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The hepatics of King George Island, South Shetland Islands, Antarctica, with particular reference to the Admiralty Bay region

ABSTRACT: This paper reports on eleven species of hepatics collected on King George Island, South Shetland Islands (61°50′—62°15′S latitude and 57°30′—59°00′W longitude). A short account of the vegetation of this Antarctic island is provided and the role of liverworts in particular plant communities is discussed. Two species, *Hygrolembidium ventrosum* (Mitt.) Grolle and *Scapania abcordata* (Berggr.) S. Arnell are reported for the first time from the Antarctic botanical zone; the latter is recorded for the first time in the Southern Hemisphere and, additionally, this is the first record of the genus *Scapania* from Antarctica. A detailed description of the habitat of each taxon is given and distribution maps for the eleven species are provided. A key to the eleven species from King George Island is given, and a detailed taxonomic discussion is included for *Cephaloziella varians* (Gott.) Steph and *Lophozia excisa* (Dicks.) Dumort. The former is considered to be synonymous with the widespread Arctic species *C. arctica* Bryhn & Douin ex K. Müll.

Key words: Antarctica, bryology, Hepaticae, taxonomy, distribution.

Introduction

Liverworts form an inconspicuous component of the Antarctic terrestrial vegetation. They are much less prominent than mosses and are usually present in small quantities concealed within moss turves, cushions and mats.

Until now, little has been known of the liverwort flora of the southern polar regions. Strictly hepaticological papers dealing with the Antarctic biome are very few (Stephani 1901; 1905; Steere 1961; 3orte 1962; Schuster 1969a; Grolle 1972; Ochyra et al. 1982; Seppelt 1983). Some limited information about the occurrence of liverworts in various plant communities can be found in papers on the vegetation of particular regions of the Antarctic (Skottsberg 1912; Steere 1965; Longton 1966, 1967; Longton and Holdgate 1967, 1979; Greene 1967; Collins 1969; Gimingham and Smith 1970; Lindsay 1971; Young and Kläy 1971; Smith 1972, 1979, 1984a; Smith and Corner 1973; Allison and Smith 1973; Smith and Gimingham 1976; Fenton and Smith 1982). Additional reference to Antarctic hepatics can be also found in general manuals, floras and monographs on the Hepaticae (Fulford 1963a, 1968, 1976; Schuster 1969b, 1974, 1980; Schuster and Damsholt 1974; Engel 1980).

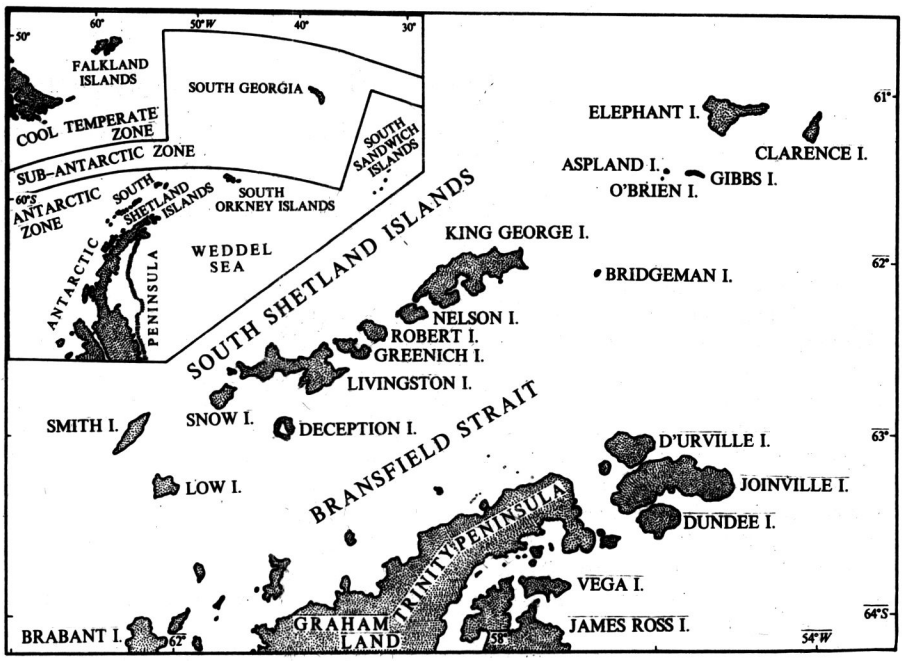

Fig. 1. South Shetland Islands showing the location of King George Island; inset — The Scotia Ridge and Antarctic Peninsula showing botanical zones and position of the South Shetland Islands

The present paper reports on eleven species of liverworts from King George Island, South Shetland Islands (Fig. 1), including a detailed description of the habitat and distribution maps for each species. The material was collected by the senior author between December 7, 1979, and March 21, 1980, during the course of the Fourth Polish Antarctic Expedition to

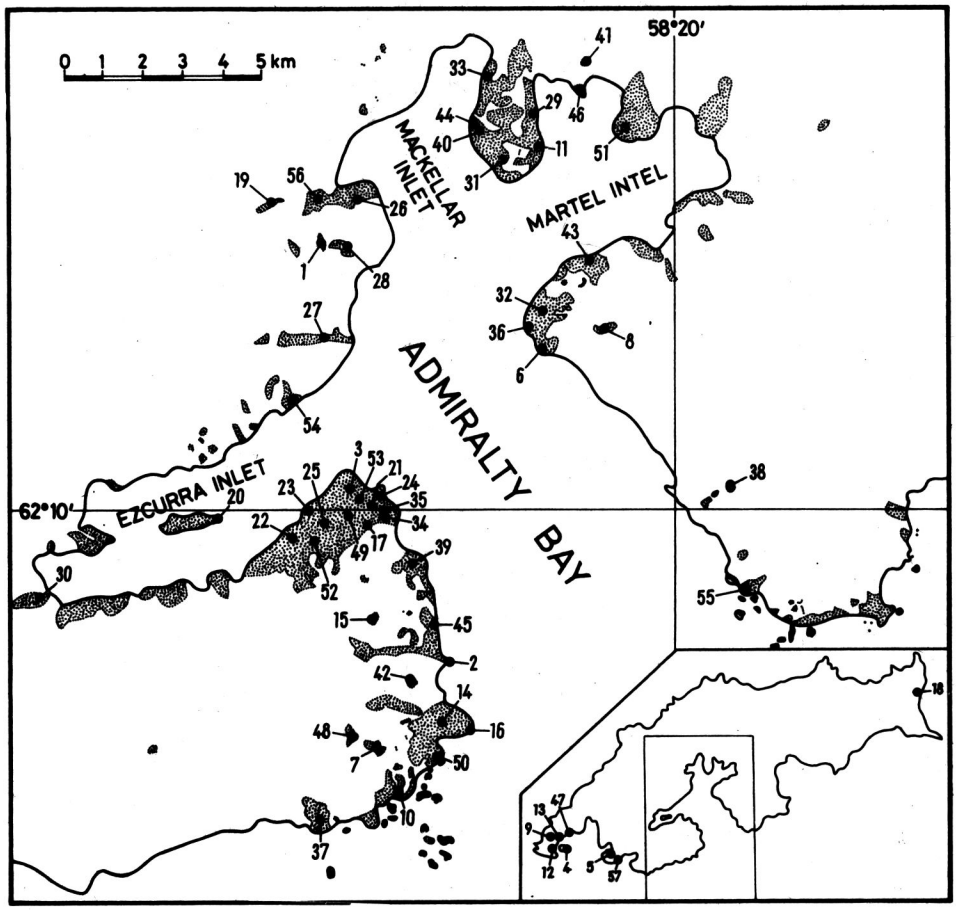

Fig. 2. Collecting localities for Hepaticae on King George Island, with particular reference to the Admiralty Bay region. The numbers correspond to those of specific localities in

Arctowski Station on King George Island, which was conducted under the auspicies of the Institute of Ecology of the Polish Academy of Sciences. Most of the material was collected in the Admiralty Bay region and on Fildes Peninsula (Fig. 2). Some additional collections from other parts of King George Island were made by Dr. Bolesław Jabłoński, whereas Dr. A. L. Žukova, Komarov Botanical Institute, Leningrad, submitted some liverworts collected by Dr. V. A. Nikolaev during 1972—1973. Unfortunately, most of the latter specimens possesses only very general locality data and, therefore, are not especially useful for phytogeographical considerations.

