Cryptogamie, Bryologie, 2005, 26 (1): 79-90

Hepatics of Heard Island

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(Received 01 November 2004, accepted 17 November 2004)

Abstract — A list of hepatics known from Heard Island, based on the collections made by N. J. M. Gremmen and V.R. Smith, and the complete list of references from the literature to the former collections, is presented. From the 18 species collected by N.J.M. Gremmen, 7 species are new to the island; only one species formerly reported (*Chiloscyphus coadunatus*) was not present in the collections. Two species new to science, *Chiloscyphus gremmenii* Váňa and *Pachyglossa grolleana* Váňa are described and illustrated.

Hepaticae / Heard Island / new species / new record / Subantarctic

INTRODUCTION

Of all sub-Antarctic islands, Heard Island is one of the least studied. The island is visited by small numbers of researchers only, and for relatively short times. Consequently much basic information on the islands biota and biological communities is lacking.

Between December 2000 and February 2001 N.J.M. Gremmen visited Heard Island. Collections of bryophytes were made in the eastern part of the island, mainly between Compton Lagoon and Cape Lockyer. In addition a number of collections was made in the western part of the island, between Vahsel Glacier and Azorella Peninsula. This collection was augmented by some 30 specimens, collected in the western part of the island by V. R. Smith in the same period. The central part of the island, which is largely glaciated, was not visited.

STUDY AREA

Heard Island (52°05'S, 73°30'E) is a small, isolated island in the Southern Indian Ocean, well south of the Antarctic Polar Frontal Zone. The nearest land is formed by McDonald Island, 54 km to the west, and the Kerguelen Islands, 470 km to the northwest. The nearest continent is Antarctica, 1 650 km to the south, with Australia 3 500 km to the northwest, and Africa 4 800 km towards the northeast.

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The island consists of a relatively young volcanic complex (< 1 million years), on a basement of much older formations, which form part of the Kerguelen Plateau (Quilty & Wheller, 2000). The volcanic cone of Big Ben reaches 2 750 m high, and forms the central part of the island, regularly showing relatively small-scale volcanic activity.

Most of the island is glaciated, but glaciers have retreated considerably during the past decades (Scott, 1990; Budd, 2000), and large tracts of lowland as well as some upland areas, are free of ice. The climate is cold, oceanic, with a mean annual temperature of ca. 1.2 °C, usually very strong winds, mostly from the south-west, and a mean precipitation of 1400 mm.yr^{-1}, mostly in the form of snow.

Vascular vegetation and closed bryophyte communities are mostly restricted to lowland areas, but stands of *Azorella selago* and of *Pringlea antiscorbutica* occur locally at altitudes exceeding 300 m a.s.l. (Bergstrom & Selkirk, 2000). Open communities dominated by bryophytes cover much of the ice-free areas, but at higher elevations and in exposed sites lichens dominate the vegetation.

METHODS

During fieldwork for a vegetation survey, some 180 hepatic specimens were collected. Fieldwork was concentrated in the eastern part of the island, between the Spit and Compton Lagoon, although also some areas along the south coast were briefly visited. In addition one week was spent in the western part of the island, mainly in the area around Atlas Cove and Azorella Peninsula. Although we attempted to cover all habitats on the island, access to high altitude sites free of permanent snow and ice was very restricted, because they were difficult to reach, and also because snow-free periods were short. Therefore the number of collections from high altitudes is quite small.

In addition to the collections, field observations on the occurrence of specific hepatic species were made. These observations were used in the notes on the ecology and within-island distribution of the species.

All the specimens were determined or checked by J. Váňa. In the following list of the species, firstly the literature reports are cited, following the specimens collected by N.J.M. Gremmen (NJMG) and V.R. Smith (VRS). The material is deposited in the herbarium of the Australian Antarctic Division (ADT), Kingston, Tasmania, with some duplicates in the herbarium of the Charles University in Praha, Czech Republic (PRC).

RESULTS

Anastrophyllum auritum (Lehm.) Steph. (**new for Heard Island**)
NJMG: 1539.

Only a single collection was made, in dense bryophyte vegetation near the top of Corinth Head, Azorella Peninsula. Here this species was quite abundant. **Distribution**: Widespread in the Southern Hemisphere and the tropical mountains; Heard I., Crozet Is. and Marion I. in the Subantarctic area.

Blepharidophyllum densifolium (Hook.) C. Massal. (Bergstrom & Selkirk, 1997: 352; Bergstrom & Selkirk, 2000: 38, 39, 41; Bergstrom, Whinam & Belbin, 2002: 132; Grolle, 2002: 61 [coll. Jenkins, Bergstrom])
NJMG: 0542, 1350 p.p., 1586 p.p., 1594 p.p. + 1 field observation; *VRS: 141A*.

Found in small amounts in dense, usually species-rich bryophyte mats in damp places. Most collections are from the western part of the island, except one, which came from Lavett Bluff. **Distribution**: Heard I., Kerguelen Is., Crozet Is., Marion I. and Prince Edward I., Gough I., Fuegia, Patagonia.

Cephalozia badia (Gottsche) Steph. (**new for Heard Island**)
NJMG: 1586 p.p., 1587.

