



Lichens of Franz Josef Land archipelago

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Abstract: Information on lichens of Franz Josef Land is summarized based on original and literature data. Two hundred twenty nine lichen species are documented, of which 59 species and two varieties are newly reported for this territory. This represents only 13% of the Arctic lichen flora richness. We have found 28 rare lichen species in the archipelago and recommend to include 9 species in the Red Data Book of the Arkhangelsk Region of Russia.

Key words: Russian Arctic, Franz Josef Land, lichenized fungi, polar desert, new records.

Introduction

The first information about lichens of Franz Josef Land was published by Fischer (1896), who reported seven lichen species collected by the expedition of Jackson and Harmsworth in 1894–97. The Italian expedition “Spedizione Polare di S. A. R. Luigi Amadeo di Savoia Duca degli Abruzzi 1899–1900” collected 24 lichen species which were subsequently determined by A. Jatta and published by Mattiolo and Belli (1903). Elenkin and Savichz (1912) reported 41 lichen species collected by I.V. Palibin during the Russian expedition on the icebreaker “Ermak” in 1901. Lyngé (1931) published 69 lichen species collected by O. Hanssen during the Norwegian expedition in 1930. Around the same time Savichz (1932) published results of the Russian expedition on the icebreaker “Sedov” in 1929. Further contributions to the lichen flora were done within the framework of the geobotanical study of Alexandra Land Island (Alexandrova 1969, 1977, 1981, 1983). Additional information on some lichen



taxa from the region occurred in subsequent papers on lichens or lichenicolous fungi (Vitikainen 1994; Zhurbenko and Santesson 1996; Urbanavichus 2001; Jørgensen 2004; Halonen *et al.* 2009; Zhurbenko 2009; Kukwa and Zhurbenko 2010; Onut-Brännström *et al.* 2018). Andreev *et al.* (1996) summarized data on 127 lichen taxa known by that time from Franz Josef Land. The panarctic lichen checklist (Kristinsson *et al.* 2010) lists 154 species for the archipelago. Recent book on plants and fungi of the polar deserts in the northern hemisphere (Zhurbenko and Konoreva 2015) contains data on 100 terrestrial lichen species from the area.

The aim of this paper is to summarize all information on lichens of Franz Josef Land based on original and literature data.

Materials and methods

This synopsis presented below is mainly based on identification of lichen collections of S.S. Kholod (2012, 2015) and V.P. Savichz (1930). Results of revision of some additional lichen collections, as well as all available literature reports, are also included. The parts of the archipelago where lichens were collected by S.S. Kholod and prior to his field studies are shown in Figs 1 and 2, respectively. Lichen identification was performed by standart light microscopy using Zeiss Primo Star, MBS-10 and MS-2 microscopes. For determination of lichen substancies of *Lepraria*, *Ochrolechia*, *Pertusaria* and *Stereocaulon* species thin layer chromatography was employed (Orange *et al.* 2001). The maps were prepared using MapInfo programme. Voucher specimens are housed in the lichen herbarium of the Komarov Botanical Institute in St. Petersburg, Russia (LE).

Study area

Franz Josef Land archipelago (Arkhangelsk Region of Russia) consisting of 192 islands is located in the northern part of the Barents Sea, within 79°55'–81°51'N and 44°50'–65°30'E. Its area is 16134 km². The Austrian and British straits divide the archipelago into 3 groups: western, central and eastern (Govorucha 1968). The distribution of water masses and degree of ice cover of the surrounding water spaces have a significant effect on the physics-geographical conditions of the archipelago. Its western part is under the prevailing influence of the Atlantic waters. The Arctic waters predominate in its eastern and northeastern parts. The central islands are under the mixed influence of the Atlantic, Arctic and Barents Sea waters. The arrival of radiation heat in the archipelago is 60 kcal/year. Its low value is due to the low standing of the sun, the high albedo of glacial surfaces, and the prolonged polar night (up to

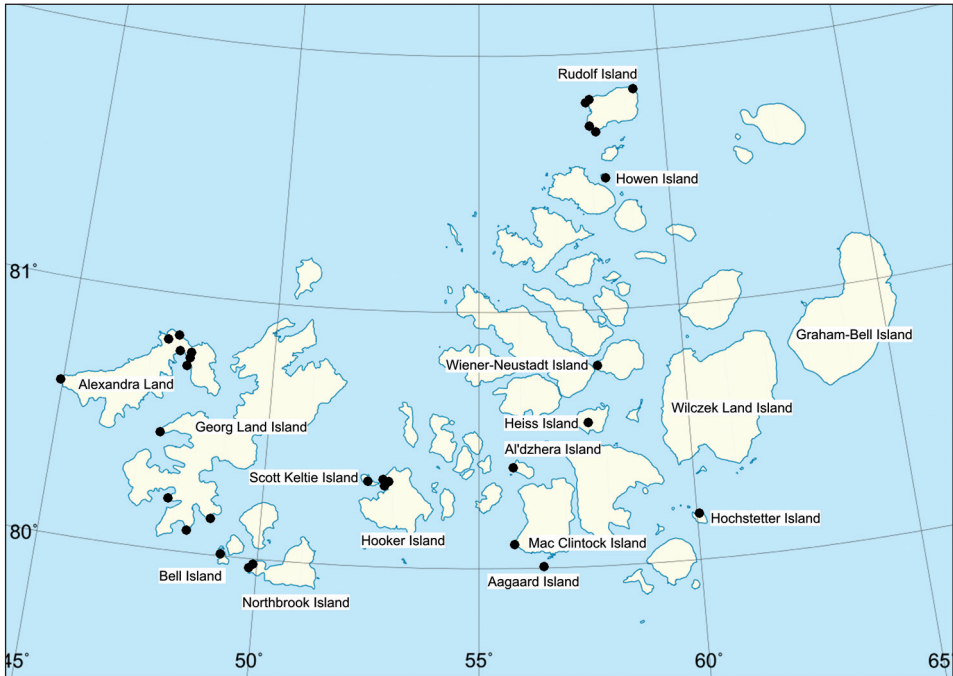


Fig. 1. Previous collecting localities of various collectors.