Because of the sparcity of place names on King George Island we have considered it important to provide the latitude and longitude of particular stations where specimens were collected. The place names are adopted from

Table 1

Summary of localities on King George Island where Hepaticae have been collected

Name of place	Latitude and longitude	Part of island
1. Admiralen Peak	62°06'S—58°32'W	Admiralty Bay
2. Agat Point	62°11'30"S—58°26'W	„ „
3. Ambona	62°09'30"S—58°29'W	„ „
4. Ardley Island	62°13'S—58°56'W	Fildes Peninsula
5. Barton Peninsula	62°14'S—58°47'W	Bransfield Strait
6. Basalt Point	62°07'30"S—58°23'W	Admiralty Bay
7. Bastion Hill	62°13'S—58°28'W	Bransfield Strait
8. Bell Zygmunt	62°07'S—58°22'W	Admiralty Bay
9. Bellingshausen Station	62°12'S—58°58'W	Fildes Peninsula
10. Blue Dyke	62°13'30"S—58°27'W	Bransfield Strait
11. British Point	62°05'S—58°23'30"W	Admiralty Bay
12. Buchta Gidrografov	62°13'S—58°56'30"W	Fildes Peninsula
13. Buchta Kamenistaja	62°12'S—58°57'30"W	„ „
14. Creeping Slopes	62°12'30"S—58°26'W	Admiralty Bay
15. Czajkowski Needle	62°11'15"S—58°27'30"W	„ „
16. Demay Point	62°13'S—58°25'W	„ „
17. Ecology Glacier	62°10'S—58°28'W	„ „
18. Faraway Nunataks	61°57'30"S—57°40'W	Destruction Bay
19. Garnuszewski Peak	62°05'30"S—58°31'W	Admiralty Bay
20. Gdynia Point	62°09'45"S—58°33'W	„ „
21. Hala	62°09'S—58°29'W	„ „
22. Italia Valley	62°30'S—58°31'W	„ „
23. Jardine Peak	62°10'S—58°30'W	„ „
24. Jasnorzewski Gardens	62°09'S—58°28'30"W	„ „
25. Jersak Hills	62°09'30"S—58°29'30"W	„ „
26. Kapitan Peak	62°05'30"S—58°29'W	„ „
27. Klekowski Crag	62°07'30"S—58°30'W	„ „
28. Komandor Peak	62°06'S—58°29'W	„ „
29. Moraine Point	62°04'20"S—58°24'W	„ „
30. Mt. Belweder	62°11'S—58°38'30"W	„ „
31. Mt. Flagstaff	62°05'S—58°25'W	„ „
32. Mt. Wawel	62°07'S—58°24'W	„ „
33. Ore Point	62°04'20"S—58°25'30"W	„ „
34. Ornithologist's Creek	62°09'30"S—58°28'W	„ „
35. Penguin Ridge	62°09'30"S—58°28'W	„ „
36. Point Hennequin	62°07'S—58°28'30"W	„ „
37. Red Hill	62°14'S—58°30'W	Bransfield Strait
38. Rembiszewski Nunataks	62°09'30"S—58°18'W	Admiralty Bay
39. Rescuers Hills	62°10'30"S—58°27'W	„ „
40. Round Hill	62°04'40"S—58°27'W	„ „
41. Shark Fin	62°03'S—58°22'W	„ „
42. Siodło	62°12'S—58°27'W	„ „
43. Smok Hill	62°06'30"S—58°22'W	„ „
44. Speil Point	62°04'45"S—58°25'30"W	„ „
45. Sphinx Hill	62°11'15"S—58°26'W	„ „
46. Stenhouse Bluff	62°03'S—58°22'W	„ „

47. Suffield Point	62 12'S 58 55'W	Fildes Peninsula
48. The Tower	62 13'S 58 28'W	Admiralty Bay
49. Ubocz	62 10'S 58 29'W	„ „
50. Uchatka Point	62 13'15"S 58 25'W	Bransfield Strait
51. Ullman Spur	62 04'30"S 58 21'W	Admiralty Bay
52. Unnamed Hills	62 09'30"S 58 30'W	„ „
53. Upłaz	62 09'30"S 58 29'W	„ „
54. Urbanek Crag	62 08'30"S 58 32'W	„ „
55. Vauréal Peak	62 10'45"S 58 17'30"W	„ „
56. Wegger Peak	62 05'30"S 58 31'30"W	„ „
57. Winship Point	62 15'S 58 44'W	Bransfield Strait

Birkenmajer (1980a, 1984) and information about them is summarized in Table 1.

Physiography, geology and climate

King George Island, the largest of the South Shetland Islands, is located between lat. 61°50′ and 62°15′S and long. 57°30′ and 59°00′W (Fig. 1). The archipelago lies about 770 km south-west of Cape Horn and about 160 km north of Trinity Peninsula, the northernmost part of the Antarctic Peninsula. Separated from the Antarctic Peninsula by Bransfield Strait and from Tierra del Fuego by Drake Passage, these islands form part of the Scotia Ridge, which is a continuous submarine ridge joining South America and Lesser Antarctica.

King George Island is elongated in a south-west to north-east direction; it is about 65 km long, and its width varies between 5 and 40 km. The coastline is deeply indented and embayed, usually with ice cliffs and glaciers entering the sea, and there are precipitous rocky headlands. The island is not especially mountainous, and the highest elevations of ice cap reach about 610 m. Over 90 per cent of the island's surface is covered by ice cap and glaciers.

The largest embayment on King George Island is Admiralty Bay on its southern coast (Fig. 2). Three arms of this fjord penetrate deeply into the axial part of the island, namely Ezcurra Inlet on the west, Mackellar Inlet on the north, and Martel Inlet on the east and north-east. The coastal areas of Admiralty Bay show various geomorphological features including long, broad or narrow, level or gently sloping beaches, high steep cliffs, sea stacks, rocky headlands, moraines, and patterned ground, all of which are ice-free and provide suitable habitats for the development of terrestrial vegetation. There are also numerous inland rock exposures and nunataks

which are also extensively vegetated. The bay is enclosed on three sides by mountainous ranges varying in height from 150 to 610 m with the fourth side open to the sea; thus the bay is well protected from prevailing north-westerly winds. Most of the ice-free coastal areas are well irrigated by melt streams in summer, but larger permanent lakes are absent. Some snow-free areas throughout the Admiralty Bay region have undergone considerable glacial erosion. Similar geomorphological features also occur elsewhere along the coast of the island, and there is abundant morainic debris around Lions Rump and Three Brothers Hill.

The largest area of exposed ground on King George Island is Fildes Peninsula, which forms the south-western promontory of the island. It is an extensive, low-lying, uniformly raised marine platform. Although snow and ice cover the highest areas throughout the year, and snow occupies gullies and erosion channels during the summer, this rocky peninsula is devoid of a true ice cap. A major feature of the Fildes Peninsula landscape are numerous lakes of varying area and depth.

A comprehensive geological study of the island has recently been undertaken by Polish geologists under the management of Professor K. Birkenmajer (Birkenmajer 1980b, 1981, 1982), who has also reviewed all previous work carried out on the island (Birkenmajer 1980c).

An outline of the geology of the Admiralty Bay region has been recently provided by Birkenmajer (1980d). Exposures are composed mainly of igneous rocks and interstratified sediments. Volcanic rocks can be separated into two broad groups, namely Mesozoic and Tertiary andesites, basalts, tuffs, and rocks of the Andean Instrusive Suit including diorites, granodiorites and gabbros. The Quaternary rocks include a group of intrusive and late Pleistocene and Holocene moraines, outwash, raised beaches and recent coastal and mountain slope deposits.

King George Island lies within the maritime Antarctic (Holdgate 1964; Smith 1984b) and has an Antarctic climate typical of that province. In summer there are four months with a mean monthly air temperature above 0°C but in none of these does it exceed 1.5°C; in winter the mean monthly temperature never falls below −10°C. Precipitation is fairly high and is estimated to be about 400 mm per annum. In summer rainfall is frequent but snow and freezing temperatures are also common. Cloud cover is usually greater in summer than in winter. A major climatic feature of this area is katabatic, predominantly westerly, winds reaching hurricane force. Wind-blown ice crystals, granular snow and grains of sand or gravel have a very destructive effect on exposed terrestrial vegetation. As elsewhere in the Antarctic, the general features of the macroclimate are of importance in determining the nature of the terrestrial vegetation on King George Island. However, the more critical development of the vegetation is largely determined by microclimatic conditions which are usually markedly different

from those recorded during synoptic meteorological observations, especially with respect to temperature and water availability (Longton. and Holdgate 1967; Walton 1982, 1984).

Vegetation

The vegetation of King George Island is typical of the northern maritime Antarctic, having strong affinities with the other islands in the South Shetland Islands, the South Orkney Islands and north-western region of the Antarctic Peninsula. This region is devoid of extensive closed phanerogamic vegetation and only rich cryptogamic vegetation developed under the cold oceanic conditions prevailing here dominates the landscape, but the diversity of the flora and range and extent of communities diminishes southwards.

