

# A SYNOPTIC FLORA OF SOUTH GEORGIAN MOSSES:

## VII. *Pottia*

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ABSTRACT. *Pottia austro-georgica*, the only species of the genus known from South Georgia, is described and illustrated. Notes on habitat and distribution, together with a full list of specimens examined and short historical notes on taxonomy are provided. The species is reinstated as a distinct taxon, having formerly been considered *Pottia macrophylla*, and its relationship with other taxa is discussed. *P. austro-georgica* var. *microphylla* is reduced to synonymy.

THE Pottiaceae of South Georgia form a prominent part of the bryological flora of the island, of particular importance being the large number of species of *Tortula* which are widespread and abundant. Other taxa in the family, including the *Pottia* described here, although well distributed are at most locally frequent.

The arrangement of the text, the description of species and the citation of specimens and field records, follows the format of other papers in this series (Greene, 1973; Newton, 1977). It should be noted, however, that in addition to the collections cited by Newton (1977) further material has been available for study, the source of which is indicated by Bell and Greene (1975).

### POTTIACEAE

#### *Pottia* (Reichenb.) Ehrh. ex Fuernr.

This genus, represented by a single species on South Georgia, is characterized by short stems bearing crowded leaves with rounded quadrate upper leaf cells which are often papillose on both surfaces. The capsule is erect and symmetrical, oval to shortly cylindrical with a peristome either rudimentary or absent.

#### *Pottia austro-georgica* Card.

##### *Syn. Pottia austrogeorgica* var. *microphylla* Card. et Broth.

Plants forming compact dense cushions, often with bright dark red sporophytes, tomentose below. Stems erect, short (0.4—) 0.5—0.7 (—1.0) cm. high, single or with 2–3 sub-perichaetial branches, leaves crowded, erecto-patent and rigid when moist, erect and with curved apices when dry. Leaves 1.0—1.5 (—2.0) × (0.30—) 0.35—0.55 (—0.60) mm., narrowly ovate-lanceolate to shortly oblongo-lanceolate, shortly acuminate. Margin plane, occasionally slightly recurved below the apex, dentate or denticulate above, crenulate for some distance below. Nerve strong, percurrent or slightly excurrent. Leaves with prominent border from apex to about mid-leaf. Cells above (10.0—) 11.0—14.5 (—23.0) × 8.7—14.5 (—21.0)  $\mu$ m., rounded quadrate to rounded hexagonal, obscured by dense C-shaped and circular papillae, border formed by 2–3 rows of thick yellow-walled cells with few or no papillae, rhombic to elongate towards apex, quadrate towards mid-leaf, below elongate, rectangular, smooth, lax and hyaline. Autoecious, female inflorescences terminal on main shoots, males lateral on main or side shoots, or terminal on latter. Perichaetial bracts longer and wider than vegetative leaves, longly acuminate and often coarsely toothed at apex. Seta 2.0—5.0 (—8.0) mm. long, stout, slightly curved, twisted when dry. Calyptra very large covering entire capsule, 1.5—2.5 mm. long, cucullate, smooth. Capsule 1.0—1.4 × (0.5—) 0.6—0.9

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mm., erect, shortly cylindrical to ovate, wide-mouthed both wet and dry, lacking a peristome. Operculum 1.0 mm. long, obliquely longly rostrate, not attached to the columella. Spores (27.0—) 29.0—39.0 (—42.0)  $\mu$ m., dark red to brown with prominent verrucae. (Fig. 1.)

#### *Habitat and distribution* (Fig. 2)

*Pottia austro-georgica* is a locally frequent species on the island, growing on rocks by the shore and on dry sea cliffs, occasionally on *Poa flabellata* tussock peat banks. Altitude 0—60 (—180) m. The species is also known to occur farther south on the South Orkney and South Shetland Islands (Matteri, 1977).

#### *Notes*

The short stems bearing rigid erecto-patent dark green leaves, forming cushions on rocks or, less commonly, on peat should enable identification of sterile material of this species, although microscopic confirmation of leaf shape and size, and the presence of a clear border and densely papillose cells may be necessary. Fruiting material is easily recognized by the presence of usually abundant dark red almost brown capsules, with large calyptrae borne on thick short setae. In the vegetative state, small species of *Tortula* and *Encalypta* may readily be separated from *P. austro-georgica* by having their leaves when moist spreading with more or less reflexed apices.