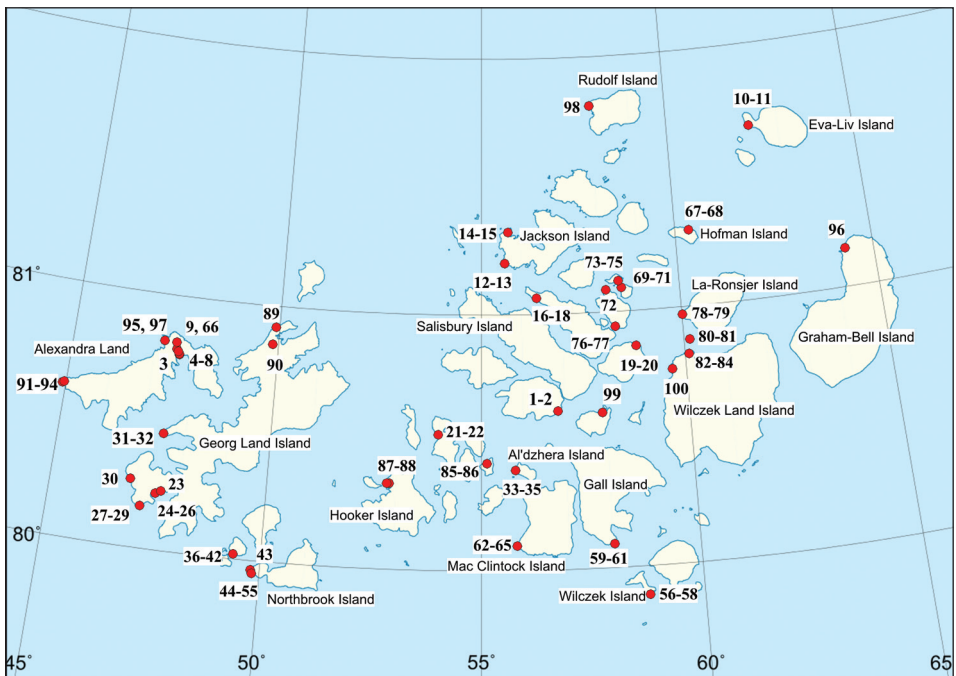


Fig. 2. New collecting localities of S.S. Kholod.

130 days). Despite the lack of radiation heat, the overcooling of the archipelago does not occur due to the influx of advective heat and the influence of the sea. Average monthly temperatures in winter do not drop below -27°C . The average monthly summer temperatures do not exceed $+2^{\circ}\text{C}$ (July, August), the average annual air temperature is -12°C . The summer on the archipelago is damp and cold, often with night frosts (Govorucha 1968).

Most of the islands are an elevated basaltic plateau divided into separate blocks by tectonic faults. 85% of the archipelago is covered with glaciers. Melt waters of glaciers are the main sources of rivers, lakes and lightly saline lagoons. Different types of ecotopes are represented by such landscape elements as coastal shafts, marine terraces, mountain slopes, moraine ridges or areas along the glacier margins with thixotropic soils.

Franz Josef Land is located within the polar desert nature zone (Matveyeva 2015). The soil profiles are thin, incomplete and characterized by weak expression of genetic horizons. Humus soils occur in the west of the archipelago, sandy and sandy loamy soils dominate in its eastern parts. Cryogenic processes led to widespread polygonal soils. Bryophytes and lichens dominate in the vegetation cover. In most plant communities the projective cover is 3–5%, however, along the banks of meltwater streams it reaches 20–25%, and occasionally, for instance near bird colonies, even 90%.

List of collecting localities of S.S. Kholod (except for no. 96) at Franz Josef Land (Fig. 2)

Note. The localities are referenced in the text by the number that appears in bold in the list.

1. Champ Island, Cape Trieste, $80^{\circ}38'\text{N}$, $56^{\circ}55'\text{E}$, grass community with *Saxifraga oppositifolia*, 24 July 2012.
2. *ibid.*, riverbank, moss cushions, 24 July 2012.
3. Alexandra Land Island, south of Nagurskaya station, $80^{\circ}47'29.5''\text{N}$, $47^{\circ}35'13.3''\text{E}$, polygonal *Phippsia*-lichen-hepatic community, 27 July 2012.
4. *ibid.*, $80^{\circ}46'27.1''\text{N}$, $47^{\circ}38'12.3''\text{E}$, moss-lichen community, 29 July 2012.
5. *ibid.*, $80^{\circ}46'29.2''\text{N}$, $47^{\circ}38'09.7''\text{E}$, hepatic-lichen community, 29 July 2012.
6. *ibid.*, $80^{\circ}46'31.6''\text{N}$, $47^{\circ}38'06.0''\text{E}$, scree hepatic-lichen community, 29 July 2012.
7. *ibid.*, terrace, moss community, 29 July 2012.
8. *ibid.*, $80^{\circ}47'00.2''\text{N}$, $47^{\circ}37'17.6''\text{E}$, grassland-moss community, 29 July 2012.
9. *ibid.*, $80^{\circ}48'30.0''\text{N}$, $47^{\circ}36'18.4''\text{E}$, moss peat on terrace, 30 July 2012.
10. Eva-Liv Island, Cape Kluv, $81^{\circ}40'\text{N}$, $62^{\circ}15'\text{E}$, pebble terrace, lichen community, 3 August 2012.
11. *ibid.*, polygonal lichen community, 3 August 2012.

12. Jackson Island, Cape Norwegia, 81°12'N, 55°35'E, terrace, lichen-moss community with *Luzula confusa*, 4 August 2012.
13. *ibid.*, scree slope, grass-lichen-moss community, 4 August 2012.
14. Jackson Island, Cape Bystrov, 81°19'N, 55°40'E, plain with streams, hepatic-lichen community, 4 August 2012.
15. *ibid.*, scree glacier terrace, hepatic-lichen community, 4 August 2012.
16. Ziegler Island, 81°03'N, 56°19'E, lake shore, grass-lichen community, 5 August 2012.
17. *ibid.*, ridge between lagoon and inner lake, grass-moss-lichen community, 5 August 2012.
18. *ibid.*, lake shore, moss-lichen-hepatic community, 5 August 2012.
19. Wiener Neustadt Island, Cape Tirol, 80°52'N, 58°55'E, sandy coastal terrace, moss-hepatic community, 6 August 2012.
20. *ibid.*, sandy coastal terrace, polygonal lichen-hepatic community with *Luzula confusa* and *Potentilla hyparctica*, 6 August 2012.
21. Nansen Island, 80°32'N, 53°57'E, gravelly polygons, grass-hepatic-lichen community, 8 August 2012.
22. *ibid.*, watershed, lichen-moss community with grasses, 8 August 2012.
23. Georg Land Island, Gray's Bay, 80°13'50.1"N, 47°36'02.8"E, terrace, moss cushions, 12 August 2012.
24. *ibid.*, Cape Kalina, 80°13'23.2"N, 47°29'18.2"E, grass-moss community, 12 August 2012.
25. *ibid.*, moss community with single vascular plants, 12 August 2012.
26. *ibid.*, 80°13'22.4"N, 47°30'19.7"E, margin of coastal terrace, moss-lichen community, 12 August 2012.
27. *ibid.*, Cape Krauter, 80°09'33.6"N, 47°11'00.7"E, grass-moss community, 12 August 2012.
28. *ibid.*, 80°09'32.4"N, 47°11'07.3"E, terrace, moss community, 12 August 2012.
29. *ibid.*, 80°09'33.8"N, 47°11'08.1"E, terrace, grass-lichen community, 12 August 2012.
30. *ibid.*, Sumgina Peninsula, 80°15'15.5"N, 46°54'01.7"E, dry hillock, *Papaver polare-Phippsia algida-Saxifraga cernua* community, 13 August 2012.
31. *ibid.*, Cape Nansen, 80°27'10.9"N, 47°28'51.6"E, polygonal moss-lichen community, 13 August 2012.
32. *ibid.*, 80°27'09.7"N, 47°29'10.0"E, top of a plateau, grass-lichen community, 13 August 2012.
33. Alger Island, Cape Rihtgofena, 80°23'N, 55°45'E, coastal terrace, grass-lichen community with *Luzula confusa*, *L.nivalis* and *Potentilla hyparctica*, 17 August 2012.
34. *ibid.*, coastal terrace, lichen-grass-moss community with *Salix polaris*, 17 August 2012.

