

# A NEW SPECIES OF THE MOSS GENUS *PLAGIOTHECIUM* FROM SOUTH GEORGIA

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ABSTRACT. *Plagiothecium falklandicum* (Card. et Broth.) M. E. Newton, sp. nov. (basionym *P. roeseanum* var. *falklandicum* Card. et Broth.) is described and illustrated from South Georgian material and discussed taxonomically.

*Plagiothecium cavifolium* var. *falklandicum* Card. et Broth., hitherto known only from the Falkland Islands, is now known to form part of the bryophyte flora of the sub-Antarctic island of South Georgia, where it is widespread. It was described on the basis of a single gathering (Mt. Adam, W. Falkland, 872 (Cardot and Brotherus, 1923)) as a variety of *P. roeseanum* B.S.G., a species which has since been referred to the synonymy of *P. cavifolium* (Brid.) Iwats. (Iwatsuki, 1970). There can be little doubt, however, that this austral taxon is incorrectly ascribed to *P. cavifolium* and is worthy of specific status, to which it is here raised.

*Plagiothecium falklandicum* (Card. et Broth.) M. E. Newton, sp. nov. Basionym: *Plagiothecium roeseanum* var. *falklandicum* Card. et Broth.

Densely caespitose or loosely matted. Shoots julaceous, irregularly branched, erect or ascending to c. 6.5 (–8.0) cm, glossy yellowish-green. Rhizoids sparse, more or less confined to leaf bases, reddish-brown. Stem with central cylinder. Leaves of main axis and branches similar, (1.60–) 1.80–3.20 (–3.45) × (0.70–) 0.80–1.50 (–1.80) mm, closely imbricate, more or less symmetrical above leaf insertion, obovate or elliptical with short acumen and deeply concave, little altered when dry, widest at  $\frac{1}{2}$  to  $\frac{2}{3}$  from base, unequally decurrent on opposite sides of leaf, each descending portion gradually tapering but more or less obtuse, terminating in cell with bulging walls. Margin plane, entire. Nerve forked, the longer arm extending to middle of leaf or less. Cells in upper part of lamina vermicular, (71.0–) 77.5–152.0 (–183.0) × 5.5–10.5  $\mu\text{m}$ , c. 10–12 times as long as broad, with thin lateral walls and thicker end walls, becoming shorter, broader and porose towards base of leaf, those in decurrent region shortly rectangular to rounded, thin-walled and lax. Autoecious. Bracts of perichaetium broadly obovate, involute, those of perigonium ovate, deeply concave. Seta (1.2–) 1.6–2.2 (–2.8) cm, smooth, orange. Capsule 1.50–2.50 × 0.75–1.00 mm, c. 2–3 times as long as broad, erect or inclined, reddish-brown, becoming light brown to orange when empty, exothecial cells rounded-quadrate, incrassate. Calyptra cucullate, irregularly notched at base, straw coloured with dark brown tip. Operculum conical to shortly rostrate; annulus large, separating. Outer peristome teeth transversely striate–papillose below, with scattered papillae above, yellowish; inner peristome as long as or longer than outer, processes more or less perforate, with basal membrane to  $\frac{1}{4}$ – $\frac{1}{3}$ , cilia rudimentary or absent. Spores (11.0–) 12.5–14.0 (–17.5)  $\mu\text{m}$ , finely papillose. (Figs. 1 and 2.)

## Notes

Apart from the recently described *P. berggrenianum* Frisvoll with tapering auricles and ovate leaves (Frisvoll, 1981), *Plagiothecium* has few julaceous representatives. *P. cavifolium* var. *falklandicum* (as *P. roeseanum* var. *falklandi-*