Found in small amounts in dense, usually species-rich bryophyte mats in damp places. Only collected from Laurens Peninsula. **Distribution**: Heard I., South Sandwich Is., South Georgia, South Orkney Is., South Shetland Is., maritime Antarctic, Falkland Is., Fuegia, W-Patagonia.

Cephaloziella varians (Gottsche) Steph. (Bergstrom & Selkirk, 1997: 352 ? part. sub *C. exiliflora;* Bergstrom & Selkirk, 2000: 38, 39 ? part. sub *C. exiliflora;* Bergstrom, Whinam & Belbin, 2002: 132 ? part. sub *C. exiliflora;* Grolle, 2002: 62 [coll. Bergstrom])
NJMG: 0068, 0074 p.p., 0132, 0143, 0240, 0266, 0316, 0416, 0466, 0478, 0479, 0536 p.p., 0559 p.p., 0560, 0568 p.p., 0676, 0934, 1153, 1158 p.p., 1190, 1338 p.p., 1379 p.p. + 9 field observations; *VRS: 8 p.p., 10A p.p., 13 p.p., 20 p.p., 21A, 107 p.p.*

A very common species, usually growing intermixed with other bryophytes, found all over the island, in a wide range of habitats: in wet mires, in feldmark communities, in nutrient-rich *Poa cookii* grassland, sheltered caves, and in *Azorella* cushion vegetation, from sea level to well over 300 m a.s.l. The problem of *Cephaloziella exiliflora – C. varians* was discussed in detail in Bednarek-Ochyra *& al.* (2001). Based on their arguments, only *C. varians* can be expected in Heard I. **Distribution**: Widespread in the Holarctic and austral Southern Hemisphere including antarctic area.

Chiloscyphus coadunatus (Sw.) J.J. Engel et R.M. Schust. (Grolle, 2002: 66 [coll. Jenkins]).

Not present in the collections of NJMG and VRS; until now only one collection of this subcosmopolitic species from Heard I. known. **Distribution**: Subcosmopolitan; St. Paul I., Heard I. and Kerguelen Is. in the Subantarctic area.

Chiloscyphus gremmenii **Váňa sp. nov.** (Figs 1, 2).
Diagnosis: ***Plantae*** *dioicae (?), terricolae, dense caespitosae vel rarius aliis bryophytis intermixtae, virens vel fuscovirens.* ***Caulis*** *repens, 0.5-1.0 cm longus et 600-900 μm latus, sparsim ramosus ramis intercalaribus lateralibus; sectione transversali cellulis corticalibus non differentiatis, cellulis medullaribus leptodermaceis. Rhizoides sparsim presentes in caulibus sub amphigastriis.* ***Folia*** *caulina succuba, remota, alternata, ovata vel ovato-rectangulata apicibus ad 0.1-0.3 bilobus (rarius trilobus) vel emarginatis, lobis obtusis, subacutis vel acutis inaequalibus, lamina basi bistratosa.* ***Amphigastria*** *caulina libera, transverse vel subtransverse inserta, emarginata vel ad 0.5 bifida, laciniis triangulatis parum divergentibus.* ***Cellulae foliorum*** *25-30 × 20-27 μm, basales ad 45 × 30 μm metientes, parietibus minute incrassatae vel tenuibus, trigonis nullis vel subnullis. Cuticula laevis vel sublaevis.* ***Propagula*** *in margine foliorum rarissima, unicellularia, fusco-brunnea.* ***Folia involucralia*** *foliis caulinis subsimilia, majora, parum concava, libera. Amphigastrium involucrale foliis involucralibus simile.* ***Perianthia*** *terminalia, epigonanthia, ad 0.5 trigona, ore*