35. *ibid.*, coastal terrace, moss community, 17 August 2012.
36. Mejbek Island, 80°01'25.3"N, 49°22'17.3"E, sandy coastal terrace, liverwort crusts with *Saxifraga oppositifolia* and *S. caespitosa*, 22 August 2012.
37. *ibid.*, 80°01'24.2"N, 49°22'05.3"E, dry hillock, zoogenic community with *Poa arctica* and *Luzula confusa*, 22 August 2012.
38. *ibid.*, 80°01'23.2"N, 49°22'29.4"E, wet plume below glacier, moss community with *Orthothecium chryseon*, 22 August 2012.
39. *ibid.*, 80°01'11.2"N, 49°22'21.5"E, moss mats, 22 August 2012.
40. *ibid.*, 80°01'04.8"N, 49°24'53.9"E, grass-moss-lichen community on peat, 22 August 2012.
41. *ibid.*, 80°01'05.2"N, 49°24'57.3"E, grass-lichen-moss community, 22 August 2012.
42. *ibid.*, 80°01'06.9"N, 49°24'58.0"E, moss mats, 22 August 2012.
43. Northbrook Island, Cape Flora, 79°57'44.2"N, 50°03'40.8"E, *Phippsia*-moss-hepatic community, 23 August 2012.
44. *ibid.*, 79°56'54.1"N, 50°06'08.3"E, dry terrace, grass-lichen-moss community, 23 August 2012.
45. *ibid.*, 79°56'51.3"N, 50°06'37.2"E, terrace, *Alopecurus*-grass-moss community, 23 August 2012.
46. *ibid.*, 79°56'54.1"N, 50°06'22.3"E, terrace, grass-lichen-moss community, 23 August 2012.
47. *ibid.*, 79°56'52.3"N, 50°06'08.9"E, terrace, closed grass-moss community, 24 August 2012.
48. *ibid.*, 79°56'52.6"N, 50°06'13.3"E, terrace, closed *Alopecurus*-moss community, 24 August 2012.
49. *ibid.*, 79°56'50.3"N, 50°06'56.5"E, terrace, *Alopecurus*-lichen-moss community, 24 August 2012.
50. *ibid.*, 79°56'47.9"N, 50°07'46.3"E, terrace, closed *Alopecurus*-moss community, 24 August 2012.
51. *ibid.*, 79°56'49.9"N, 50°06'24.2"E, terrace, *Phippsia*-hepatic community, 25 August 2012.
52. *ibid.*, 79°56'50.2"N, 50°06'24.0"E, terrace, hepatic-moss community, 25 August 2012.
53. *ibid.*, 79°56'49.9"N, 50°05'35.0"E, terrace, dense lichen community, 25 August 2012.
54. *ibid.*, 79°56'59.6"N, 50°06'03.1"E, S-exposed slope, lichen-moss community, 25 August 2012.
55. *ibid.*, 79°56'58.2"N, 50°05'47.7"E, terrace, dense moss community, 25 August 2012.
56. Wilczek Island, Cape Orgel, 79°53'41.1"N, 58°52'47.1"E, high terrace, lichen-moss community, 26 August 2012.

57. *ibid.*, 79°53'41.9"N, 58°52'41.0"E, coastal terrace, hepatic-lichen community, 26 August 2012.
58. *ibid.*, 79°53'41.1"N, 58°52'05.3"E, moss-lichen community among scattered limestones, 26 August 2012.
59. Gall Island, Cape Tegetgoff, 80°05'36.3"N, 58°02'38.2"E, dense lichen-moss-hepatic community, 27 August 2012.
60. *ibid.*, 80°05'37.9"N, 58°02'25.5"E, dense moss community, 27 August 2012.
61. *ibid.*, 80°5'52.5"N, 58°01'52.7"E, lagoon shore, closed lichen-hepatic community, 27 August 2012.
62. McClintock Island, Cape Dillan, 80°05'31.6"N, 55°48'11.5"E, high coastal terrace, moss-hepatic community, 28 August 2012.
63. *ibid.*, 80°05'31.5"N, 55°48'13.9"E, sloping terrace, thin moss-grass community, 28 August 2012.
64. *ibid.*, 80°05'34.3"N, 55°49'31.7"E, S-exposed slope, lichen-moss community with *Papaver polare*, 28 August 2012.
65. *ibid.*, 80°05'32.9"N, 55°49'38.3"E, high terrace, lichen-moss community, 28 August 2012.
66. Alexandra Land Island, Nagurskaya station, 80°48'33.4"N, 47°36'36.8"E, peat hill, moss-hepatic community, 2 September 2012.
67. Hofman Island, 81°17'40.6"N, 60°25'20.7"E, *Phippisia*-community with hepatic crusts, 4 September 2012.
68. *ibid.*, 81°17'40.0"N, 60°25'21.3"E, terrace with hillocks and dry depressions, polygonal moss community, 4 September 2012.
69. Kejna Island, 81°06'03.2"N, 58°31'39.1"E, small hillocks on coastal terrace, moss-lichen community, 5 September 2012.
70. *ibid.*, 81°06'02.8"N, 58°31'38.7"E, pebble coastal terrace, dense lichen community, 5 September 2012.
71. *ibid.*, 81°05'52.4"N, 58°31'25.1"E, glacial terrace, moss-lichen community, 5 September 2012.
72. *ibid.*, 81°06'07.7"N, 58°04'12.5"E, pebble coastal terrace, polygonal moss-lichen community, 5 September 2012.
73. Kuna Island, 81°06'51.8"N, 58°27'53.3"E, ridge, grass-moss-lichen community, 5 September 2012.
74. *ibid.*, 81°07'00.5"N, 58°28'42.0"E, ridge slope, *Phippisia*-moss community, 5 September 2012.
75. *ibid.*, 81°07'00.5"N, 58°28'36.4"E, ridge slope, moss-lichen community, 5 September 2012.
76. Greeley Island, 80°56'07.3"N, 58°21'46.1"E, rocky slope, moss-lichen community, 6 September 2012.
77. *ibid.*, 80°56'10.4"N, 58°21'35.0"E, scree slope, sparse *Potentilla*-lichen community, 6 September 2012.