*Br. Antarct. Surv. Bull. No. 60, 1983, pp. 63–67*

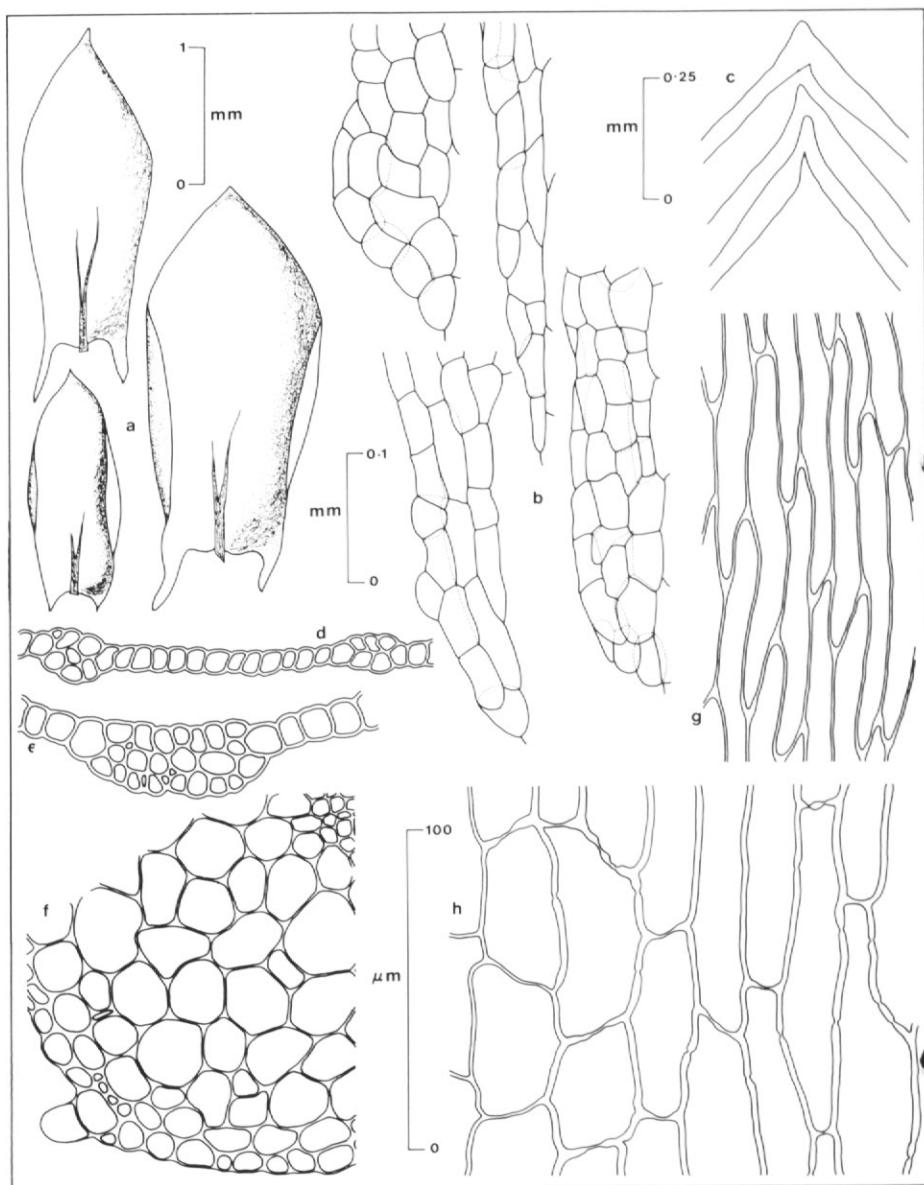


Fig. 1. *Plagiothecium falklandicum*.

a. Stem leaves; b. leaf auricles; c. leaf apices; d. transverse section of leaf in region of double nerve; e. transverse section at leaf base; f. transverse section of stem and leaf auricle; g. upper leaf cells; h. basal leaf cells between margin to left and nerve to right.

Scales: upper left for leaves, upper right for leaf apices, median for auricles and transverse sections, lowest for leaf cells.

a and c from Clarke and Greene 58 and Greene 265 and 380; b, g and h from Greene 2557b; d, e, and f from Greene 709.