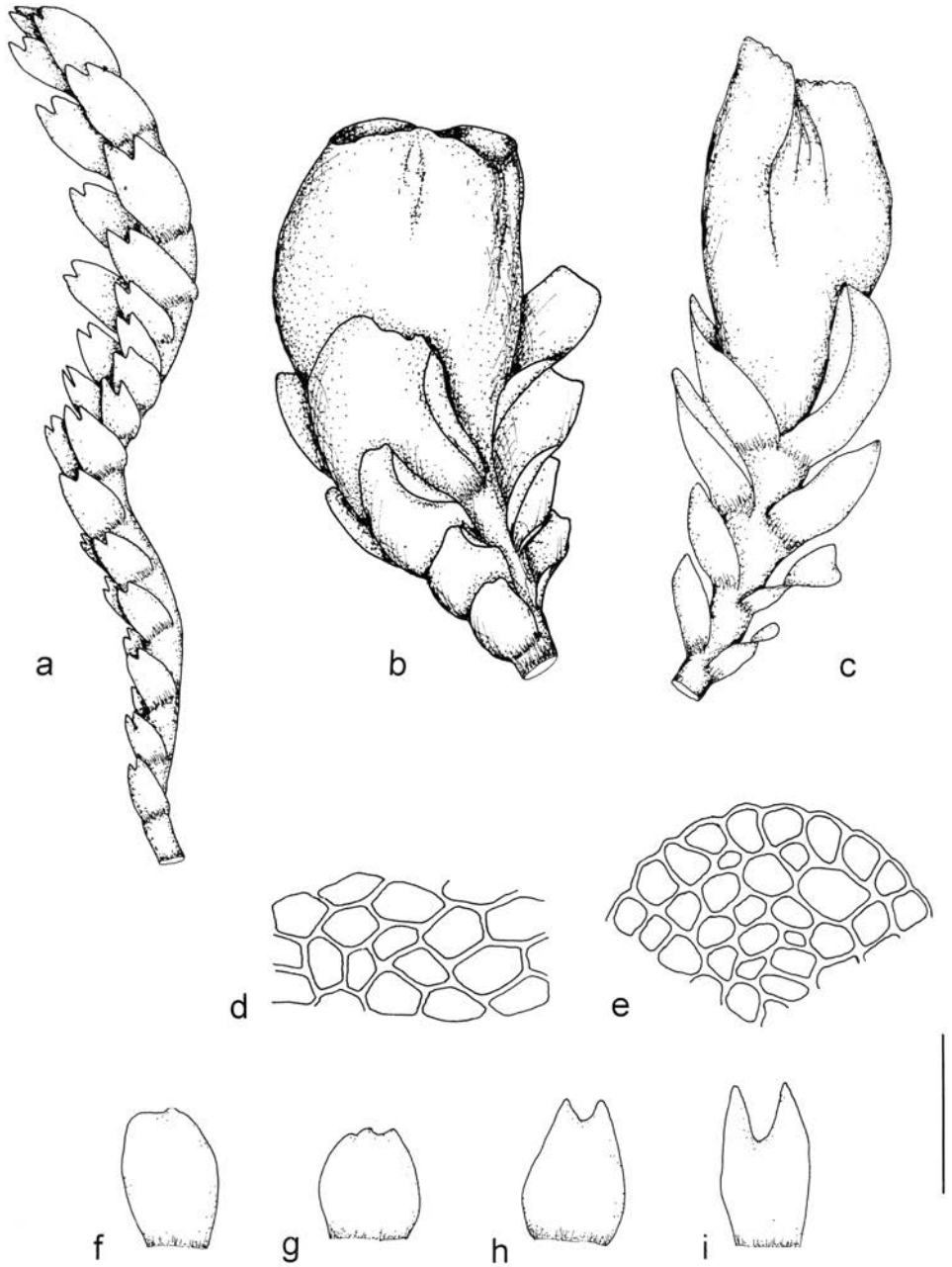

Fig. 1. *Chiloscyphus gremmenii* Váňa. **a**, shoot; **b-c**, female shoots with perianth; **d**, mid-leaf cells; **e**, stem cross section; **f-i**, underleaves; *Gremmen 1524* (type, ADT). Scale: a-c, 750 µm; d-e, 75 µm; f-i, 300 µm.

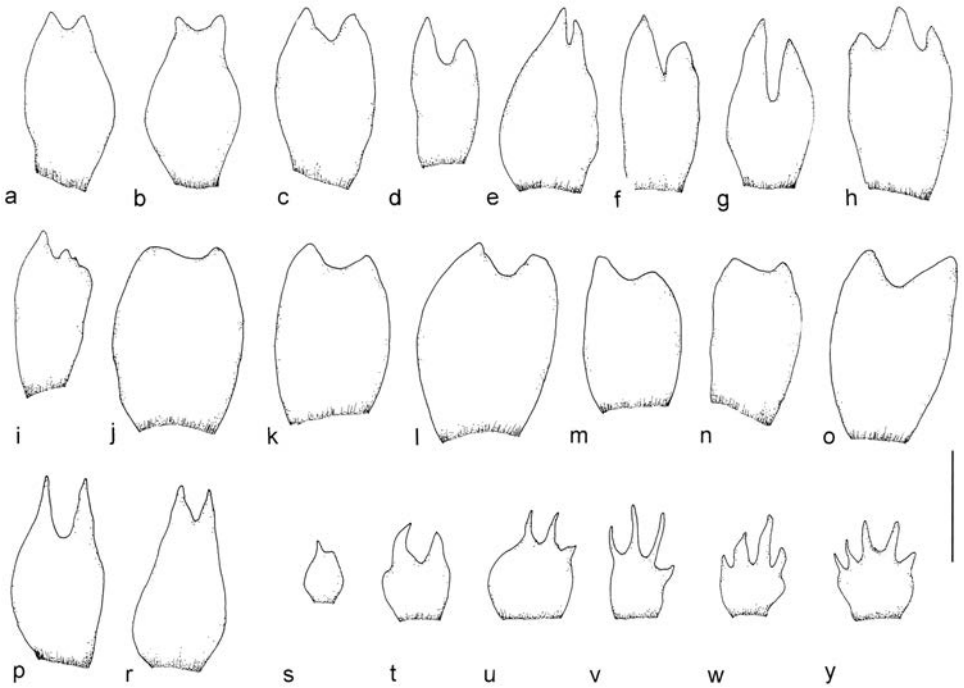

Fig. 2. *Chiloscyphus gremmenii* Váňa. **a-r**, leaves; **s-y**, underleaves; a-i, *Gremmen 1558* (PRC), j-n, *Gremmen 1524* (type, ADT), o-y, *Gremmen 0957* (PRC). Scale: a-y, 300 μm.

trilobato, lobis integerrimis. ***Capsula*** *sphaeroidea; sporae parvae 12-14 μm, sublaeves; elateri bispiri.*