A single specimen of *Pottia* from Maiviken, Cumberland West Bay (Greene, 3464), has been excluded from *Pottia austro-georgica*, as defined above, owing to several unusual features. The vegetative characters of this material are generally intermediate between *P. austro-georgica* and the *Pottia heimii* complex, and combine the densely papillose leaf cells and more or less distinct border of the former with a sub-excurrent nerve and entire leaf margin of the latter. Sporophytic characters, including setal length and an operculum attached to the columella, as well as the size of the calyptra, indicate a close relationship to *P. heimii*, which is unknown on the island. The identity of this plant cannot be settled until more material becomes available for study.

#### *Taxonomy*

*Pottia austro-georgica* was first described by Cardot (1906) for a specimen from South Georgia (Type, Skottsberg 290, PC, South Georgia, Royal Bay, Moltke Harbour, leg. C. Skottsberg 29.iv.1902, 2 specimens). These specimens and four duplicates in BM, H, S and UPS, have been examined and all correspond in all essential features with recent South Georgian material notably in the leaf areolation and fruiting characters.

Cardot and Broth. (1923) recognized a variety *microphylla* Card. et Broth. from South Georgia, which was considered to have smaller leaves than the typical form. Examination of the type specimen (Skottsberg 19, H, PC, S, UPS, South Georgia, Bay of Isles, Rosita Harbour ad rupes, leg. C. Skottsberg 25.iv.1909) showed the material to fall well within the range of variation of *P. austro-georgica* and thus is reduced to synonymy.

The author agrees with Cardot (1906, 1908) in considering *P. austro-georgica* to be closely related to *P. fusco-mucronata* C. Müll., a species described by Müller (1883) for material from Iles Kerguelen, which also has short setae, a calyptra covering the entire capsule and obscure leaf cells. In a fuller description, Müller (1889) stated "operculo in columella crassa persistente", a character which distinguishes it from the South Georgian taxon. One sterile specimen of the original collection (BM, "Ex Museo botanico Berolinensi, *Pottia fusco-mucronata* C. Müll. n. sp., Kerguelensland, Gazellen-Expedit., Naumann, Nov. 1874") has been examined and showed stem leaves which lack the distinct toothed border of *P. austro-georgica*, thus confirming the distinctness of the species.

Dixon (1923) was the first to suggest the close similarity of *P. austro-georgica* with *Henne-*