A vegetation classification for the maritime Antarctic has received much attention in recent years (Longton 1967, 1979, 1982; Gimingham and Smith 1970; Smith and Giminigham 1976) and many communities based on both physiognomic and floristic criteria have been recognized. This classification has been applied succesfully in describing of vegetation at several localities in the maritime Antarctic (Lindsay 1971; Smith 1972, 1979; Allison and Smith 1973; Smith and Corner 1973; Longton and Holdgate 1979) as well as on Continental Antarctica (Longton 1973; Nakanishi 1977; Seppelt and Ashton 1978).

The only account of the vegetation of King George Island has been provided by Lindsay (1971). Although no quantitative analysis of the island's vegetation has been attempted, a broad description of the vegetation is presented here.

The most widespread communities comprise various associations in the short moss cushion and turf subformation and fruticose and foliose lichen subformation (Smith 1984b). They occupy large expanses of rocky and more exposed situations such as screes, wind-swept hillsides, plateaux, moraines, ridges, nunataks, and rock faces ranging from near sea level to the summits of the highest nunataks. Bryophytes usually predominate in more stable sheltered habitats, particularly at the moister sites where there is some accumulation of soil or organic matter. Less discrete communities occupy different microhabitats on rock faces, ledges and overhangs. Depending on the situation bryophyte cover may be high and moss colonies coalesce to form a closed stand, or remain as solitary cushions scattered among boulders and gravel. Hepatics are common associates in some associations growing usually intermixed among shoots of mosses and only occasionally forming larger patches. All species of hepatics known to occur on King George Island were found in the associations of these subformations. *Lophozia excisa*, *Barbilophozia hatcheri*, *Cephaloziella varians* are frequently

present here and in other vegetation types, while *Pachyglossa dissitifolia*, *Herzogobryum teres*, *Anthelia juratzkana*, *Hygrolembidium ventrosum*, *H. isophyllum* and *Scapania obcordata* appeared to be exclusive to these communities.

There are three major categories of moss-dominated communities depending on growth-form of the main species and the environmental conditions of the habitat. The most widespread are communities of the moss carpet subformation. They occupy areas inundated by melt water during the summer and the margin of pools, lakes, rills and streams. Closed stands of *Sanionia uncinata*, *Calliergon sarmentosum* and *Calliergidium austro-stramineum*, the three dominant species in this association, often cover large expanses of raised beaches or gently sloping hillsides. Of liverworts only *Cephaloziella varians* is commonly present among the mosses and occasionally this species forms small patches on the surface of the moss carpet. Occasionally, *Cephalozia badia* and *Barbilophozia hatcheri* grow on the surface where the moss carpet is drier.

The margin of melt water channels, wet rock ledges subjected to dripping water and other flushed areas with moving water, especially close to penguin rookeries, are colonized by communities of the moss hummock subformation. They are dominated by several moss species of a large cushion growth-form, giving a hummocky appearence to the communities, such as *Brachythecium austro-salebrosum*, *Bryum pseudotriquetrum* and *Tortula filaris* but quite often deep, undulating carpets of *Sanionia uncinata* also play a significant role. Particular stands of these communities are seldom extensive albeit they are usually very distinct in the field. The only species of hepatic found was occasional patches of *Cephaloziella varians*, an ubiquistous species growing everywhere in moist and wet habitats.

The most interesting type of bryophyte-dominated communities in the maritime Antarctic are those formed by the tall turf-forming mosses *Chorisodontium aciphyllum* and *Polytrichum strictum*. They are usually restricted to well-drained slopes or stony ground and are characteristic by peat accumulation beneath living moss. These plant communities develop deep peat banks which are one of the most striking features of the landscape at many localities in the maritime Antarctic (Fenton and Smith 1982). On King George Island typical peat banks occur only on Ardley Island near Fildes Peninsula at the south-west tip of the island. In the Admiralty Bay area this community is replaced by one formed by *Polytrichum alpinum* which is seldom associated with *Chorisodontium aciphyllum*. Peat accumulation is smaller and, therefore, this community does not form characteristic peat banks. The constant liverwort associates of the communities of the moss turf subformation are *Barbilophozia hatcheri* and *Cephaloziella varians*, and occasionally *Lophozia excisa*. The hepatics usually grow intermixed with

shoots of mosses and only *C. varians* may sometimes form extensive patches on the surface of mosses where they have become moribund.

The two native vascular plants, *Deschampsia antarctica* Desv. and *Colobanthus quitensis* (Kunth.) Bartl., are quite frequent at several sites in the Admiralty Bay region, and in places form extensive swards which can be classified in the grass and cushion chamephyte subformation. These communities usually occupy north-facing, sheltered slopes at lower elevations and develop on gravelly well-drained soils. Stands of vascular plants are usually open with a variety of bryophyte and lichen associates. The constant hepatic associates are *Cephaloziella varians*, *Barbilophozia hatcheri* and *Lophozia excisa*, but only the former is found in any quantity.

To complete this brief account of the terrestrial plant communities of King George Island reference should be made to the communities of the crustose lichen subformation. Some of these are formed by a variety of crustose lichens and present the most colourful scenes, especially in or near bird nesting sites or penguin rookeries. Mosses occur in some stands only very occasionally but no hepatics have been recorded.

The Hepaticae of King George Island

The following account of the hepatics occurring on King George Island is arranged is systematic order as outlined by Grolle (1983). Detailed ecological and geographical data are provided for each taxon, and in the case of difficult and confusing ones a taxonomic discussion is also included. Specimens collected personally by R. Ochyra are indicated by number only, without citation of collector. A complete set of this collection has been deposited in the Bryological Herbarium in the Institute of Botany, Polish Academy of Sciences, Kraków (KRAM-B), and a nearly full set of duplicates is preserved in the Cryptogamic Herbarium, Department of Botany, Charles University, Prague (PRC). All other specimens are cited with the collector's name, and location of specimens is indicated by abbreviation of the herbaria according to Holmgren et al. (1981). Lists of specimens examined are accompanied by distribution maps. Synonyms are given only in the case of taxa described or reported from within the Antarctic botanical zone.

Of the eleven taxa of liverworts found on King George Island, the genus *Scapania* and *Hygrolembidium ventrosum* are recorded for the first time from within the Antarctic, and *Scapania obcordata* is recorded for the first time in the Southern Hemisphere. All known taxa of hepatics found in the King George Island study area including all the places visited can be keyed as follows:

1. Leaves unlobed 2
— Leaves with 2—4 lobes 4
2. Plants not isophyllous; leaves subrotundate, unistratose; underleaves smaller than leaves . . . . . *Hygrolembidium ventrosum*
—. Plants nearly isophyllous; underleaves nearly the same size as leaves 3
3. Leaves narrowly ovate, polystratose . . . . . *Pachyglossa disstifolia*
—. Leaves subrotundate, unistratose . . . . . *Hygrolembidium isophyllum*
4. Leaves with 3—4 lobes . . . . . *Barbilophozia hatcheri*
—. Leaves bilobed 5
5. Underleaves present 6
—. Underleaves absent (at least on sterile stems) 8
6. Underleaves nearly the size as leaves; plants in herbarium mostly with whitish colour . . . . . *Anthelia juratzkana*
—. Underleaves smaller than leaves; plants without whitish colour 7
7. Stem and leaf lobes hispid, with projections . . . . . *Cephaloziella hispidissima*
—. Stem and leaves without projections . . . . . *Cephaloziella varians*
8. Plants filiform; leaf margin crenulate . . . . . *Herzogobryum teres*
—. Plants not filiform; leaf margins entire 9
9. Leaf lobes unequal; at least some leaves keeled . . . . . *Scapania obcordata*
—. Leaf lobes equal; no leaves keeled 10
10. Leaves about 1/2 bilobed, cucullate . . . . . *Cephalozia badia*
—. Leaves less than 1/2 bilobed, never cucullate . . . . . *Lophozia excisa*

Lepidoziaceae

Hygrolembidium isophyllum Schust.

Nova Hedwigia 15 (2—4): 467. 1968.
Illustrations: Schuster (1968).

Habitat and geographical distribution. *Hygrolembidium isophyllum* is a very rare species on King George Island and is known only from one locality on Ardley Island near Fildes Peninsula (Fig. 3). It grows in abundance near sea level on moist soil in crevices among big boulders on raised

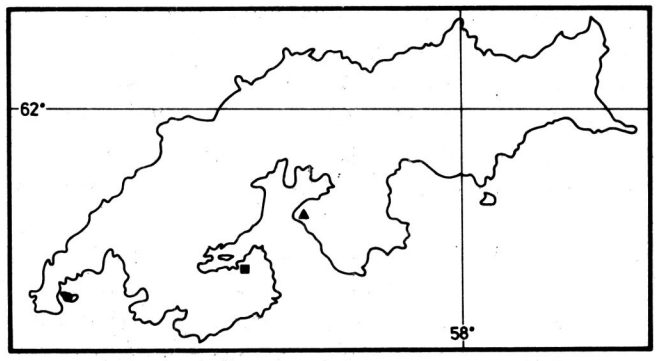

Fig. 3. Distribution map for *Hygrolembidium isophyllum* (circle), *H. ventrosum* (triangle) and *Scapania obcordata* (square) on King George Island

beaches in a community dominated by *Usnea antarctica*. The common associates are *Herzogobryum teres* and *Andreaea regularis*.