Plants relatively small, deep green to brownish green, in separate prostrate patches or scattered among other bryophytes. **Shoots** prostrate or creeping, 0.5-1.0 cm long, with leaves 600-900 μm wide, branching not common, exclusively lateral-intercalary (*Plagiochila*-type). Stems ovate, 200-300 × 150-200 μm, 8-12 cells high, without hyalodermis; cortical cells not differentiated, all cells of the same size, 25-35 μm in diameter, thin-walled, ± without trigones. Rhizoids rare, colourless, scattered to restricted to small region at underleaf bases. **Leaves** succubous, nearly flat, upwards oriented, obliquely inserted, oblong-rectangular to ovate, mostly bilobed in different degree: some leaves retuse to emarginate, great part of leaves slightly to more deeply bilobed (0.1-0,3 of the leaf length), occasional leaves trilobed, lobes obtuse, subacute to acute, mostly unequal size. Basal part of leaves bistratose from 1-2 rows of cells up to nearly 0.5 of the leaf length. **Underleaves** small, of the stem width or slightly larger in the upper parts of shoots, variable in size, some unlobed to emarginate, some bilobed up to 0.5 their length, lateral teeth (sometimes two on one side) present or absent. **Cells** subquadrate to hexagonal, thin- to slightly thick-walled, 25-30 × 20-27 μm, in basal part up to 45 × 30 μm, trigones small to absent. Cuticle smooth or nearly so. **Gemmae** rarely formed from marginal leaf cells, 1-celled, polygonal, smooth, brownish. **Dioecious** (?), male inflorescences not observed. **Gynoecia** terminal on leading shoots, ♀ bracts larger than leaves, similar in shape, slightly concave. Bracteole large, nearly the size of bracts, free of them. **Perianth** epigonanthous, at least up to 0.5 ± trigonous, with ± acute

angles, mouth lobate, open and wide, mostly entire margined; perianth cells similar to leaf-cells. **Capsule** sphaerical, 550-600 µm in diam., epidermal and internal cells with nodulose thickenings. Spores oblong-angular, nearly smooth, 12-14 µm; elaters bispiral, gradually tapering to the end, 10-12 µm wide.
Type: Heard I., in crater West of Corinth Head, 53°00´33.1´´S, 73°24´30.0´´E, loose mats on dead mosses and organic deposits between rocks in steep rockfall in crater, damp, sheltered, alt. 60 m, 9 February 2001 *coll. N.J.M. Gremmen 1524*; ADT (holotype), PRC (isotype).
Known only from Heard I.: *NJMG: 0957, 0969, 1251, 1330 p.p., 1365, 1417, 1486, 1505 p.p., 1510 p.p., 1524, 1525 p.p., 1533 p.p., 1558, 1584 p.p.* + 1 field observation; *VRS: 4*.

Mostly found in damp, sheltered habitats, in caves and in bryophyte mats between lava rocks. Most collections are from the western part of the island, but a few are from caves in the escarpment below Scarlet Hill.

Species characteristic with narrowly ovate, oblong-rectangular leaves with bistratose basal half of leaves (character uncommon in *Chiloscyphus*). In this genus this character is known only for *Lophocolea* subgenus *Notholophocolea* R. M. Schust., characterised by isophyllous to subisophyllous plants with ovate, not bilobed leaves, without asexual reproduction (cf. *Chiloscyphus boveanus* (C. Massal.) J.J. Engel et R.M. Schust.).

Clasmatocolea rigens (Hook. f. et Taylor) J.J. Engel (Grolle, 2002: 63 [coll. Jenkins])
NJMG: 0549 p.p., 0559 p.p., 1231, 1267 p.p., 1272, 1379 p.p., 1381, 1383; VRS: 8 p.p., 10A p.p., 13 p.p., 20 p.p., 38, 102 p.p., 105A, 106A, 107 p.p., 113.

A common species in the western part of the island, characteristically found in habitats influenced by animals, such as in *Poa cookii* grassland influenced by birds, and in areas with seal colonies. Most collections are from the western part of the island, but two are from the southern coastal area. **Distribution**: Heard I., Kerguelen Is., South Sandwich Is., South Georgia, South Shetland Is., Falkland Islands, southern South America to central Chile.

Cryptochila grandiflora (Lindenb. et Gottsche) Grolle (Bergstrom & Selkirk, 1997: 352; Bergstrom & Selkirk, 2000: 38, 39; Grolle, 2002: 63 [coll. Jenkins, Bergstrom])
NJMG: 0260, 0459, 0538, 1057, 1125 p.p., 1149, 1157 p.p., 1160, 1196 + 2 field observations; *VRS: 78*.

Mostly found in *Acaena*-bryophyte communities, and open *Azorella*-bryophyte vegetation, in most parts of the island. **Distribution**: Eury-circum-subantarctic, penetrate to Guatemala, Réunion and Borneo; in Subantarctic and Antarctic area Heard I., Kerguelen Is., Crozet Is., Marion I. and Prince Edward I., South Sandwich Is., South Georgia and South Shetland Is.

