A SYNOPTIC FLORA OF SOUTH GEORGIAN MOSSES: III. *Leptotheca*, *Philonotis*, *Mielichhoferia* AND *Pohlia*

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ABSTRACT. Descriptions, taxonomic notes and habitat data are given for the South Georgian species of the genera *Leptotheca*, *Philonotis*, *Mielichhoferia* and *Pohlia*. Keys for their identification, distribution data and full lists of specimens examined are provided for each species. *Leptotheca gaudichaudii* Schwaegr., *Pohlia cruda* var. *imbricata* (Card.) Bartr. and *P. wahlenbergii* var. *glacialis* (Schleich. ex Brid.) E. F. Warburg are reported from the island for the first time, while *Bryum alticaule* C. Muell., *Bryum pulvinatum* C. Muell., *Meesia austro-georgica* C. Muell., *Philonotis vagans* var. *inundata* Card. and *Philonotis varians* Card. are reduced to synonymy.

THE species to be considered include all the members of the family Bryaceae to be found on South Georgia with the exception of those in the genera *Bryum* and *Leptobryum*. Only species of *Bryum* could be confused with some of the present species but the former may be recognized by their combination of oblong-lanceolate leaves with uniform shortly elongate, hexagonal cells and the length of the nerve which is often excurrent. The capsule in *Bryum* is unlike that in *Pohlia* and *Mielichhoferia* in that it is more distinctly pear-shaped rather than smoothly ovoid with a sharply defined neck. Some other species not in this family have been included since they are sometimes mistaken for members of the Bryaceae, particularly in the field. As all the genera described have a number of common morphological features, a key is provided to facilitate their separation.

The arrangement of the descriptions and the citation of distribution records follows the format used in previous papers in this series (Greene, 1973; Bell, 1973), the first of which gives historical details of bryophyte collections from South Georgia.

The genera considered may be separated from one another as follows:

1. Nerve excurrent in mature leaves 2
   Nerve ending below leaf apex or percurrent, but never excurrent 3
2. Lamina cells elongate-rectangular or, if isodiametric, papillose .. .. ***Philonotis***
   Lamina cells isodiametric, smooth .. .. ***Leptotheca***
3. Inflorescences on short lateral branches, gemmiform, lamina cells 6–8 μm. wide .. .. ***Mielichhoferia***
   Inflorescences terminal, not gemmiform, lamina cells wider than 8 μm. .. ***Pohlia***

AULACOMNIACEAE

Leptotheca Schwaegr.

A genus characterized especially by the presence of ovate-lanceolate leaves with rounded-quadrate, incrassate cells and an excurrent nerve. There is only one representative of this genus on South Georgia.

Leptotheca gaudichaudii Schwaegr.

Plants forming deep, dull-green turves (1·5–) 3–7 cm. high; shoots irregularly branched, densely matted with brown tomentum below. Leaves 1·5–4 by 0·3–0·6 mm., appressed and sometimes slightly crisped when dry, erecto-patent when moist, ovate-lanceolate, acute, lamina extending for differing lengths along each side of the excurrent nerve. Margin plane, irregularly denticulate above, weakly crenate below. Nerve strong, percurrent in juvenile leaves, variably excurrent when mature. Cells 9–15 μm., isodiametric, rounded-quadrate, incrassate, regular throughout the leaf. Dioecious. Sporophytes not known on South Georgia. (Fig. 1.)

Habitat and distribution (Fig. 2)

A rather uncommon species most frequently found round the bases of *Poa flabellata* tussocks, *L. gaudichaudii* has been collected at altitudes of up to 160 m., but it typically occurs at or near sea-level.

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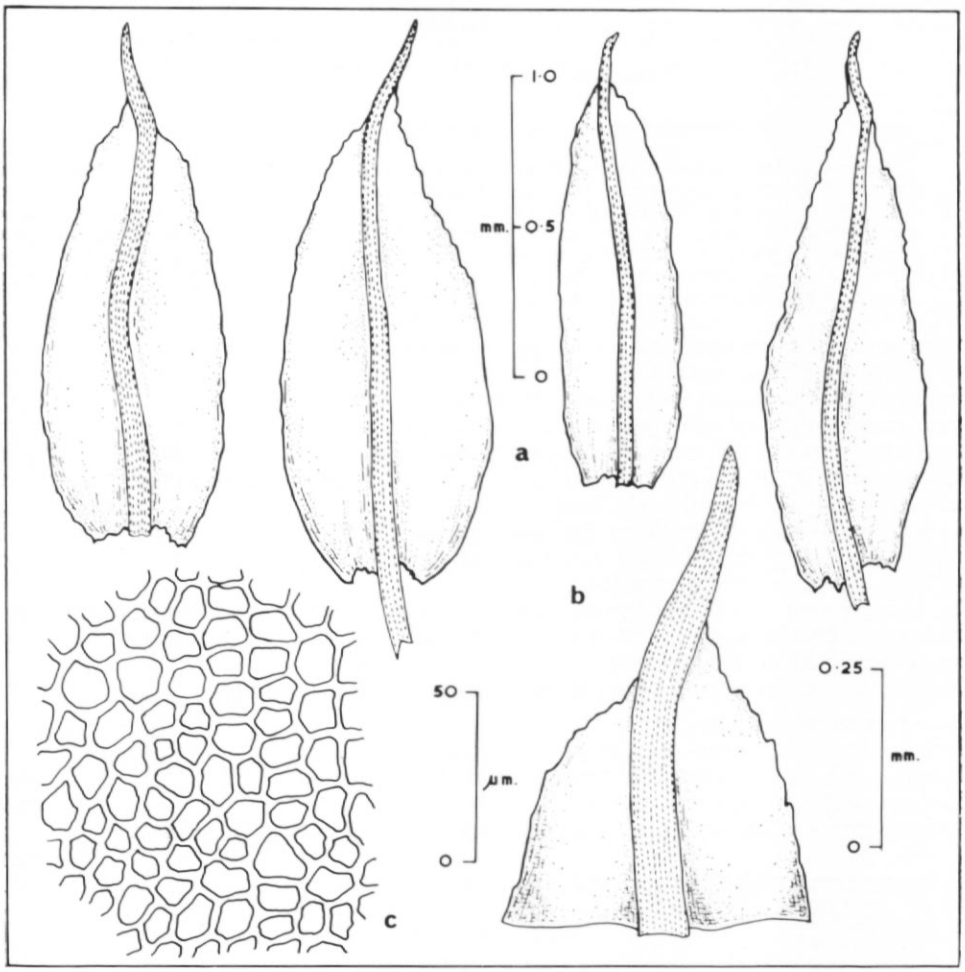

Fig. 1. *Leptotheca gaudichaudii*.
a. Leaves; b. Apex; c. Cells.
Scales: upper for leaves; lower left-hand for cells; lower right-hand for apex.

Notes

Although this species is easily recognizable under the microscope by its areolation with incrassate, isodiametric cells and excurrent nerve, its appearance is closely reminiscent of such species as *Pohlia inflexa* and *P. nutans*. The best distinguishing feature in the field is the excurrent nerve taken in conjunction with the habitat. *L. gaudichaudii* normally grows in turves of rather limited extent on the dead leaf bases which build up around tussocks, but occasionally, as on parts of the Barff Peninsula, more luxuriant stands can build up, particularly where *P. flabellata* overhangs a cliff and the moss has a larger area exposed for growth.

Taxonomy

This is the first report of *L. gaudichaudii* from South Georgia, although it is not an unexpected addition to the range of a species recorded from Australasia and southern South America, as well as the Falkland Islands. The South Georgian material has been compared with Schwaegrichen's original description (Schwaegrichen, 1824) and with a portion of the

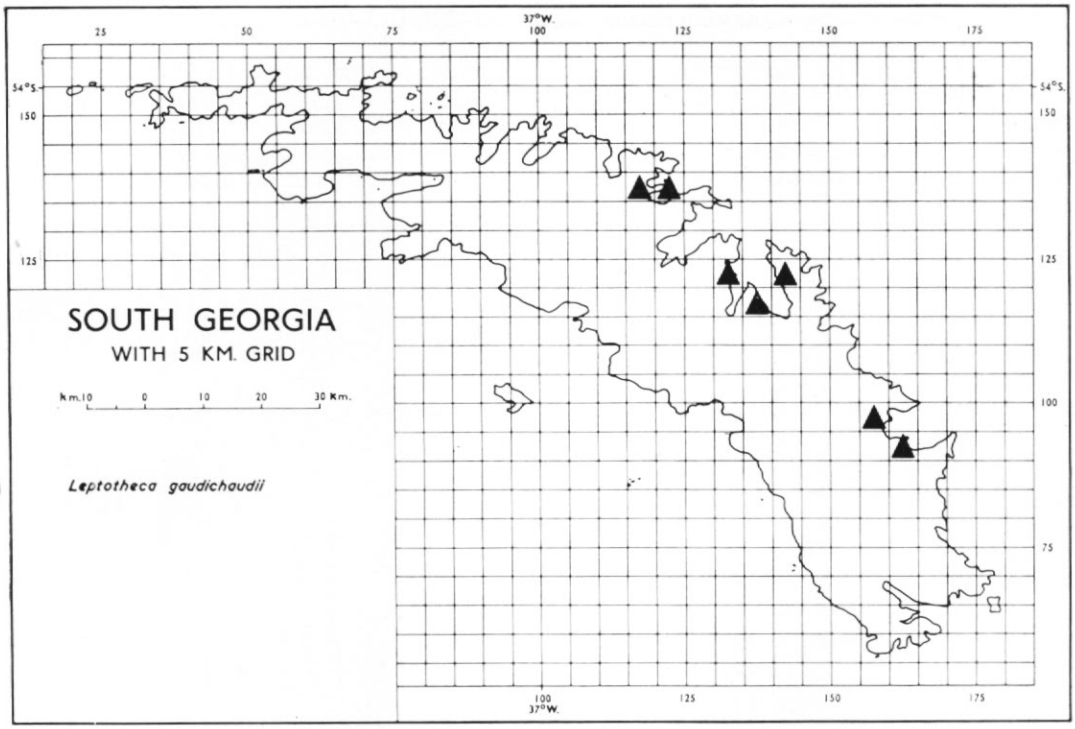

Fig. 2. The known distribution on South Georgia, by 5 km. squares, of *Leptotheca gaudichaudii* based on the specimens and field records given in the Appendix.

type specimen (Gaudichaud No. 121, BM ex K, Port Jackson, Herb. Gay in Herb. Hook.), and it agrees well in external morphology and in the leaf shape and areolation.

Bartramiaceae

Philonotis Brid.

Shoots forming dense or loose turves, usually yellow-green above and matted with rust-coloured rhizoids below. Branches usually arising from stem apex, sometimes whorled below inflorescence. Central strand of stem circular in cross-section. Leaf cells papillose, but sometimes only slightly so. Dioecious, the male inflorescence discoid.

Key to species

1. Cells with prominent central papilla, branches numerous, clustered below inflorescence .. .. ***P. scabrifolia***
   Cells with indistinct terminal papilla, branches few, scattered in upper region of shoot 2
2. Leaf cells 15–30 μm. wide, margin with *c.* 5 inflated cells at basal angles .. ***P. vagans***
   Leaf cells 9–17 μm. wide, margin without inflated cells at basal angles .. ***P. acicularis***

Philonotis acicularis (C. Muell.) Kindb.

Syn. Bartramia acicularis C. Muell.
Philonotis varians Card.
Meesia austro-georgica C. Muell.

Plants forming extensive turves of erect, yellow-green shoots (2–) 4–7 (–9) cm. high at maturity; branches produced from apical region of previous year's shoots, the latter becoming

prostrate, stems matted below with rhizoids. Leaves 1–2 by 0·3–0·6 mm., variable in shape, at base of stems oblong-ovate with nerve failing to reach apex which may be obtuse; becoming oblong-lanceolate with excurrent nerve and acute apex higher up stem. Margin plane, entire below, variably denticulate above, with 2–3 rows of narrow, elongated cells extending almost to the leaf base. Cells 20–45 (–60) by (7–) 9–17 (–21) μm., rectangular or irregularly elongate-hexagonal, with weak papillae formed by extensions of cell ends, more conspicuous on dorsal surface. Dioecious. Capsule brown, $\pm$ globose, slightly plicate when dry. (Fig. 3.)

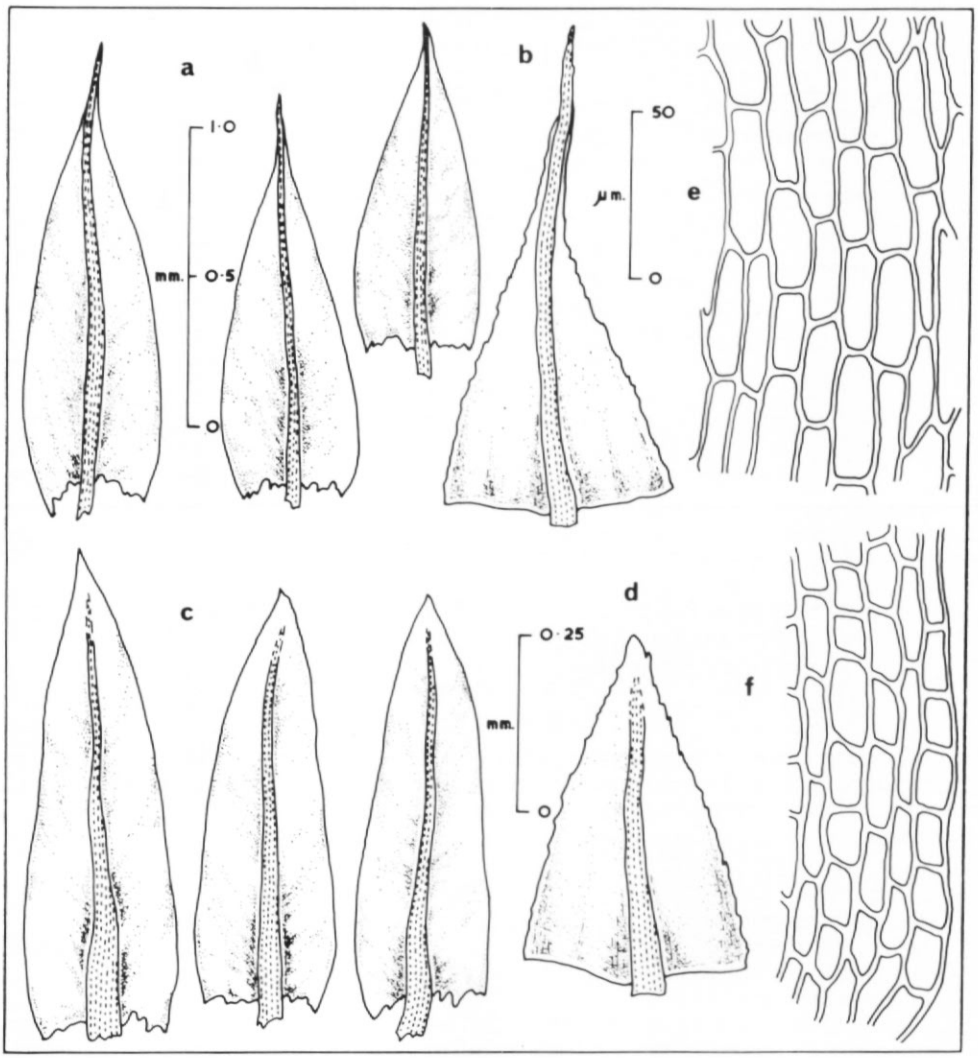

Fig. 3. *Philonotis acicularis*.
a. Upper leaves; b. Apex of upper leaf; c. Lower leaves; d. Apex of lower leaf; e. Upper cells; f. Alar and marginal cells.
Scales: upper left-hand for leaves; upper right-hand for cells; lower for apices.

