

A SYNOPTIC FLORA OF SOUTH GEORGIAN MOSSES:

V. *Willia* AND *Racomitrium*

By B. G. BELL

ABSTRACT. The species from South Georgia belonging to the genera *Willia* and *Racomitrium* are described, a key for the latter genus, and short historical notes on taxonomy for all species, being provided. Habitat and distribution data for each species together with full lists of all specimens examined are also given. *Willia grimmiioides* C. Muell. is reduced to synonymy with *W. austro-leucophaea* (Besch.) Broth. *Racomitrium austro-georgicum* Par. and *R. heterostichoides* Card., previously synonyms of *R. crispulum* (Hook. f. et Wils.) Hook. f. et Wils., are considered to merit specific rank, while *R. crispulum* (Hook. f. et Wils.) Hook. f. et Wils. var. *rupestre* (Hook. f. et Wils.) Dix. is reported for the first time from the island.

ONLY a single species of *Willia* is known from South Georgia, the species being locally frequent in moist bryologically rich rock crevices. By contrast, the eight species of *Racomitrium* form an important constituent of the island's vegetation and occupy a wide variety of habitats including *Festuca erecta* grassland and moist to dry rock surfaces. Identification to genus is not difficult but in either case some confusion might arise with species of *Grimmia* and in the case of *Willia* also with species of *Tortula*. The best distinguishing characters are considered below and a key is provided to the species of *Racomitrium*.

The arrangement of the text, the descriptions of species and the citation of specimens and field records follows the format of earlier papers in this series (Greene, 1973, Newton, 1974) but it should be noted that in addition to the collections cited by Greene (1973, table IV) reference is made to the author's recent material. The B. G. Bell (1971-72) Collection, which comprises 1,393 numbers, was obtained during 1971-72 from a variety of localities mainly on the north-east coast, although visits were made to other parts of the island. Greene (1973, fig. 2) summarized on a map of South Georgia all the grid squares from which bryophytes are known to have been collected but the following seven, with the localities visited by the author or in the case of 155 055 by R. Webb, are additional to those given by Greene:

Grid square	Locality
155 055	Coastal area above southern shores of Rogged Bay.
155 100	Valley west of Mount Krokisius.
160 055	Coastal area on east side of Doubtful Bay.
165 075	Coastal area between Herz Glacier and Müller Point, Iris Bay.
165 080	Coastal area and high ground to south of Bertrab Glacier, Gold Harbour.
170 070	Coastal area west and south of Wirik Bay.
175 070	Coastal area and high ground on north side of Cape Vahsel.

POTTIACEAE

Willia C. Muell.

This genus, first described for material from South Georgia, is characterized by having a hyaline portion of lamina forming the apex of most vegetative leaves, and capsules which are immersed with the calyptra base divided into several rounded lobes. It is represented by a single species on South Georgia.

Willia austro-leucophaea (Besch.) Broth.

Syn. Willia grimmiioides C. Muell.

Stems forming short compact cushions 1-2.5 (-5) cm. high, green above, black below, regularly dichotomously and fastigiate branched, the branch leaves crowded, imbricate, when moist erecto-patent, when dry erect. Leaves (1.3-) 2.1-2.7 (-3.4) (including hair point) \times (0.5-) 0.6-0.9 mm., oblong-spathulate from a narrow base, weakly pandurate, apex obtuse and hyaline in upper leaves, abruptly produced into a long hyaline weakly denticulate

hair point. Lamina concave, not to weakly plicate at base. Margin plane, often bistratose above. Nerve strong becoming brown-black in older leaves, excurrent, ceasing in hair point. Cells above $(5-8-17(-20) \times (6-8-12(-14)) \mu\text{m.}$, quadrate to shortly rectangular, with small indistinct papillae, chlorophyllose, incrassate towards margin, below longly rectangular, lax, hyaline, without papillae. Dioecious. Perichaetial bracts longer and narrower than vegetative leaves and with a longer hair point. Seta $2.0-3.0$ mm. long. Calyptra large, campanulate, mitriform with several rounded lobes. Capsule $1.2-1.6 \times 0.5-0.6$ mm., immersed, erect, cylindrical, smooth. Annulus broad, persistent. Peristome absent. (Fig. 1.)

Habitat and distribution (Fig. 2)

Willia austro-leucophaea is confined to moist rock ledges and crevices, invariably in coastal areas and often very near the shoreline, and is widely distributed around the island. Altitude 0-120 m.

Notes

In the field, *Willia austro-leucophaea* may be easily confused with species of *Grimmia*, due to its immersed capsules or, if sterile, with species of *Tortula* as its growth form and the presence of a long hair point to the leaves is similar to *T. cf. grossiretis* and *T. monoica*. Under the microscope the absence of sinuose leaf cells and the gymnostomous capsule will separate *W. austro-leucophaea* from species of *Grimmia*, while the absence of distinct C-shaped papillae on the leaf cells, the weak panduration of the leaves and the lack of strongly revolute margins distinguishes it from both species of *Tortula*.

Taxonomy

This taxon was first described as a species of *Grimmia* by Bescherele (1885) for material collected from Fuegia by Hariot (Type Hariot 157, BM, *Grimmia austro-leucophaea*, Ile Hoste, Terre de Feu). Brotherus (1902) transferred it to *Willia*, a genus erected by Müller (1890) for material the latter described as *Willia grimmioides* and which had been collected by Will on South Georgia (Type Will s.n., HBG, *Willia grimmioides* C. Müll., ad rupes des Köppenberges, Austro-Georgia, cfr. et calyptra, 19 Majo 1883). Both type specimens have been examined and, as the author has no doubt that they should be referred to a single taxon, *Willia grimmioides* is here reduced to synonymy with the earlier described *Willia austro-leucophaea*. Recent collections from South Georgia agree with these specimens in all respects.

van Zanten (1971) suggested that a specimen of a further species, *Willia senilis* C. Muell., had been identified from South Georgia by Müller and that the material was in the British Museum (Nat. Hist.). It is possible that van Zanten was referring to a specimen named *W. senilis* which bears no collecting data although it is adhering to a page of Müller's (1890) paper "Bryologia Austro-Georgiae" in which he described *W. grimmioides* from South Georgia. On examination it was found to be inseparable from the present species and, while the type specimen of *W. senilis* has not been examined, the author has no reason to doubt Cardot's (1908) decision to reduce this species to synonymy with *Willia austro-leucophaea*.

The only other species in the genus *Willia*, *W. marginata* (Hook. f. et Wils.) C. Muell., was reported from Iles Kerguelen by Hooker and Wilson (1844) as a *Schistidium* which was later transferred to *Willia* by Müller (1901). Type material of this species in the British Museum (Nat. Hist.) has been examined (Hooker 731, BM, *Schistidium marginatum* Hook. f. et Wils. Kerguelen's Land, Antart. Exp. 1839-1843) and the presence of a pronounced border of elongate incrassate cells in the vegetative leaf, together with the absence of a longly excurrent hair point, show this taxon to be quite distinct from the South Georgian species.

GRIMMIACEAE

Racomitrium Brid.

The species of *Racomitrium* known from South Georgia show a wide variation of growth form, including turves, cushions, mats or wefts. Although the presence of many short lateral branchlets is indicative of the genus, the occurrence of strongly nodulose cell walls in the base

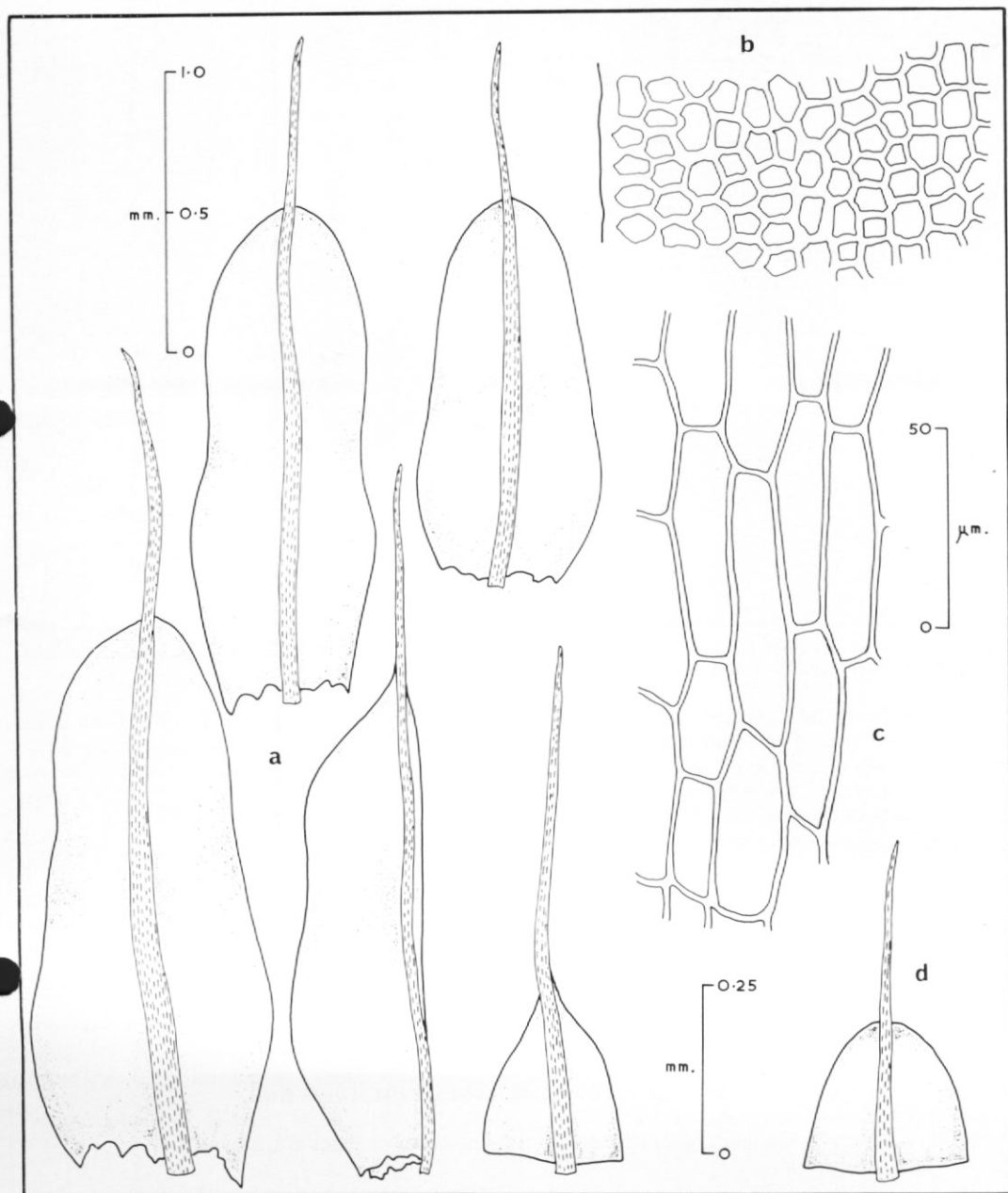


Fig. 1. *Willia austro-leucophaea*.

a. Leaves; b. Upper cells; c. Lower cells; d. Apices.

Scales: upper left-hand for leaves; upper right-hand for cells; lower for apices.

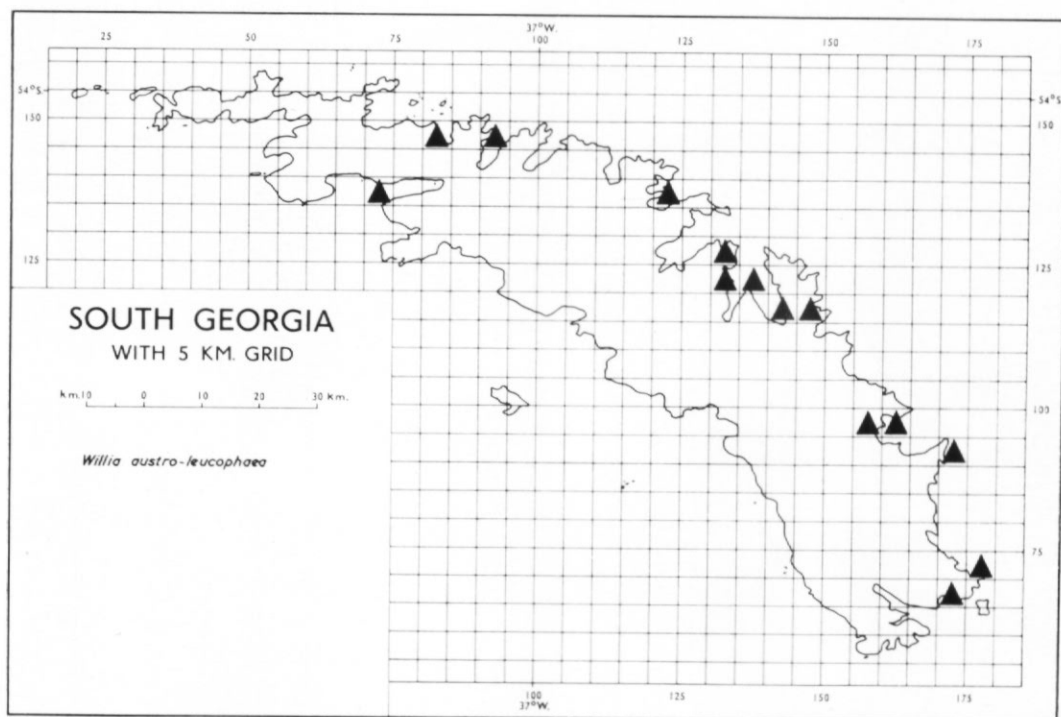


Fig. 2. The known distribution on South Georgia, by 5 km. squares, of *Willia austro-leucophaea* based on the specimens and field records given in the Appendix.

of the vegetative leaf is the definitive generic character which should prevent any confusion with species of *Grimmia*, a genus in which the walls of the basal leaf cells are only weakly sinuouse at most. A further distinction is that in *Racomitrium* the capsules are exserted, whereas in *Grimmia* they are immersed or emergent.

The species of *Racomitrium* known from South Georgia may be recognized as follows:

- | | | |
|---|----------------------------|---|
| 1. Plants hoary, leaves with hair point longer than 0.3 mm. | | 2 |
| Plants not hoary, leaves with hair point absent or shorter than 0.3 mm. | | 3 |
| 2. Hair point smooth | <i>R. striatipilum</i> | |
| Hair point erose-dentate | <i>R. lanuginosum</i> | |
| 3. Leaves widely ovate-lanceolate, alar cells swollen and coloured .. | <i>R. willii</i> | |
| Leaves narrowly oblong to ovate-lanceolate, alar cells usually not distinct | | 4 |
| 4. Leaves with crenate hair point, upper cells short and mostly rounded .. | <i>R. austro-georgicum</i> | |
| Leaves with hair point smooth or absent, upper cells variable in length, but rarely rounded | | 5 |
| 5. Plants with prostrate stems and ascending branches, most leaves with a short smooth hyaline hair point | <i>R. heterostichoides</i> | |
| Plants with erect fastigiate branched stems, most leaves lacking a hyaline hair point | | 6 |
| 6. Leaves strongly plicate with two strong plicae on each side of the nerve | <i>R. ptychophyllum</i> | |
| Leaves weakly plicate, lacking two plicae on each side of the nerve .. | | 7 |
| 7. Leaves generally narrow, 0.4–0.5 mm. wide, hair point absent, apex obtuse or sub-acute, upper lamina cells 14–29 μ m. long | <i>R. pachydietyon</i> | |
| Leaves generally broad, 0.6–0.8 mm. wide, sometimes with hair point, apex acute, upper lamina cells 6–18 μ m. long | | 8 |

8. Lamina cells with distinct transverse wall thickenings *R. crispulum* var. *rupestre*
 Lamina cells without distinct transverse wall thickenings *R. crispulum* var. *crispulum*

Racomitrium austro-georgicum Par.

Syn. *Grimmia austro-patens* C. Muell.

Rhacomitrium skottsbergii Card. et Broth.