Fossombronia australis Mitt. (Mitten, 1877: 73; Mitten, 1879: 45; Schiffner, 1906: 71; Bergstrom & Selkirk, 1997: 352; Bergstrom & Selkirk, 2000: 38, 39, 41; Bergstrom, Whinam & Belbin, 2002: 132; Grolle, 2002: 63 [only references])
NJMG: 0007, 0028, 0037, 0063, 0070, 0077, 0156, 0157, 0270, 0327, 0383, 0411, 0531 p.p., 0536 p.p., 0549 p.p., 0720, 0781 p.p., 1125 p.p., 1158 p.p., 1197 p.p., 1266, 1267 p.p., 1492, 1601 + 48 field observations; *VRS: 8 p.p., 10A p.p., 13 p.p., 19, 57, 109.*

Common in all parts of the island, in *Acaena*-dominated mire and drainage-line communities, as well as in *Azorella* vegetation and *Poa cookii* grassland, often in areas somewhat influenced by birds or seals. **Distribution**: New Zealand, Macquarie I., Australia, Heard I., Kerguelen.

Herzogobryum atrocapillum (Hook. f. et Taylor) Grolle (Bergstrom & Selkirk, 1997: 352; Bergstrom & Selkirk, 2000: 38, 39; Bergstrom, Whinam & Belbin, 2002: 132; Grolle, 2002: 64 [coll. Bergstrom)

NJMG: 0219, 0227, 0228 p.p., 0343, 1202, 1226, 1227, 1293 p.p., 1456, 1505 p.p., 1510 p.p., 1525 p.p., 1533 p.p., 1550, 1584 p.p., 1599 + 1 field observation; *VRS: 16A*.

Small mats on dead moss, in rock crevices or small caves and other damp and sheltered places, mostly below 200 m a.s.l. **Distribution**: New Zealand, Heard I., Kerguelen Is., Crozet Is., Marion I. and Prince Edward I., Bouvet I., South Orkney Is.

Herzogobryum vermiculare (Schiffn.) Grolle (Bergstrom & Selkirk, 1997: 352; Bergstrom & Selkirk, 2000: 38, 39; Grolle, 2002: 64 [coll. Bergstrom])

NJMG: 0654, 0879, 0887, 0925, 0977, 1003, 1050, 1212, 1416; VRS: 74C.

Grows in dense mats in rock crevices or in cliff faces, mostly above 200 m a.s.l. Although both species of *Herzogobryum* were found in the western as well as in the eastern part of the island, it is striking that all collections of *Herzogobryum* from Round Hill turned out to be *H. atrocapillum*, while all from Scarlett Hill were *H. vermiculare*. **Distribution**: New Zealand, Heard I., Kerguelen Is., Crozet Is., Marion I. and Prince Edward I., South Georgia, Falkland Is., W-Patagonia.

Jungermannia coniflora Schiffn. (Bergstrom & Selkirk, 1997: 352; Bergstrom & Selkirk, 2000: 38, 39; Grolle, 2002: 65 [coll. Bergstrom])

NJMG: 0027, 0246, 0287, 0345 p.p., 0384, 0386, 0515, 0531 p.p., 0568 p.p., 0781 p.p., 0786, 1107, 1142, 1172, 1197 p.p. + 7 field observations.

A common species in the eastern part of the island, but also recorded from the Laurens Peninsula (cf. Bergstrom & Selkirk 1997). Mostly found in closed *Azorella*-bryophyte communities on damp, mineral soils. **Distribution**: Heard I., Kerguelen Is., Marion I.

Lophozia leucorhiza (Mitt.) R.M. Schust. (**new for Heard Island**)

NJMG: 0032, 0345 p.p., 1065, 1330 p.p., 1338 p.p.1586 p.p. + 1 field observation.

Found in mossy *Azorella*-feldmark, both in the western and in the eastern part of the island. **Distribution**: Heard I., Kerguelen Is.

Marchantia berteroana Lehm. & Lindenb. (Bergstrom & Selkirk, 1997: 352; Bergstrom & Selkirk, 2000: 38, 39; Bergstrom, Whinam & Belbin, 2002: 132) + ***Marchantia polymorpha*** L. (**new for Heard Island**)

NJMG: 0593 + 22 field observations for *Marchantia* spec.

Marchantia was observed many times in the eastern part of the island, between Paddick Valley, Spit Bay, and Skua Beach. Unfortunately only one specimen was collected. This turned out to be *M. polymorpha*. Previous records from the island are listed as *M. berteroana* Lehm. & Lindenb. (Bergstrom & Selkirk, 1997; Bergstrom, Whinam & Belbin, 2002), and it is well possible that many of the field observations belong to this species. *Marchantia* occurs mostly on wet, organic soil, in drainage lines, along small streams, and in areas influenced by animals. **Distribution**: *M. berteroana* pan-south temperate, widely distributed in the Subantarctic area, reaching to Costa Rica, New Guinea and Java, known also from Brazil and mid-Atlantic islands, reaching to maritime Antarctic. *M. polymorpha* subcosmopolitan, in the Subantarctic area only known from St. Paul I. and Kerguelen Is., questionable report also from South Shetland Is.

Pachyglossa fissa (Mitt.) Herzog et Grolle (Bergstrom & Selkirk, 1997: 352; Bergstrom & Selkirk, 2000: 38, 39; Bergstrom, Whinam & Belbin, 2002: 132; Grolle 2002: 68 [coll. Bergstrom])
NJMG: 1103 p.p., 1110, 1586 p.p.

A rare species, found both in the eastern and the western part of the island, in small groups between other bryophytes. **Distribution**: Heard I., Kerguelen Is., Marion I. and Prince Edward I., South Georgia, South Orkney Is., Falkland Is., Fuegia, Patagonia.

