenulate, free margin incurved, apical tooth 1 cell long, short, sometimes \pm elongate. **Underleaves** suborbicular to ovate, 1.5-3 \times the stem width, 100-210 μm wide, 100-220 μm long, \pm 1/2 bifid, lobes acute, sometimes ending in a row of 2 cells, margins entire to crenulate, surface smooth, bases slightly rounded, an enlarged cell present at either base, insertion line weakly curved. **Androecia** terminal on short to long branches, usually incurved, 3-13 pairs of bracts, bract keel without wing, 2 antheridia per bract, 1-2 bracteoles restricted to the base of the spike. **Gynoeceia** on short branches, with 1-2 underleaves and 1-3 vegetative leaves followed by 1 pair of bracts and 1 bracteole, innovations lacking; bracts ovate, different in size, the smaller outer one 260-420 μm wide, 350-550 μm long, the larger inner one 480-600 μm wide, 700-800 μm long, apex of bracts acute, lobule oblong, 1/3 of the lobe length; bracteole obovate, 500-570 μm wide, 620-750 μm long, 1/4 bifid, apex of lobes acute, margins entire to \pm crenulate, sometimes with few teeth. **Perianth** obconical, 490-730 μm wide, 850-1000 μm long, sometimes stipitate (then up to 1350 μm long), 2 flattened lateral keels with cristate margins formed by long ciliae (up to 6 cells in a row) and laciniae (up to 10 cells in a row and 2-4 cells wide), sometimes only few ciliae, surface smooth, beak short to long, 30-80 μm long, the upper cells elongate, erect. **Sporophyte.** Seta articulate, 8-10 cells long, in transverse section with 4 inner and 12 outer cells; capsule 280-300 μm diam., valves pale, suberect after dehiscence, cells of outer layer rhombic, large, with nodulose wall thickening in the upper half of the valve, cells of the basal half of the valve rectangular to irregular, large, thin-walled, marginal cells rectangular, inner layer with nodulose wall thickening in upper part of the valve and in lamella-like structures in the valve center, otherwise thin-walled, opposite valves with 5 elaters (1 apical and 4 lateral) and 2 elateroids, or with 6 elaters (all lateral) and without elateroids; elaters and elateroids yellowish to hyaline, elaters attached to the upper half of valve by one end, 150-300 μm long, spiral bands not seen, end attached to the valve margin rounded, free end dilated or not dilated, elateroids attached over

their entire length to valve surface bordering the valve center, 100-150 μm long, pale, without spiral band, ends broadly acute to rounded. Spores irregularly polygonal in outline, 15-30 \times 30-60 μm , surface verruculose, rosettes not observed.

Vegetative reproduction by means of caducous branches.

DISTRIBUTION AND ECOLOGY

This new species is thus far known only from Dominica and Guadeloupe (Lesser Antilles), at elevations between 700 and 1200 m. *Prionolejeunea grollei* has been found growing exclusively epiphyllous on fern fronds of a species of Hymenophyllaceae, in the understorey of rain forest where humidity is constantly high and direct sunlight lacking. Accompanying bryophytes are usually Lejeuneaceae, e.g. *Cyclolejeunea* cf. *accedens* (Gottsche) A.Evans and *Lejeunea subspathulata* Spruce (S.V. & V. 22355). *Prionolejeunea denticulata* (Weber) Schiffn., *P. decora* (Taylor) Steph., *Lejeunea asprella* Spruce, *Cheilolejeunea holostipa* (Spruce) Grolle & R.L. Zhu and *Cyclolejeunea* cf. *accedens* (S.-V. & V. 22612) with *Lejeunea paucidentata* (Spruce) Grolle, *Microlejeunea stricta* (Gottsche et al.) Steph., and *Aphanolejeunea* sp. occurring nearby; *Cyclolejeunea luteola* (Spruce) Grolle, *Prionolejeunea denticulata* (Weber) Schiffn., *Telaranea nematodes* (Gottsche ex Aust.) M.A.Howe, *Calypogeia peruviana* Nees & Mont., *Leskeodon cubensis* (Mitt.) Thér., and *Aphanolejeunea sicaefolia* (Gottsche in Steph.) A.Evans (S.-V. & V. 17890/A, 17890/B, 17890/D). The epiphyllous occurrence of *Calypogeia peruviana* demonstrates the very humid nature of the habitat.

DISCUSSION

Prionolejeunea grollei is clearly distinguished from the other species of the genus by its obconical perianths with long crests at the broadly truncate apex. The perianth crests of *P. grollei* are formed by ciliae and laciniae separated from each other up to their base, while in other *Prionolejeunea* species, ciliae and laciniae are clearly united at the base, forming broad appendages. Additionally, *P. grollei* is characterized by asymmetrically-ovate to ovate leaves with a narrow base dilating to distal portions, leaf margins varying from slightly crenulate to denticulate, and large mid-lobe cells (25-45 μm diam.). The new species is morphologically most similar to *P. decora* (Taylor) Steph. and *P. guadalupensis* (Lindenb.) Steph. *Prionolejeunea guadalupensis* is also autoicous, has leaf margins nearly entire to denticulate with only some cells tipped by a small papilla (as in *P. grollei*), occurs usually on fern fronds, and is restricted to the West Indies (Spruce, 1895; Pagán, 1942). However, *P. guadalupensis* differs by its ovate to orbicular leaves lacking the narrow base dilated distally, by the acute to short-apiculate leaf apex (acute to acuminate in *P. grollei*), median cells of the lobe varying from 15 to 25 μm diam., and perianths obcordate, usually with auriculate keels and denticulate to dentate margins. *Prionolejeunea decora* resembles *P. grollei* in plant size, leaf apex, narrow base of leaf lobe, and leaf shape although in *P. decora* leaves can

be also ovate-falcate and caducous. The leaf margins of *P. decora* are irregular as in *P. grollei*, but vary from denticulate to serrate and a tooth of 1-4 cells is often found near the leaf apex on the dorsal margin. Moreover, *P. decora* is dioicous, has mid-lobe cells varying from 10-25 μm diam., and the perianths are obovate to pyriform with laciniate to ciliate-laciniate keels occupying more than a half of its length.

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