Habitat and distribution (Fig. 4)

P. acicularis is one of the major constituents of stream-side vegetation and is common in all wet habitats, particularly at low altitudes where frequent associates are *Pohlia wahlenbergii*

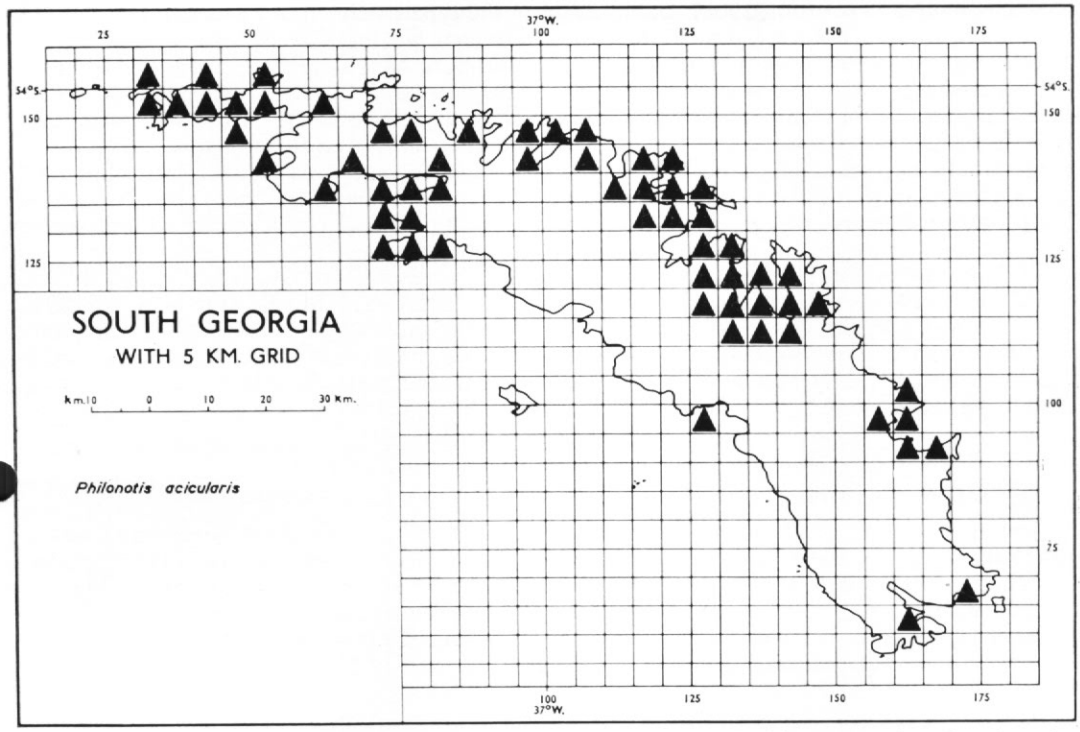

Fig. 4. The known distribution on South Georgia, by 5 km. squares, of *Philonotis acicularis* based on the specimens and field records given in the Appendix.

var. *glacialis* and *Philonotis vagans*. It may even form swards several square metres in area extending out from the stream banks to float on the surface of moving water. Altitude 0–350 m.

Notes

This species shows a remarkable degree of variation in its leaf shape and nerve excurrence. In spring the apical region of the previous season's shoots produces up to six branches which at this stage bear leaves with rather obtuse apices into which the nerve does not reach. As the season progresses, the stem elongates and leaves are formed which are more acute and in which the nerve is excurrent. At the end of the growing season the stems bear leaves showing a complete gradation between these two extremes.

Inflorescences are very local on South Georgia and sporophytes are correspondingly rare.

Two species on South Georgia which could be confused with *P. acicularis* are *P. vagans* and *Pohlia wahlenbergii* var. *glacialis*. Distinguishing features are given in the notes for each taxon.

Taxonomy

Considerable taxonomic confusion has arisen as a result of the variability described above. This has not been helped by a shortage of representative specimens which has only recently been rectified.

P. acicularis was first described (as *Bartramia acicularis* C. Muell.) by Müller (1890) for a specimen collected on South Georgia by Will (Type Will M; Fundort Hochplateau, Süd-Georgien, 2.v.83). It was later transferred to *Philonotis* by Kindberg (1891). In the type description, Müller stated that the nerve failed to reach the leaf apex and this subsequently led Cardot to describe a new species—*P. varians* Card.—distinguished from *P. acicularis* by

its excurrent nerve (Cardot, 1906). Comparison of the type specimen of *P. varians* (Skottsberg 359, S-PA, Jason Harbour, Cumberland Bay, South Georgia, leg. Carl Skottsberg, 23.iv.1902; Skottsberg 357, S-PA, e specem. origin., Géorgie du Sud, baie Cumberland, Jason Harbour, leg. Skottsberg, 1902) and of the type of *P. varians* f. *robusta* Card. (Skottsberg 356, S-PA; Pot Harbour, Cumberland Bay, South Georgia, leg. Carl Skottsberg, 18.v.1902) with that of *P. acicularis* has shown them to be identical, each bearing the full range of variation in nerve length and leaf shape. Matteri (1968) retained both species as distinct, describing the leaf variation in *P. acicularis* as dimorphic but that in *P. varians* as polymorphic. In view of the progressive change in leaf shape through the growing season, it is necessary to unite these two taxa.

Examination of the type specimen of *Meesia austro-georgica* C. Muell., which was described by Müller (1890) for a plant collected on South Gergoia (Will M, Fundort Hochplateau, Quelle, Süd-Georgien, 2.v.83), has shown that this should also be considered synonymous with *P. acicularis*. It is a specimen in which the most prominent shoots are of the early season type with obtuse leaves and short nerve, the growth of the previous season's stems showing clearly the mature leaf type of *P. acicularis*.

Philonotis scabrifolia (Hook. f. et Wils.) Braithw.

Syn. Bartramia willii C. Muell.

Slender, glaucous to yellow-green plants forming turves 1–4 cm. deep. Sterile and fertile plants markedly different, sterile shoots straggling or in loose turves with irregularly pinnate branching. Leaves 0·6–1·1 by 0·3–0·6 mm., on sterile shoots ovate-lanceolate. Margin irregularly dentate, plane to slightly revolute. Nerve excurrent or percurrent. Cells 10–18 by 8–11 μm., quadrate, with prominent central papilla. Leaves on fertile shoots broadly triangular, their margins less dentate and the cells only weakly papillose. Dioecious. Capsule broadly ovate, 1·7–2·7 mm. long, lightly plicate. (Fig. 5.)

Habitat and distribution (Fig. 6)

A common species of rock crevices and ledges, often growing intermixed with other bryophytes. Altitude 0–600 m.

Notes

P. scabrifolia is widespread on South Georgia and fertile shoots, particularly females, are not uncommon. Sporophytes, however, are rare as the sexes do not usually grow together.

This species is easily recognizable in the field by its distinctive colour and branching pattern, and under the microscope by the large central papilla of the lamina cells. It is unlikely to be confused with any other species.

Taxonomy

Philonotis scabrifolia was first reported from South Georgia by Müller (1890) as *Bartramia willii* C. Muell. However, Cardot (1908) has shown that *B. willii* must be considered synonymous with *P. scabrifolia*, the latter erected by Hooker and Wilson (1844) for plants collected during the 1839–43 Antarctic expedition. Hooker and Wilson placed the species in the genus *Hypnum*, misled no doubt by the straggling growth form of the sterile shoots which is often reminiscent of a pleurocarpous moss. It was transferred to *Philonotis* by Braithwaite (1893).

The type specimen (Lyall No. 26, BM, Lord Auckland Island, Antarct. Exp. 1839–43) has been examined and, although it is sterile, it is clearly identical with the material gathered on South Georgia. It possesses the characteristic papillae on the lamina cells and shows the same unusual branching pattern.

Philonotis vagans (Hook. f. et Wils.) Mitt.

A robust, turf-forming species with erect, yellow-green shoots 3·5–8·5 cm. high at maturity, matted below with red-brown rhizoids; branches produced from shoot apices as in

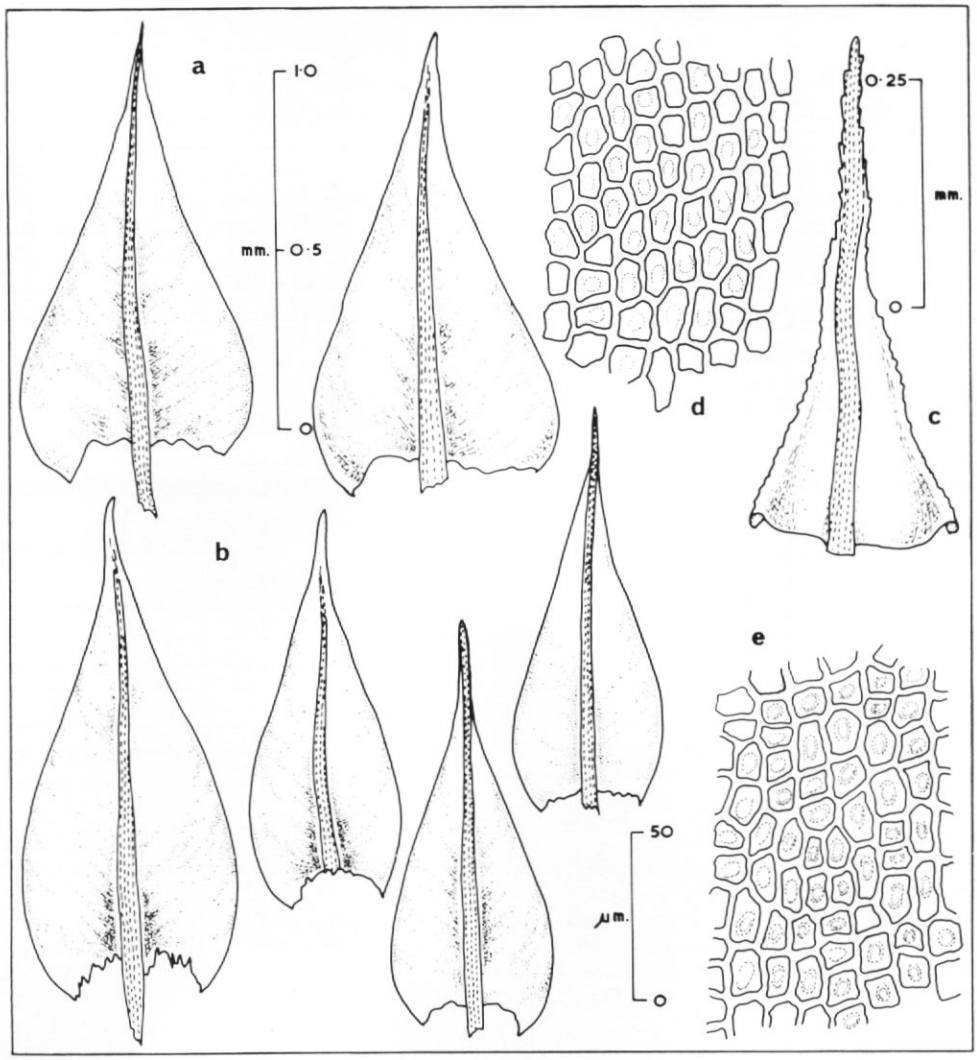

Fig. 5. *Philonotis scabrifolia.*
a. Leaves from fertile shoot; b. Leaves from sterile shoot; c. Apex; d. Leaf cells from fertile shoot; e. Leaf cells from sterile shoot.
Scales: upper left-hand for leaves; upper right-hand for apex; lower for cells.

P. acicularis. Leaves 1·5–3·5 by 0·7–1·3 mm., ovate to broadly oblong-lanceolate, with obtuse to acute apex varying along stem as in *P. acicularis.* Margin plane, differentiated, especially in upper leaves, with 2–3 rows of narrow, elongated cells, at base with a row of *c.* 5 inflated cells. Nerve in basal leaves failing to reach ± obtuse apex, in upper leaves excurrent from acute apex. Cells 50–90 by 15–30 µm., irregularly hexagonal-rectangular, lax, becoming wider at leaf base, papillae indistinct, terminal. Dioecious. Sporophytes unknown on South Georgia. (Fig. 7.)

Habitat and distribution (Fig. 8)

A local plant of lowland streams and flushes, usually associated with *P. acicularis* and *Pohlia wahlenbergii* var. *glacialis.* Altitude 0–150 m.

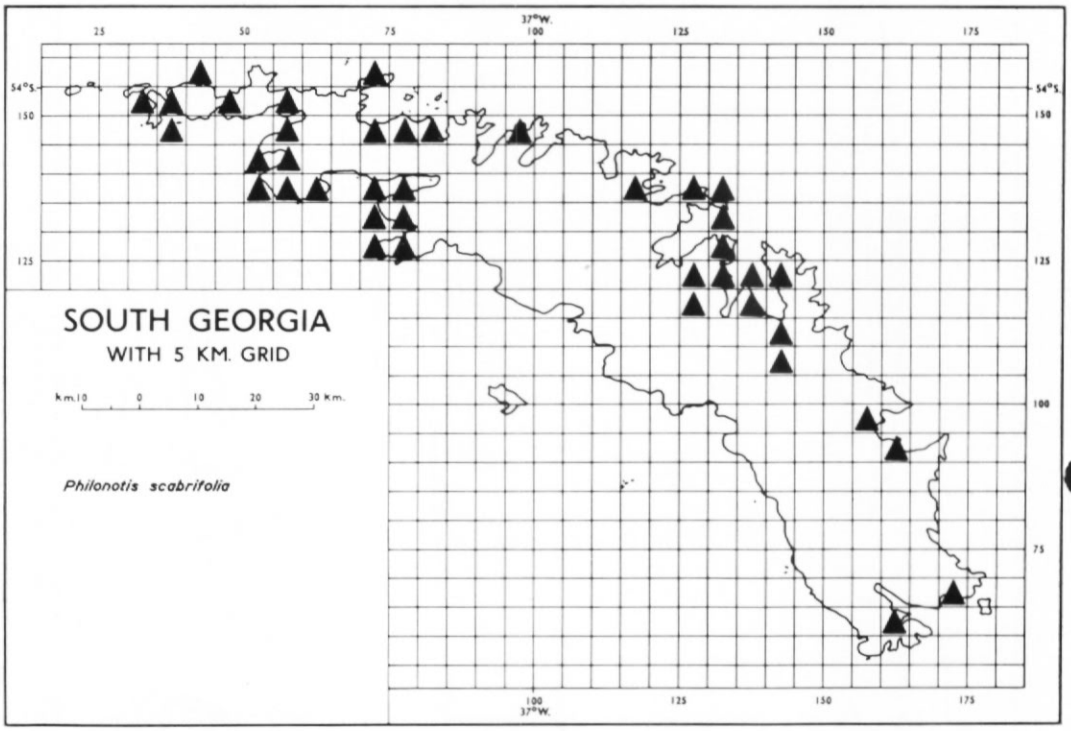

Fig. 6. The known distribution on South Georgia, by 5 km. squares, of *Philonotis scabrifolia* based on the specimens and field records given in the Appendix.