78. La-Ronsjer Island, 80°58'29.2"N, 60°00'23.3"E, coastal terrace, polygonal moss-hepatic community, 7 September 2012.
79. *ibid.*, 80°58'22.2"N, 60°00'27.7"E, coastal terrace, moss-lichen community, 7 September 2012.
80. Geidzh Island, 80°52'13.7"N, 60°05'02.2"E, plateau, thin grass-lichen community, 7 September 2012.
81. *ibid.*, 80°52'18.4"N, 60°05'25.1"E, plateau, thin grass-lichen community, 7 September 2012.
82. Wilczek Land Island, 80°48'50.4"N, 59°54'17.4"E, terrace, *Phippsia*-moss-lichen community, 7 September 2012.
83. *ibid.*, 80°48'44.0"N, 59°55'30.3"E, S-exposed slope, moss-lichen community, 7 September 2012.
84. *ibid.*, 80°48'44.5"N, 59°55'50.4"E, S-exposed slope, moss-lichen community, 7 September 2012.
85. Bryce Island, 80°25'15.7"N, 55°10'55.1"E, terrace, polygonal grass-lichen community, 8 September 2012.
86. *ibid.*, 80°25'22.0"N, 55°11'08.1"E, boulders and limestones near snowbank, lichen-moss community, 8 September 2012.
87. Hooker Island, Cape Sedov, 80°20'26.3"N, 52°52'00.6"E, plateau, spotted moss community, 9 September 2012.
88. *ibid.*, 80°20'17.8"N, 52°47'13.8"E, coastal terrace, dense grass-moss community, 9 September 2012.
89. Georg Land Island, Armitage Peninsula, 80°54'33.3"N, 49°53'07.7"E, coastal terrace, dense moss community, 10 September 2012.
90. *ibid.*, 80°51'17.0"N, 49°52'45.2"E, coastal terrace, sparse moss-lichen community, 10 September 2012.
91. Alexandra Land Island, Mary Harmsworth Cape, 80°35'40.4"N, 44°55'10.5"E, coastal terrace, closed lichen community, 11 September 2012.
92. *ibid.*, 80°35'41.9"N, 44°54'56.8"E, depression on coastal terrace, moss mats, 11 September 2012.
93. *ibid.*, 80°35'45.4"N, 44°59'13.7"E, stony lichen community, 11 September 2012.
94. *ibid.*, 80°35'41.3"N, 44°56'33.4"E, pebble lichen community, 11 September 2012.
95. *ibid.*, Nagurskaya station, 80°48'45.5"N, 47°17'00.6"E, *Phippsia*-lichen-hepatic community, 17 September 2012.
96. *ibid.*, 80°48'N, 47°17'E, 15 September 2007. Note: collected Zaverina.
97. Rudolf Island, near polar station, 81°48'31.2"N, 57°54'38.3"E, sparse polygonal lichen community, 2 August 2012.
98. Wilczek Land Island, Heller Cape, 80°46'15.2"N, 59°32'17.7"E, high coastal terrace, moss-lichen community, 7 September 2012.

99. Graham-Bell Island, 81°10'26.1"N, 64°06'35.7"E, sandy watershed, moss-lichen community, 10 August 2015.
100. Heiss Island, 80°36'33.4"N, 57°52'43.7"E, polygonal moss-lichen community on loamy sand, 12 August 2015.

Results

The synopsis presented below includes 229 species arranged alphabetically by genus and species. Literature reports are arranged chronologically. Synonymous names used in the literature are given. Species that are newly reported for Franz Josef Land are designated by '*'.

Acarospora molybdina (Wahlenb.) Trevis. – Hooker Island, Rubini Rock, 27 July 1930, V.P. Savichz 234. LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Agonimia gelatinosa (Ach.) M.Brand *et* Diederich – 97 (Fig. 2). LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

Alectoria gowardii Lumbsch [syn. *Gowardia arctica* P.Halonen *et al.*] – LITERATURE REPORTS: Alger Island, Scott-Keltie Island, (Halonen *et al.* 2009; Zhurbenko 2009; Kristinsson *et al.* 2010).

A. nigricans (Ach.) Nyl. [syn. *Gowardia nigricans* (Ach.) P.Halonen *et al.*] – Scott Keltie Island, 25 July 1930, V.P. Savichz 908; Hooker Island, Cape Sedov, 26 July 1930, V.P. Savichz 1410; Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 1980; **7, 8, 11, 12, 15, 17, 20, 29, 32–34, 49, 53, 54, 57, 58, 65, 69, 70, 76, 77, 79, 80, 81, 85, 88, 91** (Fig. 2). LITERATURE REPORTS: Hochstetter and Northbrook Islands (Elenkin and Savichz 1912); Bell Island (Lyngé 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

A. ochroleuca (Hoffm.) A.Massal. – Hooker Island, Cape Sedov, 26 July 1930, V.P. Savichz 1410; Rubini plateau, 1 September 1930, Demme; **15, 32, 36, 70, 86, 91, 99** (Fig. 2). LITERATURE REPORTS: Northbrook and Hochstetter Islands (Elenkin and Savichz 1912); Northbrook Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Allocetraria madreporiformis (With.) Kärnefelt *et* A. Thell – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

Amandinea cacuminum (Th.Fr.) H.Mayrhofer *et* Sheard [syn. *Rinodina cacuminum* (Th.Fr.) Malme] – LITERATURE REPORTS: Northbrook Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

A. coniops (Wahlenb.) M.Choisy *ex* Scheid. *et* H.Mayrhofer [syn. *Buellia coniops* (Wahlenb. in Ach.) Th.Fr.] – LITERATURE REPORTS: Northbrook

Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1981, 1983); without localities (Andreev *et al.* 1996).