Stems forming loose to compact cushions (0.5—) 1.0—4.5 cm. high, green above, brown to black below, the branching dichotomous and usually regular, the leaves when moist patent to erecto-patent and often recurving, when dry imbricate. Leaves (1.2—) 1.8—2.3 × 0.3—0.6 mm., narrowly ovate-lanceolate, tapering to a short crenate hyaline hair point. Lamina irregularly and weakly plicate at base. Margin irregularly revolute on one or both sides for varying distances above the base, frequently bistratose. Nerve strongly channelled, percurrent. Cells above 6—18 (—30) × 6—10 μm., rounded or rounded quadrate to shortly rectangular and nodulose, at border strongly incrassate on outer walls, below becoming longly rectangular, nodulose. Dioecious. Seta 3—4 mm. long. Capsule 1.1—1.4 × 0.6—0.8 mm., ovoid. Operculum rostrate. Peristome of 16 red-brown teeth, smooth to weakly papillose, divided at apex, variably perforate. (Fig. 3.)

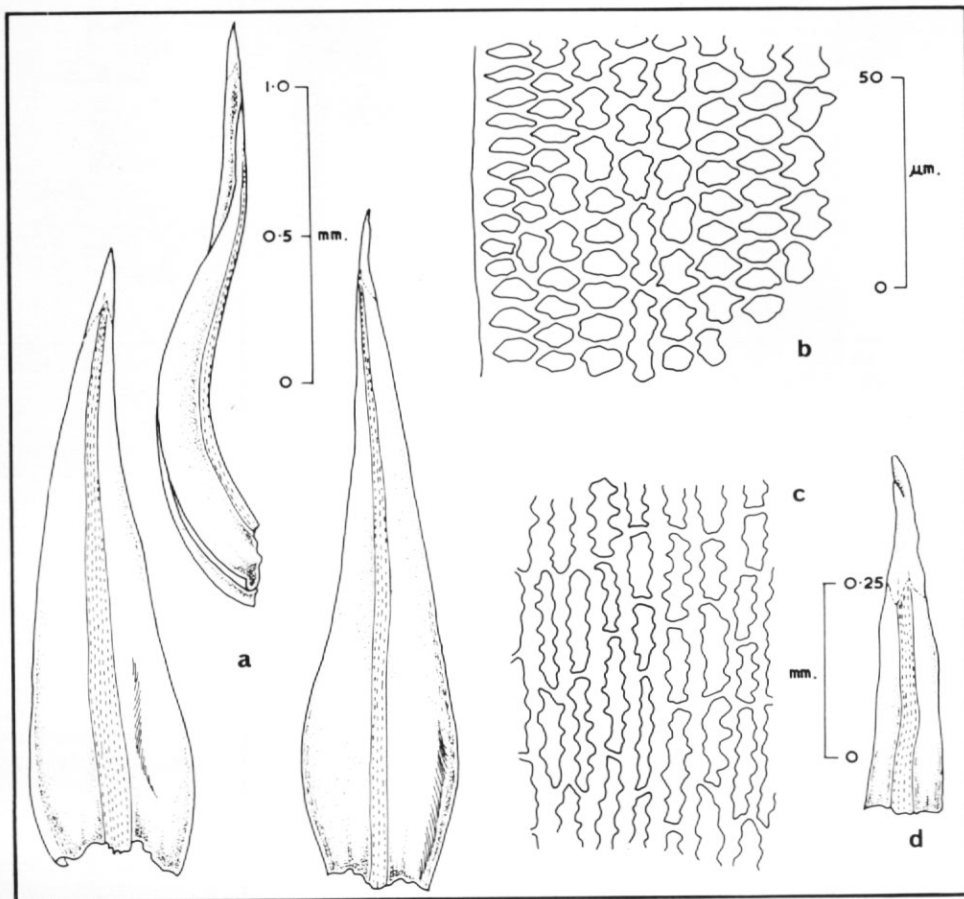


Fig. 3. *Racomitrium austro-georgicum*.

a. Leaves; b. Upper cells; c. Lower cells; d. Apex.

Scales: left-hand for leaves; upper right-hand for cells; lower right-hand for apex.

Habitat and distribution (Fig. 4)

A very common species of rock surfaces, crevices and ledges infrequently found on bare ground. Altitude 0–300 (–360) m.

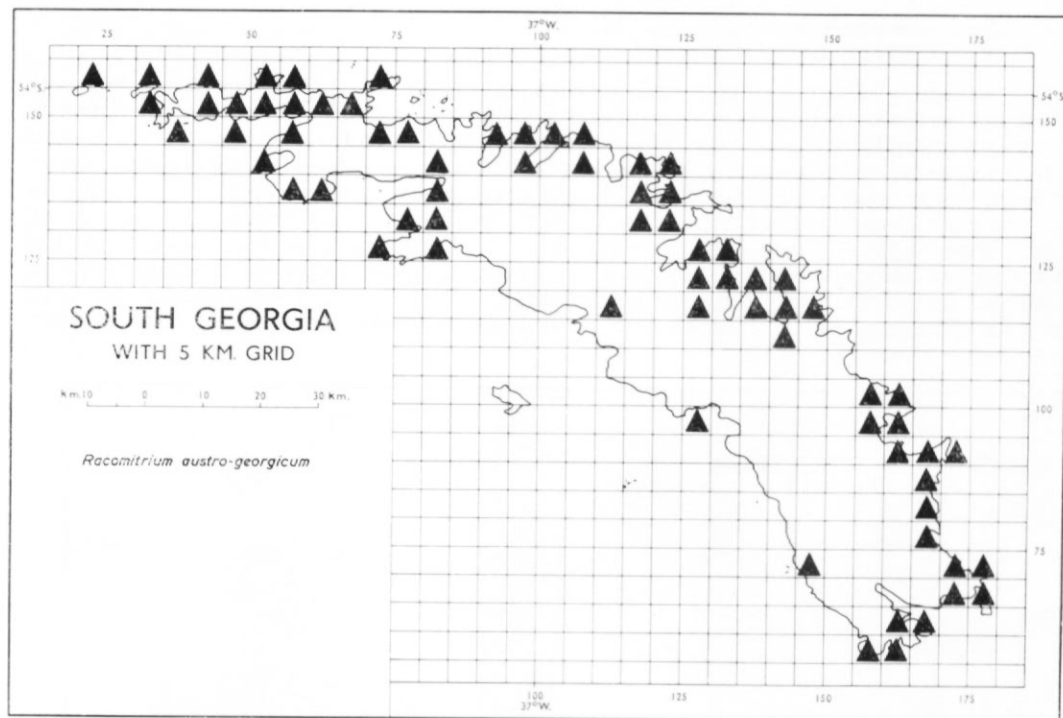


Fig. 4. The known distribution on South Georgia, by 5 km. squares, of *Racomitrium austro-georgicum* based on the specimens and field records given in the Appendix.

Notes

R. austro-georgicum can be confused with *R. crispulum* and *R. pachydictyon* in the field. However, the short crenate hyaline hair point on the majority of leaves distinguishes the present species from *R. crispulum* where hair points, if present, are smooth and *R. pachydictyon* where hair points are absent.

R. austro-georgicum is known to extend farther south along the Antarctic Peninsula and its offshore islands (Bell, 1973).

Taxonomy

Racomitrium austro-georgicum was first described from South Georgia by Müller (1890) as *Grimmia austro-patens* C. Muell. for material collected by Will during the German International Polar-Year Expedition of 1882–83 (Type Will No. 53, M, *Grimmia* (*Dryptodon*) *austro-patens* C.M., Fundort Thal am Ross-Gletscher, Süd-Georgien, 7.v.83.). Paris (1895) transferred it to *Racomitrium* and changed the specific epithet to *austro-georgicum* but he did not provide an author citation for the species or any information on the basonym. Later, Paris (1898) listed the same combination ascribing the citation to himself and provided the correct basonym. It is apparent that he made this combination to avoid creating a homonym with a South African species *Grimmia austro-patens* C. Muell. which he transferred to *Rhacomitrium austro-patens* C. Muell. in Rehm. at the same time. Although Müller had effectively published the South African species in *Exsiccate Musci Austro-Africani* distributed by Rehm between 1875 and 1877, he did not validate the name until much later (Müller, 1899). Consequently, Paris (1895,

1898) was incorrect in assuming that the epithet, *austro-patens*, was validly published for the South African species and that it should therefore be retained. When Müller (1899) provided a description for the South African species under *Grimmia austro-patens* C. Muell., he, in fact, created a *homonymum illegitimum* but the taxon was later transferred to *Racomitrium austro-patens* by Brotherus (1902) with the citation (C. Muell.) Rehm. This species remained *R. austro-patens* (C. Muell.) Rehm. until reduced to synonymy with *R. crispulum* (Hook. f. et Wils.) Hook. f. et Wils. by Dixon and Gepp (1923).

Following Paris (1895, 1898), the South Georgian species continued to be called erroneously *R. austro-georgicum* Par. and Brotherus (1902) did not validate the name simultaneously with the South African taxon. Paris (1905) also failed to cite the correct basionym and altered the author citation from Par. to (C.M.) Par. Hence the first valid publication of the name *R. austro-georgicum* Par. appears in Cardot (1906), who cited the correct basionym.

The situation remained the same until Clifford (1955) reduced *R. austro-georgicum* Par. to synonymy with *R. crispulum*. Roivainen (1955) retained *R. austro-georgicum* Par. as a distinct species and an examination of Müller's type, as well as material determined by Cardot and Roivainen leaves the author in no doubt that it is a distinct taxon to which the South Georgian material can be referred.

No possibility arises of correcting the error of Paris (1895, 1898) in order to retain the specific epithet *austro-patens* for the South Georgian species because this has remained in use for the South African taxon. Therefore, the author suggests the epithet *austro-georgicum* should continue to be used for the South Georgian taxon, which may be validated as follows:

Racomitrium austro-georgicum Par.

Basionym: *Grimmia austro-patens* C. Muell. 1890. Bryologia austro-georgiae. In Neumayer, G. Die Internationale Polarforschung 1882-83. Die Deutschen Expeditionen und ihre Ergebnisse. Bd. 2, p. 316.

Racomitrium austro-georgicum Par. Cardot, J. 1906. Notice préliminaire sur les mousses recueillies par l'Expédition Antarctique Suédoise. II. Espèces de la Géorgie du Sud. Bull. Herb. Boissier, 2ème sér., 6, No. 1, p. 7.

The type specimen of the South African species has been examined by the author (Rehmann 137, BM, *Grimmia austro-patens* C.M. n. sp. In Monte Tabulari, Dr. A. Rehmann, Musci austro-africani, 1875-77) and, while it shows some similarity to the South Georgian taxon, it differs in one fundamental respect, namely the lack of a crenate hair point on the majority of the vegetative leaves. As this character is basic to the delimitation of the South Georgian species, and as only a few South African specimens have been examined, all of which lacked crenate hair points, it is suggested that the two taxa should continue to be treated separately.

A further species, *Racomitrium skottsbergii* Card. et Broth., was described from South Georgia by Cardot and Brotherus (1923) (Type Skottsberg 36, S-PA, *Racomitrium skottsbergii* Card., Sydgeorgien, Cumberland Bay, angstunila ind Morainfjord, 18.iv.1909. Det. Cardot; Skottsberg 36, BM, *Racomitrium skottsbergii* Card. n. sp., South Georgia, Cumberland Bay, Moraine Fiord, 18.iv.1909. Det. J. Cardot.). From an examination of both of these specimens, the author agrees with Roivainen (1955) that *R. skottsbergii* Card. et Broth. cannot be separated from the present species.

Racomitrium crispulum (Hook. f. et Wils.) Hook. f. et Wils.

Stems forming loose to compact cushions 1.5-5 cm. high, green above, black below, sparsely to abundantly fastigiate branched, the branch leaves crowded, when moist patent to erecto-patent but often recurving, when dry erect, closely appressed, rarely showing a distinct spiralled arrangement. Leaves (1.7-) 1.9-2.5 (-3.4) × (0.5-) 0.6-0.8 (-0.9) mm., ovate to ovate-lanceolate, tapering to an acute apex normally lacking a hair point which, when present, is short and smooth. Lamina not or weakly plicate towards base. Margin revolute on one or both sides for varying distances above the base, rarely bistratose, often reflexed on one side. Nerve invariably channelled, ceasing at or just below apex. Cells above (4-) 6-18 (-28) × (6-) 7-8 (-10) μm., quadrate to shortly rectangular, incrassate, sinuose to nodulose, rarely with strong transverse wall thickenings, below longly rectangular, nodulose, not to weakly transversely thickened, in alar group slightly inflated and usually colourless. Dioecious.

Seta 2—4.5 cm. long, slender. Calyptra mitriform. Capsule 1.2—1.6×0.6—0.8 mm., erect, oblong to cylindrical, smooth, Operculum rostrate. Peristome teeth 16, entire or slightly cleft, variably papillose.

var. *crispulum*

Syn. Dryptodon crispulus Hook. f. et Wils.

As above but with the leaves rarely spirally arranged and the upper leaf cells (4—) 6—15 (—23)×6—10 μm., showing no transverse wall thickenings. (Fig. 5.)

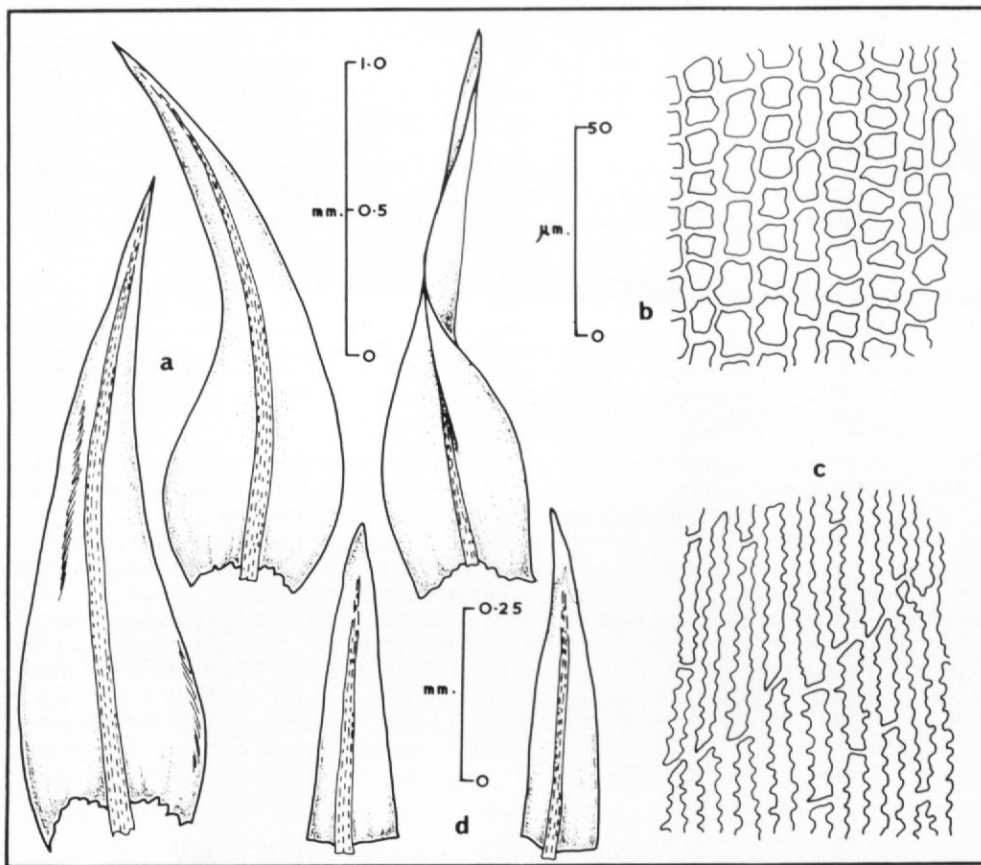


Fig. 5. *Racomitrium crispulum* var. *crispulum*.

a. Leaves; b. Upper cells; c. Lower cells; d. Apices.

Scales: upper left-hand for leaves; upper right-hand for cells; lower for apices.

var. *rupestre* (Hook. f. et Wils.) Dix.

Syn. Dryptodon rupestris Hook. f. et Wils.

Racomitrium rupestre (Hook. f. et Wils.) Hook. f. et Wils.