Notes

As with *P. acicularis*, *P. vagans* rarely produces gametangia of either sex on South Georgia which, no doubt, accounts for the lack of sporophytes.

In the field, *P. vagans* is easily confused with *P. acicularis* and *Pohlia wahlenbergii* var. *glacialis*, two plants with which it is often associated. *P. acicularis* is, on the whole, a less robust plant with narrower leaves, but *P. wahlenbergii* var. *glacialis* is hardly to be distinguished without microscopic examination. Plants of the latter species have a tendency to be more glaucous than *P. vagans* which usually shows a yellowish tinge, but this distinction is not reliable. Under the microscope, *P. vagans* is easily recognizable by the row of inflated cells at the basal margins.

Taxonomy

This species was first described by Hooker and Wilson (1844) as *Bryum vagans* Hook. f. et Wils. The type specimen (J. D. Hooker no. 113, BM ex K, Hermite Island, Cape Horn, Antarct. Exp. 1839–43) is sterile, and is, indeed, similar to some members of the Bryaceae since the papillae in the lamina cells are poorly developed. There is no doubt, however, that Mitten (1859) was correct in transferring the species to *Philonotis* as the sporophytes, known from South America, are clearly of this genus.

P. vagans was first reported from South Georgia by Cardot (1906), who also recognized an aquatic form which he described as var. *inundata* Card. The type specimen of this variety (Skottsberg 412, S-PA, South Georgia, Cumberland Bay, Jason Harbour, in rivul., leg. Carl Skottsberg, 23.iv.1902) has been examined and, although it agrees with Cardot's description in being darker than the typical form and in tending to have a complanate leaf arrangement, it is not considered that these distinctions warrant taxonomic recognition in view of the range

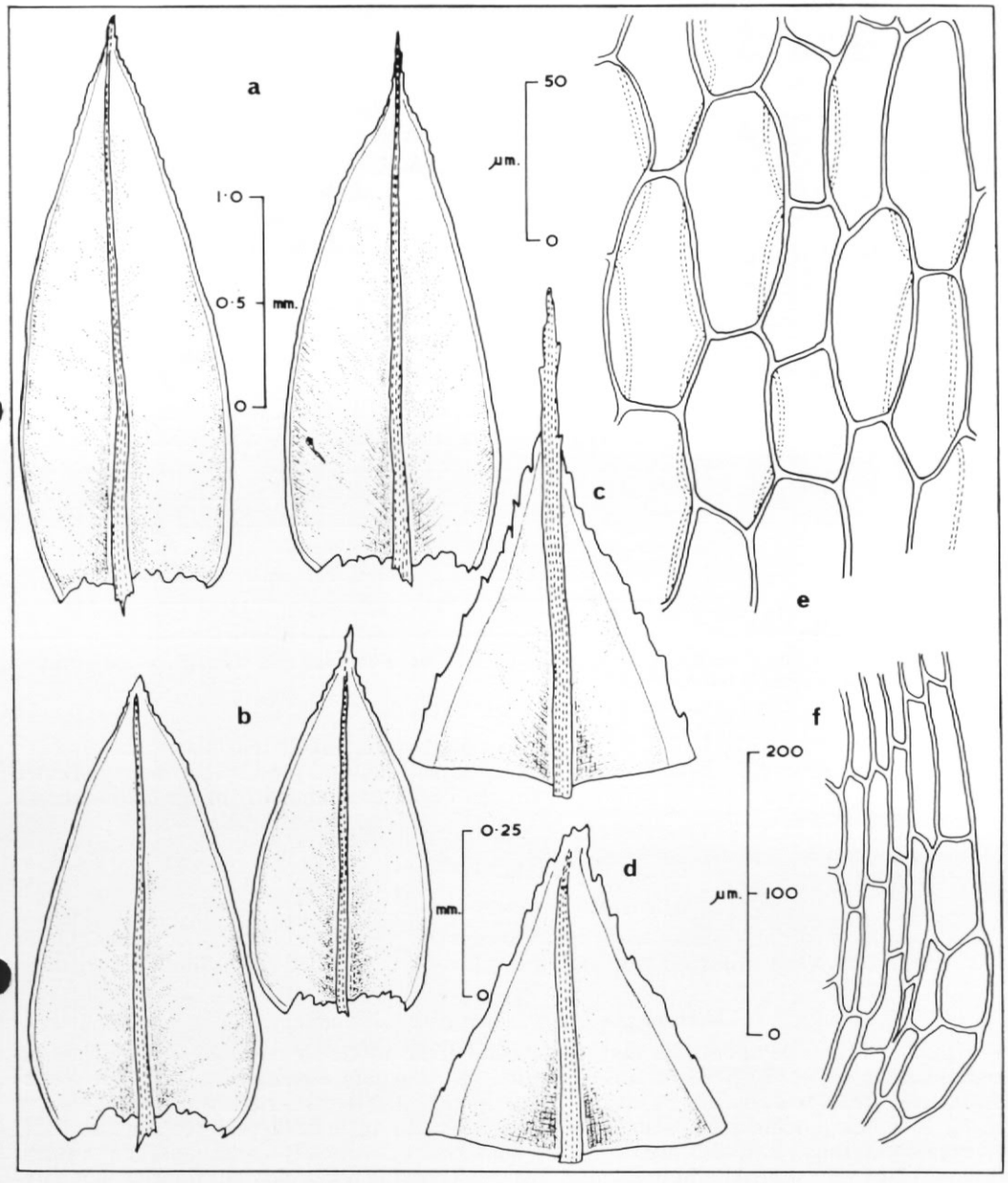

Fig. 7. *Philonotis vagans*.
a. Upper leaves; b. Lower leaves; c. Apex of upper leaf; d. Apex of lower leaf; e. Upper cells; f. Alar and marginal cells.
Scales: upper left-hand for leaves; upper right-hand for upper cells; lower left-hand for apices; lower right-hand for alar and marginal cells.

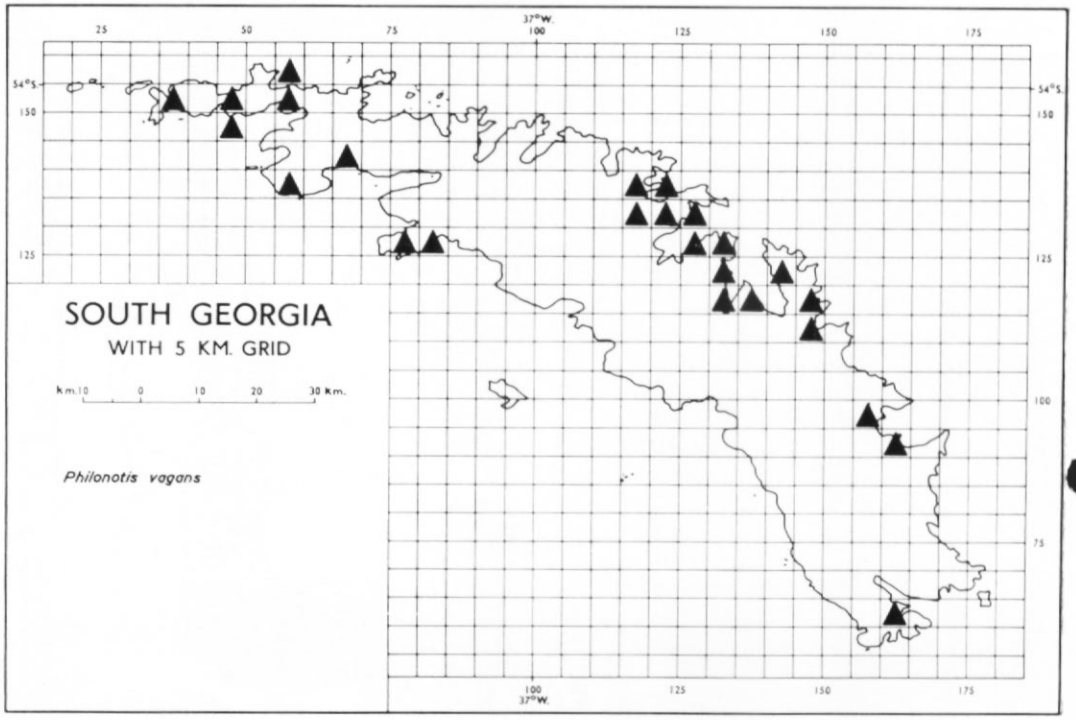

Fig. 8. The known distribution on South Georgia, by 5 km. squares, of *Philonotis vagans* based on the specimens and field records given in the Appendix.

of intermediate forms to be found on South Georgia. It seems likely that the characters cited by Cardot are phenotypic modifications associated with submergence. Specimens collected in late autumn or in early spring before growth has begun are frequently of the colour shown by Skottsberg's material.

Bryaceae

Mielichhoferia Nees et Hornsch.

Small, cushion-forming plants with inflorescences on very short, lateral branches. Outer peristome absent. Only one species of this genus has been recorded from South Georgia.

Mielichhoferia austro-georgica C. Muell.

Irregularly branched shoots forming dense, dull-green turves or cushions 1–3 (–6) cm. in height. Leaves 0·7–1·9 (–2·3) by 0·3–0·5 mm., erecto-patent when moist, narrowly ovate-lanceolate, often somewhat asymmetric. Margin plane, slightly dentate towards apex. Nerve ending in or below acute apex. Cells 24–40 by 6–8 μm., elongate hexagonal-rectangular, walls less than 2 μm. thick. Inflorescences normally dioecious, occasionally synoecious, gemmiform, borne at tip of very short lateral branchlets, the bracts hardly differentiated. Capsule elongate-ovate, horizontal or pendulous, outer peristome lacking, inner rudimentary, scarcely visible above rim. (Fig. 9.)

Habitat and distribution (Fig. 10)

A characteristic moss of rock crevices and fissures showing no distinct altitude preference. Altitude 0–550 m.

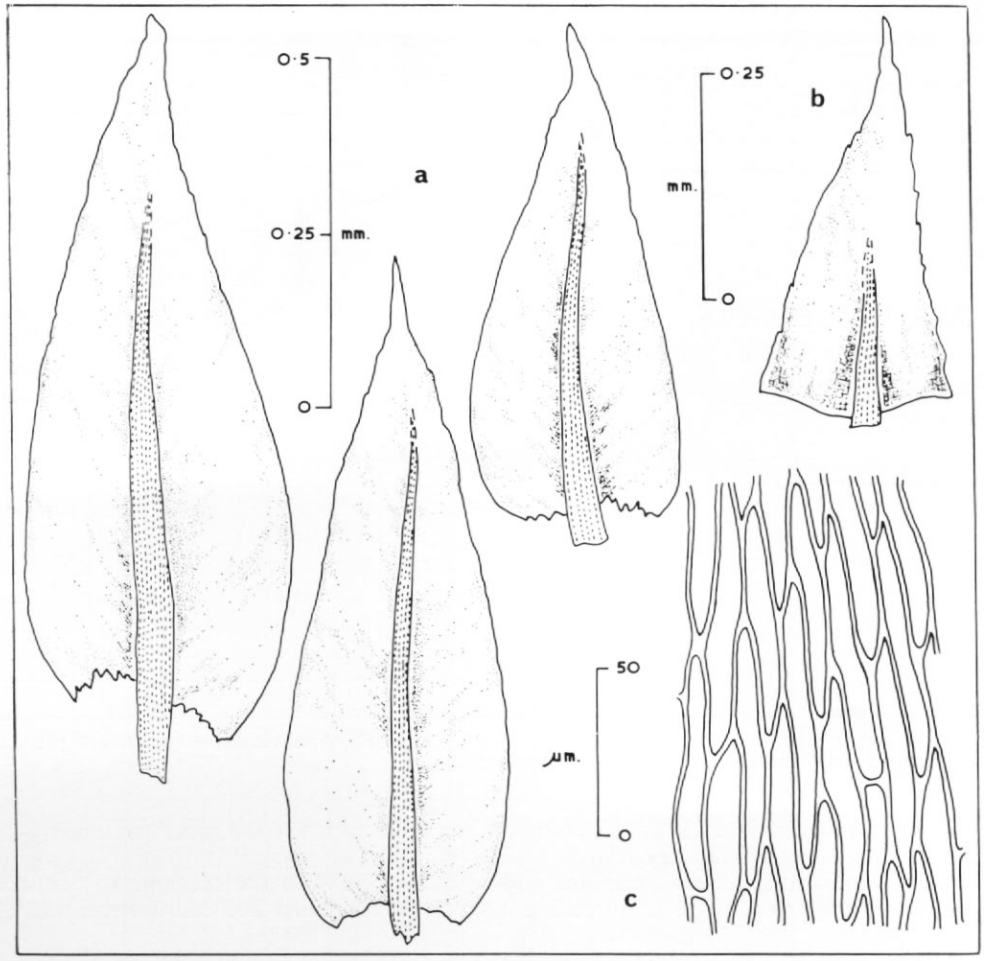

Fig. 9. *Mielichhoferia austro-georgica.*
a. Leaves; b. Apex; c. Cells.
Scales: upper left-hand for leaves; upper right-hand for apex; lower for cells.

Notes

This is a species which regularly fruits on South Georgia and the shape of the sporophytes, together with their lack of an outer peristome, are useful distinguishing features. Another field character is the abundant gemmiform inflorescences which appear to be borne laterally on the shoot and which have the bracts scarcely differentiated from vegetative leaves. These features will distinguish *M. austro-georgica* from any species of *Pohlia* with which it could be confused, and microscopic confirmation can be provided by the narrow lamina cells and the presence of asymmetric leaves.