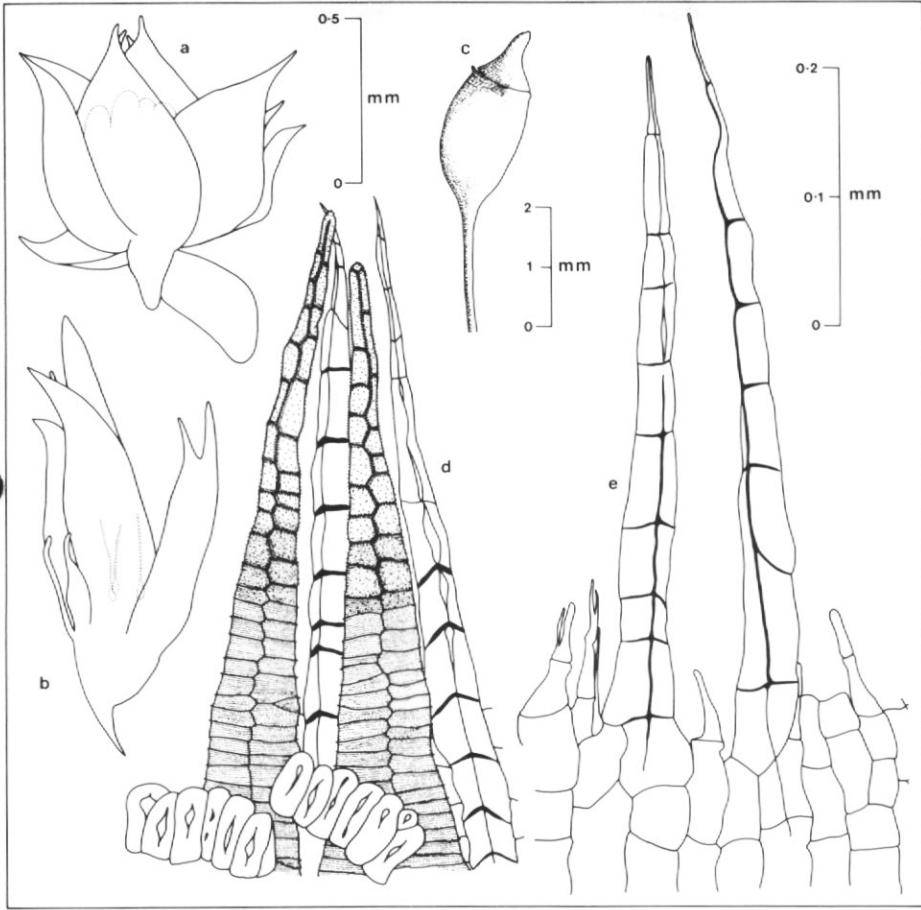


Fig. 2. *Plagiothecium falklandicum*.

a. Antheridial branch; b. archegonial branch; c. capsule; d. outer view of part of peristome and annulus; e. inner peristome.

Scales: left for fertile branches, median for capsule, right for peristomes.

a from Clarke and Greene 75; b from Greene 231; c and e from Greene 709; d from Clarke and Greene 255.

*cum*) was defined in terms of its robust, terete shoots and its shortly apiculate, more or less symmetrically oblong, elliptical leaves (Cardot and Brotherus, 1923). In all these respects it is indistinguishable from the South Georgian taxon, as confirmed by three isotypes (Halle et Skottsberg 872, H, PC, Iles Falkland, Mt. Adam, près du sommet, 1907; T. Halle et C. Skottsberg 872, BM, Falkland, Mt. Adam, c. 700 m, 13.xii.1907). Although the Falkland material is sterile, *P. roeseanum* B.S.G. itself was described as dioecious (Bruch and others, 1851) and thus differs from the South Georgian specimens. They also differ in the termination of the decurrent portion of the leaves. Thus, the leaf auricles of *P. roeseanum*, as seen in type material (Röese, MANCH, In Fagetis, Thuringiae; BM, Inselberg Salt. thuring, in terra nuda, Sub Fagos, Bose Tu—[illegible], 1862, P. & sn.) as well as other specimens from the herbarium of W. P. Schimper (MANCH, Ad terram sylvaticam

Thuringiae, *ex herb.* Charles Bailey, W. P. Schimper 185; MANCH, Ad terram sylvaticam Thuringiae, Pugillus Muscorum Europaeorum 1865, *ex herb.* J. Cosmo Melvill), are narrowly tapered with a straight-walled terminal cell, unlike the more or less rounded cell of South Georgian material. A further point of difference lies in the presence in *P. cavifolium* of up to three nodose cilia (Iwatsuki, 1970). *P. cavifolium* is therefore an inappropriate species in which to include this austral taxon.

Both in its autoecious inflorescence and in its more or less rounded leaf auricles, *P. falklandicum* corresponds with *P. denticulatum* (Hedw.) B.S.G., the var. *obtusifolium* (Turn.) Moore of which was described as a julaceous variety of *Hypnum denticulatum* L. *ex* Hedw. (Turner, 1804). Type material (Brown, BM, Crevices of wet rocks at the top of Bulbein, C. Donegall, *ex herb.* Hooker) serves to confirm the type description of ovate leaves and hence its distinction from *P. falklandicum* with obovate or elliptical leaves. It should be noted, however, that the type specimen is inadequate to justify dissection for the examination of auricles, despite there being a possibility that the specimen belongs to some other species. In an early annotation *in scheda*, the var.  $\gamma$ , which was Turner's (1804) var. *obtusifolium*, has been altered to the var.  $\beta$ , the var. *sylvaticum* (Brid.) Turn. which is now regarded as worthy of specific status (Bridel, 1801; Bruch and others, 1851). Moore (1872), however, designated the var. *obtusifolium* as the var.  $\beta$  of *P. denticulatum* and in doing so referred to Turner's var.  $\gamma$ . As a result, it is unclear which determination is intended by the note *in scheda*. Clarification of the point is crucial to the nomenclatural treatment of *P. denticulatum* var. *obtusifolium* but is unimportant in the present context.