As above but with the leaves invariably spirally arranged and the upper leaf cells 9—18 (—28)×(6—) 7—8 (—9) μm., possessing strong transverse wall thickenings. (Fig. 6.)

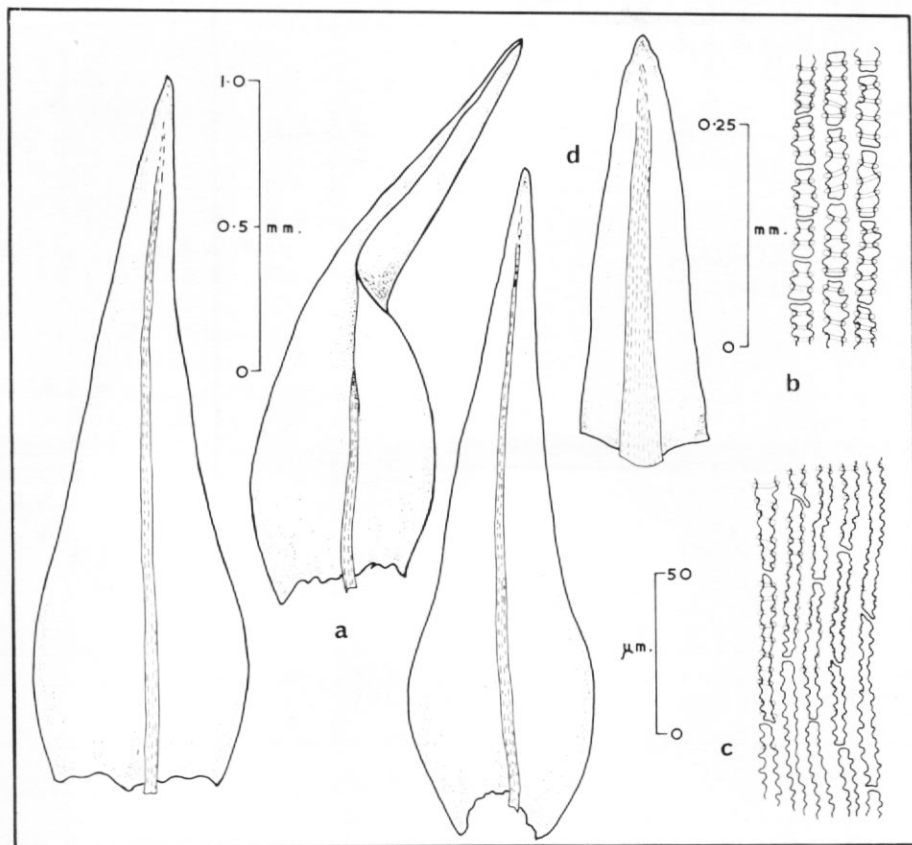


Fig. 6. *Racomitrium crispulum* var. *rupestre*.

a. Leaves; b. Upper cells; c. Lower cells; d. Apex.

Scales: upper left-hand for leaves; upper right-hand for apex; lower for cells.

Habitat and distribution (Figs. 7 and 8)

A well-distributed species of moist rock crevices and ledges, the var. *crispulum* being the commoner and locally abundant, while the var. *rupestre* is rare and restricted within a locality. Altitude 0–300 m.

Notes

Although a variable taxon, *R. crispulum* can be readily distinguished from other species of *Racomitrium* on South Georgia. It may be confused with *R. austro-georgicum* but, under the microscope, the presence or absence of a crenate hair point and the nature of the areolation are reliable characters for separating the two. Any confusion with *R. pachydictyon* should be resolved on examination of the leaf apex and the upper leaf areolation.

The spiral leaf arrangement helps to distinguish the var. *rupestre* in the field but microscopic examination is essential to determine the presence of transverse thickenings in the upper leaf cells, the most reliable difference to the var. *crispulum*.

The var. *crispulum* is also known from a locality farther south on Bellingshausen Island, South Sandwich Islands (Bell, 1973).

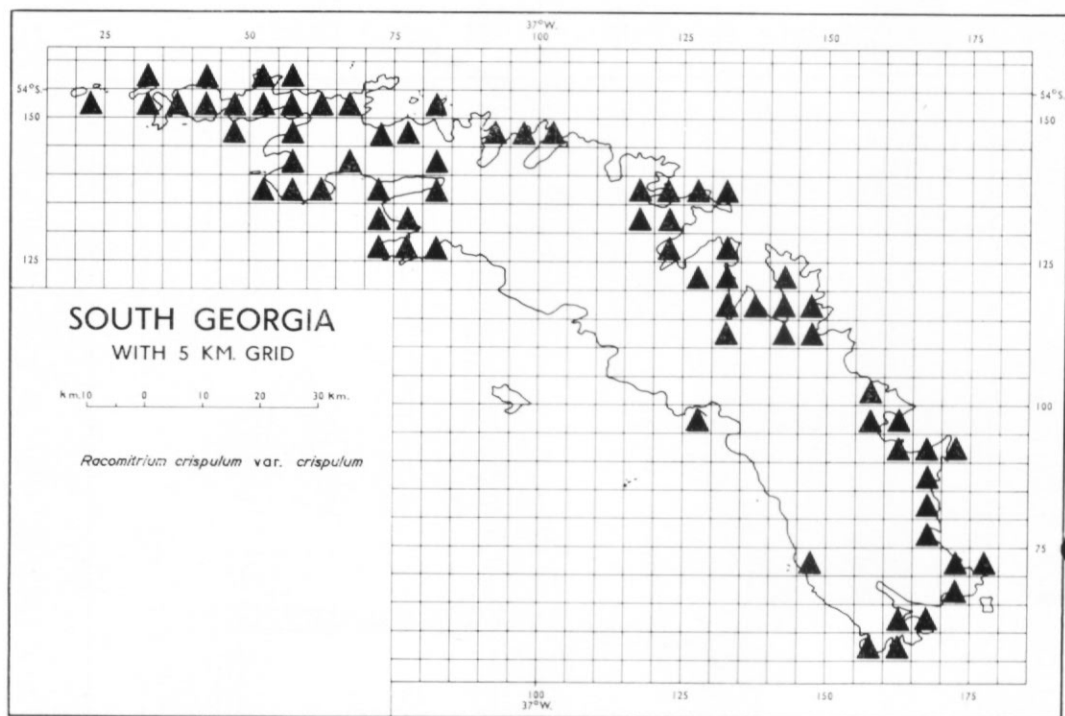


Fig. 7. The known distribution on South Georgia, by 5 km. squares, of *Racomitrium crispulum* var. *crispulum* based on the specimens and field records given in the Appendix.

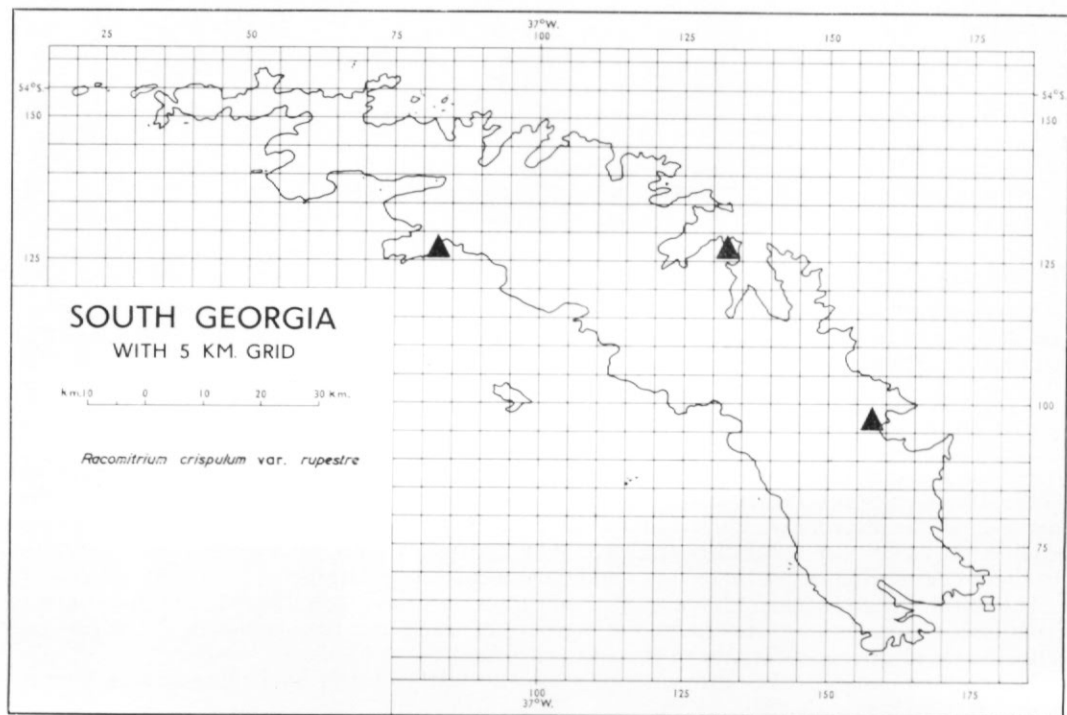


Fig. 8. The known distribution on South Georgia, by 5 km. squares, of *Racomitrium crispulum* var. *rupestre* based on the specimens and field records given in the Appendix.

Taxonomy

R. crispulum var. *crispulum* was first described by Hooker and Wilson (1844) as *Dryptodon crispulus* for material from Campbell Island (Lectotype Hooker No. 3, BM, *Dryptodon crispulus* H. f. et Wils., Campbells Island, Antart. Exp., 1839–1843, J.D.H.) but it was later transferred to *Racomitrium* (Hooker, 1854). Following an examination of the lectotype and its comparison with the type description, there is no doubt that the South Georgian material should be referred to this species.

R. crispulum var. *crispulum* has not, as such, been reported previously from South Georgia but Cardot and Brotherus (1923) reported as *R. nigratum* (C. Muell.) Jaeg. a specimen collected by Skottsberg (Skottsberg 37, PC). This collection has been examined and should be referred to the present taxon. Sim (1926) considered that *R. nigratum* should be placed under *R. crispulum* var. *crispulum* and not under *R. crispulum* var. *rupestre* as suggested by Dixon (1926).

R. crispulum var. *rupestre* was first described by Hooker and Wilson (1844) as *Dryptodon rupestris* for material from Hermit Island (Lectotype Hooker, s.n., BM, Herb. R. J. Shuttleworth, Recd. 1877, *Dryptodon rupestris* H. f. et Wils., Hermit Is., An. Exp.) and subsequently transferred to *Racomitrium* (Hooker, 1854) but Dixon (1926) reduced it to a variety as *R. crispulum* var. *rupestre*. Although only five specimens have been seen from South Georgia which can be referred to this variety, there is no doubt that these constitute a discrete taxon which differs sufficiently to warrant separate varietal status.

Racomitrium heterostichoides Card.

Stems forming prostrate mats 0.5–2.0 cm. high, or compact wefts 2.0–7.0 cm. high, yellow-green, black in older regions, branching dichotomous, the branches numerous and bearing many short lateral branchlets, the leaves crowded, when moist erecto-patent and weakly falcato-secund towards shoot apex, when dry erect. Leaves $1.1-2.5 \times 0.2-0.6$ (–0.7) mm., narrowly ovate-lanceolate, tapering to a short smooth hyaline hair point. Lamina variably plicate at base. Margin generally revolute on one side for most of its length. Nerve distinct, channelled, ceasing at base of hair point. Cells above (7–) 11–26 (–42) \times 6 (–10) μ m., shortly rectangular, sinuose, incrassate, becoming longer and nodulose below. Inflorescences and sporophytes unknown on South Georgia. (Fig. 9.)

Habitat and distribution (Fig. 10)

A local species which is nevertheless widely distributed, *R. heterostichoides* is found on rock surfaces and only very occasionally on soil. Altitude 15–300 m.

Notes

R. heterostichoides may be readily distinguished by its distinctive mode of branching, the regularly ascending branches with many short lateral branchlets being very characteristic. Under the microscope the presence of a short smooth hyaline hair point on most leaves will distinguish it from any other species with which it might be confused.

Taxonomy

The present species was first described by Cardot (1905) for material collected by Skottsberg from southern South America during the Swedish South-Polar Expedition of 1901–03, (Type Skottsberg Ser. N:R 79, S-PA, *Racomitrium heterostichoides* Card., Isla de los Estados, P. Cook, 18.xi.1903) and later reported by Cardot (1906) from South Georgia (Skottsberg 319, S-PA). Clifford (1955) considered *R. heterostichoides* to be a form of *R. crispulum* (Hook. f. et Wils.) Hook. f. et Wils., an opinion not shared by Roivainen (1955), who referred to the type specimen and material he himself had collected in Tierra del Fuego. In addition to the specimens cited in the Appendix, which include Cardot-determined specimens from South Georgia, the author has examined the type of this species and Roivainen-determined material from Fuegia, and is convinced that *R. heterostichoides* is quite distinct, particularly in its growth form and short hyaline hair point.

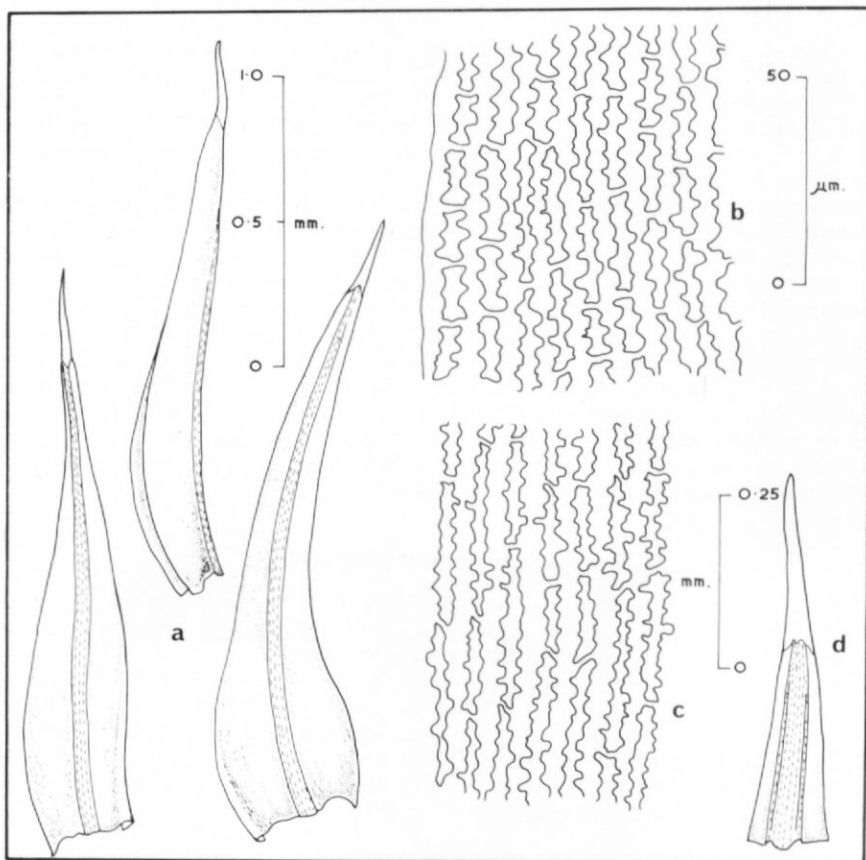


Fig. 9. *Racomitrium heterostichoides*.

a. Leaves; b. Upper cells; c. Lower cells; d. Apex.

Scales: upper left-hand for leaves; upper right-hand for cells; lower for apex.

Racomitrium lanuginosum (Hedw.) Brid.

Syn. Grimmia glacialis C. Muell.

Stems forming prostrate mats or loose to compact cushion-shaped wefts 2–6 (–10) cm. high, dull green, hoary, branching irregular, the branches numerous and slender with crowded leaves which when moist are patent and when dry appressed. Leaves (1.9–) 2.5–4.0 (–4.3) (including hair point) \times 0.3–1.0 mm., ovate-lanceolate, tapering to a long hyaline hair point which is often up to half the length of the leaf, rarely short, erose-dentate, flexuose and undulate when dry, being composed in the lower part of papillose lamina cells. Lamina variably plicate at base. Margin not to weakly revolute for varying distances above base on both sides of the leaf. Nerve narrow, channelled, ceasing just below tip of hair point. Cells above (8–) 14–34 (–47) \times 7–10 (–15) μ m., rectangular, sinuose, papillose, below becoming narrower, nodulose and smooth. Inflorescences and sporophytes unknown on South Georgia. (Fig. 11.)