There is a good deal of variability in the size and depth of turf in this species. At sea-level, where *M. austro-georgica* is found on rocks and cliff bases behind the shore, extensive deep turves may be formed by the build-up of successive years' growth. At higher altitudes the cushions formed in rock fissures may be very much shorter and restricted in area.

Taxonomy

This species, described by Müller (1890), has not been reported outside South Georgia where it was first collected by Will (type HBG, Ostseite des VexirBerges cum Blindis;

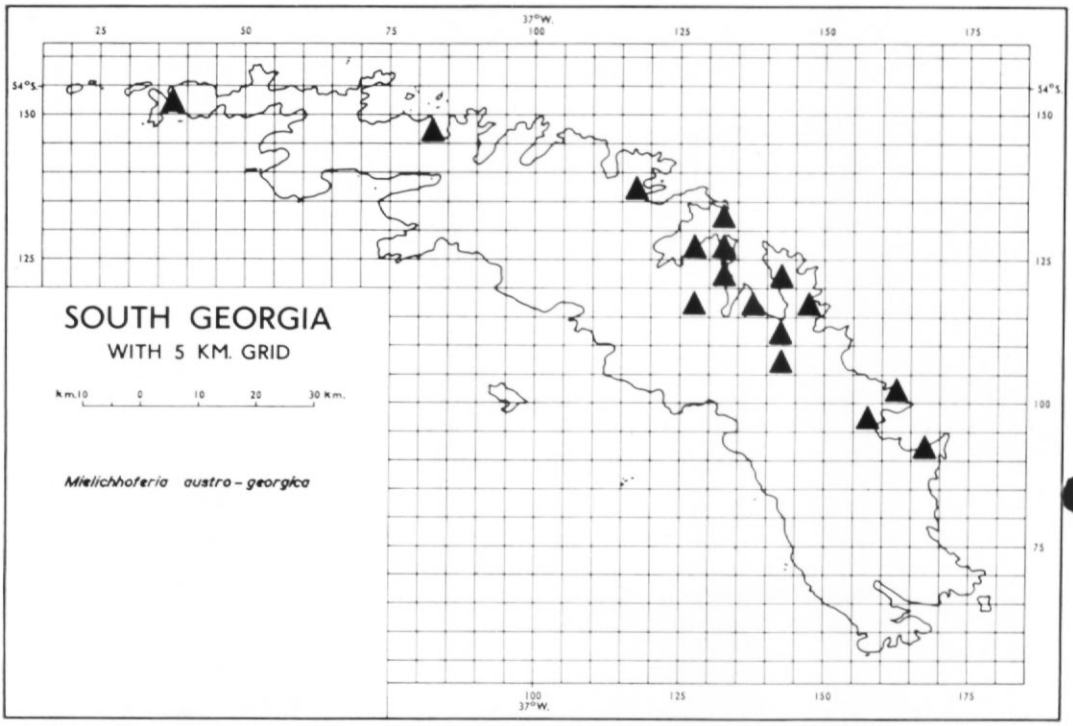

Fig. 10. The known distribution on South Georgia, by 5 km. squares, of *Mielichhoferia austro-georgica* based on the specimens and field records given in the Appendix.

G. Will M; Süd-Georgien, 1883). It could well occur in some of the more southerly island groups such as the South Orkney Islands.

The type specimen has been examined and it agrees well with the subsequently collected material in all important respects, including inflorescence position and cell dimensions.

Pohlia Hedw.

Erect, turf-forming plants. Leaves ovate to ovate-lanceolate, denticulate towards apex, border not thickened. Nerve failing to reach apex or sometimes percurrent. Cells linear-rhomboid to broadly hexagonal-rectangular, lax or incrassate. Capsule pendulous.

Key to species

1. Areolation lax, cells > 15 μm. wide and often over 20 μm. .. ***P. wahlenbergii*** var. ***glacialis***
   Areolation not lax, majority of cells < 15 μm. wide 2
2. Cells long, usually > 100 μm., sinuose, leaf insertion narrow; plants yellow-green, shining with metallic lustre 3
   Cells < 100 μm. long, not sinuose, leaf insertion not markedly narrowed; plants dull green or only slightly glossy 4
3. Plants in loose turves, leaves spreading .. .. ***P. cruda*** var. ***cruda***
   Plants in dense turves, leaves imbricate .. .. .. ***P. cruda*** var. ***imbricata***
4. Cells incrassate with walls 3 μm. thick or more; leaves not, or only slightly decurrent; fertile stems common, comose .. .. ***P. nutans***
   Cells thin walled with walls < 2 μm. thick; leaves longly decurrent; fertile stems uncommon, not comose .. .. ***P. inflexa***

Pohlia cruda (Hedw.) Lindb.

Syn. Bryum viridatum C. Muell.
Webera cruda (Hedw.) Fuernr.

Plants turf-forming or scattered amongst other bryophytes. Shoots 2–4 cm. high, red-brown below, glaucous green to yellowish above, with metallic lustre; branching irregular from base of stem. Leaves 1·1–3·2 by 0·5–1·0 mm., appressed to spreading, ovate to ovate-lanceolate, insertion narrow, variably concave. Margin weakly denticulate above, entire below. Nerve failing to reach apex, vinous red at base in mature leaves. Cells (95–) 110–135 (–160) by 9–11 (–14) μm., long and narrow, sinuose, with rounded ends and thin walls <2 μm. thick. Dioecious or synoecious. Perichaetial bracts linear-lanceolate, patent, the margin markedly revolute and dentate. Mature sporophytes unknown on South Georgia. (Fig. 11.)

var. *cruda*

Shoots scattered or forming loose turves, stems not julaceous. Leaves spreading, ovate-lanceolate, not, or only slightly concave. Margin not markedly revolute.

var. *imbricata* (Card.) Bartr.

Syn. Webera cruda var. *imbricata* Card.

Shoots generally forming dense turves, stems julaceous. Leaves imbricate, ovate, concave. Margin markedly revolute.

Habitat and distribution (Fig. 12)

P. cruda is a common species of rock crevices and ledges, showing a preference for sites with a southerly aspect. It has been found at altitudes from 0 to 830 m., but it is most frequent at intermediate altitudes. There is no apparent difference in habitat preference between var. *cruda* and var. *imbricata* but the latter is less common and has not yet been seen at altitudes of more than 600 m.

Notes

P. cruda is a distinctive species in its characteristic colour and leaf lustre. Vegetative shoots could be mistaken for *P. wahlenbergii*, but the areolation of these two species is quite different.

Greene and others (1970) reported that in the Antarctic botanical zone this species is represented solely by the var. *imbricata* while noting that one or two specimens examined approached var. *cruda*. On South Georgia, while plants referable to var. *cruda* are most frequent, julaceous specimens fitting the description of var. *imbricata* are not uncommon. However, some specimens show characters intermediate between the two varieties and there is a complete gradation of forms on the island. It would seem most likely that the imbricate plants represent a response to severe environmental conditions but, if this is so, the factors responsible are not immediately apparent. It might well be expected that the occurrence of imbricate plants would be correlated with such features as high altitude, but this does not appear to be the case since neither of the specimens from the highest altitudes (660 and 830 m.) show imbrication.

Sporophyte production is very rare on South Georgia and no mature capsules have been seen. Inflorescences, particularly females, are not uncommon, but gametangial maturation is abnormal and usually unsuccessful (Clarke and Greene, 1970).

Taxonomy

This species was first reported from South Georgia by Müller (1890) under the name *Bryum viridatum* C. Muell. Cardot (1908) pointed out that this taxon was identical to *P. cruda* and therefore reduced *B. viridatum* to synonymy. The type specimen of *Bryum viridatum* has not been located.

The type specimen of *P. cruda* has not been examined but detailed examination has shown that European and South Georgian specimens are remarkably similar in their morphology.

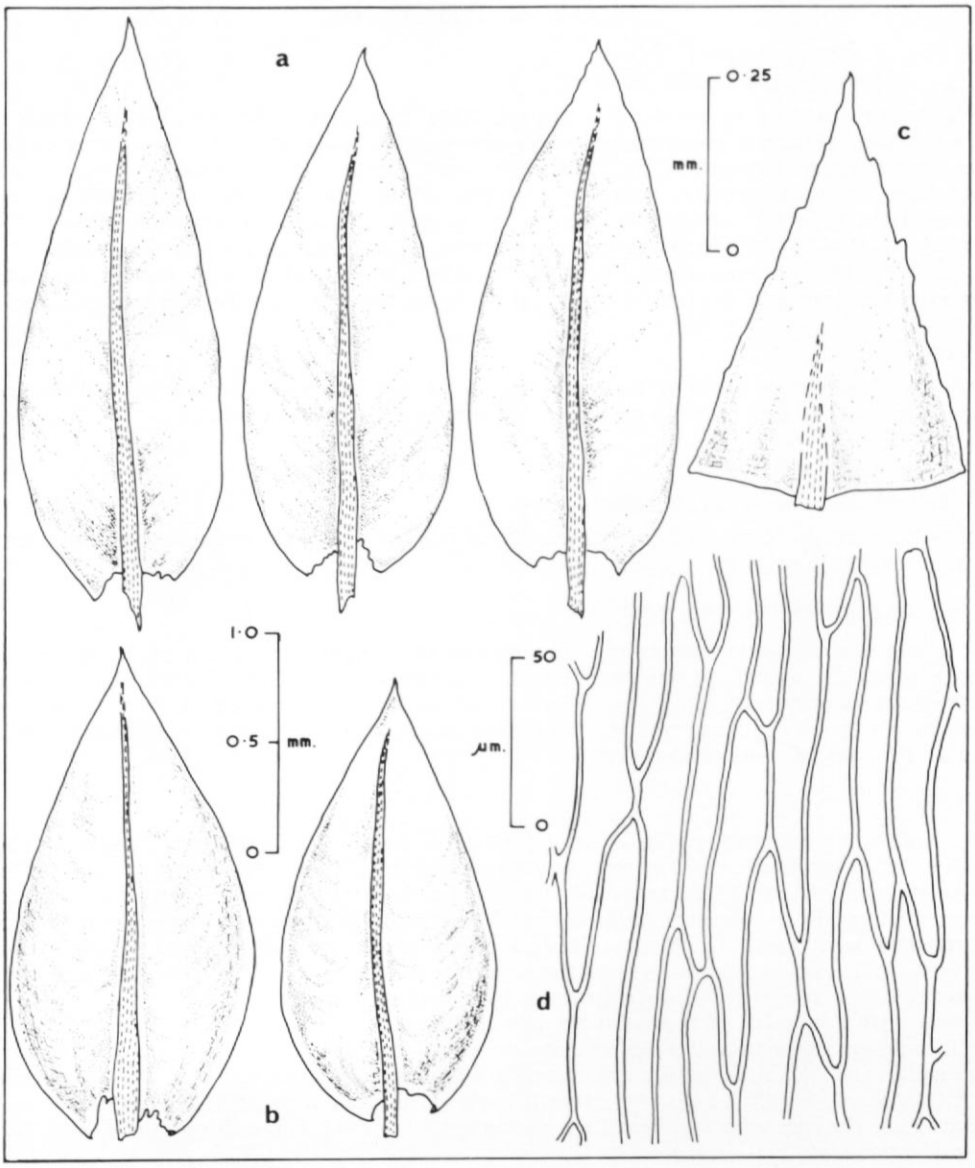

Fig. 11. *Pohlia cruda*.
a. Leaves of var. *cruda*; b. Leaves of var. *imbricata*; c. Apex; d. Cells.
Scales: upper for apex; lower left-hand for leaves; lower right-hand for cells.

The major difference is the presence on South Georgia of plants referable to var. *imbricata*, first described as *Webera cruda* var. *imbricata* by Cardot (1901) and later transferred to *Pohlia* by Bartram (1957).

This is the first report of var. *imbricata* from any latitude north of the South Orkney Islands. South Georgian specimens have been compared with the type specimen (Voyage de la Belgica No. 233a, PC, Canal de la Gerlache: XIème débarquement, sur les corniches de la falaise, dans les endroits détrempés, leg. Racovitza, 1 février 1898) and agree well although, as mentioned above, intermediates between this variety and the var. *cruda* have been seen.

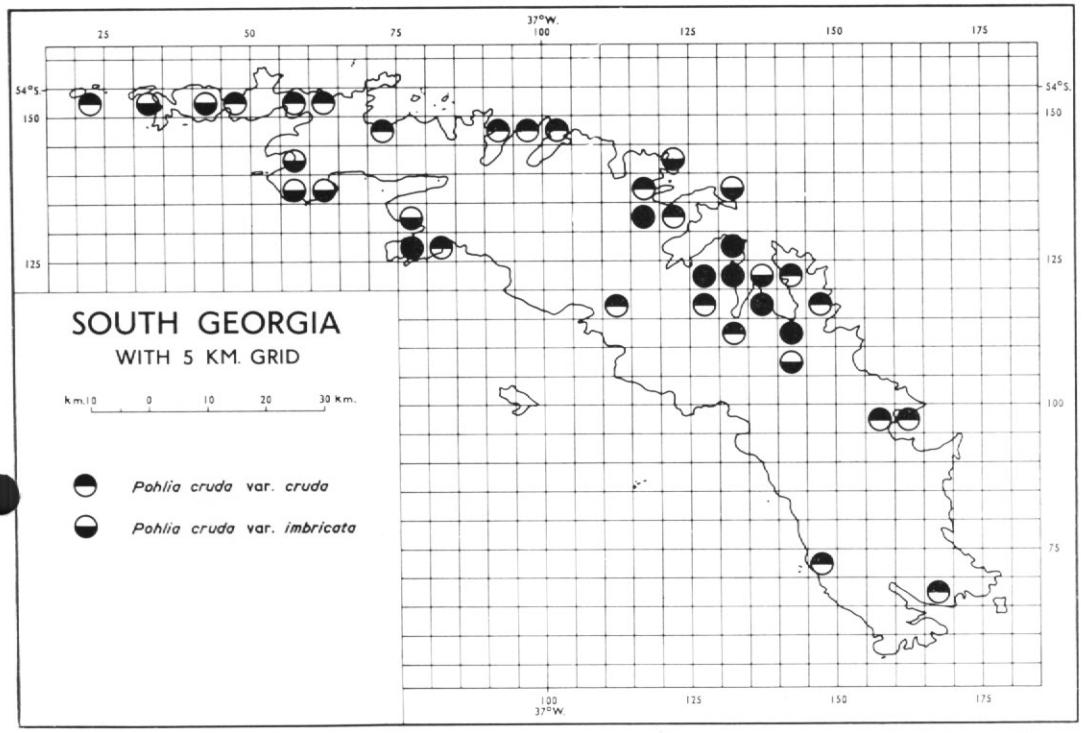

Fig. 12. The known distribution on South Georgia, by 5 km. squares, of *Pohlia cruda* based on the specimens and field records given in the Appendix.