A. punctata (Hoffm.) Coppins *et* Scheid. [syn. *Buellia punctiformis* (DC.) A.Massal. f. *stigmatea* (Köbr.) Vain.] – LITERATURE REPORTS: Northbrook Island, Bell Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Arctocetraria nigricascens (Nyl.) Kärnefelt *et* A.Thell [syn. *Cetraria nigricascens* Nyl.] – Alger Island, 1 August 1930, V.P. Savichz 1850; **19** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**Arctomia delicatula* Th.Fr. – Bell Island, 28 July 1930, V.P. Savichz 1318.

Arthrorhaphis alpina* (Schaer.) R.Sant. – Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz 15; **40 (Fig. 2).

Aspicilia berntii (Lyngé) A.Nordin *et al.* – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

A. cf. perradiata (Nyl.) Hue [syn. *Lecanora perradiata* Nyl.] – LITERATURE REPORTS: Alger Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

A. rosulata Körb. [syn. *Lecanora proserpens* Nyl.] – LITERATURE REPORTS: Bell Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Athallia vitellinula (Nyl.) Arup *et al.* [syn. *Caloplaca vitellinula* (Nyl.) Oliv.] – LITERATURE REPORTS: Georg Land Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Bacidia bagliettoana* (A.Massal. *et* De Not.) Jatta – **95 (Fig. 2).

Baeomyces carneus Flörke – **7, 40** (Fig. 2). LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Biatora ementiens* (Nyl.) Printzen [syn. *Lecidea ementiens* Nyl.] – Bell Island, 28 July 1930, V.P. Savichz; **21, 22 (Fig. 2).

**Bilimbia lobulata* (Sommerf.) Hafellner *et* Coppins – Hooker Island, Cape Sedov, 23 July 1930, V.P. Savichz; 2 August 1930, V.P. Savichz 11; Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 273.

**B. microcarpa* (Th.Fr.) Th.Fr. – Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 1741.

B. sabuletorum (Schreb.) Arnold [syn. *Myxobilimbia sabuletorum* (Schreb.) Arnold] – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

Blastenia ammiospila* (Wahlenb.) Arup *et al.* – Scott Keltie Island, 25 July 1930, V.P. Savichz 1252; **62, 69, 78, 83, 85 (Fig. 2).

Bryobilimbia hypnorum (Lib.) Fryday *et al.* [syn. *Mycobilimbia hypnorum* (Lib.) Kalb *et* Hafellner] – LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Kristinsson *et al.* 2010; Ezhov *et al.* 2014).

Bryocaulon divergens (Ach.) Kärnefelt [syn. *Cornicularia divergens* Ach.] – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz 484; 26 July 1930, V.P. Savichz 1410; Scott Keltie Island, 25 July 1930, V.P. Savichz 216, 908, 984; Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 525, 1980; Heiss Island, 29 July 1957, L.S. Govorukha; **7, 10–13, 17, 20, 26, 29, 37, 44, 45, 47–50, 54, 56, 65, 77, 79, 80, 82, 99** (Fig. 2). LITERATURE REPORTS: Rudolf Island (Mattirolo and Belli 1903); Bell Island (Lyngé 1931); Northbrook Island (Elenkin and Savichz 1912; Lyngé 1931; Savichz 1932); Hooker Island, Rudolf Island (Savichz 1932); Hooker Island, Northbrook Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Bryonora castanea (Hepp) Poelt – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**B. septentrionalis* Holt.-Hartw. – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz 1459.

Bryoplaca jungermanniae (Vahl) Søchting *et al.* [syn. *Caloplaca jungermanniae* (Vahl.) Th.Fr.] – **80** (Fig. 2). LITERATURE REPORTS: Northbrook Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**B. tetraspora* (Nyl.) Søchting *et al.* – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz 484; 26 July 1930, V.P. Savichz 1415.

Bryoria chalybeiformis (L.) Brodo *et* D.Hawksw. [syn. *Alectoria jubata* (L.) Ach. f. *chalybeiformis* (L.) Th.Fr.; *Bryopogon chalybeiforme* (L.) Elenkin var. *prolixum* (Ach.) DR.] – **17, 34, 49** (Fig. 2). LITERATURE REPORTS: Northbrook Island (Lyngé 1931); Hooker and Rudolf Islands, (Savichz 1932); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

B. fuscescens (Gyeln.) Brodo *et* D.Hawksw. – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

B. nitidula (Th.Fr.) Brodo *et* D. Hawksw. [syn. *Alectoria nitidula* Th.Fr.; *Bryopogon nitidulum* (Th.Fr.) Elenkin *et* Savichz] – Scott Keltie Island, 25 July 1930, V.P. Savichz 208; Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 525; **15, 57** (Fig. 2). LITERATURE REPORTS: Northbrook Island, Hochstetter Island (Elenkin and Savichz 1912); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**Bryostigma muscigenum* (Th.Fr.) Frisch *et* G.Thor – Scott Keltie Island, 25 July 1930, V.P. Savichz 922.

**Buellia badia* (Fr.) A.Massal. – Hooker Island, Rubini Rock, 23 July 1930, V.P. Savichz; Aagaard Island, 31 July 1930, V.P. Savichz.

Calogaya arnoldii (Wedd.) Arup *et al.* [syn. *Caloplaca saxicola* auct., *C. miniata* (Hoffm.) Körb.] – LITERATURE REPORTS: Rudolf Island (Mattirolo

and Belli 1903); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010). This is a common lichen morphologically very similar to *Caloplaca saxicola* (Hoffm.) Nordin (Gaya 2009; Gaya *et al.* 2011; Vondrák *et al.* 2016) and formerly often misidentified as the latter species (see for instance: Urbanavichus 2010). The species can only be confidently identified using molecular data, so this identification is uncertain as it was evidently based only on morphology.

**Caloplaca sibirica* H.Magn. – Scott Keltie Island, 25 July 1930, V.P. Savichz 984; Hooker Island, Cape Sedov, 26 July 1930, V.P. Savichz 1415; 2 August 1930, V.P. Savichz 7.