Pachyglossa grolleana **Váňa, sp. nov.** (Figs 3, 4)
Syn.: ? *Invisocaulis laxifolius* R. M. Schust., *Austral Hep*. 2: 362, 2002, nom. illeg. (Art. 36.1 of I.C.B.N.; type not seen).
Diagnosis: Plantae *dioicae, terricolae, dense caespitosae vel rarius aliis bryophytis intermixtae, flavovirens vel brunneae.* ***Caulis*** *repens vel ascendens, basi stolonibus affixus, sparsim ramosus ramis intercalaribus lateralibus; sectione transversali cellulis corticalibus 1-stratosis, parum incrassatis, cellulis medullaribus leptodermaceis. Rhizoides sparsim presentes in caulibus et stolonibus.* ***Folia*** *caulina remota, subtransverse inserta, alternata, ± concava, ovata vel late obovata, lamina ubique unistratosa, rarius basi bistratosa, marginibus integerrimis vel subintegerrimis, non decurrentibus, apice integro vel rarius minute bifido.* ***Amphigastria*** *caulina libera, appressa, transverse inserta, foliis caulinis similia, paulum minora et ovoidea, apice saepe emarginato subbiloba.* ***Cellulae foliorum*** *10-18 × 8-14 µm metientes, qudraticae-rectangulatae, parietibus minute incrassatae vel tenuibus, trigonis nullis vel subnullis. Cuticula laevis.* ***Folia involucralia*** *foliis caulinis subsimilia, multo majora, libera, ad basim bistratosa.* ***Amphigastrium*** *involucrale foliis involucralibus simile, sed interdum brevius, amphigastriis caulinis multo majus.* ***Perianthia*** *terminalia, parum innovata, epigonanthia, obtuse trigona, tricarinata, trilobata, lobis obtusis subintegris seu emarginatis, apice non raro imprimis in lobis lateralibus anguste fissis.* ***Androecia*** *terminalia vel intercalaria, 2-4-juga, bracteae indistincte lobulatae. Antheridia solitaria, pedicello 1-cellulari-seriato.* ***Capsula*** *ovoidea, bistratosa. Elateri bispiri.*
Plants in dense mats, rarely separate shoots intermixed between other bryophytes, yellowish-green to brownish. **Shoots** very small, 120-160 µm wide, sparsely branched, branches lateral-intercalary (*Plagiochila*-type), arising from leafless stolons. Stem 8-12 cells high, with one row of somewhat thick-walled cortical cells, medullary cells thin-walled, all cells ± of the same size. **Rhizoids** rare, scattered mostly individually on the ventral size of stem or on stolons. **Plants** subisophyllous. **Leaves** small, of the stem wide, scale-like, very remote, concave, mostly appressed to the stem and sheathing it, ovate or widely ovate to ovate-triangular, edentate, unlobed to rarely slightly retuse to shallowly bifid at the apex, subtransversely broadly inserted, non deccurrent. **Underleaves** similar to leaves in form or somewhat narrower to triangular, slightly smaller, free, more commonly emarginate or bilobed than leaves, nearly transversely inserted. **Leaf cells** 10-18 × 8-14 µm, subquadrate to oblong rectangular, cell walls thin- to moderately thick-walled, trigones absent to nearly absent. Basal part of good developed leaves bistratose. Cuticle smooth. **Dioecious**. Androecia terminal becoming intercalary on main shoots. ♂ bracts saccate, imbricate, in 2-4 pairs; antheridia 1 per bract, stalk 1-seriate. **Gynoecia** terminal on leading shoots, sometimes with single innovation. ♀ bracts forming head-like structure, larger than leaves, similar in shape, bistratose in basal region, margin in terminal part ± crenulate to occasionally bilobed. Bracteoles larger than underleaves, mostly the size of bracts, often ovoid with slightly bilobed apex; in the good developed bracteoles basal 2-3 rows of cells