Habitat and distribution (Fig. 12)

A very common and widely distributed species of a variety of habitats including wet and dry rock surfaces and crevices, screes and *Chorisodontium* banks. Altitude 0–375 (–870) m.

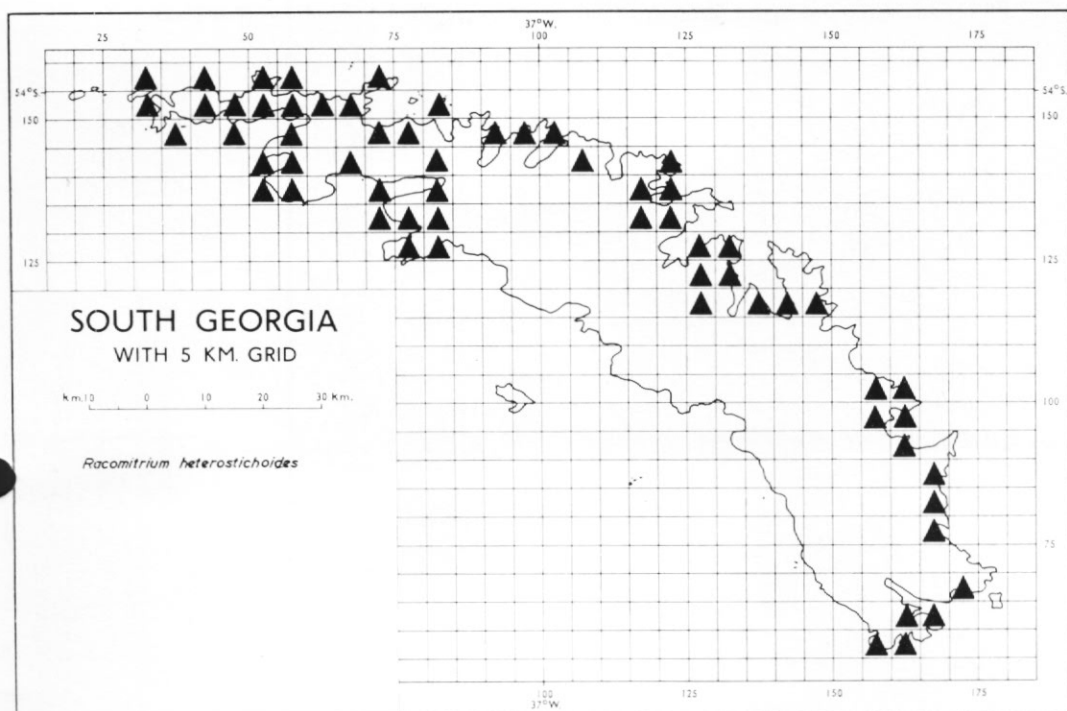


Fig. 10. The known distribution on South Georgia, by 5 km. squares, of *Racomitrium heterostichoides* based on the specimens and field records given in the Appendix.

Notes

R. lanuginosum shows variation in its growth form and in its degree of hoariness so that the following three ecological forms can be recognized: a prostrate mat growing in exposed conditions on rock surfaces and ledges, a loose to compact cushion-shaped weft growing on rock ledges in more sheltered conditions and a compact cushion-shaped weft growing on *Chorisodontium* banks in a range of habitat conditions. In the compact weft growth forms, the leaf hair points tend to be shorter and not strongly erose-dentate, whereas in the other forms long strongly erose-dentate hair points occur. Any confusion which may arise in the field with *R. striatipilum* should be dispelled on microscopic examination of the leaf hair points, which are smooth in *R. striatipilum*.

Taxonomy

This well-known cosmopolitan species was first described by Hedwig (1801) as *Trichostomum lanuginosum* Hedw., and later transferred to *Racomitrium* by Bridel (1819). It was first reported from South Georgia by Müller (1890) as *Grimmia glacialis* C. Muell. (Type Will 45, HBG, M, *Grimmia glacialis* C. Müll. n. sp., Brockenthal, an felsen in grossen polstern findet sich ausserdem im unt. Whalerthal und am grossen Gletscher, Süd-Georgien 10.ii.83.), a species reduced to synonymy with *R. lanuginosum* by Roivainen (1955). The type specimen of *Grimmia glacialis* has been examined and there is no doubt that it should be referred to *R. lanuginosum* (Hedw.) Brid.

Racomitrium pachydietyon Card.

Stems forming erect compact yellow-green cushions, 1.0–5.0 (–7.0) cm. high, sparingly fastigiate branched, the branches bearing few lateral branchlets, their leaves crowded, when

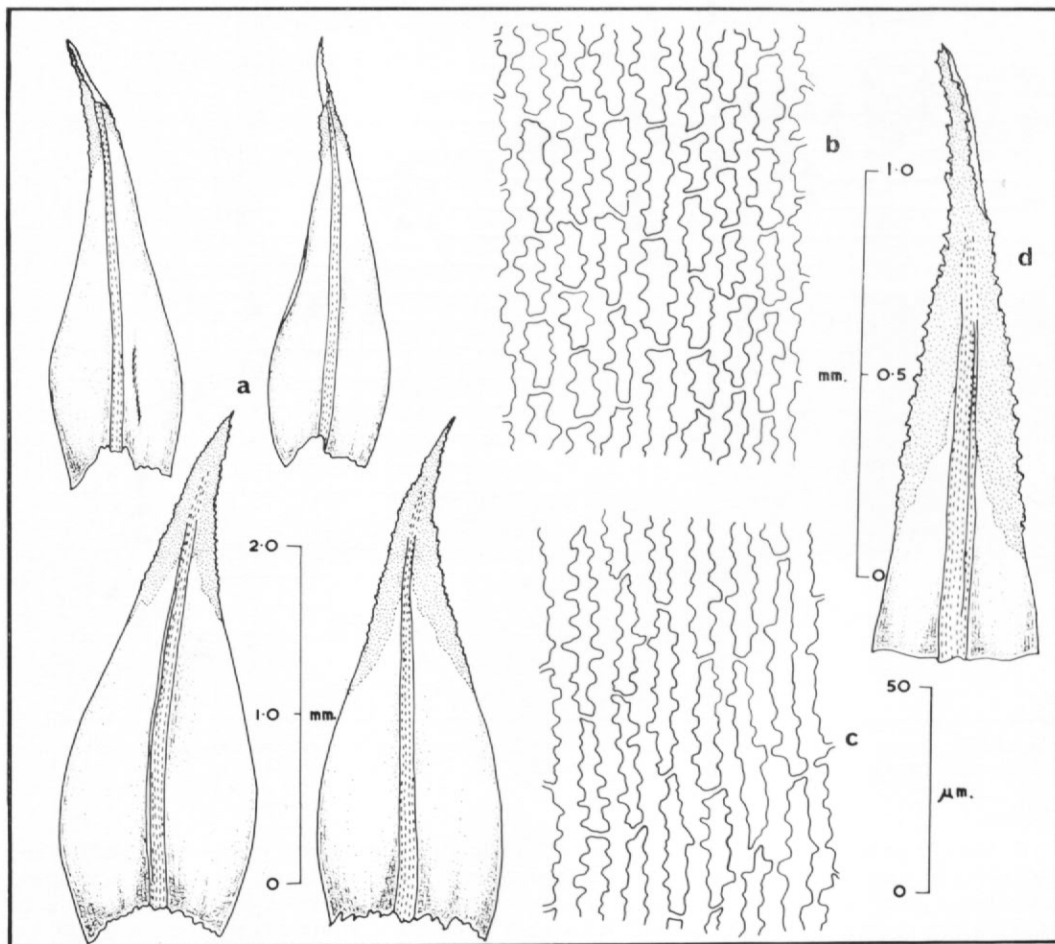


Fig. 11. *Racomitrium lanuginosum*.

a. Leaves; b. Upper cells; c. Lower cells; d. Apex.

Scales: left-hand for leaves; upper right-hand for apex; lower right-hand for cells.

moist patent to erecto-patent, when dry erect and tightly imbricate. Leaves (1.9—) 2.1—2.5 \times 0.4—0.5 (—0.6) mm., narrowly lanceolate, acuminate, the apex obtuse or subacute invariably rounded at tip. Lamina sometimes weakly plicate at base. Margin entire, one side frequently reflexed. Nerve strong, ceasing at or just below apex. Cells above (9—) 14—29 (—40) \times 7—9 (—10) μ m., rectangular, twice as long as wide, rarely shorter, remaining so to apex, nodulose, incrassate, below longly rectangular with extremely thickened longitudinal nodulose walls, alar cells few, swollen, coloured. Sexual habit unknown. Seta 1—2 cm. long, slender. Capsule 1—1.5 mm. long, erect, narrowly oblong to cylindrical, smooth. Operculum rostrate. Peristome of 16 red teeth, entire, variably papillose throughout. (Fig. 13.)

Habitat and distribution (Fig. 14)

An uncommon species confined to dry rock surfaces and ledges. Altitude 0—225 (—1,110) m.

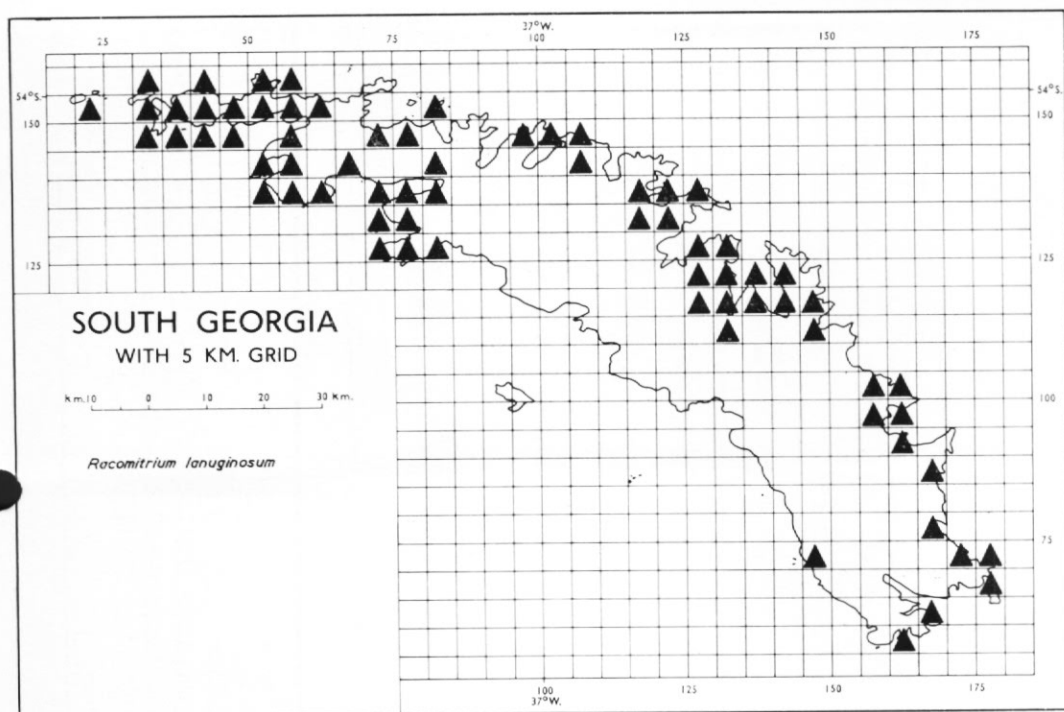


Fig. 12. The known distribution on South Georgia, by 5 km. squares, of *Racomitrium lanuginosum* based on the specimens and field records given in the Appendix.

Notes

R. pachydictyon may be confused with *R. crispulum* in the field but under the microscope the nature of the leaf areolation and apex should readily separate the two species.

Taxonomy

This species was first described by Cardot (1908) for material collected by Skottsberg during the Swedish South-Polar Expedition of 1901–03 and which he had originally treated as a variety of *R. symphyodontum* (Skottsberg 78, S-PA, PC, *Racomitrium symphyodontum* var. *muticum* Card., Isla de los Estados, P. Cook., Svenska Sydpolarexpeditionen, 1901–1903, 18.xi.1903, Det. J. Cardot.). At the same time Cardot (1908) considered that two further specimens, which he had previously identified as *R. rupestre* Card. and *R. flavescens* Card., should be referred to the present species (Skottsberg Ser. N:R 80, S-PA, *Racomitrium flavescens* Card., Isla de la Estados, P. Cook, Svenska Sydpolarexpeditionen 1901–1903, 19.xi.1903, Det. J. Cardot; Skottsberg Ser. N:R 312 in parte, S-PA, *Racomitrium rupestre* Card., South Georgia, Cumberland Bay, Mt. Duse, Svenska Sydpolarexpeditionen 1901–1903, 2.v.1902, Det. J. Cardot). Skottsberg No. 78 has been selected as the lectotype of *R. pachydictyon*, thus making the other Skottsberg specimens syntypes. All of these specimens have been examined and are considered by the author to form a well-defined taxon which agrees with the South Georgian specimens in all respects.

Racomitrium ptychophyllum (Mitt.) Mitt.

Stems forming erect yellow-green cushions or turves 2.5–4.5 cm. high, sparingly fastigiately branched, the branch leaves crowded, when moist erecto-patent, when dry erect and tightly imbricate. Leaves 2.5–3.5 (–4.0) × 0.6–0.8 mm., oblong-lanceolate, tapering to an obtuse

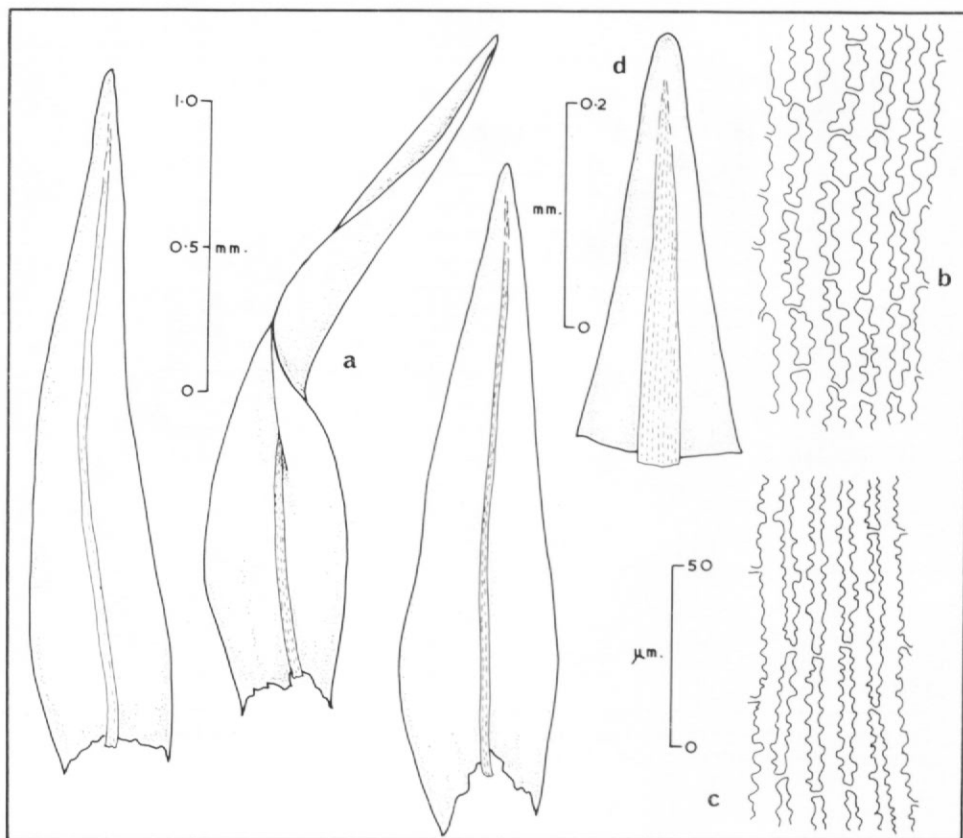


Fig. 13. *Racomitrium pachydietyon*.

a. Leaves; b. Upper cells; c. Lower cells; d. Apex.