C. stillicidiorum (Vahl.) Lyngé [syn. *C. cerina* (Ehrh. ex Hedw.) Th.Fr. var. *chloroleuca* (Sm.) Th.Fr.] – Bell Island, Scott Keltie Island, 25–28 July 1930, V.P. Savichz; Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz 7; **1, 13, 54, 77** (Fig. 2). LITERATURE REPORTS: Northbrook Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Candelariella arctica (Körb.) R.Sant. [syn. *C. crenulata* (Wahlenb.) A.L.Sm.] – LITERATURE REPORTS: Georg Land Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. aurella (Hoffm.) Zahlbr. [syn. *C. epixantha* (Ach.) Sandst., *C. subsimilis* (Th.Fr.) J.Steiner] – **80** (Fig. 2). LITERATURE REPORTS: Rudolf Island (Mattiolo and Belli 1903); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. cf. canadensis* H.Magn. – **59 (Fig. 2).

C. vitellina (Nyl.) Hertel – LITERATURE REPORTS: Alger Island, Bell Island, Georg Land Island, (Lyngé 1931); Alexandra Land Island (Alexandrova 1983); Hooker and Northbrook Islands (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Carbonea vorticosa (Flörke) Hertel [syn. *Lecidea vorticosa* (Flörke) Körb.] – LITERATURE REPORTS: Alexandra Land Island, Bell Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Catillaria contristans* (Nyl.) Zahlbr. – **22, 59 (Fig. 2).

Cetraria aculeata (Schreb.) Ach. [syn. *Cornicularia aculeata* Schreb., *C. tenuissima* (L.) Savichz] – **10, 71** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); Hooker Island (Savichz 1932); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. ericetorum Opiz [syn. *C. crispa* (Ach.) Nyl.] – **8, 14, 15, 21, 36, 58, 97** (Fig. 2). LITERATURE REPORTS: Northbrook Island, Rudolf Island (Mattiolo and Belli 1903); Hochstetter Island (Elenkin and Savichz 1912); Bell Island, Northbrook Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. islandica (L.) Ach. – Hooker Island, Cape Sedov, 26 July 1930, V.P. Savichz 1410; Alger Island, 1 August 1930, V.P. Savichz 1839, 1884; **4, 6, 7,**

12, 13, 17, 18, 20, 22, 26, 29, 31, 32, 34, 35, 37, 39, 41, 44–47, 55–57, 58, 65, 71, 76, 79, 82, 88, 91, 97, 98, 99, 100 (Fig. 2). LITERATURE REPORTS: Hochstetter Island, Northbrook Island (Elenkin and Savichz 1912); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1969; 1983); Scott Keltie Island (Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. muricata* (Ach.) Ach. – **15, 20, 37, 60, 91 (Fig. 2).

C. nigricans Nyl. – LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Cetrariella delisei (Bory ex Schaer.) Kärnefelt et A.Thell [syn. *Cetraria delisei* (Bory) Nyl., *C. hiascens* (Fr.) Th.Fr.] (Fig. 3) – Hooker Island, Cape Sedov, 1930, V.P. Savichz; **4, 6, 9, 14, 18–20, 23, 33, 42, 52, 60–63, 71, 89, 92–94, 97, 98** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); Alexandra Land Island, Alger Island (Lynge 1931); Alexandra Land Island (Alexandrova 1969, 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. fastigiata (Delise ex Nyl.) Kärnefelt et A.Thell [syn. *Cetraria hiascens* (Fr.) Th.Fr. f. *fastigiata* Delise] – **99** (Fig. 2). LITERATURE REPORTS: Hooker Island (Savichz 1932); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).



Fig. 3. Lichen vegetation dominated by *Cetrariella delisei*.

Circinaria leproscens (Sandst.) A.Nordin *et al.* [syn. *Aspicilia leproscens* (Sandst.) Hav., *Lecanora leproscens* Sandst.] – LITERATURE REPORTS: Georg Land Island, Northbrook Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Cladonia amaurocraea* (Flörke) Schaer. – **14 (Fig. 2).

C. bellidiflora (Ach.) Schaer. [syn. *C. bellidiflora* var. *coccocephala* (Ach.) Vain.] – LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. borealis* S.Stenroos – **17, 69 (Fig. 2).

C. carneola* (Fr.) Fr. – **82 (Fig. 2).

C. chlorophaea (Flörke *ex* Sommerf.) Spreng. – **39, 49, 76** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); Scott Keltie Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. coccifera (L.) Willd. [syn. *C. coccifera* var. *stematina* Ach.] – Hooker Island, Cape Sedov, plateau, 2 August 1930, V.P. Savichz 8; **26, 34, 58, 76** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. cornuta (L.) Hoffm. – LITERATURE REPORT: McClintock Island (Zhurbenko 2009).

C. gracilis* (L.) Willd. – Alger Island, 1 August 1930, V.P. Savichz 1850; **26, 65, 99 (Fig. 2).

**C. libifera* Savichz – Alger Island, 1930, V.P. Savichz 1859.

C. macroceras* (Delise) Hav. – **75 (Fig. 2).

C. mitis Sandst. [syn. *C. arbuscula* (Wallr.) Flot. ssp. *mitis* (Sandst.) Ruoss] – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

C. phyllophora* Hoffm. – **15 (Fig. 2).

C. pleurota* (Flörke) Schaer. – **37 (Fig. 2).

C. pocillum (Ach.) O.J.Rich. – Hooker Island, Cape Sedov, 1930, V.P. Savichz; Scott Keltie Island, 25 July 1930, V.P. Savichz 1278; Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 517, 1742, 1967, 1985; **23, 43, 46, 64** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); Alexandra Land Island (Alexandrova 1981; 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. pyxidata (L.) Hoffm. – McClintock Island, Cape Dillan, 30 July 1930, V.P. Savichz 724; Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz 8; **17, 21, 33, 35, 36, 40–42, 47, 48, 52, 53, 55, 64, 67, 71, 78, 90, 91, 95** (Fig. 2). LITERATURE REPORTS: Georg Land Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. rangiferina (L.) F.H.Wigg. – LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

C. stricta (Nyl.) Nyl. – **18, 26, 53, 82, 97** (Fig. 2). LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014).

C. uncialis (L.) Weber *ex* F.H.Wigg. [syn. *C. uncialis* var. *paradoxa* Elenkin *et* Savichz] – LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Dactylina ramulosa (Hook.) Tuck. – LITERATURE REPORT: Hooker Island (Zhurbenko 2009).