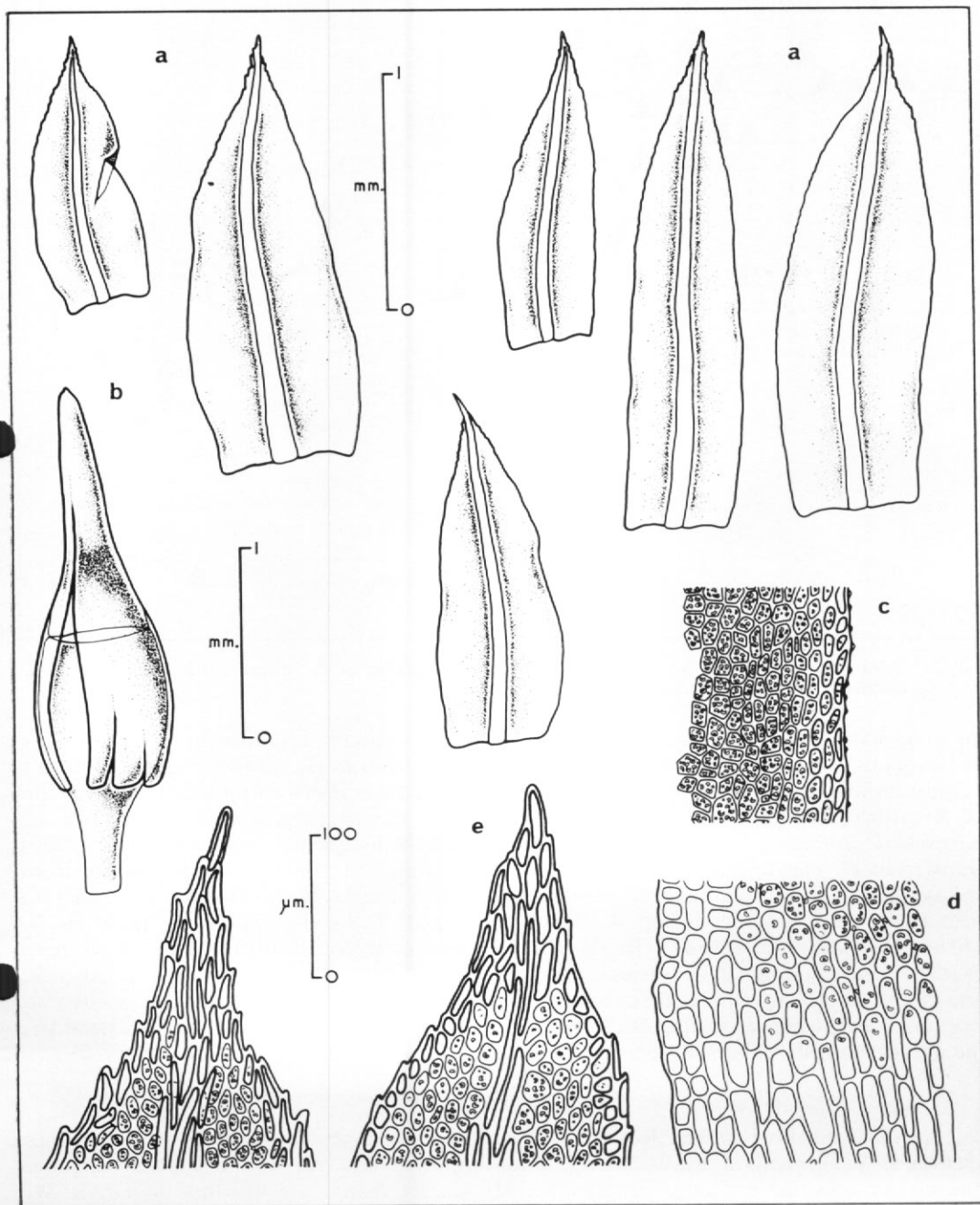


Fig. 1. *Pottia austro-georgica*.

a. Leaves; b. Capsule with calyptre; c. Upper leaf cells with border; d. Median leaf cells; e. Leaf apices with border. Scales: upper for leaves; median for capsule; lower for cells.

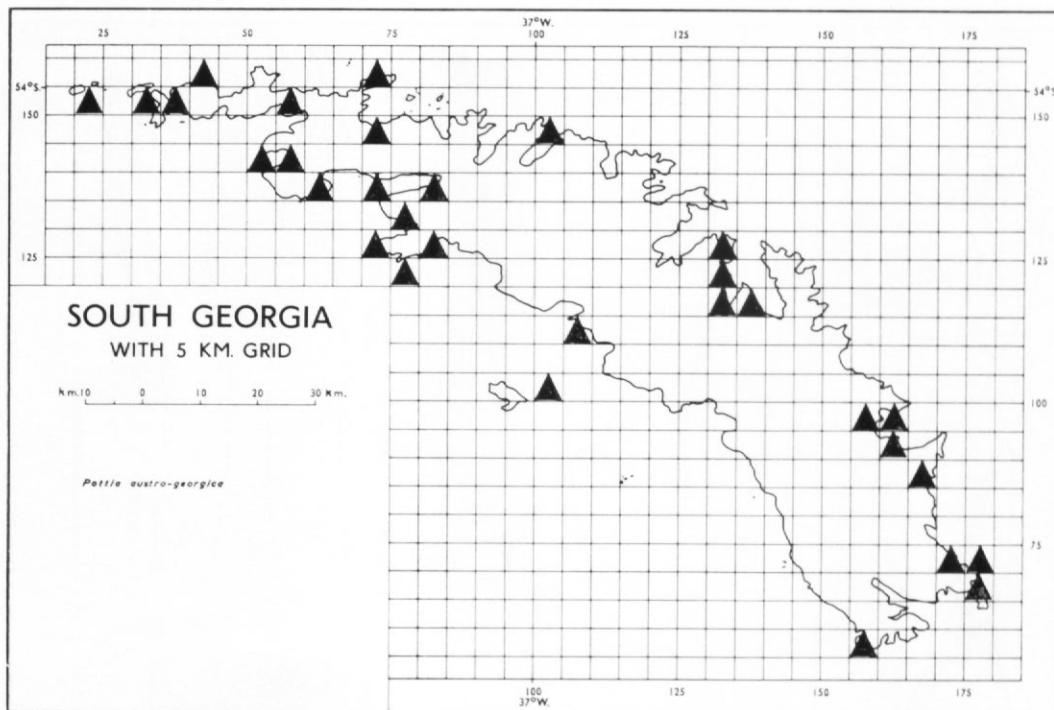


Fig. 2. The known distribution on South Georgia, by 5 km. squares, of *Pottia austro-georgica* based on the specimens and field records given in the Appendix.