Scales: upper left-hand for leaves; upper right-hand for apex; lower for cells.

apex which lacks a hair point but is often hyaline at tip. Lamina plicate throughout with two strong plicae on either side of the nerve. Margin variably revolute on both sides, often to near apex. Nerve strong, ceasing just below apex. Cells above $9-27 (-36) \times 6-9 (-11) \mu\text{m}$., shortly rectangular, becoming longer below, nodulose throughout. Inflorescences and sporophytes unknown on South Georgia. (Fig. 15.)

Habitat and distribution (Fig. 16)

An uncommon species with a restricted distribution, *R. ptychophyllum* is found in moist situations in rock crevices and on gravel. Altitude 0–45 m.

Notes

R. ptychophyllum is a distinctive species in the field exhibiting a regular growth form with upright fastigiate branched stems. Under the microscope, the oblong-lanceolate leaves without hair points but with regular plication are characters which will readily separate this taxon from the other South Georgia species of *Racomitrium*.

Taxonomy

R. ptychophyllum was first described as *Grimmia ptychophylla* by Mitten (1866) (Type Lindsay s.n. PC, From NY Botanical Gdns., Herb. W. Mitten, presented Dec. 06, *Rhacomitrium*

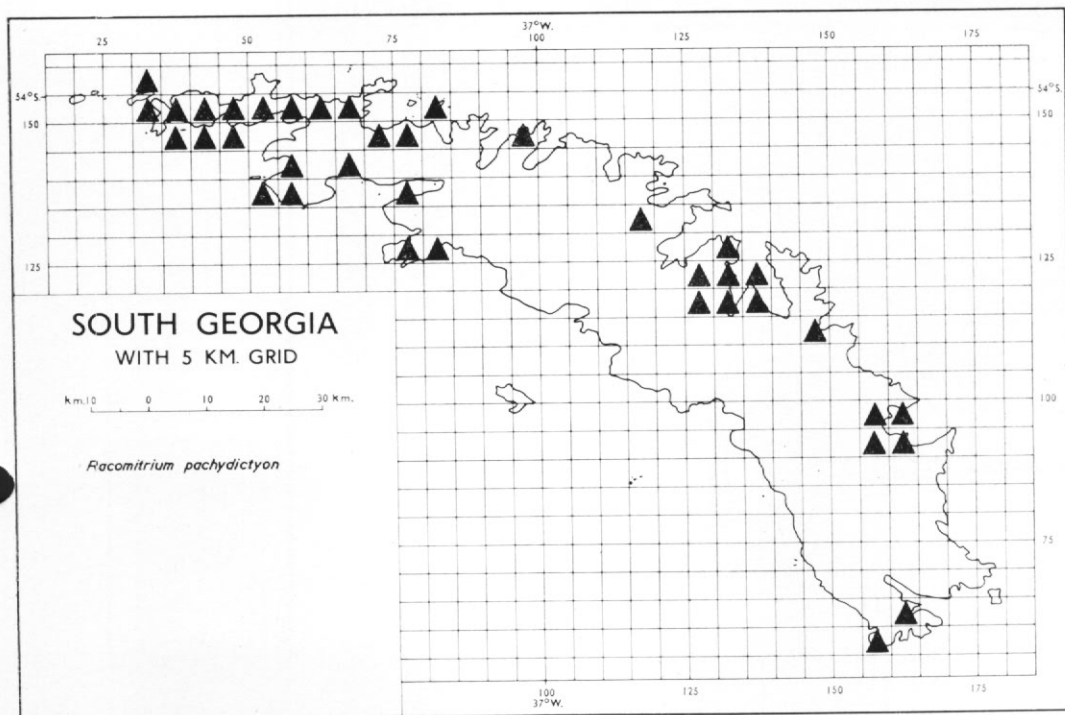


Fig. 14. The known distribution on South Georgia, by 5 km. squares, of *Racomitrium pachydictyon* based on the specimens and field records given in the Appendix.

ptychophyllum Mitt., Otago, New Zealand), who later transferred it to *Racomitrium* (Mitten 1867). Cardot (1906) first reported the species from South Georgia (Skottsberg 321, S-PA, *Rhacomitrium ptychophyllum* Mitt., Géorgie du Sud, Cumberland Bay, Leg. Skottsberg, 15.v.02, Det. J. Cardot). Both the type specimen and Skottsberg 321 have been examined and their characters are in complete agreement with the remaining South Georgian material.

Racomitrium striatipilum Card.

Stems forming prostrate mats, loose to compact wefts or loose turves 2–7 (–15) cm. high, yellow-green in colour, moderately hoary, irregularly branched, the branches usually bearing a few short lateral branchlets, the leaves when moist erecto-patent, when dry erect, rarely falcato-secund. Leaves (1.9–) 2.7–4.0 (–4.6) × 0.4–0.9 (–1.1) mm., ovate-lanceolate, tapering to a long hyaline flexuose hair point which is broad and striate at base and entire to weakly denticulate. Lamina invariably weakly plicate towards base. Margin entire, revolute on one side throughout its length. Nerve distinct, channelled, continued into hair point. Cells above (3–) 6–32 (–36) × 5–10 μm., generally longly rectangular, sometimes quadrate particularly towards margin, strongly sinuose, incrassate, below elongate rectangular, nodulose. Inflorescences and sporophytes unknown on South Georgia. (Fig. 17.)

Habitat and distribution (Fig. 18)

A well-distributed species of rock ledges and crevices but occasionally on soil in *Acaena* and *Festuca* communities. Altitude 0–165 m.

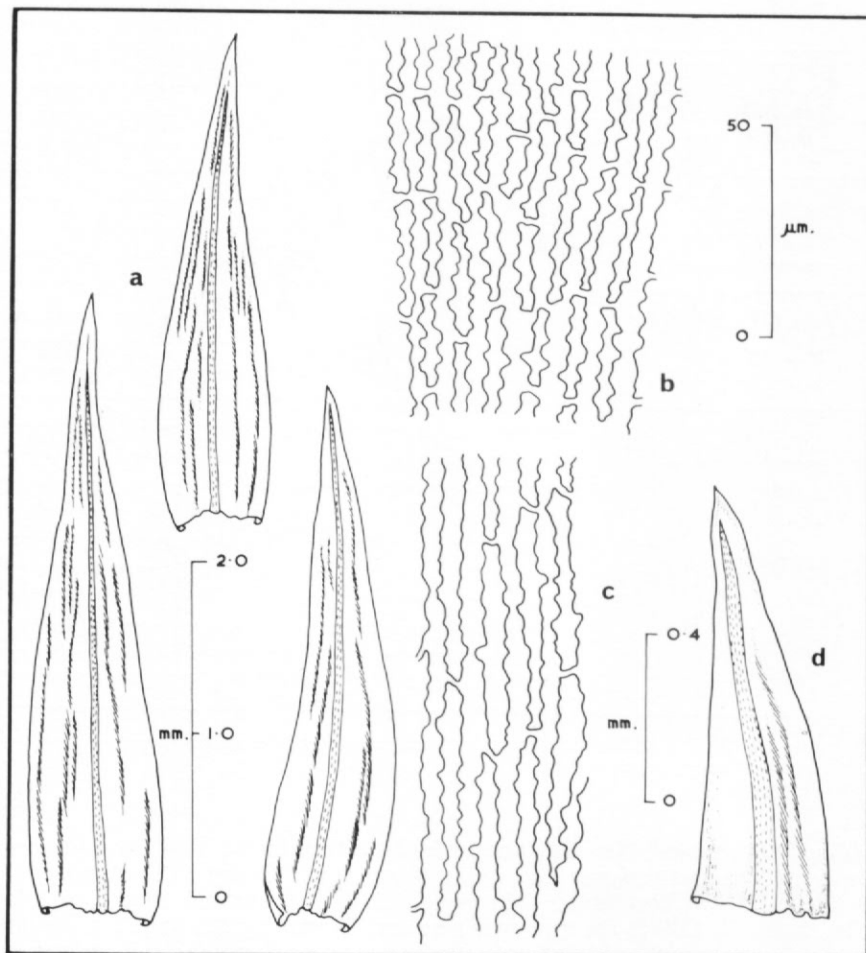


Fig. 15. *Racomitrium ptychophyllum*.

a. Leaves; b. Upper cells; c. Lower cells; d. Apex.

Scales: left-hand for leaves; upper right-hand for cells; lower right-hand for apex.

Notes

In the field *R. striatipilum* is only likely to be confused with some forms of *R. lanuginosum*. The two species can easily be distinguished under the microscope by the presence of a smooth hair point in *R. striatipilum* compared with the erose-dentate hair point of *R. lanuginosum*.

Taxonomy

Cardot (1905) described the present species (Type Skottsberg Ser. N:R 74, S-PA, *Racomitrium striatipilum* Card., Tierra de Fuego, Bahia Tejenika, 5.xi.1902, Leg. Carl Skottsberg, Svenska Sydpolarexpeditionen 1901–1903.) and was the first to report it from South Georgia (Cardot, 1908) from another specimen collected by Skottsberg (Skottsberg 321 in parte, S-PA, South Georgia, Cumberland Bay, Pot Harbour, 15.v.1902). Both of these specimens have been examined and agree well, in all essential respects, with each other and the remaining South Georgian material cited in the Appendix.

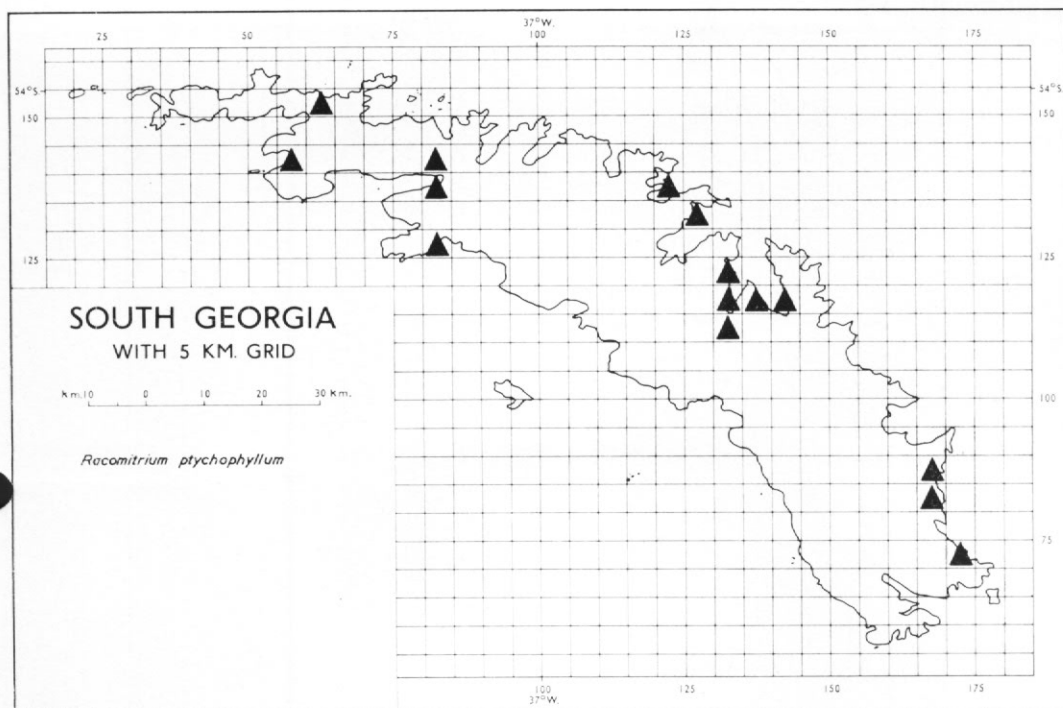


Fig. 16. The known distribution on South Georgia, by 5 km. squares, of *Racomitrium ptychophyllum* based on the specimens and field records given in the Appendix.

Racomitrium willii (C. Muell.) Kindb.

Syn. *Grimmia willii* C. Muell.

Stems forming short loose to deep compact wefts 2.0–9.5 cm. high, bright yellow-green in colour, abundantly irregularly branched, the branches with numerous short lateral branchlets, the leaves when moist erecto-patent, when dry appressed with flexuose tips. Leaves (1.5–) 3.0–4.5 (–4.9) × (0.4–) 0.6–1.3 mm., widely ovate-lanceolate, with short hyaline denticulate hair points. Lamina strongly and irregularly plicate. Margin revolute from base to apex on both sides. Nerve narrow indistinct, ceasing about mid-leaf, invariably bounded on both sides by a strong plica extending almost to apex. Cells above 8–36 (–61) × 6–11 μm., linear, nodulose, papillose, a little longer below, alar group enlarged often coloured and forming small auricles. Inflorescences and sporophytes unknown on South Georgia. (Fig. 19.)

Habitat and distribution (Fig. 20)

A well-distributed species, generally of moist habitats, often associated with *Chorisodontium* or *Festuca*, occasionally with other mosses on rock ledges. Altitude 0–150 (–210) m.

Notes

A distinctive species, which may be recognized in the field by its bright yellow-green colour and under the microscope by the ovate-lanceolate plicate leaves with distinct alar cells. It is more likely to be confused with *Breutelia integrifolia* than with any other species of *Racomitrium* but the unistratose lamina composed of nodulose cells is instantly distinct from the non-nodulose cells of the bistratose lamina of *B. integrifolia*.

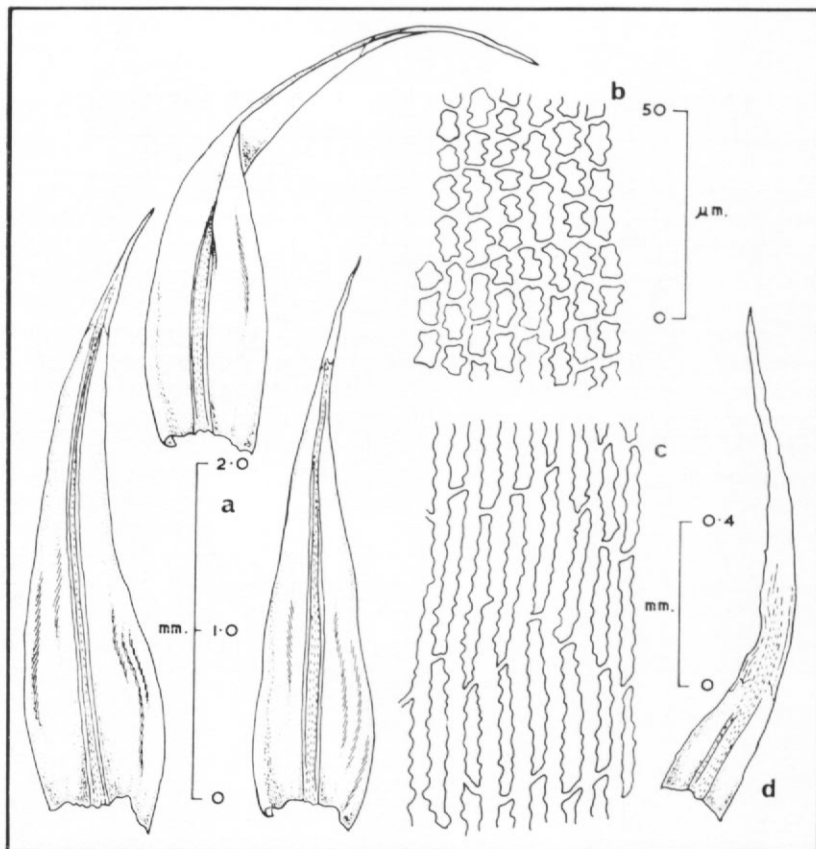


Fig. 17. *Racomitrium striatipilum*.

a. Leaves; b. Upper cells; c. Lower cells; d. Apex.

Scales: left-hand for leaves; upper right-hand for cells; lower right-hand for apex.