The species was described by Schuster (1968) from material collected in Tierra el Fuego as a member of the new subgenus *Hydrobiellopsis* of *Hygrolembidium*. According to Engel (1974) and Schuster (1982) *H. isophyllum* is known only from southern South America, the Falkland Islands and South Georgia, but they overlooked that it had also been reported by Smith (1972) from Signy Island, South Orkney Islands, where this species is fairly frequent in some sociations of the *Usnea — Andrea* association. According to Dr. R. I. Lewis Smith (pers. comm.) the species also occurs on Powell Island in the same archipelago and on Cape Tuxen on the west coast of the Antarctic Peninsula. The present record is new to the South Shetland Islands.

Records. FILDES PENINSULA: Ardley Island, 5 m (*2500/80*).

Hygrolembidium ventrosum (Mitt.) Grolle in Zinderen Bakk, Winterbs & Dyer

Marion Prince Edward Isl. Rep. S. Afr. Biol. Geol. Exped. 1965—1966: 233. 1971. — *Lembidium ventrosum* Mitt., Jour. Linn. Soc. Bot. (London) 15: 69. 1876.
Illustrations: Herzog (1952).

Habitat and geographical distribution. *Hygrolembidium ventrosum* **is a very** rare species on King George Island and like the former species is known only from one locality (Fig. 3). It was found in excellent fruiting condition although generally the collected material is scanty. The species grows on slightly moist soil in sheltered situations in association with *Pohlia cruda* var. *imbricata*, *Polytrichum alpinum* and *Andreaea regularis* in the community of *Usnea fasciata*.

The positive identification of the King George Island material represent the first record of *H. ventrosum* from Antarctica. Additionally, this species is known only from the two subantarctic islands of Marion Island (Grolle 1971) and Kerguelen Islands from where it was described by Mitten (1876), and (doubtfully) from New Zealand (Herzog 1952). Schuster (1982) provided a distribution map of all known species of the genus *Hygrolembidium*, including *H. ventrosum*.

Records. ADMIRALTY BAY: Mt. Wawel, 40 m (*2157/80*, *2158/80*).

Cephaloziaceae

Cephalozia badia (Gott. in Neum.) Steph.

Spec. Hepat. 3: 313. 1908. — *Jungermannia badia* Gott. in Neum., Int. Polarforsch. 1882—1883 Deutsch. Exp. Ergebn. 2: 452. 1890. — *Cephalozia cucullifolia* Steph., Wiss. Ergebn. Schwed. Südpolar-Exp. 1901—1903 4 (1): 2. 1905.

Illustrations: Gottsche (1890 as *Jungermannia badia*), Stephani (Icon. Hepat. *Cephaloziella* no. 13, ined.), Fulford (1968).

Habitat and geographical distribution. *Cephalozia badia* is one of the rarest species of liverworts in terms of frequency and cover, being recorded at only four stations on King George Island (Fig. 4). It was frequent only in Italia Valley. This species occurs exclusively in moist to wet situations, on bare soil on banks of melt water channels and on moist ledges, usually intermixed with turf-forming mosses such as *Polytrichum alpinum*, *P. piliferum* and *Pohlia nutans*.

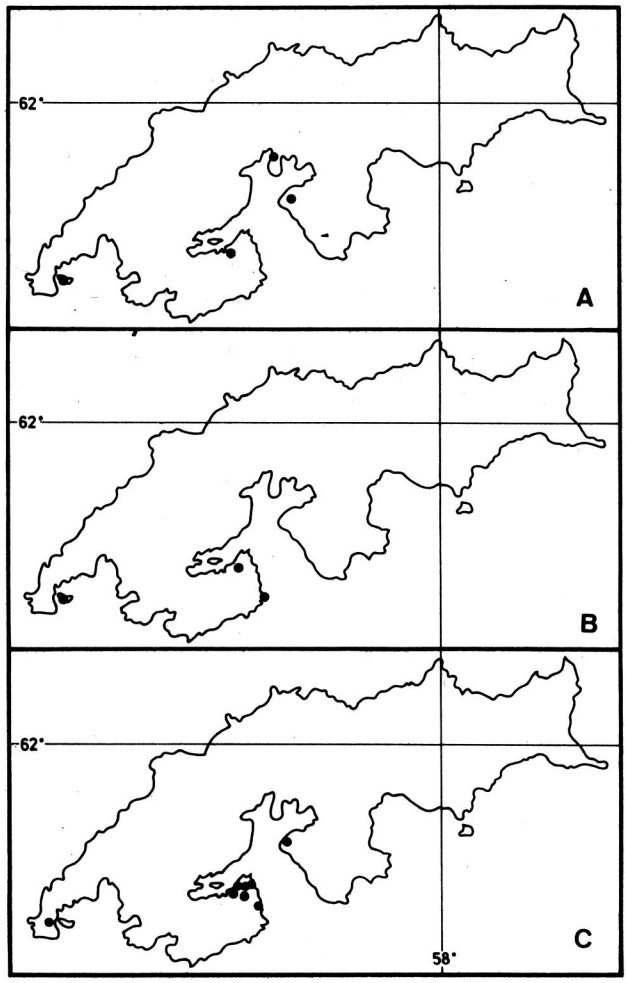

Fig. 4. Distribution map for *Cephalozia badia* (A), *Cephaloziella hispidissima* (B) and *Anthelia juratzkana* (C) on King George Island

Cephalozia badia is a subantarctic species confined in its distribution to the South American sector, where it grows sporadically in Tierra del Fuego and on the Falkland Islands, and on South Georgia from where it was originally described (Fulford 1968). In the maritime Antarctic *C. badia* is scattered throughout the region from the South Sandwich Islands to Danco Coast on the Antarctic Peninsula (Ochyra and Váňa 1989). Antarctic populations of this species were described by Stephani (1905) as a separate species, *Cephalozia cucullifolia*, but Grolle (1972) reduced it to synonymy with *C. badia*.

Records. ADMIRALTY BAY: Italia Valley, 100 m (*89/80*, *91/80*); Ore Point, 4 m (*515/80*); Mt. Wawel, 30 m (*2187/80*). FILDES PENINSULA: Ardley Island, 10 m (*2491/80*; *Nikolaev 2*, *8* — LE, PRC).

Cephaloziellaceae

Cephaloziella hispidissima Schust.

Nova Hedwigia 22: 208. 1973.
Illustrations: Schuster (1973).

Cephaloziella hispidissima is a very distinctive taxon and is quite easily recognized from all other species of this genus in the austral regions. The most distinctive characters are sharp, 1—2-celled projections on the surface of the stems and dorsal surface of the leaves. The material collected on King George Island is sterile and no brood bodies have been observed. It is the first fully documented report of this species from within the Antarctic botanical zone, although Schuster (1969a) mentioned it from the Antarctic Peninsula region as new to science, but later this author (Schuster 1973) did not include any Antarctic material in his description of the species. However, recently one of the authors (R. O.) has been kindly informed (in litt.) by Dr R. M. Schuster that his collection of *C. hispidissima* was made on Livingston Island, South Shetland Islands.

Habitat and geographical distribution. *Cephaloziella hispidissima* is a very rare species and is known only from four stations (Fig. 4). It grows in rather dry situations on soil on ledges or more frequently over the moribund surface of moss turves and cushions (e.g. *Polytrichum alpinum*, *Andreaea depressinervis*, *Pohlia nutans*). On Ardley Island *C. hisidisima* was collected among shoots of *Chorisodontium aciphyllum* in exposed and dry parts of peat banks overgrown with lichens.

Cephaloziella hispidissima was described from material collected in Tierra del Fuego by Schuster (1973) but be also gave one additional record of this species from New Zealand (South Island). On the basis of the present known distribution, *C. hispidissima* appears to be an amphipacific temperate

species, although further records are to be expected from other austral regions. Dr. R. I. Lewis Smith (pers. comm.) has collected material which is probably referable to this species on Signy Island, South Orkney Islands.

Records, ADMIRALTY BAY: Demay Point, 40 m (*1370/80*); Jersak Hills, 100 m (*5069a/79*). FILDES PENINSULA: Ardley Island, 10 m (*2487/80*).

Cephaloziella varians (Gott. in Neum.) Steph.