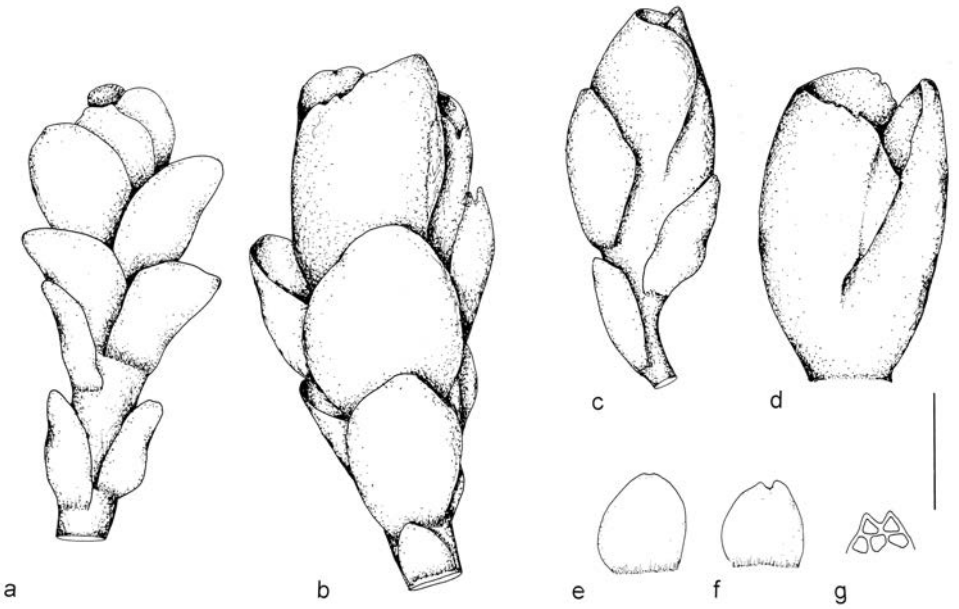

Fig. 3. *Pachyglossa grolleana* Váňa. **a**, shoot; **b-c**, female shoots with perianth; **d**, perianth; **e-f**, leaves; **g**, leaf apex with cells; a, *Smith 16* (PRC), b-d, *Poulsen 369B* (type, KRAM), e-g, *Gremmen 1486* (PRC). Scale: a-d, 300 μm; e-f, 150 μm; g, 50 μm.

bistratose. **Perianths** in young stage ovoid, slightly contracted to mouth, later wide at mouth, epigonanthous, ± symmetrically trigonous, with dorsal antical keel, angles winged, ± acute, mouth obtuse trilobate, the lobes ± crenulate, notched, emarginate to entire margined, basal part bistratose. Perianth cells similar to leaf cells, equally firm-walled, lacking trigones, 12-17 × 8-14 μm, subisodiametric to shortly oblong. **Capsule** subsphaerical to elliptic, with 2-stratose wall, epidermal cells with strongly nodose thickenings on radial walls, inner capsule wall cells with stipitate nodulose thickenings. Elaters gradually tapering to the end, bispiral; spores not observed.

Type: Kerguelen Is., Peninsule Courbet, Val Studer, Grande Cascade, ca 800 m SE of Lac Superiéur; lat. 49°17'05''S, long. 70°03'03''E; alt. 100 m; a shaded humid ravine, on sloping exposed rock, 18 December 1998 c. fr. *coll. R. S. Poulsen No. 369B*; KRAM (holotype), C, PRC (isotypes).

Distribution: Heard I.: *NJMG: 0059 p.p., 0074 p.p., 0088, 0228, 0257, 0522, 1083, 1116, 1486 p.p.* + 2 field observations; *VRS: 16, 102 p.p.*; Kerguelen Is. (type + *Poulsen 491, 626*; spec. in KRAM, C, PRC), Marion I. (*Ochyra 1036/01*; KRAM, PRC), ? Prince Edward I. (*R.M. Schuster 88-574* as *Invisocaulis laxifolius* n. nudum; not seen).

Small loose groups or mats in wet or very damp habitats, such as streamsides, small caves, seepage areas in cliff faces, and mossy feldmark communities.

The species is dedicated to Dr. Riclef Grolle, who contributed so much to the knowledge of subantarctic liverworts; moreover, the genus *Pachyglossa* was the first genus he studied with his teacher, Prof. T. Herzog. This newly described species is the smallest in the genus, with very small leaves, not wider than stem, and the bistratose part of the leaf lamina is limited to 1-2 rows of cells near the

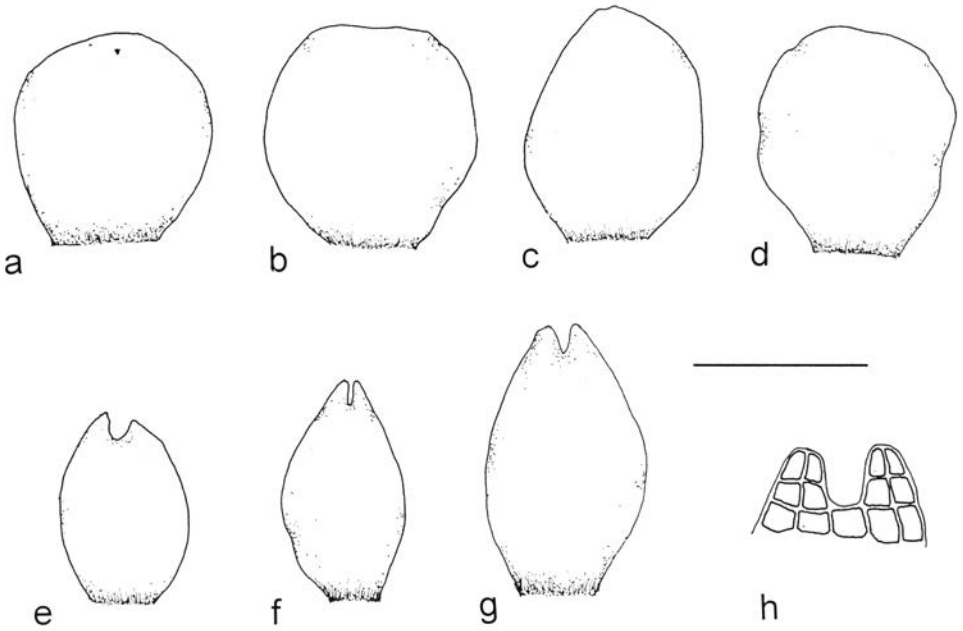

Fig. 4. *Pachyglossa grolleana* Váňa. **a-d**, female bracts; **e-g**, female bracteoles; **h**, apex of female bracteole with cells; a-c, e, *Smith 16* (PRC); d, f-h, *Poulsen 369B* (type, KRAM). Scale: a-g, 150 μm; h, 50 μm.

insertion of well-developed leaves and on the basal part of the perianth; most of the leaves can be unistratose.