Diplotomma alboatrum (Hoffm.) Flot. – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

Epilichen scabrosus (Ach.) Clem. – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Flavocetraria cucullata (Bellardi) Kärnefelt *et* Thell [syn. *Cetraria cucullata* (Bell.) Ach.] – Hooker Island, Cape Sedov, 1914, I.M. Ivanov; 26 July 1930, V.P. Savichz 1410; Heiss Island, 29 July 1957, L.S. Govorukha; **7, 8, 12, 13, 15, 17, 20, 22, 29, 31, 34, 35, 45, 47, 50, 56, 79, 82, 84, 97, 98, 99, 100** (Fig. 2). LITERATURE REPORTS: Northbrook Island (Elenkin and Savichz 1912; Lyngre 1931; Savichz 1932); Hooker Island, Rudolf Island (Savichz 1932); Alexandra Land Island (Alexandrova 1969, 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

F. nivalis (L.) Kärnefelt *et* A.Thell [syn. *Cetraria nivalis* (L.) Ach.] (Fig. 4) – Hooker Island, Rubini Rock, 1930, V.P. Savichz 597; Heiss Island, 29 July 1957,



Fig. 4. Lichen vegetation dominated by *Flavocetraria* species.

L.S. Govorukha; **1, 4, 12, 15, 29, 53, 56, 57, 79, 91, 97** (Fig. 2). LITERATURE REPORTS: Rudolf Island (Mattiolo and Belli 1903); Hochstetter Island (Elenkin and Savichz 1912); Northbrook Island (Mattiolo and Belli 1903; Lyngge 1931); Bell Island (Lyngge 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1969, 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Gyalolechia bracteata (Hoffm.) A.Massal. [syn. *Fulgensia bracteata* (Hoffm.) Räsänen] – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

Helocarpon crassipes* Th.Fr. – **14, 17, 24, 97 (Fig. 2).

Henrica theleodes (Sommerf.) Savić *et al.* [syn. *Polyblastia theleodes* (Sommerf.) Th.Fr.] – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

Hypogymnia physodes (L.) Nyl. – LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1977, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Ionaspis lacustris (With.) Lutzoni [syn. *Lecanora lacustris* (Wither) Nyl.] – LITERATURE REPORTS: Alexandra Land Island, Cape Harmsworth (Lyngge 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Japewia tornoënsis (Nyl.) Tønsberg – Scott Keltie Island, 25 July 1930, V.P. Savichz 216; Bell Island, 28 July 1930, V.P. Savichz 1318; **15, 40, 53, 96** (Fig. 2). LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Lecania subfuscula* (Nyl.) S.Ekman – **95 (Fig. 2).

Lecanora campestris (Schaer.) Hue – LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

L. epibryon (Ach.) Ach. – Hooker Island, Cape Sedov, 26 July 1930, V.P. Savichz 1415; 2 August 1930, V.P. Savichz; **13, 21, 22, 53, 54** (Fig. 2). LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**L. intricata* (Ach.) Ach. – Hooker Island, Rubini Rock, 2 August 1930, V.P. Savichz.

L. polytropa (Hoffm.) Rabenh. – Hooker Island, Rubini Rock, 23 July 1930, V.P. Savichz; 27 July 1930, V.P. Savichz; 2 August 1930, V.P. Savichz; Scott Keltie Island, 25 July 1930, V.P. Savichz; Bell Island, 28 July 1930, V.P. Savichz; McClintock Island, 30 July 1930, V.P. Savichz 291; **13, 53** (Fig. 2). LITERATURE REPORTS: Rudolf Island (Mattiolo and Belli 1903); Alexandra Land Island, Bell Island (Lyngge 1931); Alexandra Land Island (Alexandrova 1981, 1983); Bell Island, Hooker Island, McClintock Island, Scott Keltie Island (Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

- **L. pulicaris* (Pers.) Ach. – Scott Keltie Island, 25 July 1930, V.P. Savichz.
L. subsulphurea Nyl. – LITERATURE REPORTS: Rudolf Island (Mattirollo and Belli 1903); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).
Lecidea atrobrunnea (Ramond ex Lam. et DC.) Schaer. – Hooker Island, Rubini Rock, 23 July 1930, V.P. Savichz; 27 July 1930, V.P. Savichz 234; McClintock Island, 30 July 1930, V.P. Savichz. LITERATURE REPORTS: Northbrook Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).
L. berengeriana (A.Massal.) Th.Fr. [syn. *Mycobilimbia berengeriana* (A.Massal.) Hafellner et V.Wirth] – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).
L. lapicida (Ach.) Ach. s. l. [syn. *L. cyanea* (Ach.) Roehl., *L. hoelii* Lyngé, *L. lapicida* var. *pantherina* (DC.) Ach., *L. pantherina* (Ach.) Vain.] – 43 (Fig. 2). LITERATURE REPORTS: Bell Island, Northbrook Island, Alger Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).
**L. ramulosa* Th.Fr. – 23 (Fig. 2).
L. tessellata Flörke [syn. *L. cyanea* (Ach.) Lyngé, *L. spilota* Th.Fr.] – LITERATURE REPORTS: Bell Island (Lyngé 1931); without localities (Kristinsson *et al.* 2010).
Lecidella anomaloides (A.Massal.) Hertel et H. Kiliás [syn. *Lecidea goniophila* auct.] – LITERATURE REPORTS: Rudolf Island (Mattirollo and Belli 1903); Georg Land Island, Bell Island, Northbrook Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).
L. bullata Körb. [syn. *Lecidea nansenii* Lyngé] – LITERATURE REPORTS: Georg Land Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).
L. stigmatea (Ach.) Hertel et Leuckert [syn. *Buellia stigmatea* Körb.] – LITERATURE REPORTS: Northbrook Island, Bell Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).
Lepra panyrga (Ach.) Hafellner [syn. *Pertusaria panyrga* (Ach.) A.Massal.] – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).
Lepraria gelida Tønsberg et Zhurb. – Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 1988; 3, 11, 21, 30, 53 (Fig. 2). LITERATURE REPORT: without localities (Kristinsson *et al.* 2010);
L. neglecta (Nyl.) Lettau [syn. *Lecidea neglecta* (Nyl.) Vain.] – 1, 54, 63, 69 (Fig. 2). LITERATURE REPORTS: Northbrook Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).
L. cf. subalbicans (I.M.Lamb) Lendemer et Hodkinson – LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014).
Lichenomphalia alpina (Britzelm.) Redhead *et al.* – LITERATURE REPORTS: Georg Land Island, Howen Island (Ezhov *et al.* 2014, 2016).

L. umbellifera (L.) Redhead *et al.* – LITERATURE REPORTS: Champ Island, Wiener-Neustadt Island (Ezhov *et al.* 2014, 2016).

Lopadium coralloideum (Nyl.) Lyngé – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz 431, 432; **79**. LITERATURE REPORTS: Hooker Island (Ezhov *et al.* 2014).