Wiss. Ergebn. Schwed. Südpolar-Exp. 1901—1903 4 (1): 4. 1905. — *Jungermannia varians* Gott. in Neum., Int. Polarforsch. 1882—1883 Deutsch. Exped. Ergebn. 2: 452, 1890. — *Cephalozia varians* (Gott. in Neum.) Steph., Résult. Voy. S. Y. Belgica 1897—1899 Rap. Sci. 6 (5): 5. 1901. — *Cephaloziella arctica* Bryhn & Douin ex K. Müll., Rabenh. Krypt. Fl. 6 (2): 159. 1913, syn. nov.
Illustrations: Gottsche (1890 as *Jungermannia varians*).

This is the commonest and most widespread species of liverworts in the Antarctic but its identity presents a permanent source of taxonomic confusion. Species of the genus *Cephaloziella* tend to be highly variable morphologically and their taxonomy is in need of critical revision. Sporophytic characters and sexuality are essential in the taxonomy of this genus. The main problem with the Antarctic populations is that only two collections of fertile material have been made: one from the South Sandwich Islands (Grolle 1972) and the other from Litchfield Island off the Antarctic Peninsula (Schuster and Damsholt 1974). Unfortunately, the large collection of material collected on King George Island is also entirely sterile.

Antarctic populations of *Cephaloziella*, with the exception of the very distinct *C. hispidissima* discussed above, are usually named *C. varians* (Gott. in Neum.) Steph. This species was described from sterile material collected by H. Will on South Georgia during the German Polar Year Expedition of 1882—1883. *C. varians* was recently synonymized with *C. exiliflora* (Tayl.) Steph., a protean and plastic species (Fulford 1976). On the other hand, Engel (1978) referred South Georgian material to *C. dusenii* Steph., a species confined in its distribution to southern South America, the Falkland Islands and South Georgia. However, Fulford (1976) also placed the latter into synonymy with *C. exiliflora*. Schuster (1973) was also of the opinion that *C. dusenii* may "represent the common and protean circumsubantarctic *C. exiliflora* (Tayl.) Douin". Recently Grolle (1972), having examined material with perianths from the South Sandwich Islands, considered *C. varians* to be a good species and he was of the opinion that the other records from the Antarctic named *C. varians* are probably erroneous. The name *C. exiliflora* has recently been used by Seppelt (1983, 1986) and Kanda (1987) for material collected from Greater Antarctica, and this name was also approved with some hesitation by Ochyra et al. (1982).

The problem of the identity of the Antarctic populations of *Cephaloziella*

was discussed by Schuster and Damsholt (1974). Having examined fertile specimens from the Antarctic collected by R. M. Schuster on Litchfield Island near Anvers Island these authors came to the conclusion that the Antarctic plants appear to be indistinguishable from *C. arctica* Bryhn & Douin ex K. Müll. According to these authors "Antarctic plants agree with the leptodermous phases ("var. *alpina*") of *C. arctica* in the thin-walled cells". The only two features differentiating Antarctic plants from ordinary *C. arctica* are (1) the often larger and bifid underleaves which give the shoots a subisophyllous appearance and (2) the lobe margins of the female bracts seem devoid of dentation. However, too much reliance should not be placed on these two characters and Schuster and Damsholt (1974) concluded that the Antarctic plants should be regarded as a geographical race of *C. arctica*. This opinion was recently confirmed again by Schuster (1980) and quite recently he expressed the opinion (in litt.) that "I am **almost** convinced that *C. arctica* must go into synonymy of *C. varians* ...".

Both *C. arctica* and *C. varians* have been examined cytologically. Inoue (1976) reported a chromosome number of n = 9 for *C. arctica* from Alaska. On the other hand, South Georgian material of *C. varians* examined by Newton (1980) has a chromosome number n = 18 (16+2 m), and material from King George Island (named tentatively as *C.* cf. *exiliflora*) shows the same cytological situation (Ochyra et al. 1982). Thus, it is possible that austral populations are diploid cytotypes of *C. arctica*. This kind of cytological differentiation is not exceptional in highly polymorphic and widespread taxa of liverworts. For instance, Antarctic populations of *Barbilophozia hatcheri* are differentiated cytologically and two chromosome races have been found with n = 9 and n = 18 (Ochyra et al. 1982), whereas the Holarctic populations of this species have only n = 9 or n = 10. Similarly, in the protean *Lophozia excisa* from Antarctica a triploid race was reported by Ochyra et al. (1982) which had not been previously known in the genus *Lophozia*.

If the identity of the Antarctic populations named *C. varians* and *C. arctica* could be accepted, the number of bipolar taxa will increase by one species, which is widespread in the polar regions of both hemispheres. However, this action will lead to considerable nomenclatural changes because some austral taxa were described much earlier than *C. arctica*.

Habitat and geographical distribution. *Cephaloziella varians* is widespread throughout the maritime Antarctic and it is the only species of hepatics known to occur on the Continent excluding the Antarctic Peninsula. At present this species is known from a few collections made in Victoria Land, Wilkes Land and Princess Elizabeth Land (Ochyra and Váňa 1989).

Cephaloziella varians is the most abundant species of liverworts on King George Island (Fig. 5). It grows predominantly in moist to wet situations and is a common associate of plant communities dominated by turf- and

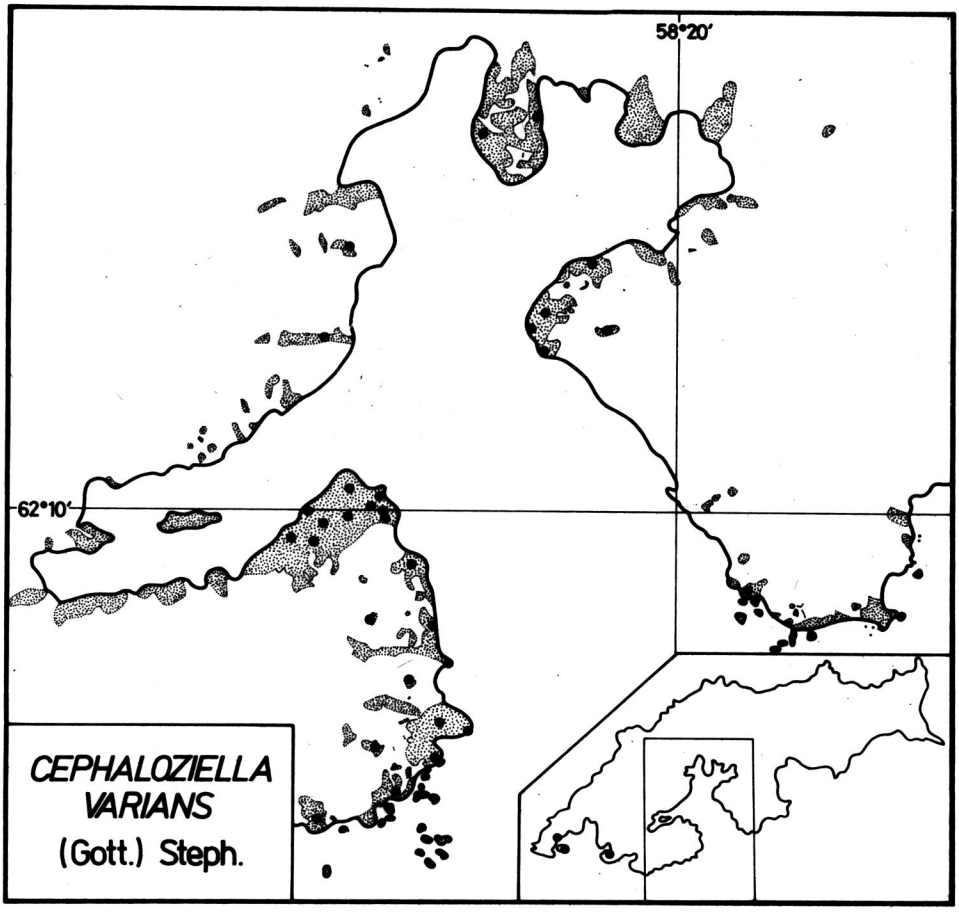

Fig. 5. Distribution map for *Cephaloziella varians* in the Admiralty Bay region and on King George Island

carpet-forming mosses such as *Polytrichum strictum*, *P. alpinum*, *Chorisodontium aciphyllum*, *Sanionia uncinata*, *Calliergon sarmentosum*, *Calliegidium austro-stramineum* and *Brachythecium austro-salebrosum*. Filamentous shoots of *C. varians* are nearly always present among shoots of mosses, but occasionally larger patches grow over the surface of moss where it has become moribund. The plant communities dominated by these mosses are most frequently developed on well drained or permanently moist to wet habitats on level or gently sloping ground, usually overlying stabilized screes, in wet depressions, and along rills and melt water channels. Less frequently the species occurs on soil- or peat-covered rock ledges, in rock crevices and fissures, on wet or moist soil among boulders on raised beaches, and occasionally it grows over or between rocks in rather drier sites amongst *Lophozia excisa* and *Barbilophozia hatcheri*. *C. varians* is also

a common associate of the Antarctic herb tundra formation formed by the only two Antarctic flowering plants, *Deschampsia antarctica* and *Colobanthus quitensis*, which occupy well-drained, north-facing, sheltered habitats in coastal areas, usually in the vicinity of breeding colonies of sea-birds.