Pohlia inflexa (C. Muell.) Wijk et Marg.

Syn. Bryum inflexum C. Muell.

Stems erect, 2–3 cm. high, forming loose, dull green turves often matted with dark brown rhizoids below; branching irregular from stem base, with leaves evenly and rather widely spaced, appressed when dry giving a catenulate appearance, spreading when moist. Leaves 1·0–2·5 (–2·7) by 0·5–0·9 mm., ovate or shortly ovate-lanceolate, apex broadly acute, V-shaped in section, longly decurrent. Margin frequently recurved below, slightly crenate at apex. Nerve failing to reach apex or sometimes percurrent. Cells (45–) 55–90 by 10–14·5 μm., elongate-hexagonal, normally with rounded ends, the longitudinal walls < 2 μm. thick. Reddish brown, ovoid bulbils occasionally present in upper leaf axils. Dioecious. Fertile shoots not comose. Seta 1·5–4 cm. Capsule pendulous, pyriform, exothecial cells irregular in outline, almost isodiametric, with incrassate, sinuose walls; outer peristome yellow to red, papillose, lamellae numerous; inner peristome hyaline, slightly papillose, segments perforate, basal membrane one-third height of peristome, cilia nodulose. (Fig. 13.)

Habitat and distribution (Fig. 14)

A common plant of stream sides and glacial outwash plains, typically growing on sandy or gravelly soil. Altitude 0–550 m.

Notes

P. inflexa is quite distinct from *P. nutans*, even in the vegetative state, but the characters separating them require careful examination. In vegetative plants the leaf shape and decurrence, and particularly the thin-walled cells of *P. inflexa*, are distinctive features, but if sporophytes

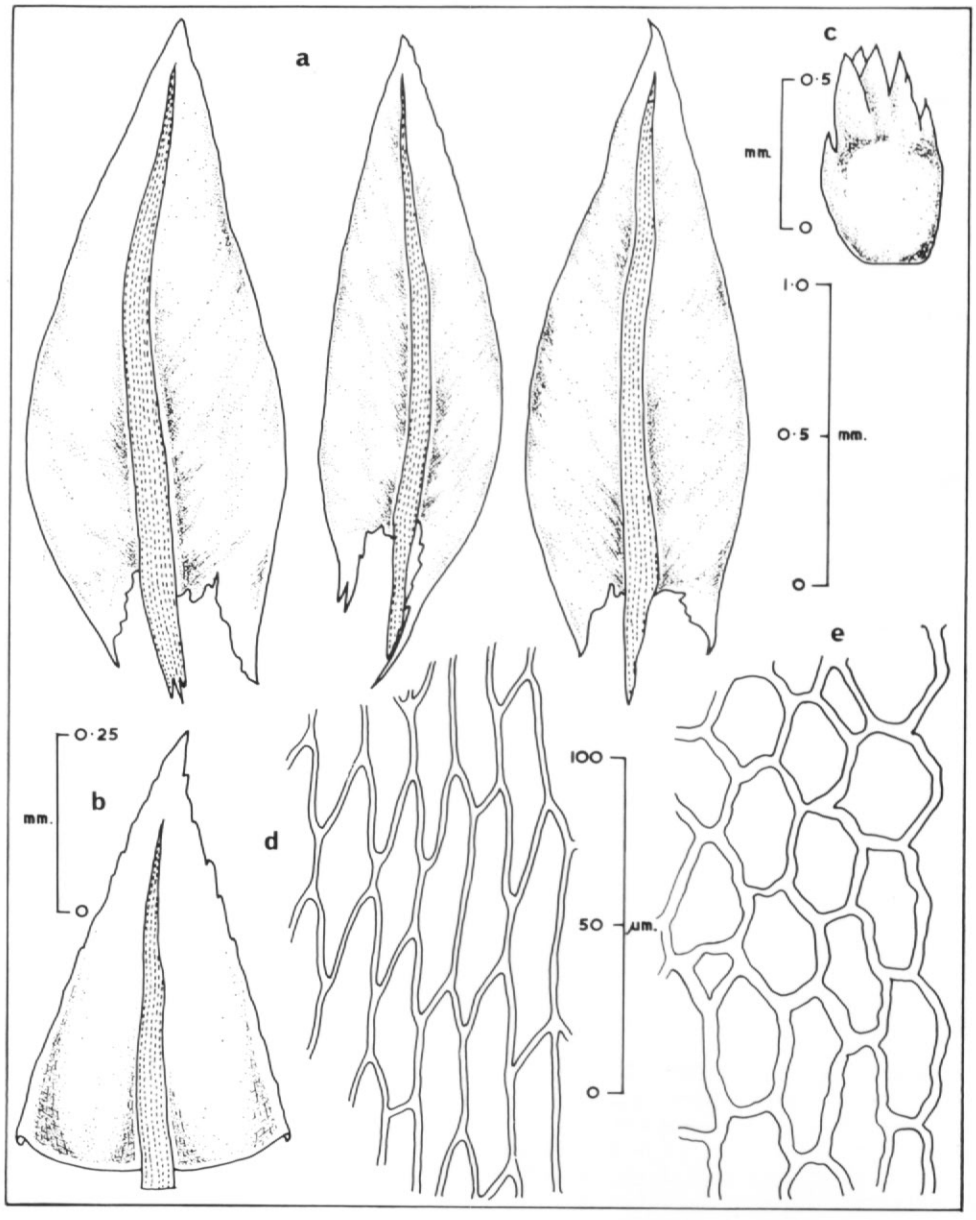

Fig. 13. *Pohlia inflexa*.
a. Leaves; b. Apex; c. Bulbil; d. Leaf cells; e. Exothecial cells.
Scales: upper for bulbil; median for leaves; lower left-hand for apex; lower right-hand for cells.

are present the shape and arrangement of the exothecial cells give the most decisive characters. *P. nutans* never bears bulbils.

Inflorescences and sporophytes are uncommon in this species and the main method of reproduction is presumably vegetative.

P. inflexa has not been reported from anywhere except South Georgia, but its ecological

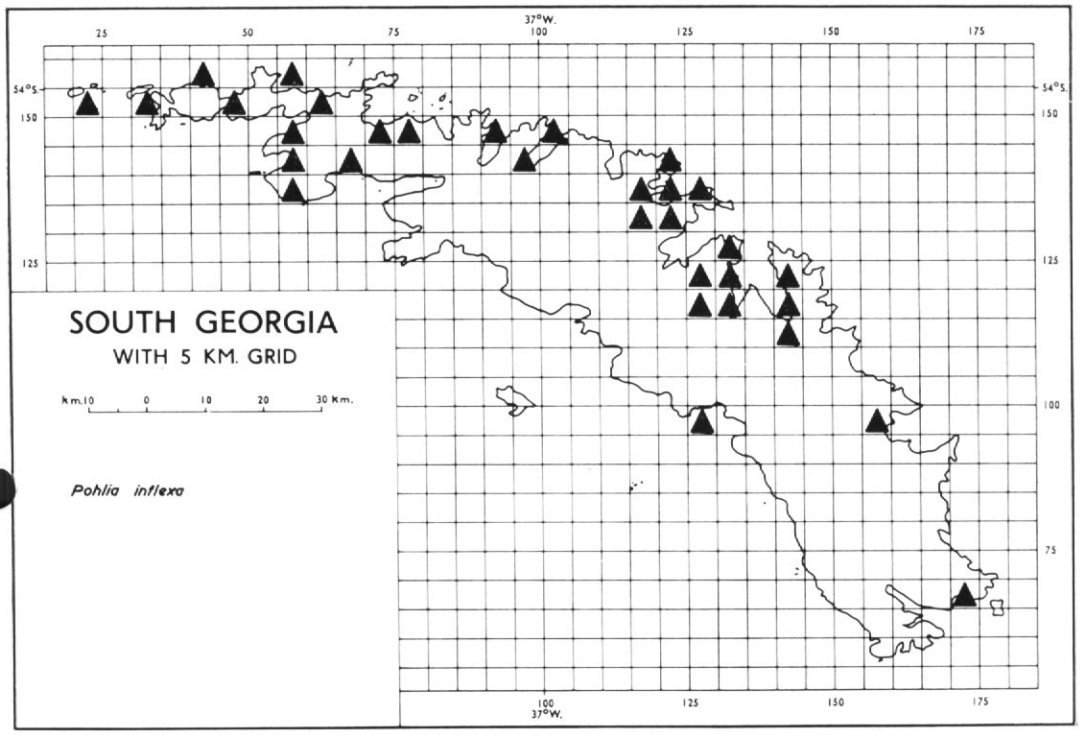

Fig. 14. The known distribution on South Georgia, by 5 km. squares, of *Pohlia inflexa* based on the specimens and field records given in the Appendix.

behaviour suggests that it could well occur elsewhere in the sub-Antarctic region or possibly even farther south.

Taxonomy

P. inflexa, an endemic species, was first described by Müller (1890) as *Bryum inflexum* C. Muell. for a specimen collected on South Georgia by Will; it was transferred to *Pohlia* by van der Wijk and Margadant (1965). Unfortunately it has not been possible to trace the type specimen or any authenticated material of this species. Nonetheless, Müller's description is sufficiently precise for there to be little doubt as to the identity of the plant. *P. inflexa* is reminiscent of some European species. For example, the bulbils are similar to those of *P. drummondii* (C. Muell.) Andrews, which has been reported from Patagonia (Cardot and Brotherus, 1923), while the leaf shape, as Dr. E. Nyholm (personal communication) has commented, is close to that of *P. minor* var. *gracilis* (Hopp. et Hornsch.) Wijk et Marg. (= *P. gracilis* Hopp. et Hornsch.).

Pohlia nutans (Hedw.) Lindb.

Syn. Webera nutans Hedw.
Bryum pulvinatum C. Muell.
Pohlia pulvinata (C. Muell.) Broth.
Webera pulvinata (C. Muell.) Par.

Shoots erect, 1–2 (–4) cm. high, forming dense, olive- or yellow-green, slightly glossy turves matted with brown rhizoids below. Stems usually branching from base, occasionally with innovations below inflorescence, with erect to spreading leaves arranged regularly along

vegetative stems but comosely arranged when fertile. Leaves 1·3–2·4 by 0·4–1·0 mm., ovate-lanceolate to lanceolate, apex acute. Margin weakly revolute below, denticulate towards apex, occasionally shortly decurrent. Nerve strong, percurrent or not reaching apex. Cells (40–) 50–85 by 9–14 μm., elongate-rectangular, usually with flat or oblique end walls, longitudinal walls incrassate, 3 μm. thick or more. Paroecious. Perichaetial bracts longer, narrower and margins more prominently denticulate than in vegetative leaves. Seta 1·5–4 cm. Capsule light brown, pendulous, pyriform to elongate-ovate, exothecial cells rectangular, elongate, thin-walled, arranged in rows. (Fig. 15.)

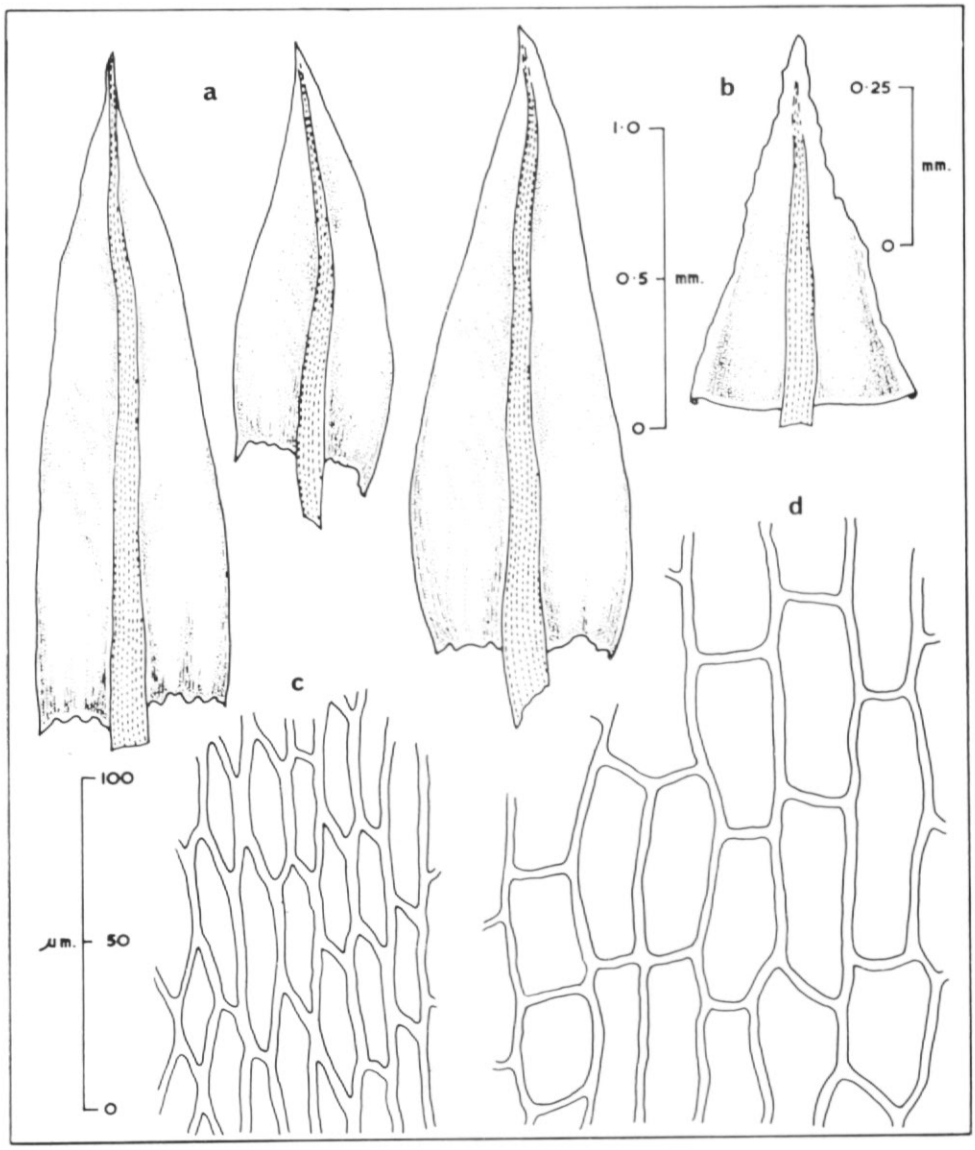

Fig. 15. *Pohlia nutans*.
a. Leaves; b. Apex; c. Leaf cells; d. Exothecial cells.
Scales: upper left-hand for leaves; upper right-hand for apex; lower for cells.