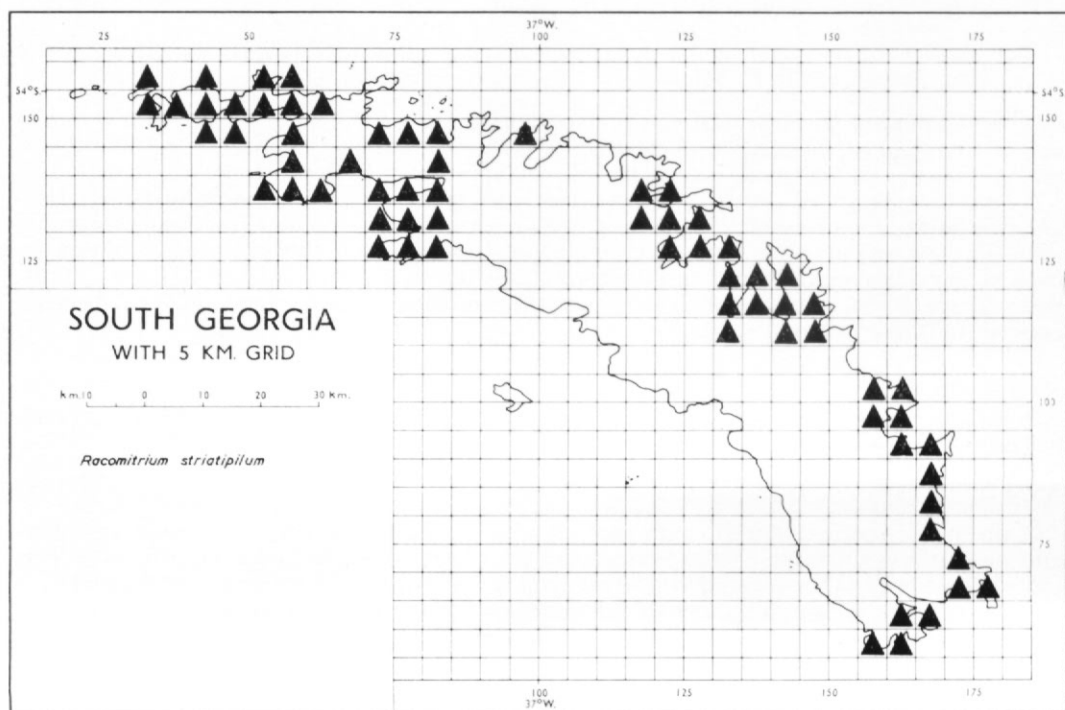


Fig. 18. The known distribution on South Georgia, by 5 km. squares, of *Racomitrium striatipilum* based on the specimens and field records given in the Appendix.

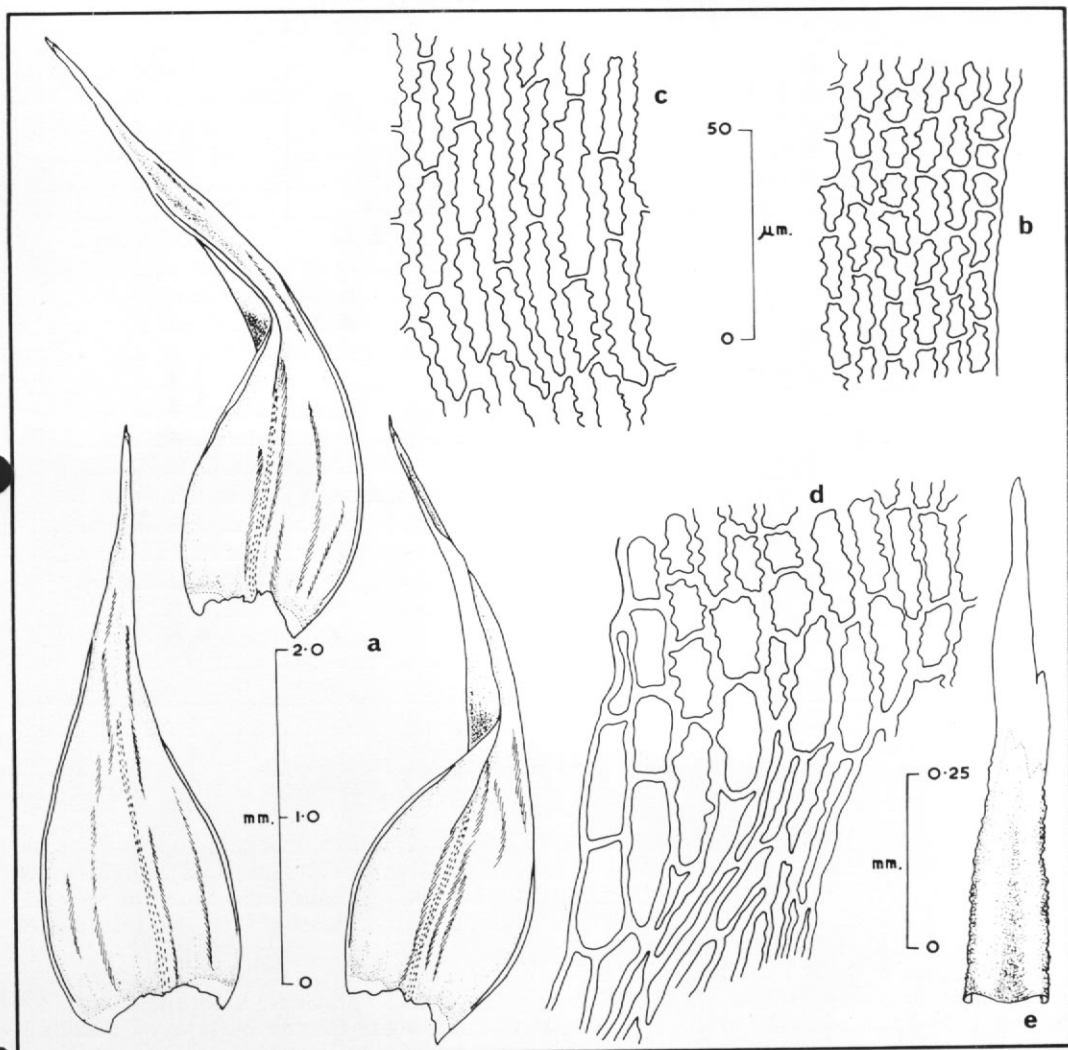


Fig. 19. *Racomitrium willii*.

a. Leaves; b. Upper cells; c. Lower cells; d. Alar cells; e. Apex.

Scales: left-hand for leaves; upper right-hand for cells; lower right-hand for apex.

Taxonomy

R. willii was first described by Müller (1890) as *Grimmia willii* C. Muell. for material collected from South Georgia during the German International Polar-Year Expedition of 1882-83 (Type Will 45, HBG, *Grimmia* (*Racomitrium*) *willii* C. Muell., An Felsen im Hintergrund des Thales rechts am S.W.-Gletscher in grossen Polstern, Süd-Georgien, 10.v.83). Kindberg (1891) transferred the species to *Racomitrium*. The type specimen has been examined, as has Cardot-determined material from South Georgia, and all these specimens show clearly the distinctive leaf characteristics of the species.

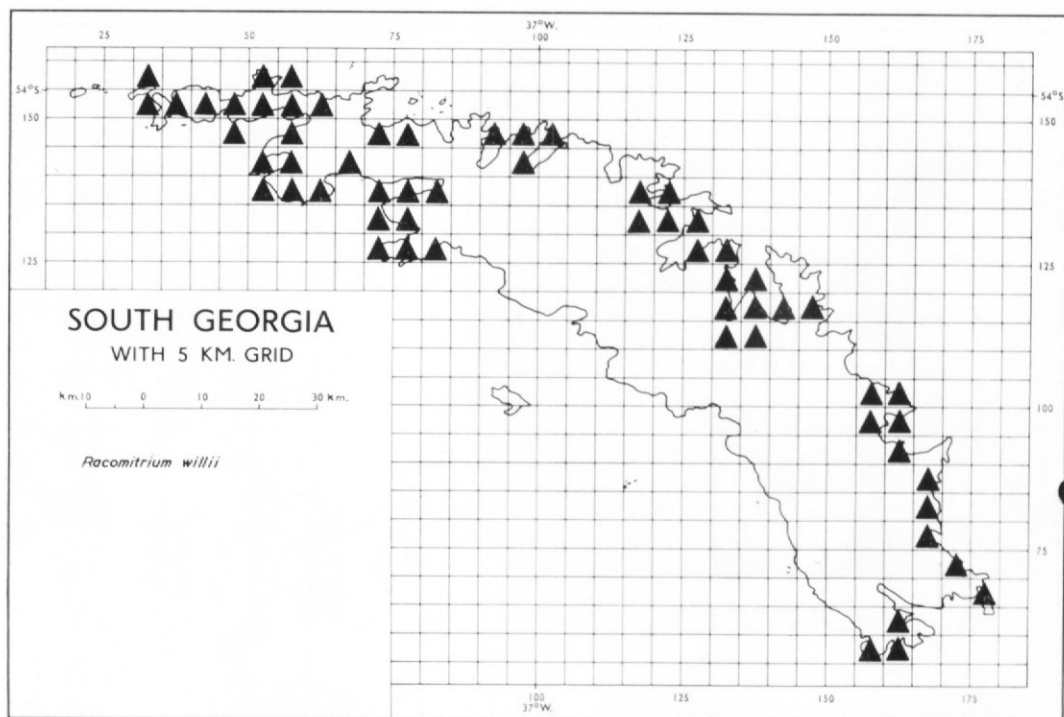


Fig. 20. The known distribution on South Georgia, by 5 km. squares, of *Racomitrium willii* based on the specimens and field records given in the Appendix.

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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: B. G. Bell, 1971-72; T. V. Callaghan, 1967-68; C. M. Clapperton, 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. E. Longton, 1963-64; R. I. L. Smith, 1969-71; D. W. H. Walton, 1969-70; R. Webb, 1971-72; 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.

Willia austro-leucophaea (Besch.) Broth.

- 070 135 R. Smith 1407 (B, BM, CHR, INACH, MEL, NY).
 080 145 Clarke and Greene CG521 (BM), Clarke and Greene CG522 (AAS). 090 145 Greene 1637 (AAS, B, O, PC, S-PA).
 120 135 Field record 5430.
 130 120 Clarke and Greene CG636 (BM). 130 125 Clarke and Greene CG408 (AAS, BA, H, LE, MSC, O, PRE, TNS), Greene 3461b (AAS), Greene 3466 (B, BA, BM, CHR, H, INACH, LE, MEL, MSC, NY). 135 120 Bell 552 (AAS, PC, PRE, S-PA, TNS), Bell 924 (AAS). 140 115 R. Smith 1274 (AAS). 145 115 Greene 835 (AAS).
 155 095 Greene 2411 (AAS, H, MEL, O), Greene 2419 (AAS, B, BA, BM, CHR, H, INACH, LE, MEL, MSC, NY, O, PC, PRE, S-PA, TNS). 160 095 Bell 973 (B, BA, BM, CHR, H, MSC, PC, S-PA), Bell 1157 (AAS), Greene 2245 (AAS, B, BA, BM, CHR, H, INACH, LE, MEL, MSC, NY, O, PC, PRE, S-PA, TNS), Will s.n. (HBG, as *W. grimmoides*). 170 065 Field record 1782. 170 090 Bell 558 (BM), Bell 564 (AAS, O, PRE, S-PA, TNS).
 175 070 Field record 5852.

Inadequately localized

Drehkuppel, zwischen Moor, Austro-Georgia, 6.ii.83, Will s.n. (HBG, M, as *W. grimmoides*).

Racomitrium austro-georgicum Par.

- 020 155 Field record 3526.
 030 150 Bell 20 (B, BA, BM, PRE), Greene 270 (BM), Greene 348 (AAS, H, TNS), Greene 389 (AAS, MSC). 030 155 Bell 24 (AAS, CHR), Bell 41 (BM, MEL), Bell 43 (AAS), Bell 52 (BM), Greene 408 (BM, CHR, MEL), Greene 414 (AAS, B, BA, PC, S-PA), Greene 417 (AAS, O), Greene 427 (BM, CHR, MEL, PC). 035 145 Field record 2752. 040 150 Greene 713 (BM, MSC, O), Greene 764 (AAS, B, CHR, H, S-PA, TNS). 040 155 Field record 2749. 045 145 Field record 2744. 045 150 Field record 2774.
 050 140 Field record 3132. 050 150 Bell 368 (AAS), Bell 390 (AAS), Bell 410 (AAS). 050 155 Bell 458 (AAS), Bell 469 (AAS). 055 135 Field record 2942. 055 145 Field record 3166. 055 150 Bell 421 (AAS). 055 155 Greene 646b (AAS), Greene 670 (AAS, MSC, O). 060 135 Field record 3147. 060 150 Field record 3059. 065 150 Bell 55 (AAS). 070 125 Field record 3187. 070 145 Greene 1190 (AAS, B), Greene 1216 (BM, CHR, H, LE, MEL, NY, PC, PRE, S-PA, TNS), Greene 1228 (BM), Greene 1230 (AAS, H), Greene 1239 (AAS, B, BA, CHR, INACH, LE, NY, PC, S-PA, TNS), Greene 1307 (BM, PRE, TNS). 070 155 Greene 621 (AAS), Greene 635 (AAS, LE, NY), Greene 636 (BM, MSC, O).
 075 130 Field record 3161. 075 145 Field record 2727. 080 125 Field record 3042. 080 130 Field record 3045. 080 135 Field record 2969. 080 140 Field record 3038. 090 145 Greene 1642 (BM, INACH, MEL, MSC), Greene 1667 (AAS). 095 140 Field record 2755. 095 145 Field record 2753.
 100 145 Field record 2738. 105 140 Field record 2736. 105 145 Field record 2734. 110 115 Lynch 6b (AAS). 115 130 Bell 321 (AAS), Greene 3078 (BM, H, S-PA), Greene 3104 (BM), Longton 143 (AAS, B, H). 115 135 Bell 360 (BM, MSC), Greene 3228 (AAS, LE), Greene 3329 (AAS, CHR, MEL), Longton 67 (AAS, CHR, NY), Longton 73 (B, BA, BM, MEL, S-PA). 115 140 Longton 90 (AAS, INACH, LE, PC). 120 130 Greene 2965 (AAS, BA, CHR, NY, S-PA), Longton 182 (BM, NY). 120 135 Clarke and Greene CG112 (AAS), Greene 3414 (BM, H, MEL, PC, S-PA, TNS), Longton 101 (BM, INACH), Sladen JB19/44 (BM). 120 140 Greene 3356 (BM), Webb 189 (AAS).
 125 095 Greene 2553 (B, BM). 125 115 Field record 2726. 125 120 Bell 1294 (AAS), Greene 1535a (BM, S-PA). 125 125 Greene 1580b (BA, BM), Greene 2926 (AAS). 130 120 Bell 70 (BM, PC), Bell 73 (AAS, BA), Bell 134 (AAS, B, H, INACH), Bonolli-Cipoletti s.n. (AAS ex herb. BA acc. no. 16987), Clarke and Greene CG249 (BM, O), Greene 1779 (AAS), Greene 1838 (AAS, MSC, O), Greene 1862 (B, BA, BM, CHR, H, INACH, LE, TNS), Greene 3515 (AAS, B, BA, H, LE, MEL), Greene 3534 (BM, CHR, INACH, LE, MEL, NY, PC, PRE, S-PA, TNS), Greene 3535 (AAS, B, BA, H, INACH, NY, PC, PRE, S-PA, TNS), Longton 472 (AAS, B, BA, CHR, H, INACH, MEL, TNS), Longton 473 (BM, INACH, PC, S-PA, TNS), R. Smith 1181 (BM), R. Smith 1182 (AAS), R. Smith 1245 (AAS, H, MEL, MSC, NY, O, PC, PRE), Tröim 140 (BM, as *R. striatipilum*). 130 125 Bell 77 (BM, LE), Bell 86 (AAS, O), Bell 117 (BM, NY, S-PA), Bell 961 (BM), Bonner 264 (BM), Greene 101 (AAS, BA, INACH, LE, NY, PRE), Greene 113 (BM), Greene 1830 (BM, MEL, NY, PC, S-PA). 135 115 Bell 169 (BM, CHR, H, INACH). 135 120 Field record 3210. 140 110 Longton 263 (B, BM, INACH, PRE, S-PA, TNS). 140 115 Bell 1273 (AAS, CHR, O), Longton 230 (AAS, BA, CHR, H, LE, MEL), Longton 239 (AAS, CHR, LE, NY, PC), Longton 276 (AAS, H, LE, NY, PRE), Longton 359 (BM, PC, PRE, S-PA), Longton 360 (AAS, MSC). 140 120 Greene 988 (AAS, B, CHR), Greene 995 (AAS, B, H, INACH, MEL, TNS), Greene 1002 (BA, BM, H). 145 070 Greene 2777 (AAS, B, BA, LE, NY, PRE). 145 115 Greene 886 (BA, BM, MSC, O), Greene 898 (BM, PRE, S-PA), Longton 233 (BA, BM, MEL, PRE), Longton 301 (BA, BM, CHR), Longton 305 (AAS, LE, MEL, NY).
 155 055 Field record 5830. 155 095 Bell 1330 (BM, PRE), Greene 2114 (AAS), Greene 2174 (BM, INACH). 155 100 Bell 484 (AAS), Bell 495 (AAS, B, INACH), Bell 1309 (BM, NY). 160 055 Field record 5845. 160 060 Greene 2457 (BM). 160 090 Field record 5555. 160 095 Bell 952 (BA, BM,

- LE, PC, S-PA), Bell 1356 (AAS), Greene 2283 (B, BM, H, INACH, PRE), Greene 2284 (AAS, B, H, INACH, PRE), Greene 2285 (AAS, LE, MSC, NY, O), Greene 2287 (BA, BM, CHR, INACH, LE, MEL, NY, PC, PRE, S-PA), Greene 2318 (AAS, TNS). 160 100 Bell 1350 (BM, TNS), Bell 1359 (AAS). 165 060 Field record 5836. 165 075 Field record 5618. 165 080 Field record 5585. 165 085 Bell 272 (AAS), Bell 298 (BA, BM, H, MEL, MSC, NY). 165 090 Field record 5577. 170 065 Field record 5632. 170 070 Field record 5568. 170 090 Bell 223 (AAS), Bell 258 (AAS, LE, MEL, MSC, NY, O, PC, PRE, S-PA, TNS).
- 175 065 Field record 5606. 175 070 Field record 5599.