The only species of *Plagiothecium* hitherto reported from South Georgia is *P. georgico-antarcticum* (C. Muell.) Kindb. (Greene, 1973). Its description (as *Hypnum georgico-antarcticum* C. Muell. (Müller, 1890)) referred to slightly concave leaves which were symmetrical and glossy with short, entire acumina. In these respects its resemblance to *P. falklandicum* is obvious and examination of one of the two syntypes (Will 51, HBG, In Spalsen eines Felsens am Ausgange des Brockenthal, Süd-Georgien, 24.i.1883) has identified a further similarity in its more or less rounded auricles. Nevertheless, the two show striking differences. As Müller recognized, the widely ovate leaves of *P. georgico-antarcticum* are somewhat complanate and, although the material is insufficient to allow a renewed search for gametangia, the species is described as dioecious (Müller, 1890). Contrary to the view of Müller, moreover, the leaves are slightly asymmetrical, one side being larger than the other.

Rounded leaf auricles are also characteristic of *P. ovalifolium* Card. (incorrectly entered as *P. ovatifolium* Card. in Index Muscorum (Wijk and others, 1967)) of southern South America, as shown by type material (Skottsberg 177, PC, Terre-de-Feu, montagnes au-dessus d'Ushuaia, alt 530 m; C. Skottsberg 177, S-PA, Tierra del fuego, in monte supra Ushuaia, 530 m.d.m., 6.iii.1902; Skottsberg 178, PC, baie Lapataia; C. Skottsberg 178, S-PA, Tierra del fuego, in silva ad Bahía Lapataia, 9.x.1902; C. Skottsberg 178, S-PA, Terre-de-Feu, Lapataia, forêt, 1902, *ex herb.* H. J. Möller). The species described by Cardot (1905) is, however, clearly distinguished from *P. falklandicum* by its asymmetrically ovate, yet deeply concave leaves.

#### *Details of South Georgian specimens examined*

All specimens are included in the British Antarctic Survey bryophyte herbarium, which is currently housed at the Institute of Terrestrial Ecology, Bush Estate,

Penicuik, Midlothian, EH26 0QB. Collecting details are available from the British Antarctic Survey, Madingley Road, Cambridge, CB3 0ET.

B. G. Bell 1063, 1076, 1077, 1090, 1095, 1106, 1116, 1132, 1133, 1139b, 3431, 3432, 3433, 3434, 3435, 3436, 3437.

G. C. S. Clarke and S. W. Greene 58, 75, 91, 139, 255, 720, 721.

S. W. Greene 231, 265, 305, 380, 531, 622, 695, 709, 953, 989, 1181, 1260, 1321, 2139, 2173, 2557b, 2648, 3234.

R. E. Longton 54, 95, 311, 438.

W. J. L. Sladen JB/19/4.

J. Smith M/75, M/77.

R. I. L. Smith 1175, 4407, 4408.

BAS MISC 141, 142, 143.

#### ACKNOWLEDGEMENTS

Specimens were kindly loaned by the following institutes and herbaria, to the Directors and Keepers of which I am very grateful:

British Antarctic Survey Bryophyte Herbarium; British Museum (Nat. Hist.); Staatsinstitut für allgemeine Botanik und Botanischer Garten, Hamburg; University of Groningen Herbarium, Haren; Botanical Museum, Helsinki; Manchester Museum; Muséum Nationale d'Histoire Naturelle, Paris and the Naturhistoriska Riksmuseet, Stockholm.

I am also greatly indebted to Mr B. G. Bell and Mr P. J. Lightowers for giving me the benefit of facilities of the Bryophyte Research Group of the Institute of Terrestrial Ecology, and to Professor D. H. Valentine, University of Manchester, and Mr A. C. Crundwell, University of Glasgow, for helpful nomenclatural and taxonomic advice.

*MS received 25 March 1983; accepted 5 April 1983*

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