Habitat and distribution (Fig. 16)

Not a very common species on South Georgia, *P. nutans* is mainly confined to the coastal strip, where it grows on the bases of *Poa flabellata* tussocks. It may also be found on rock ledges, but has not been seen at high altitudes. Altitude 0–150 m.

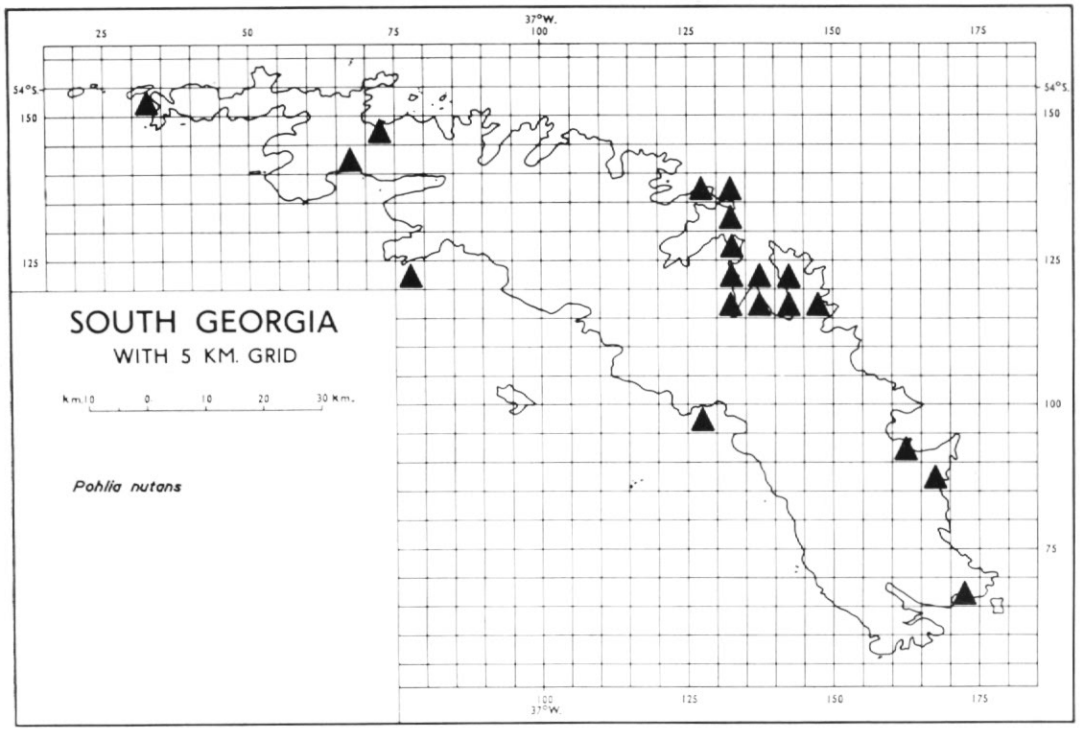

Fig. 16. The known distribution on South Georgia, by 5 km. squares, of *Pohlia nutans* based on the specimens and field records given in the Appendix.

Notes

The differences between this species and *P. inflexa* have been noted under the latter. The South Georgian specimens of the cosmopolitan *P. nutans* are very similar to those from other areas in their morphology but one unusual feature is the occasional production of deep turves which build up over several seasons and in which annual growth increments can clearly be seen. *P. nutans* is normally abundantly fertile on South Georgia.

Taxonomy

P. nutans was first reported from South Georgia (as *Webera nutans*) by Dixon (1935) from a specimen collected by Trøim. The species had, however, been collected before this by Skottsberg (Skottsberg 369, PC) but his specimens had been determined by Cardot (1908) as *Webera pulvinata* (C. Muell.) Par. This latter species was first described as *Bryum pulvinatum* by Müller (1890) from a collection made by Will on South Georgia (23 January 1883 "am Ausgange des Brockenthales"), a specimen which it has proved impossible to trace. The type description of *B. pulvinatum* agrees well with *P. nutans* in the characters of its vegetative organs, but it differs slightly in the details of peristome structure.

Cardot (1908), who had evidently examined the type specimen, commented that Müller's description of the inner peristome was not accurate and modified it accordingly. When these modifications are taken into account, the description fits that of *P. nutans* very well, although Cardot still applied Müller's name to the specimens collected by Skottsberg. Examination of

these specimens has shown that they do not differ in any important respect from *P. nutans* so it seems most likely that the plant examined by Müller was a specimen of *P. nutans* and that *Bryum pulvinatum* should be considered a synonym.

Pohlia wahlenbergii (Web. et Mohr) Andrews
var. *glacialis* (Schleich. ex Brid.) E. F. Warburg

Syn. Bryum amplirete C. Muell.
Bryum alticaule C. Muell.
Mniobryum alticaule (C. Muell.) Broth.
Webera alticaulis (C. Muell.) Par.

Plants forming deep, loose turves with erect, whitish or yellowish green shoots attaining 7 (–9) cm. in height at maturity; branches produced from the apical region of the previous year's shoots which become prostrate and matted with dark brown rhizoids. Leaves 0·9–2·3 by 0·6–1·3 mm., ovate to ovate-lanceolate, acute to almost obtuse, shortly decurrent. Margin indistinctly crenate at apex. Nerve extending almost to apex. Cells 85–140 by (13–) 15–24 μm., lax, widely elongate-hexagonal, narrowing towards margin, thin-walled. Dioecious. Inflorescences terminal, large, bracts spreading. Capsules light brown, pendulous to horizontal, wide mouthed, lacking annulus. (Fig. 17.)

Habitat and distribution (Fig. 18)

A widely distributed species of flushes and stream sides where it may form deep swards of considerable area. Altitude 0–350 m.

Notes

This species is one of the characteristic constituents of the vegetation of wet areas on South Georgia where common associates are *Philonotis acicularis* and *Philonotis vagans*. Of these species, *Philonotis acicularis* is the most abundant and in extensive swards it often forms a matrix through which stems of the others are interspersed. However, *P. wahlenbergii* var. *glacialis* can be found in pure swards of considerable extent but these are not common. All three species have considerable morphological similarity to one another and can easily be confused, especially in the field. A list of distinguishing features has been given above in the notes for *P. vagans*.

Reproduction in *P. wahlenbergii* var. *glacialis* must largely be accomplished by vegetative means—presumably fragmentation—since inflorescences and sporophytes are very infrequent.

Taxonomy

The correct application of a name to this taxon is complicated, but a good summary has been given by Warburg (1962).

The specimens of *P. wahlenbergii* collected on South Georgia are of the deep, erect, turf-forming type recognized as var. *glacialis* with the exception of one or two which were found growing in unusually shaded or disturbed habitats. It is hard to draw a definite distinguishing line between plants referable to var. *glacialis* and to var. *wahlenbergii*, but there is such a clear difference between the majority of the South Georgian specimens and the normal var. *wahlenbergii* as seen, for example, in lowland England that it seems useful to retain the taxonomic distinction at varietal level.

This is the first record of *P. wahlenbergii* from South Georgia, but the species has been recorded before under a number of different names. *Bryum amplirete* C. Muell. was described by Müller (1890) for a specimen collected on South Georgia. The type specimen (Will s.n. JE, Fuss des Krokisiusberges in einer Wasserrinne, 14.i.83, original) has been examined and the growth form, leaf shape and areolation fall well within the range of *P. wahlenbergii* var. *glacialis*. Indeed, Müller's description included no character that *P. wahlenbergii* var. *glacialis* does not show. Cardot (1908) has shown that it is impossible to distinguish *B. amplirete* from *B. alticaule* C. Muell. (= *Webera alticaulis* (C. Muell.) Par.) which had previously been described by Müller (1883), and he consequently recorded *W. alticaulis* from South Georgia.

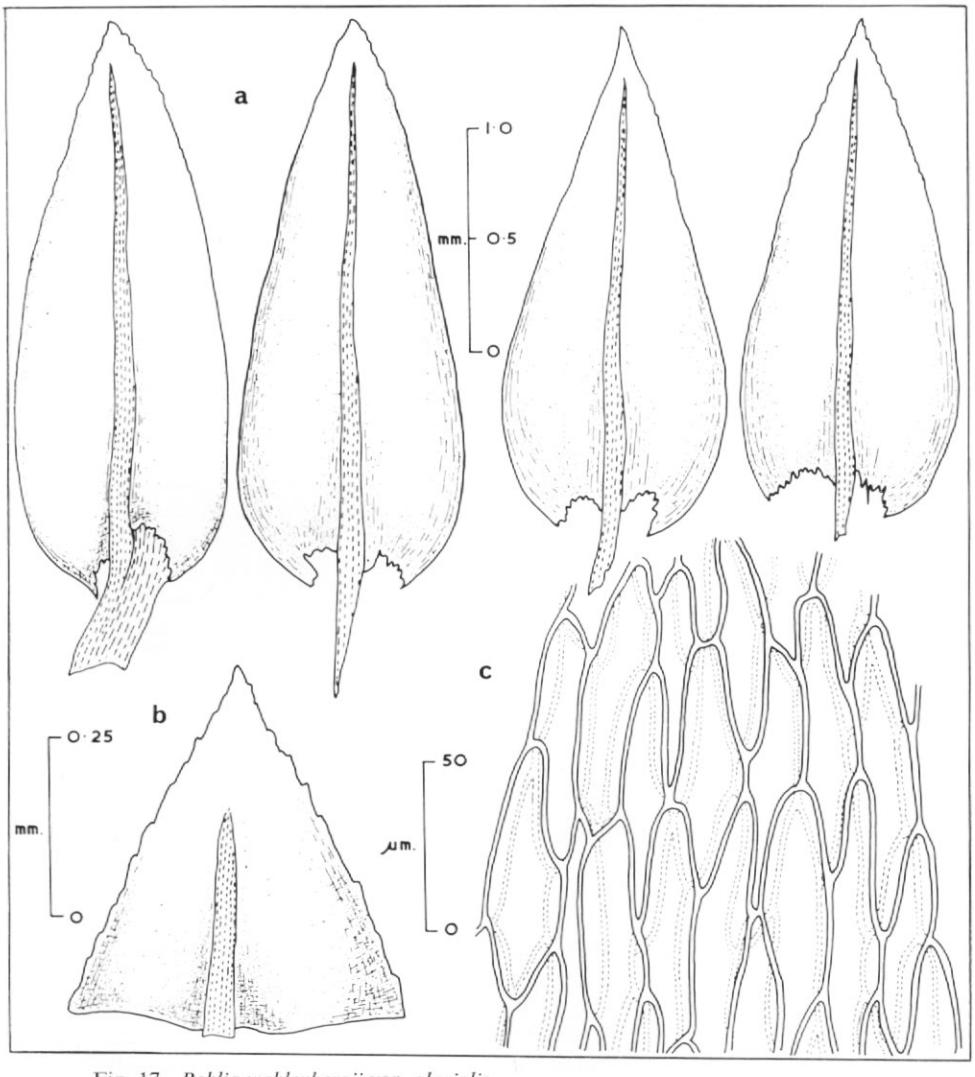

Fig. 17. *Pohlia wahlenbergii* var. *glacialis*.
a. Leaves; b. Apex; c. Cells.
Scales: upper for leaves; lower left-hand for apex; lower right-hand for cells.

The type specimen of this species (Dr. Naumann No. 16, BM, Magellans Strasse, Punta Arenas, 7.ii.76, Herb. Emil Bescherelle) has been examined and it is clear that Cardot was correct in considering *B. amplirete* synonymous with *B. alticaule*, but it is also clear that there is no character shown by either of these two species which cannot be attributed to *P. wahlenbergii* var. *glacialis* and that they should, therefore, be reduced to synonymy with this taxon.

Cardot and Brotherus (1923) recorded another related species, *Mniobryum austro-albicans* (C. Muell.) Broth., from South Georgia. This record is for a specimen collected by Skottsberg at Moraine Fjord, Cumberland Bay, which it has not been possible to trace. *M. austro-albicans* was originally described by Müller (1883) under the name *Bryum austro-albicans* and Müller stated that it was close to *Bryum albicans* (= *P. wahlenbergii*) but that it differed in its more slender stature and its smaller, narrower leaves. This description fits juvenile or etiolated

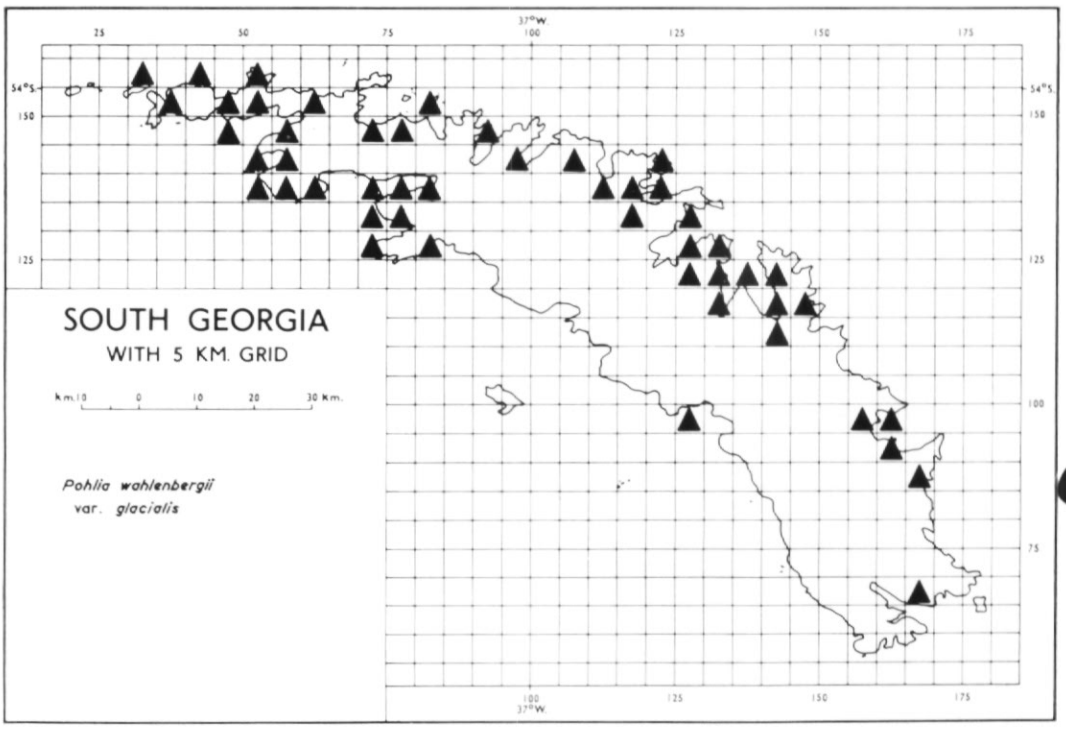

Fig. 18. The known distribution on South Georgia, by 5 km. squares, of *Pohlia wahlenbergii* var. *glacialis* based on the specimens and field records given in the Appendix.

specimens of *P. wahlenbergii* var. *glacialis* from South Georgia very closely and it seems likely that Skottsberg's specimen was such a plant. Unfortunately this must remain speculative until the specimen comes to light.