Records. BRANSFIELD STRAIT: Red Hill, 100 m (*1085/80*); Blue Dyke, 120 m (*1155a/80*); Uchatka Point, 20 m (*1054/80*); Bastion Hill, 240 m (*991/80*). ADMIRALTY BAY: Demay Point, 50 m (*1335/80*); Creeping Slopes, 60 m (*1248/80*), 120 m (*1277/80*); Agat Point, 15 m (*372/80*); Siodło Hill, 85 m (*776/80*), 130 m (*773/80*); Sphinx Hill, 95 m (*224/80*), 115 m (*190/80*), 120 m (*212/80*); Czajkowski Needle, 260 m (*664/80*); Rescuers Hills, 25 m (*4966/79*), 45 m (*1482/80*), 60 m (*4888/79*); Ornithologist's Creek, 15 m (*709/80*); Jasnorzewski Gardens, 4 m (*1490/80*); Hala, 20 m (*5199/79*); Ambona, 80 m (*1606/80, 1637/80*); Ubocz, 95 m (*4962/79*), 115 m (*2377/80*), 125 m (*2373/80*); Penguin Ridge, 52 m (*1409/80, 1415/80*); Jersak Hills, 100 m (*5071/79*), 180 m (*5141/79*); Jardine Peak, 275 m (*5156/79*); Unnamed Hills, 130 m (*647/80*); Italia Valley, 100 m (*95/80*); Klekowski Crag, 220 m (*2311/80*); Komandor Peak, 230 m (*1930/80, 1951/80*), 250 m (*1942/80*); Round Hill, 50 m (*538/80, 543/80*); Moraine Point, 3 m (*490/80*); Smok Hill, 25 m (*2055a/80*); Mt. Wawel, 40 m (*2166/80*); Point Hennequin, 10 m (*2243/80*); Basalt Point, 15 m (*2215/80, 2232/80*); Bell Zygmunt, 300 m (*2685/80*); Vauréal Peak, 35 m (*5250/79*). BARTON PENINSULA (*Jabłoński 206*). FILDES PENINSULA: Ardley Island, 10 m (*2484/80*), 30 m (*2447/80*); Buchta Kamenistaja (*Nikolaev 35* — LE, PRC).

Antheliaceae

Anthelia juratzkana (Limpr.) Trev.

Mem. R. Ist. Lomb. Ser. 3, 4: 416. 1877. — *Jungermannia juratzkana* Limpr. in Cohn, Krypt.-Fl. Schles. 1: 289, 1876.
Illustrations: Müller (1954), Schuster (1974).

Habitat and geographical distribution. *Anthelia juratzkana* is rare in the King George Island study area, and is confined in its distribution to higher elevations and the summits of nunataks, and only occasionally does it occur near sea level (Fig. 4). The plants are conspicuous and easily recognized in the field because of their characteristic grey-white appearance in encrusting, loosely gregarious patches. These occur on bare, permanently moist or wet gravelly soil, on level or gently sloping, often patterned, ground, in exposed and strongly insolated situations, very often where snow lies long into the summer. It is usually associated with *Herzogobryum teres*, *Pachyglossa dissitifolia*, *Cephaloziella varians*, *Conostomum magellanicum* and *Calliergon sarmentosum*.

It is a bipolar, arctic-alpine hepatic widely distributed in the Northern Hemisphere. In the Southern Hemisphere it is known from the highest elevations of the Bolivian Andes and New Guinea, and from Tierra del Fuego, South Georgia and New Zealand. In the Antarctic botanical zone it has been recorded sporadically on the South Orkney and South Shetland Islands. Grolle (1969) and Schuster (1969c) mapped the world distribution of this species.

Records. BRANSFIELD STRAIT: Red Hill, 120—130 m (*1087/80*, *1090/80*). ADMIRALTY BAY: Sphinx Hill, 100 m (*272/80*); Hala, 20 m (*2385/80*); Ubocz, 90 m (*2361/80*); Jardine Peak, 275 m (*5166/79*); Unnamed Hills, 150 m (*158/80*); Italia Valley, 100 m (*113/80*), 200 m (*59/80*); Mt. Wawel, 20 m (*2189/80*). FILDES PENINSULA: without exact locality data (*Nikolaev* — LE, PRC).

Jungermanniaceae

Barbilophozia hatcheri (Evans) Loeske

Verh. Bot. Ver. Prov. Brandenburg 49: 37. 1907. — *Jungermannia hatcheri* Evans, Bull. Torrey Bot. Club 25: 417, 1898.

Illustrations: Grolle (1960), Schuster (1969b).

Habitat and geographical distribution. This is a fairly common species on the island and at some stations it occurs in abundance (Fig. 6). Most localities of *Barbilophozia hatcheri* were at lower elevations, from 15 to 150 m, but occasionally it was found on the tops of higher nunataks. The species grows most often in protected habitats, particularly where moisture is retained. Such conditions in the Antarctic occur on wind-swept screes, in damp and sheltered rock crevices and fissures, under overhangs and on narrow ledges, and on sheltered hillsides. The plants usually grow in dense reddish-brown patches often intermixed with mosses, particularly *Chorisodontium aciphyllum* and species of *Polytrichum* and *Andreaea*. *B. hatcheri* in the Antarctic is a common associate of the two main plant community types, namely the fruticose lichen and moss cushion subformation, especially some associations dominated by short, cushion-forming mosses, and the moss turf subformation, particularly *Polytrichum alpinum* and *Polytrichum alpinum-Chorisodontium aciphyllum* associations.

Originally, *B. hatcheri* was described from material from Tierra del Fuego by Evans (1898), but later is appeared that this species is widely distributed in the Northern Hemisphere. This seemingly paradoxical situation that some very common Holarctic taxa were originally described from specimens from the Southern Hemisphere is not exceptional, and it is worth noting that widespread northern species such as *Sphagnum magellanicum* Brid. and *S. fimbratum* Wils. in Hook f. & Wils. in Hook. f. were originally described from the Magellanian region of southern South America.

Barbilophozia hatcheri is a bipolar arctic-alpine species. Grolle (1960) critically revised all records of *Barbilophozia floerkei* from the Southern Hemisphere and demonstrated that all material from there, except for one collection from the Peruvian Andes, is actually *B. hatcheri*. The world distribution of this species was mapped by Grolle (1969). The species is known from the Magellanian region of Patagonia, the Falkland Islands and from the subantarctic island of South Georgia, extending southward into

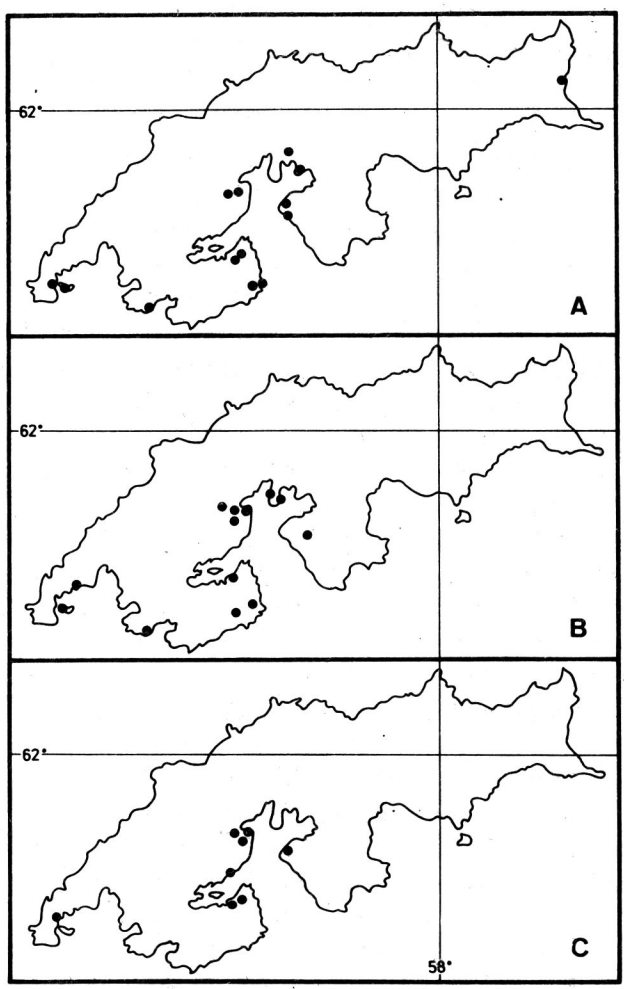

Fig. 6. Distribution map for *Barbilophozia hatcheri* (A), *Herzogobryum teres* (B) and *Pachyglossa dissitifolia* (C) on King George Island

the Antarctic botanical zone to at least lat. 68°S (Marguerite Bay) on the west side of the Antarctic Peninsula (R. I. Lewis Smith, pers. comm.).