*diella microphylla* (R. Brown ter.) Par., a New Zealand species described by Brown (1892\*) in the genus *Hennedia* and now a synonym of *H. macrophylla* (R. Brown ter.) Par. Dixon's suggestion was based on the comparison of New Zealand specimens with Cardot's description of *P. austro-georgica* as he indicated when listing *P. austro-georgica* as a synonym of *H. microphylla* preceding the epithet by a question mark. Subsequently, Sainsbury (1952, 1955) transferred *H. macrophylla* to the genus *Pottia*, deleting the South Georgian species from the synonymy. Type specimens of *H. microphylla* (BM, "herb. H. N. Dixon, New Zealand, near R. Avon, Christchurch, leg. R. Brown ter.") and *H. macrophylla* (BM, "herb. H. N. Dixon, New Zealand, banks of River Avon, Christchurch, leg. R. Brown ter.") have been examined and, although both species are undoubtedly related to *P. austro-georgica* by calyptra, seta and capsule characters, their habit and the presence of a wide complete border on vegetative leaves readily distinguishes them from the South Georgian collections. Therefore, the author suggests *P. austro-georgica* should be retained as a distinct species.

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\* Effective date May 1893, according to title page of volume.

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## APPENDIX

### DETAILS OF THE SPECIMENS AND FIELD RECORDS FROM WHICH THE DISTRIBUTION FIGURE WAS COMPILED

The references to herbaria cited after each specimen follow those recommended by Holmgren and Keuken (1974). It should be noted that the British Antarctic Survey bryophyte herbarium is now housed at the Institute of Terrestrial Ecology's Bush Research Station, Penicuik, Midlothian, Scotland EH26 0QB. 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: C. J. Barrow, 1972-73; B. G. Bell, 1971-72; N. J. Collins, 1969-70; R. I. L. Smith, 1969-71; D. W. H. Walton, T. V. Callaghan and T. Gunn, 1973-74.

A print-out from the data bank of the collecting details for the specimens cited in this Appendix is available on request from the British Antarctic Survey, Madingley Road, Cambridge CB3 0ET.

#### *Pottia austro-georgica* Card.

- 020 150 Greene 1077 (BA, BM).  
030 150 Greene 299a (B, BM, CHR, NY, PC, S, SGO), Greene 377 (AAS, BA). 035 150 Greene 455 (BM, LE, MEL, PRE). 040 155 Field record 8129.  
050 140 R. Smith 1732 (AAS). 055 140 R. Smith 1729 (BA, BM). 055 150 Clarke and Greene CG 22 (AAS, BA). 060 135 R. Smith 1733 (BM). 070 125 Field record 8133. 070 135 R. Smith 1730 (AAS, BA). 070 145 Greene 1285 (BA, BM, H, MSC, TNS). 070 155 Greene 607a (AAS).  
075 120 R. Smith 1731 (BA, BM). 075 130 Field record 8132. 080 125 Greene 2598 (AAS, MEL, S, TNS). 080 135 R. Smith 1728 (AAS).

- 100 100 Field record 8136. 100 145 Field record 8130. 105 110 Field record 8139.  
130 115 Bell 581 (BM, CHR, LE, NY, PC, PRE). 130 120 Clarke and Greene CG 250 (AAS), R. Smith 1306  
(BM). 130 125 Greene 3493 (AAS, MEL, S, TNS). 135 115 Clarke and Greene CG 300 (BA, BM).  
155 055 Field record 8135. 155 095 Greene 2412 (AAS). 160 090 Bell 1406 (BM). 160 095 Bell 960  
(AAS, B, H, MEL, MSC, PRE, TNS), Greene 2240a (BM, LE, NY, PC, S), Greene 2333 (AAS).  
165 085 Bell 1407 (BM, CHR, SGO). 170 070 Bell 1408 (BM, H, SGO), Bell 1409 (AAS, B, H).  
175 065 Bell 1410 (AAS, BA). 175 070 Field record 8127.