Inadequately localized

Angstunila ind Morainfjord, Cumberland Bay, Sydgeorgien, 18.iv.1909, Skottsberg 36 (BM, PC, S-PA as *R. skottsbergii*); Moraine Fiord, Cumberland Bay, South Georgia, 18.iv.1909, Skottsberg 30 *pro parte* (BM); Thal am Ross-Gletscher, Süd-Georgien, 7.v.83, Will 53 (M, as *Grimmia (Dryptodon) austro-patens*).

Racomitrium crispulum (Hook. f. et Wils.) Hook. f. et Wils. var. *crispulum*

- 020 150 Field record 5400.
- 030 150 Greene 314 (AAS), Greene 349 (BM). 030 155 Bell 39 (AAS), Bell 47 (AAS), Green 399 (AAS, PRE, S-PA). 035 150 Greene 495 (AAS), Greene 498 (B, BA, BM), Greene 679 (BM, S-PA), Greene 681 (AAS), Greene 697 (BM, CHR, H, INACH), Greene 698 (BM, TNS). 040 150 Greene 729 (AAS), Greene 740 (AAS), Greene 770 (AAS, LE, MEL, MSC). 040 155 Field record 5392. 045 145 Field record 5395. 045 150 Field record 5378.
- 050 135 Field record 5407. 050 150 Bell 384 (BM), Bell 404 (BA, BM, H, LE, MSC), Bell 416 (AAS). 050 155 Bell 470 (AAS, B, H, INACH). 055 135 Field record 5405. 055 140 Greene 1149 (AAS). 055 145 Field record 5424. 055 150 Bell 424 (BA, BM, CHR, LE, MEL, O, PC), Bell 431 (AAS). 055 155 Bell 460 (BM), Greene 655 (AAS, CHR). 060 135 Field record 5427. 060 150 Field record 5417. 065 140 Field record 5413. 065 150 Bell 53 (AAS). 070 125 Field record 5425. 070 130 Field record 5418. 070 135 Field record 5419. 070 145 Bonner 189 (BM), Greene 1189 (BM, NY, O, PC, PRE), Greene 1267 (AAS, B, CHR, INACH, MEL, NY, PC), Greene 1333b (BM, CHR, S-PA), Greene 1344 (BM, S-PA).
- 075 125 Field record 5421. 075 130 Field record 5404. 075 145 Field record 5402. 080 125 Greene 2647 (AAS, CHR, H), Greene 2736 (BM, S-PA), J. Smith M127 (AAS). 080 135 Field record 5409. 080 140 Field record 3039. 080 150 Field record 5411. 090 145 Greene 1652 (AAS). 095 145 Field record 5393.
- 100 145 Field record 5390. 115 130 Bell 312 (BM, PRE, S-PA, TNS), Bell 329 (AAS), Greene 3013 (B, BM, TNS), Greene 3110 (AAS, CHR, INACH), Greene 3282 (AAS), Longton 134 (AAS, B, INACH, NY, S-PA). 115 135 Cragg D3b (DHM), Greene 1419 (AAS, BA, H, LE, MSC), Greene 1445b (BM), Greene 3307 (BM, MEL, NY, PC), Greene 3316a (BM), Longton 206 (AAS, TNS), Longton 207 (BM, CHR, PRE). 120 125 Longton 154 (BM, MSC), Longton 155 (AAS). 120 130 Greene 2944 (AAS), Greene 2966 (BM), Greene 2967 (AAS, O, PRE), Longton 183 (BM, O). 120 135 Greene 3411 (AAS, H, S-PA), Longton 96 (BM, TNS).
- 125 095 Greene 2519 (BM, LE, NY, PRE). 125 120 Greene 1560 (BM, TNS). 125 135 Clarke and Greene CG142 (BM). 130 110 Clarke and Greene CG229 (BM). 130 115 Clarke and Greene CG346 (AAS). 130 120 Bell 72 (B, BA, BM), Bell 1366 (AAS), Clarke and Greene CG244 (AAS), Longton 431 (AAS, O), R. Smith 1157 (AAS). 130 125 BAS Misc. 17 (AAS), Bell 121 (BM, CHR, H, INACH, LE, MEL, MSC), Bell 1280 (BM, NY, PC, S-PA), Bell 1285 (AAS, CHR, INACH, MEL, NY, PC, S-PA), Bell 1367 (BM, MEL), Clarke and Greene CG323 (AAS), Clarke and Greene CG327 (BM, PRE), Clarke and Greene CG329 (BM), Clarke and Greene CG334 (AAS), Greene 94 (AAS), Greene 1791 (BM, INACH, MEL, MSC, O, PC, S-PA, TNS), Greene 1897 (AAS, INACH, NY), Greene 2899 (BM). 130 135 Clarke and Greene CG82 (AAS, CHR). 135 115 Bell 170 (AAS), Bell 195 (BM, NY, O, PC). 140 110 Longton 266 (AAS, B, CHR). 140 115 Bell 1274 (BM, PRE, TNS), Bell 1279 (AAS, BA, H, LE, MSC, O, PRE, TNS). 140 120 Greene 549 (BA, BM), Greene 1007 (AAS, PC), Greene 1036 (BM). 145 070 Greene 2781 (AAS, B, BA). 145 110 Longton 383 (AAS, MSC), Longton 384 (BM, NY). 145 115 Greene 873 (AAS, PC), Longton 303 (BM, INACH).
- 155 055 Field record 5834. 155 095 Greene 2302 (AAS, O, PRE, TNS). 155 100 Bell 485 (BM, O, S-PA), Bell 490 (AAS, LE, MEL, MSC, NY, O, PC, PRE, S-PA, TNS), Bell 1302 (B, BA, BM, H, LE, MSC, O, PRE, TNS). 160 055 Field record 5844. 160 060 Greene 2840 (BA, BM, H), Greene 2858 (AAS, LE, MSC). 160 090 Bell 224 (AAS, B, CHR, INACH, MEL, NY, PC). 160 095 Bell 951 (AAS, B, BA, BM, CHR, H, INACH, LE, PC, S-PA), Bell 1351 (AAS), Bell 1363 (AAS), Greene 2331b (AAS). 165 060 Field record 5839. 165 075 Field record 5854. 165 080 Field record 5851. 165 085 Field record 5563. 165 090 Field record 5850. 170 065 Field record 1793. 170 070 Field record 5848. 170 090 Field record 5849.
- 175 070 Field record 5601.

Inadequately localized

Moraine Fiord, Cumberland Bay, Georgia australis, 18.iv.1909. Skottsberg 37 (PC, as *R. nigratum*).

Racomitrium crispulum (Hook. f. et Wils.) Hook. f. et Wils. var. *rupestre* (Hook. f. et Wils.) Dix.

080 125 Greene 2630 (BM, INACH), Greene 2646 (AAS, LE, MEL, PC).

130 125 Greene 2015 (AAS, BA, BM, S-PA, TNS).

155 095 Bell 1335 (AAS, B), Bell 1337 (BM, CHR, H).

Racomitrium heterostichoides Card.

- 030 150 Bell 4 (AAS). 030 155 Bell 22 (AAS, TNS). 035 145 Field record 2724. 040 150 Greene 712 (B, BM, MSC, O), Greene 765 (AAS, O). 040 155 Field record 2748. 045 145 Field record 2754. 045 150 Field record 2758.
- 050 135 Field record 2947. 050 140 Field record 3136. 050 150 Bell 392 (BM, LE, MEL, MSC, NY, O, PC, PRE, S-PA, TNS), Bell 407 (AAS, BA, H, LE, MSC, O, PRE, TNS). 050 155 Bell 471 (AAS). 055 135 Field record 2941. 055 140 Field record 3053. 055 145 Field record 3167. 055 150 Bell 430 (B, BA, BM, CHR). 055 155 Bell 459 (AAS). 060 150 Field record 3060. 065 140 Field record 3048. 065 150 Bell 21 (BM, CHR, LE, NY, PRE). 070 130 Field record 3071. 070 135 Field record 3083. 070 145 Greene 1217 (B, BM, INACH, PRE). 070 155 Greene 634 (AAS, CHR, MEL, PC, S-PA).
- 075 125 Field record 3122. 075 130 Field record 2938. 075 145 Field record 2922. 080 125 Greene 2735 (BM, MSC, O, S-PA). 080 130 Field record 3044. 080 135 Field record 2968. 080 140 Field record 3037. 080 150 Field record 3046. 090 145 Greene 1657 (BM, INACH, PC, PRE, S-PA). 095 145 Field record 2746.
- 100 145 Field record 2741. 105 140 Field record 2737. 115 130 Bell 319 (AAS), Greene 3109 (BM, NY, PC, S-PA, TNS). 115 135 Bell 344 (BA, BM), Bell 356 (AAS, CHR, H, INACH, LE), Greene 1473 (AAS), Greene 3304 (AAS, O). 120 130 Greene 3029 (AAS, BA, CHR, INACH, NY), Longton 185 (AAS, B, CHR, H, NY, S-PA). 120 135 Sladen JB19/39 (BM). 120 140 Greene 3350 (BM).
- 125 115 Field record 2725. 125 120 Bell 1293 (BM, MEL, MSC, NY). 125 125 Greene 1580a (AAS, B, H, TNS). 130 120 Bell 153 (BM, H, INACH), Clarke and Greene CG 246 (AAS), Greene 1861 (AAS, CHR, LE, MEL, NY), Longton 429 (BA, BM, LE, NY), R. Smith 1180 (AAS), Skottsberg 319 (S-PA). 130 125 Bell 74 (BM, S-PA), Bell 84 (AAS, BA, INACH, MSC, PC), Bell 112 (B, BM, H, MEL, O), Bell 1283 (AAS, CHR, INACH, MEL, NY), Clarke and Greene CG451 (BM, H), Greene 120 (AAS). 135 115 Bell 189 (AAS). 140 115 Bell 1380 (BM, O, PC, PRE, S-PA, TNS), Longton 232 (BA, BM, MEL, PRE, TNS). 145 115 Longton 308 (AAS, INACH, LE, PC).
- 155 055 Field record 5833. 155 095 Bell 1320 (AAS). 155 100 Bell 500 (AAS). 160 055 Field record 5846. 160 060 Greene 2454 (BM, H), Greene 2824 (AAS), Greene 2838 (B, BM, CHR, LE, PC, PRE, TNS). 160 090 Bell 243 (AAS). 160 095 Bell 956 (AAS), Bell 1358 (AAS), Greene 2286 (BA, BM). 160 100 Bell 1348 (BM, PC, S-PA), Greene 2436 (AAS, H, MEL, S-PA). 165 060 Field record 5840. 165 075 Field record 5623. 165 080 Field record 5580. 165 085 Bell 264 (B, BM). 170 065 Field record 5626.

Inadequately localized

Angustundra vid Morainenfjorden, Cumberland Bay, Sydgeorgien, 18.iv.1909, Skottsberg 35 (BM, S-PA).

Racomitrium lanuginosum (Hedw.) Brid.

- 020 150 Field record 3328.
- 030 145 Field record 3316. 030 150 Bell 1 (AAS, B, CHR), Greene 221 (BM, O, S-PA), Greene 1170 (AAS, INACH, MEL, O, PC, S-PA, TNS), Greene 2004 (BM, MEL, O, PC, S-PA). 030 155 Bell 26 (BM), Greene 409 (AAS, BA, CHR, LE, MEL, NY). 035 145 Field record 2723. 035 150 Field record 2764. 040 145 Field record 2731. 040 150 Field record 2768. 040 155 Field record 2730. 045 145 Field record 2750. 045 150 Field record 2757.
- 050 135 Field record 2946. 050 140 Field record 3133. 050 150 Bell 374 (BM). 050 155 Bell 473 (AAS). 055 135 Field record 2943. 055 140 Field record 3009. 055 145 Field record 3177. 055 150 Bell 427 (AAS, BA, INACH, MEL, NY, PC, S-PA, TNS), Bell 436 (B, BM, H, LE, O, TNS), Clarke and Greene CG25 (AAS, BA, CHR, LE). 055 155 Bell 473 (AAS). 060 135 Field record 3145. 050 150 Field record 3025. 065 140 Field record 3002. 070 125 Field record 3184. 070 130 Field record 3070. 070 135 Field record 3075. 070 145 Greene 1219 (BM, O, S-PA, TNS).
- 075 125 Field record 3119. 075 130 Field record 2936. 075 135 Field record 3200. 075 145 Field record 2729. 080 125 Greene 2743 (BM, INACH, LE, MEL, NY, O, PC, PRE, S-PA, TNS), J. Smith M101 (AAS), J. Smith M117 (AAS). 080 135 Field record 2965. 080 140 Field record 2976. 080 150 Field record 2986. 095 145 Field record 2739.
- 100 145 Field record 3280. 105 140 Field record 2735. 105 145 Field record 2733. 115 130 Bell 306 (BA, BM, H, LE, MEL, MSC, NY). 115 135 Bell 349 (AAS, CHR, MEL, O, TNS), Cragg D16 (DHM), Longton 68 (BM, CHR, INACH, LE, MEL). 120 130 Greene 3027 (AAS, BA, CHR, INACH, LE, MEL, NY). 120 135 Field record 3211.
- 125 115 J. Smith M19 (AAS). 125 120 Greene 1072 (BM, PC, PRE). 125 125 Greene 1578 (AAS, BA, CHR, INACH, LE, NY, PRE). 125 135 Clarke and Greene CG118 (BM, INACH, MEL, NY), Longton 166 (AAS). 130 110 Bell 219 (AAS), Clarke and Greene CG236a (AAS). 130 115 J. Smith M17 (BA, BM, O, PC). 130 120 Bell 68 (AAS, BA, H, LE, MSC, O, PRE), Bell 143

- (BM, INACH, MEL, TNS), Bonolli-Cipoletti s.n. (AAS ex herb. BA acc. no. 16815), Clarke and Greene CG247 (AAS, PRE), Greene 171 (AAS, MEL, PC), Greene 1844 (BM, CHR, LE, NY), Greene 3509 (BA, BM, INACH, MEL, O, PC, PRE, S-PA, TNS), Longton 426 (BM, PRE, TNS), 130 125 Bonner 267 (BM), Greene 99 (BA, BM, INACH), Greene 1934 (AAS, BA, INACH, MEL, PC, PRE, S-PA, TNS), Greene 2897 (BM, CHR, LE, NY, O, PC, PRE, S-PA), Greene 3574 (AAS, CHR, INACH, NY, O, PC, PRE, S-PA, TNS). 135 115 Bell 221 (BM, NY, PC, S-PA). 135 120 Clarke and Greene CG264 (BM, S-PA, TNS). 140 115 Bell 1376 (BM, O, PRE, TNS), Longton 231 (BM, NY, PC, PRE), Longton 361 (BM, CHR). 140 120 Field record 1418. 145 070 Greene 2767 (AAS, BA, CHR, O, PRE, TNS). 145 110 Longton 379 (AAS, LE, NY). 145 115 Longton 306 (AAS, O, S-PA, TNS).
- 155 095 Bell 1315 (AAS, PRE), Bell 1341 (AAS), Greene 2300 (AAS, BA, CHR, INACH, LE, NY). 155 100 Bell 492 (B, BA, BM, H, LE, MSC, O, PRE, S-PA, TNS), Bell 1307 (BM, CHR, INACH, MEL, NY, PC, S-PA). 160 055 Field record 5842. 160 090 Bell 245 (AAS, BA, INACH, LE, MEL, MSC, PC, TNS). 160 095 Bell 954 (AAS), Bell 1353 (AAS). 160 100 Bell 1345 (AAS). 165 060 Field record 5837. 165 075 Field record 5624. 165 085 Bell 266 (B, BM, CHR, H, NY, O), Bell 287 (AAS, B, BA, LE, MEL, PC), Bell 288 (BM, CHR, H, INACH, O, PRE, S-PA, TNS), Bell 294 (AAS, B, CHR, INACH, MSC, NY, PC, S-PA). 170 070 Field record 5570.
- 175 065 Field record 5607. 175 070 Field record 5598.