Records. ADMIRALTY BAY: Demay Point, 55 m (*1359/80*); Creeping Slopes, 90 m (*1246/80*); Ubocz, 125 m (*2360/80*); Jersak Hills, 180 m (*5148/79*); Komandor Peak, 250 m (*1937/80, 1941/80*); Admiralen Peak, 305 m (*2026a/80*); Shark Fin, 140 m (*2655/80*); Ullman Spur, 40 m (*592/80*), 60 m (*595/80*); Mt. Wawel, 40 m (*2134/80*), 70 m (*2165/80*); Basalt Point, 15 m (*2222/80*). BARTON PENINSULA: Winship Point, 5 m (*Jabłoński 193*). FILDES PENINSULA: Ardley Island (*Nikolaev 2, 8 & 82* — LE, PRC); Buchta Gidrografov (*Nikolaev 76* — LE, PRC).
DESTRUCTION BAY: Faraway Nunatak (*Jabłoński 173*).

Lophozia excisa (Dicks.) Dumort.

Rec. d'Obs. 17. 1835 — *Jungermannia excisa* Dicks., Pl. Crypt. Brit. Fasc. 3: 11. 1793. — *Jungermannia propagulifera* Gott. in Neum., Int. Polarforsch. 1882—1883 Deutch Exp. Ergebn. 2: 451. 1890. — *Lophozia propagulifera* (Gott. in Neum.) Steph., Spec. Hepat. 2: 139. 1901. Illustrations: Gottsche (1890 as *Jungermannia propagulifera*). Schuster (1969b).

Schuster (1968, 1969b) reduced to synonymy with *L. excisa* the South Georgian species *Lophozia propagulifera* (Gott. in Neum.) Steph., which Grolle (1972), however, considered to be a good species. The material from King George Island is in good fruiting condition and the plants are paroecious and without any doubt should be referred to *L. excisa*. On the other hand, the material from South Georgia named by R. Grolle as *L. propagulifera*, which has also been examined by the second author, appears to be identical although it is sterile. On the basis that only paooecious plants are known in the region from southern South America to Antarctica Schuster (1969b) considered that *L. propagulifera* should be paroecious and conspecific with *L. excisa*.

Habitat and geographical distribution. Apart from *Cephaloziella varians* this is the commonest species of hepatic on King George Island (Fig. 7). It occurs most often in more-or-less protected habitats, usually intermixed with mosses such as *Bartramia patens*, *Chorisodontium aciphyllum*, *Pohlia nutans*, and species of *Polytrichum*, usually in moist and damp situations, in deep rock crevices and fissures, on rock ledges covered with humus or soil, on creees and on protected hillsides. *L. excisa* is characteristic constituent of different communities of the fruticose lichen and moss cushion subformation as well as communities within the moss turf subformation. Occasionally, it grows in mats of *Sanionia uncinata* in communities of the moss carpet subformation, especially in their drier variants. The species seems to be restricted to lower elevations, from sea level to about 150 m, and only sporadically it was found on the tops of higher nunataks.

It is a bipolar-circumboreal species that ranges in the Southern Hemisphere from southernmost South America throughout some subantarctic islands to New Zealand (Schuster 1969c). It is scattered throughout the maritime Antarctic extending southwards as far as 65°38′S in Graham Land on the west coast of the Antarctic Peninsula.

Records. ADMIRALTY BAY: Demay Point, 50 m (*1389/80*); Creeping Slopes, 60 m (*1235/80*); Sphinx Hill, 100 m (*280/80*); Rescuers Hills, 25 m (*4898/79*, *4967/79*, *4969/79*), 40 m (*289/80*), 45 m (*180/80*); Ecology Glacier, 15 m (*706/80*); Hala, 18 m (*5213/79*), 35 m (*5228/79*); Upłaz, 50 m (*2359/80*), 60 m (*2354/80*); Ubocz, 100 m (*2353/80*), 110 m (*2381/80*); Jersak Hills, 100 m (*5069/79*); Gdynia Point, 20 m (*1763/80*); Mt. Belweder, 150 m (*1593/80*); Klekowski Crag, 220 m (*2301/80*); Ore Point, 3 m (*510/80*); Speil Point, 5 m (*556/80*); Round Hill, 50 m (*534/80*); Mt. Flagstaff, 120 m (*424/80*, *426/80*); Moraine Point, 25 m (*491/80*), 30 m (*485/80*); Stenhouse Bluff, 30 m (*2626/80*, *2596/80*, *2585/80*); Mt. Wawel, 40 m (*2126/80*); Rembiszewski Nunataks, 150 m (*2732/80*, *2757/80*). FILDES PENINSULA: Ardley Island, 10 m (*2497/80*; *Nikolaev* — LE, PRC); Bellingshausen Station, 15 m (*2409/80*, *2418/80*); Buchta Kamenistaja (*Nikolaev 35* — LE, PRC).

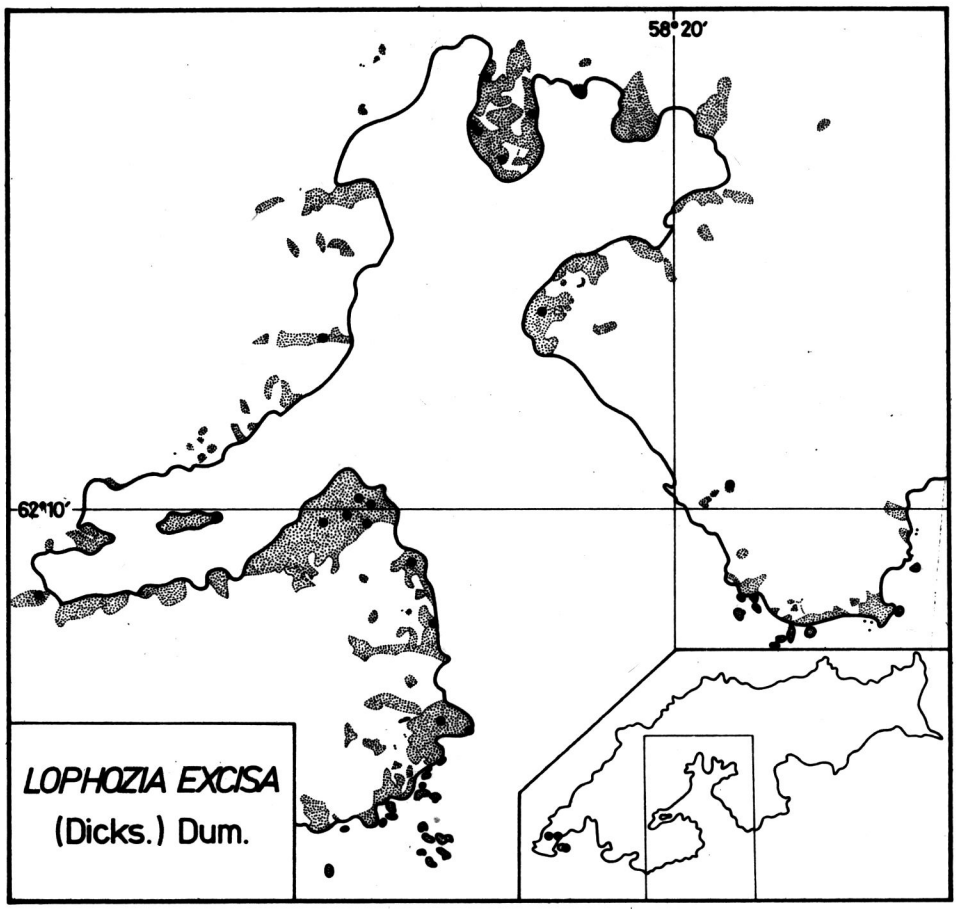

Fig. 7. Distribution map for *Lophozia excisa* in the Admiralty Bay region and on King George Island

Gymnomitriaceae

Herzogobryum teres (Carringt. & Pears.) Grolle

Oesterr. Bot. Zeitschr. 113: 233. 1966. — *Jungermannia teres* Carringt. & Pears., Pap. Proc. R. Soc. Tasmania 1887: 9. 1888.
Illustrations: Grolle (1966).

Habitat and geographical distribution. This is a rare species throughout the south-east coast of King George Island (Fig. 6). It appears to be restricted to the highest elevations on the tops of nunataks, and only a few records are known from near sea level. *Herzogobryum teres* is readily recognized in the field because of its compact and pure cushions with individual shoots erect and closely appressed to each other and with leaves densely imbricate in two rows. The species grows in two main

types of habitat. Most often it occurs in late snow areas in exposed situations, on permanently moist to wet gravelly soil, on wet soil over rock ledges, and the common associates are *Pachyglossa dissitifolia*, *Anthelia juratzkana*, *Andreaea regularis* and *Sanionia uncinata*. In few instances *H. teres* was found in relatively dry conditions, in deep rock crevices or on pockets of soil and gravel amongst loose stones. These habitats in higher elevations are usually occupied by the very widespread associations of *Himantormia lugubris* and *Usnea fasciata*, and *H. teres* grows most frequently in some ecological variants of this association dominated by different species of *Andreaea*.