Acknowledgements

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APPENDIX

DETAILS OF THE SPECIMENS AND FIELD RECORDS FROM WHICH THE DISTRIBUTION FIGURES WERE COMPILED

The references to herbaria cited after each specimen follow those recommended by Lanjouw and Stafleu (1964) except that AAS has been used for specimens in the British Antarctic Survey herbarium, at present housed in the Department of Botany, University of Birmingham, and INACH has been used for the herbarium of the Instituto Antártico Chileno, Triana 849, Santiago de Chile. The six figures before the specimens or field records refer to the 5 km. squares of the distribution maps, eastings being cited before northings.

Field records have only been cited for those squares from which no permanent specimens exist, their numbers indicating their file order in the data bank associated with the Survey's herbarium. Field records were provided by the following people: T. V. Callaghan, 1967–68; G. C. S. Clarke, 1967–68; N. J. Collins, 1969–70; J. A. Edwards, 1969–70; D. M. Greene, 1967–68; S. W. Greene, 1967–68; R. I. L. Smith, 1969–70; D. W. H. Walton, 1969–70; E. P. Wright, 1969–70.

A print-out from the data bank of the collecting details for the specimens cited in this Appendix is available on request from the Botanical Section of the British Antarctic Survey.

Leptotheca gaudichaudii Schwaegr.

115 135 Greene 1460 (AAS, B, CHR, H, LE, NY, PC, PRE, S-PA, TNS). 120 135 Sladen JB19/18 (BM)
130 120 Clarke and Greene CG307 (AAS), Clarke and Greene CG378 (BM). 135 115 Clarke and Greene CG296 (B, BA, BM, MEL, PC, S-PA). 140 120 Clarke and Greene CG199 (AAS, CHR, LE, NY, PRE, TNS), Greene 962 (BA, BM, H, MEL, S-PA), Greene 1047 (AAS, CHR, LE, NY), R. Smith 1412 (AAS)
155 095 Greene 2192 (AAS, B, BA, CHR, H, INACH, LE, MEL, NY, PC, PRE, S-PA, TNS). 160 090 Clarke and Greene CG513 (B, BA, BM, H, MEL, PC, PRE, TNS)

Philonotis acicularis (C. Muell.) Kindb.

030 150 Greene 249 (BA, BM, MEL, PC, S-PA), Greene 308 (AAS, CHR, LE, NY, PRE). 030 155 Greene 420 (AAS, INACH, NY, PC, PRE, S-PA, TNS). 035 150 Greene 1096 (BA, BM, CHR, LE, MEL, TNS). 040 150 Greene 726 (AAS, CHR, INACH, NY, PC S-PA), Greene 732 (BA, BM, MEL, PRE, TNS). 040 155 Field record 2122. 045 145 Field record 2126. 045 150 Field record 2146
050 140 Field record 3127. 050 150 Field record 2155. 050 155 Greene 669 (AAS, PRE). 060 135 Field record 3142. 060 150 Field record 3018. 065 140 Field record 2996. 070 125 Field record 3188. 070 130 Field record 3064. 070 135 Field record 3080. 070 145 Greene 1242

(AAS, BA, CHR, INACH, LE, MEL, NY, PC, PRE, S-PA, TNS), Greene 1268 (BA, BM, MEL, PC), Greene 1269 (AAS, CHR, LE, NY, PRE, S-PA), Greene 1337 (BA, BM, INACH, LE, MEL, NY, PC, S-PA, TNS)

075 125 Field record 3116. 075 130 Field record 2932. 075 135 Field record 3197. 075 145 Field record 2915. 080 125 Greene 2684b (AAS), Greene 2715 (BM, CHR, INACH, LE, TNS). 080 135 Field record 2974. 080 140 Field record 2978. 085 145 Clarke and Greene CG515 (AAS). 095 140 Field record 2142. 095 145 Field record 2129

100 145 Field record 2131. 105 140 Field rceord 2158. 105 145 Field record 2157. 110 135 Longton 195 (AAS, CHR). 115 130 Longton 130 (AAS, NY, PC). 115 135 Greene 1408 (AAS, PRE), Greene 1415 (BM, INACH, S-PA, TNS), Greene 3136 (BA, BM, INACH, MEL, PC, PRE, S-PA, TNS), Greene 3233 (BA, BM, LE, MEL), Greene 3267 (AAS, BA, CHR, INACH, LE, MEL, NY, PC, PRE), Greene 3268 (BM, S-PA, TNS), Greene 3274 (AAS, CHR, LE, NY). 115 140 Field record 1057. 120 130 Greene 2987 (AAS, BA, CHR, LE). 120 135 Clarke and Greene CG480 (BA, BM, PC), Greene 3376 (AAS, CHR, LE), Greene 3415 (BM, MEL, NY, PC), Longton 81 (AAS, MEL, PRE), Sladen JB19/48 (BM). 120 140 Bonner 248 (BM), Clarke and Greene CG482 (AAS, NY), Greene 3165 (AAS, INACH, PRE, S-PA, TNS)

125 095 Greene 2535 (BM, INACH, S-PA, TNS), Greene 2537 (AAS, LE, PC, TNS), Greene 2551 (BA, BM, PRE). 125 115 Field record 2141. 125 120 Clarke and Greene CG331 (BM, LE, PRE, TNS), Greene 1555 (AAS, BA, CHR, INACH, MEL, NY, PC, S-PA, TNS). 125 125 Clarke and Greene CG491 (BM), Greene 2922 (AAS, CHR, INACH, LE, NY, S-PA). 125 130 Skottsberg 357 *pro parte* (S-PA, as *Philonotis varians* Card.), Skottsberg 358 *pro parte* (S-PA, as *Philonotis varians* Card.), Skottsberg 359 *pro parte* (S-PA, as *Philonotis varians* Card.), Skottsberg 361 *pro parte* (S-PA, as *Philonotis varians* Card.). 125 135 Clarke and Greene CG481 (AAS, BA, INACH, LE, MEL, NY, PC, PRE, S-PA, TNS). 130 110 Clarke and Greene CG490 (BM, CHR, LE, NY). 130 115 Clarke and Greene CG492 (AAS), Greene 185b (AAS), Greene 186 (BM, INACH, MEL, PC, S-PA). 130 120 Clarke and Greene CG187 (AAS, CHR, LE, PRE, S-PA), Clarke and Greene CG479 (BM, LE, PC, PRE), Clarke and Greene CG483 (AAS, BA, INACH, NY, S-PA), Clarke and Greene CG485 (AAS, CHR, MEL, TNS), Clarke and Greene CG486 (BM, CHR, INACH, LE, MEL, PC, PRE, S-PA, TNS), Clarke and Greene CG487 (AAS, BA, NY), Clarke and Greene CG488 (BM, CHR, LE, MEL, PC, PRE), Greene 135 (BA, BM, LE, NY, PC), Greene 136 (BA, BM, INACH, MEL, PC), Greene 157a (AAS, CHR, NY, PRE, S-PA, TNS), Greene 798 (AAS), Greene 1776 (BM, INACH, MEL, PRE, S-PA, TNS), Greene, 1839 (AAS, INACH, PC, TNS), Greene 1856 (BA, BM, MEL, NY), Greene 2093 (AAS, TNS), Skottsberg 356 (S-PA, as *Philonotis varians* Card. f. *robusta*), Sladen JB18/2 (BM, TNS), Sladen JB18/8 (BM), J. Smith M84 (AAS, CHR, LE). 130 125 Clarke and Greene CG318 (BM, CHR), Greene 1831b (BA, BM, INACH, NY, S-PA), Greene 2911 (AAS), Greene 3577 (AAS, BA, MEL, PC). 135 110 Clarke and Greene CG493 (BM). 135 115 Clarke and Greene CG489 (BM, INACH, PRE, S-PA). 135 120 Field record 1403. 140 110 Clarke and Greene CG441 (AAS, CHR, NY, S-PA). 140 115 Longton 291a (AAS). 140 120 Clarke and Greene CG484 (BM), Greene 570 (BA, BM, PC, PRE, TNS). 145 115 Greene 822 (BM, CHR, MEL, NY, PRE), Greene 872b (AAS, INACH, LE, MEL), Longton 238a (AAS, BA, S-PA)

155 095 Greene 2148 (AAS, PC), Greene 2155 (BM, INACH, PRE, S-PA), Greene 2177 (AAS, BA, INACH, PC, S-PA), Greene 2381 (AAS, CHR, INACH, LE, PC, TNS), Greene 2417 (AAS, LE, PRE, TNS). 160 060 Greene 2490 (BA, BM, MEL), Greene 2853b (AAS, TNS), Greene 2854 (BM, LE, NY). 160 090 Field record 1425. 160 095 Greene 2258 (BM, CHR, MEL, NY), Will s. n. (M, as *Meesia austro-georgica* C. Muell.), Will s. n. (M). 160 100 Greene 2360 (BM, CHR, MEL, NY, PC, S-PA). 165 090 Field record 1433. 170 065 Field record 1437

Inadequately localized

Austro-Georgia, 7.i.1910, Larsen s. n. (GB), Austro-Georgia, collector unknown (GB); Georgia austr. Morainfjorden, Cumberland Bay, 18.iv.1909, Skottsberg 47 (UPS); Géorgie du Sud, Cumberland Bay, 1902, Skottsberg 358 (BM, BM ex K)

Philonotis scabrifolia (Hook. f. et Wils.) Braithw.

030 150 Greene 359 (AAS, S-PA). 035 145 Field record 2120. 035 150 Greene 474 (AAS). 040 155 Field record 2123. 045 150 Field record 2152

050 135 Field record 3101. 050 140 Field record 3126. 055 135 Field record 3227. 055 140 Field record 3012. 055 145 Field record 3164. 055 150 Clarke and Greene CG41 (BM, NY, S-PA). 060 135 Field record 3148. 070 125 R. Smith 1361 (AAS). 070 130 Field record 3072. 070 135 Field record 3078. 070 145 Greene 1339 (BM). 070 155 Clarke and Greene CG50 (AAS, TNS)

075 125 Field record 3115. 075 130 Field record 2934. 075 135 Field record 3196. 075 145 Field record 2134. 080 145 Clarke and Greene CG3 (BA, BM, INACH, PC, PRE, S-PA). 095 145 Field record 2130

115 135 Longton 66 (BA, BM, CHR, INACH, LE, MEL, NY, PRE, TNS)

125 115 Field record 2137. 125 120 Field record 1073. 125 135 Clarke and Greene CG93 (AAS), Clarke and Greene CG116 (BM). 130 120 Clarke and Greene CG56 (AAS, BM, CHR, INACH, LE, MEL, NY, PC, S-PA, TNS), Clarke and Greene CG192 (AAS, BA, PRE, TNS), Clarke and Greene CG198 (BM, CHR, LE, PC), Greene 524 (AAS), Greene 794 (AAS, O), Longton 419 (BM,

LE, MEL, PC). 130 125 Bonner 271 (BM), Greene 1799 (AAS), Greene 1894 (BM, NY PC), Greene 2031 (AAS), J. Smith M70a (AAS), J. Smith M89b (AAS). 130 130 Clarke and Greene CG129 (AAS, BA, MEL, NY). 130 135 Clarke and Greene CG81a (AAS, BM). 135 115 Clarke and Greene CG215 (BM). 135 120 Bonner 224 (AAS, CHR, NY, PC, PRE). 140 105 Field record 3149. 140 110 J. Smith M91 (AAS), J. Smith M93 (BM, S-PA). 140 120 Field record 1417

155 095 Field record 1422. 160 060 Greene 2845 (AAS). 160 090 Field record 1426. 170 065 Field record 1438

Philonotis vagans (Hook. f. et Wils.) Mitt.

035 150 Greene 702 (AAS, CHR, LE, NY, PRE, S-PA). 045 145 Field record 2127. 045 150 Field record 2149

055 135 Field record 2951. 055 150 Clarke and Greene CG31 (BM, TNS). 055 155 Clarke and Greene CG459 (AAS, BA, MEL), Clarke and Greene CG460 (INACH, PC, S-PA). 065 140 Field record 2998

075 125 Field record 3105. 080 125 Greene 2714 (BM, CHR, PC), J. Smith M104 (AAS), J. Smith M107 (AAS, NY)

115 130 Longton 140 (BM, NY). 115 135 Clarke and Greene CG461 (AAS, BA, LE, MEL, PRE), Greene 1409 (AAS, S-PA), Greene 3018 (BM, LE, PC, TNS), Greene 3237 (BM, INACH, TNS). 120 130 Greene 2962 (AAS, CHR). 120 135 Greene 3378 (BM, MEL), Longton 53 (AAS, BA, CHR, LE, NY, PC, S-PA)

125 125 Clarke and Greene CG474 (AAS). 125 130 Skottsberg 361 (S-PA), Skottsberg 412 (S-PA, as *Philonotis vagans* var. *inundata* Card.). 130 115 Clarke and Greene CG475 (AAS, PC). 130 120 Clarke and Greene CG462 (AAS, INACH), Clarke and Greene CG470 (BM, PC, S-PA), Clarke and Greene CG471 (BA, BM, PRE), Clarke and Greene CG472 (AAS, BA, CHR, INACH, LE, MEL, NY, PC), Clarke and Greene CG473 (BM, PRE, S-PA, TNS). 130 125 Clarke and Greene CG463 (BM), Clarke and Greene CG464 (BM, LE, S-PA, TNS), Clarke and Greene CG465 (AAS, PC), Clarke and Greene CG466 (BM, NY), Clarke and Greene CG467 (AAS), Clarke and Greene CG468 (BM), Clarke and Greene CG476 (AAS, BA), Clarke and Greene CG477 (AAS, CHR, INACH, PRE), Greene 1891 (BM, CHR, MEL), Sladen JB26/1 (BM). 135 115 Clarke and Greene CG469 (AAS, CHR, LE, NY, PC, PRE, S-PA, TNS). 140 120 Greene 551 (AAS, CHR, INACH, MEL, PRE, TNS), Greene 567 (BA, BM). 145 110 Longton 376 (AAS, NY, S-PA). 145 115 Greene 847 (BA, BM, INACH, MEL), Greene 895 (AAS, INACH, MEL), Longton 329b (BM)

155 095 Greene 2154 (BM), Greene 2370 (BA, BM, MEL), Greene 2377 (AAS, PC), Greene 2378 (BM, INACH, TNS). 160 060 Greene 2489 (AAS, CHR, LE, NY, PRE, S-PA), Greene 2853a (AAS). 160 090 Clarke and Greene CG478 (AAS)

Mielichhoferia austro-georgica C. Muell.