The species, described only in English by Schuster (2002) as *Invisocaulis laxifolius*, is most likely identical; marginal rows of cells differentiated as an obscure border with brownish contents of cells represents probably an artefact. Schuster (*l.c.*) placed his new species into the family Jungermanniaceae. However, the sterile plants resemble Geocalycaceae rather than Jungermanniaceae. The fertile plants described in this paper have typical Geocalycaeceae perianths.

Pedinophyllopsis abdita (Sull.) R.M. Schust. et Inoue (Bergstrom & Selkirk, 1997: 352; Bergstrom & Selkirk, 2000: 38, 39, 42; Bergstrom, Whinam & Belbin, 2002: 132; Grolle, 2002: 68 [coll. Jennings, Bergstrom])
NJMG: 1239, 1281, 1292, 1293 p.p., 1328, 1339, 1350 p.p., 1375, 1397, 1412, 1525 p.p., 1551, 1584 p.p., 1586 p.p., 1594 p.p., 2002 + 3 field observations; *VRS: 65, 136A*.

This species was found only in the western part of the island, but Bergstrom & Selkirk (1997) report it also from most other areas. It grows in loose or dense mats, often between other bryophytes, in mossy feldmark, under overhanging rocks, and locally in coastal areas. **Distribution**: Heard I., Kerguelen Is., and southernmost South America.

Riccardia georgiensis (Steph.) Hässel subsp. ***sympodea*** R.M. Schust. (**new for Heard Island**)
NJMG: 0209, 1674 + 2 field observations.

Two specimens were collected, one from a small, very damp cave, the other from a seepage area on a steep slope. **Distribution**: Heard I., Marion I., Possession I., South Shetland Is.

Riccardia sp.
NJMG: 0059 p.p.

This was one sterile thallus, growing in a bryophyte mat in a drainage line community.

DISCUSSION

Of the 18 species of hepatics collected by N.J.M. Gremmen (including *Marchantia berteroana*) and 10 species collected by V.R. Smith, 10 were listed by Bergstrom & Selkirk (1997), Bergstrom & Selkirk (2000) or Bergstrom, Whinam & Belbin (2002) on the basis of the collections of D.M. Bergstrom made in 1987, and also 10 by Grolle (2002) based on the collections of J. Jenkin made in 1980 and D. M. Bergstrom made in 1987; 7 species are new to the island (2 of them new to science). Grolle (2002) lists one species (*Chiloscyphus coadunatus* (Sw.) J.J. Engel & R.M.Schust., as *Lophocolea bidentata* (L.) Dumort.) not found in the present collection, while two species (not included *Marchantia berteroana* Lehm. & Lindenb., highly probably included in the field observations of N. Gremmen) listed by Bergstrom & Selkirk (1997), Bergstrom & Selkirk (2000) and Bergstrom, Whinam & Belbin (2002) were not collected in 2000/01 (Lophocoleoideae sp. and *Cephaloziella exiliflora* (Taylor) Douin). The first of these may be the *Chiloscyphus coadunatus* or *Clasmatocolea rigens* listed by Grolle (2002), while the second may be *Cephaloziella varians* (see the discussion at this species). If this is the case, the present number of species known from Heard Island is 19 (not counting *Riccardia* sp.).

Old data of the occurrence of hepatics in Heard Island included only one species reported, *Fossombronia australis* (Mitten 1877, 1879 – type from Heard I., 1874 *coll. H. N. Moseley*; Schiffner 1906 – Heard I., in the Corinthian Bay, 3. Feb. 1902 *coll. E. Vanhöffen*).

Although significant environmental changes have occurred on Heard Island in the past decades (Budd, 2000; Scott, 1990), and new plant species seem to have arrived at Heard Island in the recent past (Scott, 1990; Bergstrom, *pers. comm.*), we believe that the increase in hepatic species numbers reported by us is due to the fact that the non-vascular flora of this island is still very incompletely known, and that therefore an increase in collecting-effort inevitably yields species not previously recorded. Until the rise in the number of species found with increasing survey effort levels off considerably, the data available are insufficient as a base line against which to compare future changes in biodiversity and species distribution.

Given the very unequal time spent on surveying different parts of the island, we feel that an analysis of the within-island distribution patterns based on the present data is not very useful.

Ackowledgements. We are grateful to D.M. Bergstrom and the Australian Antarctic Division for providing the opportunity for NJMG to work on Heard Island, and to K. Kiefer, P. Scott, S. L. Chown, V. R. Smith, and D. J. Marshall for assistance in the field. Logistic support by the Australian Antarctic Division is gratefully acknowledged. NJMG also acknowledges support by the Netherlands Antarctic Programme. NJMG was visiting academic to the Department of Botany, University of Queensland, during his fieldwork at Heard Island. JV is thankful to R. Grolle and J.J. Engel for the examining and comments to *Chiloscyphus gremmenii* and to Z. Soldán for the inking of the figures. This work was part of AAD project 1015, and this paper is publication nr 3428 NIOO-KNAW.

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