This is a circumsubantarctic and southern cool temperate liverwort widely distributed in the Magellanian region of Patagonia, the Falkland Islands, Tristan da Cunha, South Georgia, Marion Island and in New Zealand and on Tasmania. Schuster (1979) provided a world distribution map of this species but he did not include localities from the South Orkney Islands, although Smith (1972) reported *H. teres* from Signy Island. The genus *Herzogobryum* is strictly southern cool temperate and subantarctic in distribution and at present is known to include seven species. Two of these, *H. erosum* (Carringt. & Pears.). Grolle and *H. vermiculare* (Schiffn.) Grolle, are very widespread in the southern cool temperate and subantarctic regions and their occurrence may be expected in the Antarctic.

Records. ADMIRALTY BAY: The Tower, 365 m (*1378/80*); Creeping Slopes, 135 m (*1274/80*); Italia Valley, 100 m (*88/80*, *122/80*); Komandor Peak, 230 m (*1965/80*), 250 m (*1936/80*); Kapitan Peak, 190 m (*1910/80*), 210 m (*1907/80*); Wegger Peak, 290 m (*2008a/80*), 300 m (*2014/80*); Speil Point, 3 m (*602/80*); British Point, 50 m (*557/80*); Bell Zygmunt, 300 m (*2683/80*) BARTON PENINSULA: Winship Point, 5 m (*Jabłoński 194* — KRAM-B). FILDES PENINSULA: Suffield Point, 20 m (*2450/80*); Ardley Island, 5 m (*2499/80*).

Scapaniaceae

Scapania obcordata (Berggr.) S. Arnell in S. Arnell & Mårt.

Ark. Bot. ser. 2, 4 (6): 117. 1959. — *Sarcoscyphus obcordatus* Berggr., K. Svensk. Vet. Ak. Handl. 13: 96. 1875.
Illustrations: Arnell and Mårtensson (1959), Schuster (1974).

Habitat and geographical distribution. Only a very few shoots of this liverwort have been found intermixed in a mat of *Cephalozia badia*. The plants were sterile, but all gametophytic characters share those in Arctic plants of this species and no important difference can be found. The distribution of this species on King George Island is shown in Fig. 3.

From the phytogeographical point-of-view this is a very interesting record. Until now, the genus *Scapania* was unknown in the Antarctic botanical zone and, moreover, this is an additional bipolar species. According to Schuster (1974), *S. obcordata* is chiefly a high Arctic species, restricted to

the Atlantic sector of this region from Spitsbergen and northern Sweden, west to Greenland, the High Canadian Arctic (Ellesmere Island) and Québec. The recent discovery of this species at Chukotka Peninsula (Šljakov 1981) seems to confirm Schuster's (1974) comment that *S. obcordata* is only seemingly restricted to the Atlantic sector of the Arctic and may be more widespread.

Records. ADMIRALTY BAY: Italia Valley, 100 m (*91a/80*).

Geocalycaceae

Pachyglossa dissitifolia Herz. & Grolle

Rev. Bryol. Lichénol. 27: 155. 1958.
Illustrations: Herzog and Grolle (1958), Fulford (1963a).

Habitat and geographical distribution. *Pachyglossa dissitifolia* is a rather rare species on King George Island (Fig. 6), albeit at some stations it occurs in abundance. Most collections of this species were from higher elevations, usually above 100 m and near the summits of nunataks, with only a few records from near sea level. *P. dissitifolia* grows on bare soil, in damp and exposed situations or on more sheltered rock faces supplied with trickling melt water. Some of these sites are covered by snow until mid-summer. Very often associates of this species include *Herzogobryum teres* and *Anthelia juratzkana*.

Pachyglossa dissitifolia is here considered as a subantarctic species rather than southern cool temperate, as its northern extensions in the Valdivian region and on Tristan da Cunha are confined to higher altitudes. It appears to be widespread in Tierra del Fuego and on South Georgia, and additonally it is also known from scattered localities in the maritime Antarctic. Fulford (1963b) and Schuster (1979) provided distribution maps of all species of the genus *Pachyglossa* and discussed the main problems of its present geographical distribution.

Records. ADMIRALTY BAY: Jersak Hills, 200 m (*5118/79*); Italia Valley, 100 m (*88a/80*); Urbanek Crag, 120 m (*2346/80*), 130 m (*2333/80*); Komandor Peak, 250 m (*1936a/80*); Wegger Peak, 300 m (*2005/80*), 320 m (*1997/80*); Kapitan Peak, 190 m (*1904/80*), 200 m (*1913/80*); Mt. Wawel, 40 m (*2159/80*). FILDES PENINSULA: Bellingshausen Station, 15 m (*2411/80*).

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Streszczenie

Wątrobowce stanowią z reguły mało ważny komponent zbiorowisk roślinnych Antarktyki i zazwyczaj występują tylko w niewielkich ilościach jako domieszka w poduszkach i darniach mchów. Dotychczasowe wiadomości o florze wątrobowców południowych obszarów polarnych są bardzo skąpe i niekompletne, zarówno od strony taksonomicznej, jak też fitogeograficznej i ekologicznej. Niniejsza praca przynosi obszerne informacje o ekologii, rozmieszczeniu i taksonomii 11 gatunków wątrobowców zebranych na Wyspie Króla Jerzego, zwłaszcza w rejonie Zatoki Admiralicji, w archipelagu Szetlandów Południowych, przez pierwszego z autorów podczas IV Wyprawy Antarktycznej PAN na Stację im. H. Arctowskiego, na przełomie 1979/80 r.

W wyniku szczegółowych badań terenowych na Wyspie Króla Jerzego znaleziono 11 gatunków wątrobowców, co stanowi połowę wszystkich gatunków stwierdzonych w Antarktyce. Są to w porządku systematycznym: *Hygrolembidium isophyllum* Schust., *H. ventrosum* (Mitt.) Grolle, *Cephalozia badia* (Gott. in Neum.), Steph., *Cephaloziella hispidissima* Schust., *C. varians* (Gott. in Neum.) Steph., *Anthelia juratzkana* (Limpr.) Trev., *Barbilophozia hatcheri* (Evans) Loeske, *Lophozia excisa* (Dicks). Dumort., *Herzogobryum teres* (Carringt. et Pears.) Grolle, *Scapania obcordata* (Berggr.) S. Arnell i *Pachyglossa dissitifolia* Herz. et Grolle. Dwa spośród wyżej wymienionych gatunków, *Hygrolembidium ventrosum* i *Scapania obcordata*, zostały znalezione po raz pierwszy w Antarktyce, przy czym drugi z nich znany był dotychczas tylko z Arktyki i jest to w ogóle jego pierwsze stwierdzenie na półkuli południowej. Natomiast *Hygrolembidium isophyllum* i *Herzogobryum teres* są gatunkami nowymi dla archipelagu Szetlandów Południowych.

Dla każdego gatunku podano szczegółowe dane o warunkach siedliskowych, zbiorowiskach roślinnych w jakich został stwierdzony, zasięgu pionowym i poziomym, zaś na mapach punktowych przedstawiono ich lokalne rozmieszczenie w rejonie Zatoki Admiralicji i na Wyspie Króla Jerzego. Ponadto, zawarte zostały informacje o ogólnym rozmieszczeniu geograficznym w Antarktyce i świecie, a w razie potrzeby obszernie dyskutowano problemy taksonomiczne danego gatunku. Praca zawiera również ogólny klucz do oznaczania wszystkich gatunków wątrobowców stwierdzonych na Wyspie Króla Jerzego.

Najpospolitszym gatunkiem wątrobowca na omawianym terenie jest *Cephaloziella varians*. Rośnie, zazwyczaj bardzo obficie, w hydrofilnych mszarach dywanowych, w których dominują takie gatunki, *Sanionia uncinata*, *Calliergon sarmentosum* i *Calliergidium austro-stramineum*. *C. varians* została potraktowana przez autorów jako gatunek bipolarny, ponieważ po szczegółowej dyskusji taksonomicznej została z nią zsynonimizowana *Cephaloziella arctica* Bryhn et Douin ex K. Müll., występująca rozlegle na wysokich szerokościach geograficznych półkuli północnej. Natomiast najrzadszymi gatunkami wątrobowców na Wyspie Króla Jerzego są *Hygrolembidium isophyllum*, *H. ventrosum* i *Scapania obcordata*, znane tylko z pojedynczych stanowisk.