035 150 Greene 683 (AAS)

080 145 Clarke and Greene CG16 (AAS)

115 135 Greene 1459 (AAS, BA, BM, CHR, INACH, LE, MEL, NY, PC, PRE, S-PA, TNS), Longton 77 (BM, CHR, LE, NY, PRE, S-PA)

125 115 Field record 2136. 125 125 Greene 2928 (AAS). 130 120 Clarke and Greene CG494 (AAS, CHR, LE, NY), Clarke and Greene CG495 (BA, BM, INACH, MEL, PC, PRE, S-PA, TNS), Clarke and Greene CG496 (BM, TNS), Clarke and Greene CG498 (AAS), Clarke and Greene CG499 (BA, BM, INACH, MEL, NY, PC, S-PA, TNS), Clarke and Greene CG501 (BM, PC), Clarke and Greene CG502 (AAS), Clarke and Greene CG503 (AAS), Clarke and Greene CG504 (AAS, INACH, S-PA, TNS), Clarke and Greene CG505 (BA, BM, CHR, LE, MEL, NY, PC, PRE), Clarke and Greene CG506 (AAS), Clarke and Greene CG507 (BM, CHR, NY), Clarke and Greene CG508 (AAS), Clarke and Greene CG510 (BM). 130 125 Greene 89 (BM), Greene 1896 (AAS), Greene 3480 (BA, BM, INACH, LE, MEL, NY, PC, PRE), Longton 440 (AAS, CHR, INACH, PRE, S-PA). 130 130 Clarke and Greene CG100 (AAS, MEL). 135 115 Clarke and Greene CG500 (BM). 140 105 Field record 3153. 140 110 Clarke and Greene CG509 (AAS, S-PA, TNS). 140 120 Greene 958a (BA, BM, CHR, INACH, LE, NY, PRE), Greene 1049 (AAS, BA, BM, CHR, INACH, LE, MEL, NY, PC, PRE, S-PA, TNS). 145 115 Greene 902 (BM, INACH)

155 095 Greene 2180 (BM, INACH, MEL, TNS), Greene 2197 (AAS, CHR, LE, NY, PRE, S-PA), Greene 2409 (AAS, PC). 160 100 Greene 2438 (AAS). 165 090 Clarke and Greene CG512 (BA, BM, INACH, MEL, PC, TNS)

Inadequately localized

Walls of cave on beach, Royal Bay, 19.x.1957, Bonner 203 (AAS, BA, TNS), Süd-Georgien, 1883, Will s. n. (M), Ostseite des VexirBerges cum Blindis, Will s. n. (HBG)

Pohlia cruda (Hedw.) Lindb. var. *cruda*

020 150 Field record 2163

045 150 Field record 2171

055 150 Clarke and Greene CG670 (AAS), Clarke and Greene CG671 (BM, PC). 060 150 Field record 3058. 070 145 Greene 1192a (AAS)

075 125 Field record 3106. 080 125 Greene 2644 (AAS, BA). 090 145 Clarke and Greene CG718 (AAS), Greene 1686 (BM). 095 145 Field record 2128
100 145 Field record 2132. 110 115 Lynch 6a (AAS). 115 130 Longton 131 (BM, PRE, TNS). 115 135 Longton 208 (AAS, LE). 120 130 Greene 2953 (AAS)
125 115 Field record 2138. 125 120 Clarke and Greene CG677 (AAS, INACH, LE). 130 110 Clarke and Greene CG676 (BA, BM). 130 120 Clarke and Greene CG673 (AAS, CHR, NY, S-PA), Clarke and Greene CG713 (BM, LE, PC, PRE), Greene 172 (AAS), Greene 1840 (AAS, CHR). 130 125 Clarke and Greene CG672 (BM, TNS), Clarke and Greene CG714 (AAS), Greene 100 (AAS), Greene 118 (BM), Greene 601 (BM), Greene 1784 (AAS), Greene 1793a (BM), Greene 1889 (BM, NY), Greene 2022a (AAS), J. Smith M2c (BM), J. Smith M70b (AAS), J. Smith M89c (AAS). 135 115 Clarke and Greene CG675 (AAS, MEL). 140 110 Clarke and Greene CG711 (BM, CHR, NY, S-PA). 140 120 Clarke and Greene CG674 (BM), Greene 998 (BM, S-PA). 145 070 Greene 2769 (BM). 145 115 Greene 904 (AAS)
155 095 Field record 2164. 160 095 Greene 2338 (BM, INACH, PC). 165 065 Field record 2168

Pohlia cruda (Hedw.) Lindb. var. *imbricata* (Card.) Bartr.

030 150 Greene 361 (AAS, BA, LE, NY, MEL). 040 150 Greene 742 (BM)
055 135 Field record 2952. 055 140 Field record 3013. 060 135 Field record 3141
075 125 Field record 3118. 075 130 Field record 2931
115 130 Greene 3075 (BM). 120 140 Clarke and Greene CG681 (AAS)
125 120 Clarke and Greene CG685 (BM, CHR, PC). 130 120 Clarke and Greene CG678 (BM, PRE), Clarke and Greene CG683 (BM), Clarke and Greene CG698 (AAS, MEL). 130 125 Clarke and Greene CG680 (AAS, BA, INACH, NY, TNS), Clarke and Greene CG699 (BM, S-PA, TNS), J. Smith M68g (AAS). 130 135 Clarke and Greene CG679 (BM, S-PA). 135 115 Clarke and Greene CG682 (AAS). 135 120 Clarke and Greene CG684 (AAS, CHR, LE, PC). 140 105 Field record 3150. 140 110 Clarke and Greene CG710 (AAS), Clarke and Greene CG712 (AAS)

Pohlia inflexa (C. Muell.) Wijk et Marg.

020 150 Field record 2162
030 150 Greene 378 (AAS). 040 155 Field record 2124. 045 150 Field record 2153
055 135 Field record 2953. 055 140 Field record 3056. 055 145 Field record 3163. 055 155 Greene 665 (AAS, S-PA). 060 150 Field record 3020. 065 140 Field record 3003. 070 145 Bonner 178 (AAS, LE, S-PA), Greene 1192b (AAS, BA, CHR, INACH, PRE, TNS), Greene 1241 (BA, BM, INACH, LE, MEL, NY, PC, PRE, S-PA, TNS), Greene 1324 (AAS, BA, CHR, INACH, PRE, TNS)
075 145 Field record 2914. 090 145 Greene 1725 (AAS, NY), Greene 1729 (BA, BM, CHR, INACH, LE, PC, PRE, S-PA), Greene 1730 (AAS, MEL, TNS). 095 140 Field record 2144
100 145 Field record 2133. 115 130 Greene 3077 (BM). 115 135 Cragg 10 (DHM), Greene 1399 (BM). 120 130 Greene 2961 (BM). 120 135 Field record 3218. 120 140 Greene 3347 (AAS, INACH, MEL, NY, PC, PRE, S-PA, TNS), Greene 3348 (BA, BM, CHR, LE, PRE, S-PA)
125 095 Greene 2558b (AAS). 125 115 Field record 2140. 125 120 Clarke and Greene CG662 (AAS, BM, TNS), Clarke and Greene CG696 (AAS, BA, PRE), Greene 1528 (AAS). 125 135 Clarke and Greene CG98. 130 115 J. Smith M35 (AAS). 130 120 Clarke and Greene CG657 (AAS, BA, CHR, MEL, S-PA), Clarke and Greene CG658 (AAS, S-PA), Clarke and Greene CG659 (BM, CHR, LE, PC, S-PA), Clarke and Greene CG661 (BM, MEL, NY), Clarke and Greene CG664 (BM, INACH, LE, NY, PRE, TNS), Clarke and Greene CG701 (BM, INACH), Clarke and Greene CG702 (AAS, CHR, INACH, LE, MEL, NY, PC, TNS), Greene 157b (BM, LE, NY, PC, TNS), Greene 589 (BM), Trøim 121 (BM). 130 125 Clarke and Greene CG660 (AAS, BA, PC), Greene 105 (BM, INACH, MEL, S-PA), Greene 1793b (BM, MEL), Greene 1825 (AAS), Greene 1831a (BM), Greene 3453 (AAS, BA), J. Smith M28 (AAS, PC). 140 110 Field record 2172. 140 115 Longton 289 (BM, CHR, NY). 140 120 Greene 1050 (BM, CHR, LE, MEL, NY, PC, S-PA, TNS)

155 095 Greene 2169 (AAS), Greene 2376 (BM). 170 065 Field record 2169

Pohlia nutans (Hedw.) Lindb.

030 150 Greene 246 (BM), Greene 248 (AAS), Greene 319 (BM)
065 140 Field record 2995. 070 145 Bonner 176 (AAS), FIDS Misc. 16 (AAS), Greene 1231 (BM)
075 120 Field record 3123
125 095 Greene 2558a (BM, LE). 125 135 Clarke and Greene CG667 (AAS). 130 115 Greene 188 (BA, BM, CHR, NY). 130 120 Clarke and Greene CG707 (BM, CHR, LE, PC), Clarke and Greene CG709 (AAS, INACH, MEL, TNS), Greene 180 (AAS, BA, PRE), Greene 2090 (AAS, BA, CHR, INACH, MEL, NY, PRE, TNS), Greene 3439 (AAS, LE, PC, S-PA), Skottsberg 39 (S-PA, as *Webera pulvinata* (C. Muell.) Par.), Skottsberg s. n. (BM, as *Webera pulvinata* (C. Muell.) Par.). 130 125 Cameron and Kennett 17b (AAS), Clarke and Greene CG697 (AAS), Clarke and Greene CG708 (BM, CHR, NY, S-PA), Skottsberg 369 (S-PA, as *Webera pulvinata* (C. Muell.) Par.). 130 130 Clarke and Greene CG666 (BM, PC). 130 135 Clarke and Greene CG665 (AAS, S-PA), J. Smith M79 (AAS). 135 115 Clarke and Greene CG669 (AAS, BA, CHR, INACH, LE, MEL, NY, PC, S-PA), Clarke and Greene CG704 (BM), Clarke and Greene CG706 (BM, PRE, TNS). 135 120

Clarke and Greene CG705 (AAS, LE). 140 115 Longton 252 (BA, BM, INACH, PC, S-PA, TNS). 140 120 Clarke and Greene CG668 (BA, BM, INACH, MEL, NY, PRE, TNS), Greene 932 (AAS, INACH, MEL, PRE), Longton 349 (AAS, CHR, LE, PRE). 145 115 Greene 808 (AAS, MEL, NY, PC, S-PA, TNS), Greene 813 (BM)

160 090 Field record 2166. 165 085 Cameron and Kennett 7 (BM). 170 065 Field record 2170

Pohlia wahlenbergii (Web. et Mohr) Andrews var. *glacialis* (Schleich. ex Brid.) E. F. Warburg

030 155 Greene 419 (BM, CHR, PC, PRE, S-PA, TNS). 035 150 Greene 489 (AAS, BA, CHR, INACH, PC, PRE, S-PA, TNS), Greene 518 (BM, LE, MEL, NY), Greene 699 (AAS, INACH, LE, PRE, TNS), Greene 1095 (AAS, BA, CHR, INACH, LE, MEL, NY, TNS). 040 155 Field record 2121. 045 145 Field record 2125. 045 150 Field record 2145

050 135 Field record 3102. 050 140 Field record 3128. 050 150 Field record 2154. 050 155 Field record 2156. 055 135 Field record 2950. 055 140 Field record 3055. 055 145 Field record 3173. 060 135 Field record 3143. 060 150 Field record 3019. 070 125 Field record 3182. 070 130 Field record 3065. 070 135 Field record 3081. 070 145 Greene 1246 (BM, NY), Greene 1303 (AAS, CHR, MEL, PC, PRE, S-PA)

075 130 Field record 2933. 075 135 Field record 3198. 075 145 Field record 2135. 080 125 Greene 2684a (AAS). 080 135 Field record 3033. 080 150 Field record 2988. 090 145 Clarke and Greene CG719 (BM, MEL), Greene 1726 (BM, CHR). 095 140 Field record 2143

105 140 Field record 2159. 110 135 Longton 197 (BM). 115 130 Greene 3108 (BM, LE, NY, PRE, TNS). 115 135 Greene 1414 (BM), Greene 3232 (AAS), Greene 3266 (AAS). 120 135 Greene 3385 (BM). 120 140 Bonner 246 (BM)

125 095 Greene 2533 (BM), Greene 2534 (AAS, BA, INACH). 125 120 Clarke and Greene CG717 (BM, LE, PC). 125 125 Clarke and Greene CG691 (BM), Greene 1551 (AAS, CHR, MEL). 125 130 Skottsberg 357 *pro parte* (S-PA), Skottsberg 358 *pro parte* (S-PA), Skottsberg 359 *pro parte* (S-PA, as *Webera ampliretis* (C. Muell.) Par.), Skottsberg 361 *pro parte* (S-PA, as *Webera ampliretis* (C. Muell.) Par.). 130 115 Clarke and Greene CG690 (AAS, BA), Clarke and Greene CG692 (AAS, S-PA), Greene 185a (AAS, BA, INACH), J. Smith M18a (AAS), J. Smith M96 (AAS). 130 120 Bonner 249 (BM), Clarke and Greene CG686 (AAS, NY), Clarke and Greene CG687 (BA, BM, INACH, LE, MEL, PC, PRE, S-PA, TNS), Clarke and Greene CG689 (BM, CHR, INACH, LE, NY, PC, PRE), Clarke and Greene CG700 (AAS, CHR, MEL, S-PA), Trøim 24 (BM, as *Mniobryum alticaule* (C. Muell.) Broth.), Trøim 74 (BM, as *Mniobryum alticaule* (C. Muell.) Broth.). 130 125 Clarke and Greene CG695 (AAS, BA, INACH, NY, PRE, TNS), Clarke and Greene CG715 (BM, CHR), Greene 2022b (AAS), Greene 3454 (AAS, BA, CHR, INACH, PRE, S-PA). 135 120 Clarke and Greene CG693 (BM, TNS), Clarke and Greene CG694 (AAS). 140 110 Clarke and Greene CG716 (AAS). 140 115 Longton 290 (BM, PC), Longton 291b (BM). 140 120 Clarke and Greene CG688 (AAS), Greene 1021 (BA, BM, INACH, PC, PRE, S-PA). 145 115 Greene 843 (BA, BM, MEL, PC), Greene 872a (AAS, S-PA), Longton 238b (AAS, MEL, NY), Longton 329a (AAS)

155 095 Greene 2106 (AAS, NY), Greene 2194 (BM, PC, S-PA, TNS). 160 090 Field record 2165. 160 095 Greene 2271 (AAS, LE, MEL), Will s. n. (JE, as *Bryum amplirete* C. Muell.). 165 065 Field record 2167. 165 085 Bonner 196 (AAS)