Inadequately localized

King Haakon Bay, leg. A. B. Dickinson, 15.x.1964, Longton 808 (AAS); Wilson Harbour, 19.i.1927, Disc. Invest. s.n. (BM); Brockenthal, an Felsen in grossen Polstern findet sich ausserdem im unt. Whalerthal und am grossen Gletscher, Süd-Georgien, 10.ii.83, Will 45 (HBG, as *R. glaciale*); Brockenthal, an Felsen in grossen Polstern findet sich ausserdem im unteren Whalerthal S. vom grossen Gletscher, Süd-Georgien, 10.ii.83, Will 45 (M, as *Grimmia (Rhacomitrium) glacialis*).

Racomitrium pachydietyon Card.

- 030 150 Bell 3 (AAS, S-PA, TNS), Greene 226 (BM), Greene 382 (AAS, PC), Greene 1166 (AAS, INACH), Greene 2005 (AAS, B, INACH, NY). 030 155 Bell 25 (BM, PRE). 035 145 Field record 5364. 035 150 Greene 1092 (BM). 040 145 Field record 5376. 040 150 Field record 5371. 045 145 Field record 5398. 045 150 Field record 5377. 050 135 Field record 5406.
- 050 150 Bell 383 (BM). 055 135 Field record 5408. 055 140 Field record 5415. 055 150 Bell 440 (AAS). 060 150 Field record 5416. 065 140 Field record 5414. 065 150 Bell 54 (AAS, PC). 070 145 Greene 1333a (AAS, MSC, O).
- 075 125 Field record 5660. 075 135 Field record 3220. 075 145 Field record 5375. 080 125 Greene 2645 (BM, H, MSC), J. Smith M125 (AAS, MEL). 080 150 Field record 5412. 095 145 Field record 5396.
- 115 130 Bell 299 (BM, H, INACH, LE, MEL, MSC), Bell 313 (AAS, CHR).
- 125 115 J. Smith M167 (BM). 125 120 Field record 1873. 130 115 R. Smith 1255 (AAS). 130 120 Greene 3543 (AAS, H, O), Skottsberg 312 *pro parte* (S-PA). 130 125 Bell 98 (BM, O), Clarke and Greene CG344 (AAS, PRE, S-PA, TNS), Greene 2016 (BA, BM, NY, S-PA), R. Smith 1303 (BM, LE), R. Smith 1311 (BM). 135 115 Bell 171 (AAS, NY). 135 120 Clarke and Greene CG271a (BM), 145 110 Longton 381 (BM).
- 155 055 Field record 5832. 155 095 Bell 1336 (B, BA, BM), Bell 1344 (AAS, MSC, O, PRE, S-PA, TNS), Bell 1364 (AAS, B, CHR, INACH, MEL, NY, PC), Greene 2181 (BM), Greene 2198 (AAS, CHR, LE, PC, PRE, TNS). 155 100 Bell 1301 (AAS, BM, INACH, MEL, S-PA). 160 060 Greene 2479 (AAS, B, BA, CHR). 160 095 Greene 2344 (BM, PRE). 160 100 Bell 1347 (BA, BM, H, LE).

Inadequately localized

King Haakon Bay, leg. A. B. Dickinson, 15.x.1964, Longton 811c (AAS).

Racomitrium ptychophyllum (Mitt.) Mitt.

- 055 140 Greene 1142 (BM, INACH, MEL). 060 150 Field record 3027.
- 080 125 J. Smith M99 (AAS), J. Smith M116 (BM, PRE). 080 135 Field record 2967. 080 140 Field record 3040.
- 120 135 Longton 102 (AAS, H, LE, TNS).
- 125 130 Longton 164 (BM, INACH, NY, PC, S-PA). 130 110 Bell 205 (AAS, B, H, MSC, O, PC, PRE, S-PA), Clarke and Greene CG236b (AAS, CHR, NY, S-PA). 130 115 J. Smith M29 (B, BA, BM, MEL). 130 120 Longton 430 (AAS, BA, CHR, LE, TNS). 135 115 Field record 1919. 140 115 R. Smith 1272 (AAS).
- 165 080 Field record 5587. 165 085 Bell 261 (BA, BM, CHR, MSC, O, TNS). 170 070 Field record 5569.

Inadequately localized

Cumberland Bay, Géorgie du Sud, 15.v.1902, Skottsberg 321 (S-PA).

Racomitrium striatipilum Card.

- 030 150 Greene 219 (BA, BM, CHR, LE, NY, S-PA). 030 155 Bell 38 (AAS). 035 150 Field record 2765. 040 145 Field record 2732. 040 150 Field record 2767. 040 155 Field record 2747. 045 145 Field record 2745. 045 150 Field record 2756.
- 050 135 Field record 2948. 050 150 Bell 370 (AAS), Bell 375 (AAS), Bell 380 (AAS), Bell 381 (AAS), Bell 406 (AAS), Bell 409 (AAS). 050 155 Bell 454 (BM, S-PA), Bell 479 (AAS). 055 135 Field record 2940. 055 140 Field record 3052. 055 145 Field record 3176. 055 150 Bell 422 (AAS). 055 155 Bell 461 (BA, BM, H, MEL, NY, PC), Greene 649 (AAS). 060 135 Field record 3404. 060 150 Field record 3026. 065 140 Field record 3050. 070 125 Field record 3185. 070 130 Field record 3069. 070 135 Field record 3076. 070 145 Greene 1341 (AAS, BA, CHR, INACH, LE, NY, PRE, S-PA).
- 075 125 Field record 3120. 075 130 Field record 3029. 075 135 Field record 3199. 075 145 Field record 2920. 080 125 Greene 2741 (B, BM, H, MSC, O), J. Smith M100 (AAS, CHR), J. Smith M124 (BM, LE). 080 130 Field record 3043. 080 135 Field record 2973. 080 140 Field record 3036. 080 145 Clarke and Greene CG5 (BA, BM). 095 145 Field record 2742.
- 115 130 Bell 308 (AAS), Bell 320 (BA, BM, H), Bell 322 (BM, LE, MSC, O, PRE). 115 135 Bell 343 (AAS, MEL, NY), Bell 346 (BM, LE, MSC, O, PRE, TNS), Bell 355 (B, BM, CHR, INACH, PC, S-PA, TNS), Greene 1456 (B, BM, H, MEL, TNS), Greene 3305 (AAS), Greene 3308b (BM, NY, S-PA). 120 125 Longton 152 (B, BM, INACH, S-PA, TNS). 120 130 Longton 186 (BM, INACH, PRE), Longton 187 (AAS). 120 135 Greene 3398 (AAS, MSC, O), Longton 103 (AAS, MEL, NY, PC, PRE).
- 125 125 Greene 1574 (AAS, LE, NY). 125 130 Longton 165 (AAS, BA, LE, NY, PC). 130 110 Bell 215 (AAS). 130 115 Bell 204 (AAS, LE, MSC). 130 120 Bell 140 (AAS, S-PA, TNS), Bell 156 (BA, BM, H), Clarke and Greene CG248 (BM), Longton 427 (BM, CHR, MEL), Longton 428 (AAS, NY, PRE), Longton 432 (AAS, H, INACH, MEL, PC, PRE, S-PA, TNS), Longton 433 (BM), Skottsberg 321 *pro parte* (S-PA), J. Smith M1e (AAS), R. Smith 1155 (BM, MSC, O). 130 125 Bell 83 (B, BA, BM, CHR, H, INACH, LE, MEL, MSC, NY), Bell 109 (BM, O, PC, PRE), Greene 1887 (BM, CHR, MEL, PC, S-PA, TNS). 135 115 Bell 173 (B, BM, CHR, INACH, MEL, NY, PC), Clarke and Greene CG212 (AAS). 135 120 Field record 3208. 140 110 Longton 268 (BM, CHR, MEL, PC, S-PA). 140 115 Bell 1277 (BM, CHR, H, LE, MEL, NY, PC, S-PA), Bell 1374 (AAS). 140 120 Greene 541 (B, BM, INACH, PRE, TNS), Greene 957 (BM, MEL, PC, TNS). 145 110 Longton 380 (AAS, B, BA, LE, PC). 145 115 Longton 299 (AAS, H), Longton 304 (B, BA, BM, H, INACH, LE, NY, PRE).
- 155 055 Field record 5831. 155 095 Bell 1340 (BM, TNS). 155 100 Bell 498 (AAS). 160 055 Field record 5841. 160 060 Greene 2455 (AAS). 160 090 Bell 235 (BM, O, PRE), Bell 255 (BM, S-PA, TNS). 160 095 Bell 953 (AAS). 160 100 Bell 1349 (AAS). 165 060 Field record 5838. 165 075 Field record 5621. 165 080 Field record 5579. 165 085 Bell 262 (AAS). 165 090 Bell 260 (AAS, B, CHR, INACH). 170 065 Field record 5628. 170 070 Field record 5847.
- 175 065 Field record 5609.

Inadequately localized

King Haakon Bay, leg. A. B. Dickinson, 15.x.1964, Longton 811b (AAS).

Racomitrium willii (C. Muell.) Kindb.

- 030 150 Field record 2779. 030 155 Greene 407 (BM, CHR, H, MEL, PC, S-PA, TNS). 035 150 Greene 703 (AAS, BA, LE). 040 150 Field record 3381. 045 145 Field record 2751. 045 150 Field record 3477.
- 050 135 Field record 2945. 050 140 Field record 3134. 050 150 Bell 362 (BM, CHR, LE, NY, PRE), Bell 411 (AAS, B, BA, H, MEL, O). 050 155 Bell 456 (AAS). 055 135 Field record 2939. 055 140 Greene 1141 (BM, PRE). 055 145 Field record 3178. 055 150 Bell 447 (BM, S-PA). 055 155 Greene 657 (AAS, H, INACH, TNS). 060 135 Field record 3144. 060 150 Field record 3028. 065 140 Field record 3049. 070 125 Field record 3186. 070 130 Field record 3068. 070 135 Field record 3077. 070 145 Greene 1218 (AAS, B, H, TNS).
- 075 125 Field record 3121. 075 130 Field record 2937. 075 135 Field record 3201. 075 145 Field record 2728. 080 125 Greene 2742 (BM, CHR, H, MEL, NY, PC, S-PA, TNS), J. Smith M114 (BM, INACH), J. Smith M115 (AAS, TNS), J. Smith M120 (BM). 080 135 Field record 2966. 090 145 Greene 1654 (AAS, BA, INACH, LE, NY, PRE), Greene 1681 (BM, H, S-PA, TNS). 095 140 Field record 3536. 095 145 Field record 2743.
- 100 145 Field record 2740. 115 130 Bell 301 (AAS), Bell 326 (BM). 115 135 Bell 340 (AAS, INACH, MSC, PC, TNS), Greene 1403 (B, BM, H, INACH, PRE, S-PA, TNS), Greene 1471 (AAS, NY, PC), Greene 3133 (BM, CHR, INACH, NY, S-PA, TNS), Greene 3240 (AAS, LE, PC), Greene 3308a (B, BM, CHR, INACH), Longton 61 (AAS, NY, S-PA). 120 130 Greene 3007 (AAS, BA, MEL, PRE), Longton 181 (BM, MEL, PC, S-PA). 120 135 Clarke and Greene CG106 (AAS).
- 125 125 Greene 1587 (BM, CHR, LE, MEL). 125 130 Skottsberg 269 *pro parte* (S-PA). 130 110 Bell 220 (B, BM, CHR, INACH, MEL, NY). 130 115 J. Smith M6 (BM, PRE, S-PA), J. Smith M15c (AAS). 130 120 Bell 128 (AAS, B, CHR, INACH), Bell 133 (BM, MEL, NY), Bell 135 (AAS, BA, PC, S-PA), Bell 152 (BM, H, LE, MSC, O), Clarke and Greene CG200 (BA, BM, CHR, LE, MEL, NY), Clarke and Greene CG345 (AAS, PC), Greene 1845 (AAS, B, BA, CHR, MEL, PC, S-PA,

- TNS), Greene 3510 (AAS, BA, CHR, LE, MEL), Greene 3511 (BM, PC, PRE, S-PA), J. Smith M142b (AAS), R. Smith 1156 (BM). 130 125 Bell 85 (BM), Bell 1287 (AAS), Bonner 268 (BM, CHR), Greene 1933 (BA, BM, LE, MEL, PC), Greene 2913 (B, BM, INACH). 135 110 Field record 1390. 135 115 Bell 177 (AAS, BA, H, LE, MSC, O, PRE, TNS). 135 120 Field record 1404. 140 115 Bell 1371 (AAS, PRE, TNS). 145 115 Longton 298 (AAS, BA, LE, NY), Longton 307 (B, BM, INACH, PRE).
- 155 055 Field record 5835. 155 095 Bell 1325 (AAS), Bell 1342 (AAS), Greene 2113 (AAS, CHR, NY). 155 100 Bell 493 (AAS), Bell 494 (AAS), Bell 1308 (BA, BM, CHR, INACH). 160 055 Field record 5843. 160 060 Greene 2830b (AAS). 160 090 Bell 238 (BM, PC). 160 095 Bell 958 (BM, MSC, PC, PRE, S-PA, TNS), Bell 1357 (AAS, H), Greene 2317 (AAS, BA, LE, NY, PRE). 160 100 Bell 1346 (B, BM, H, LE, MEL, NY, O). 165 075 Field record 5616. 165 080 Field record 5578. 165 085 Bell 265 (AAS), Bell 270 (BM, S-PA). 170 070 Field record 5600.
- 175 065 Field record 5608.

Inadequately localized

Angustundra vid Morainfjorden, Cumberland Bay, Sydgeorgien, 18.iv.1909, Skottsberg 34 (BM, S-PA); King Haakon Bay, leg. A. B. Dickinson, 15.x.1964, Longton 811d (AAS); An Felsen im Hintergrund des Thales rechts am S.W.-Gletscher in grossen Polstern, Süd-Georgien, 10.v.83, Will 45 (HBG, PC).