L. pezizoideum* (Ach.) Körb. – **17 (Fig. 2).

Masonhalea inermis (Nyl.) Lumbsch *et al.* [syn. *Tuckermannopsis inermis* (Nyl.) Kärnefelt] – Scott Keltie Island, 25 July 1930, V.P. Savichz 208, 907. LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Megaspora verrucosa (Ach.) Hafellner *et V.*Wirth [syn. *Pertusaria freyi* Erichsen] – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz 438; Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 1742; **8, 64** (Fig. 2). LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1969, 1977, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Melanelia hepatizon (Ach.) A.Thell [syn. *Cetraria hepatizon* (Ach.) Vain.] – **10, 12, 15, 20, 22, 26, 32, 34, 40, 57, 58, 69, 70, 71, 74, 77–79, 81, 97, 98** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); Alexandra Land Island (Alexandrova 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

M. stygia (L.) Essl. – **70, 91** (Fig. 2). LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Melanohalea infumata (Nyl.) O.Blanco *et al.* [syn. *Parmelia infumata* Nyl.] – LITERATURE REPORTS: Georg Land Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Micarea incrassata* Hedl. – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz; 3 August 1930, V.P. Savichz; Alger Island, 1 August 1930, V.P. Savichz 1897; 1 August 1930, V.P. Savichz 1893; **8, 13, 24, 85 (Fig. 2).

M. lignaria* (Ach.) Hedl. – **64 (Fig. 2).

Miriquidica lulensis (Hellbom) Hertel *et* Rambold [syn. *Lecidea lulensis* Hellb.] – **20** (Fig. 2). LITERATURE REPORTS: Alger Island, Bell Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Myriolecis hagenii (Ach.) Śliwa *et al.* [syn. *Lecanora behringii* Nyl., *L. hagenii* (Ach.) Ach., *L. hagenii* var. *saxifragae* (Anzi) R.Sant.] – LITERATURE REPORTS: Northbrook Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

M. thuleana (Poelt) Śliwa *et al.* [syn. *Arctopeltis thuleana* Poelt] – LITERATURE REPORTS: Hooker Island, Northbrook Island (Zhurbenko and Santesson 1996; Zhurbenko 2009; Ezhov *et al.* 2014); without localities (Kristinsson *et al.* 2010).

Multiclavula corynoides (Peck) R.H.Petersen – LITERATURE REPORT: Alexandra Land Island (Ezhov *et al.* 2016).

M. vernalis (Schwein.) R.H.Petersen – LITERATURE REPORT: Alexandra Land Island (Ezhov *et al.* 2016).

Ochrolechia frigida (Sw.) Lyngé [syn. *O. inaequatula* (Nyl.) Zahlbr.] – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz 484; 2 August 1930, V.P. Savichz; 3 August 1930, V.P. Savichz 554; Scott Keltie Island, 25 July 1930, V.P. Savichz 984, 1264; Bell Island, 28 July 1930, V.P. Savichz 1308; McClintock Island, 30 July 1930, V.P. Savichz; **1–8, 10, 11, 13, 15, 17, 18, 20–25, 29–35, 39, 41–46, 48–54, 56–59, 62–64, 66, 67, 71–73, 75, 77, 79–85, 88, 89, 91, 95, 96–98, 100** (Fig. 2). LITERATURE REPORTS: Hochstetter Island, Northbrook Island (Elenkin and Savichz 1912); Alexandra Land Island, Georg Land Island (Lyngé 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1977, 1981, 1983); Hooker Island, McClintock Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

O. tartarea (L.) A.Massal. – LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1981, 1983).

Pannaria hookeri (Borrer ex Sm.) Nyl. – Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz 6. LITERATURE REPORT: Hooker Island (Zhurbenko 2009).

Parmelia omphalodes (L.) Ach. – **20, 54** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); Alger Island, Northbrook Island (Lyngé 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1977, 1983); Scott Keltie Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. saxatilis (L.) Ach. – McClintock Island, 30 July 1930, V.P. Savichz; **29, 53** (Fig. 2). LITERATURE REPORTS: Alger Island, Northbrook Island (Lyngé 1931; identification uncertain); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. skultii* Hale – Hooker Island, Cape Sedov, 1930, V.P. Savichz; Scott Keltie Island, 25 July 1930, V.P. Savichz 919; Alger Island, 1 August 1930, V.P. Savichz 1839; Heiss Island, 29 July 1957, L.S. Govorukha; **4, 6, 8, 17, 20, 21, 31, 36, 41, 64 (Fig. 2).

Parvoplaca tirolensis (Zahlbr.) Arup *et al.* [syn. *Caloplaca subolivacea* (Th.Fr.) Lyngé] – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz 484; 26 July 1930, V.P. Savichz 1415; 2 August 1930, V.P. Savichz 7; Scott Keltie Island, 25 July 1930, V.P. Savichz 984; Aagaard Island, 28 July 1930, V.P. Savichz; Bell Island, 28 July 1930, V.P. Savichz; **8, 13, 15, 24, 29, 30, 46, 54, 62, 69, 76, 79, 80, 85, 96** (Fig. 2). LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1977, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Peltigera aphthosa (L.) Willd. – Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 1986; **29, 44, 49, 50, 99** (Fig. 2). LITERATURE REPORTS:

Northbrook Island (Mattiolo and Belli 1903; Elenkin and Savichz 1912); Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. canina (L.) Willd. – Scott Keltie Island, 25 July 1930, V.P. Savichz; **37, 39, 50, 55** (Fig. 2). LITERATURE REPORTS: Northbrook Island (Mattiolo and Belli 1903; Elenkin and Savichz 1912); Hochstetter Island (Elenkin and Savichz 1912); Georg Land Island (Lyngé 1931); Northbrook Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**P. extenuata* (Nyl. *ex* Vain.) Lojka – Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 1967, 1985; McClintock Island, Cape Dillon, 30 July 1930, V.P. Savichz 694.

P. didactyla (With.) J.R.Laundon *s. l.* [syn. *P. erumpens* (Taylor) Elenkin] – LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. elisabethae* Gyeln. – **60 (Fig. 2).

P. leucophlebia (Nyl.) Gyeln. [syn. *P. variolosa* (Mass.) Gyeln.] – Hooker Island, Cape Sedov, 26 July 1930, V.P. Savichz 1412; **17, 31, 35, 44, 45, 98, 86** (Fig. 2). LITERATURE REPORTS: Northbrook Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. lyngéi Gyeln. – Northbrook Island, Cape Flora, 80°11'N, 50°14'E, 28 July 1930, V.P. Savichz. LITERATURE REPORTS: Alger Island (Vitikainen 1994; Zhurbenko 2009).

P. malacea* (Ach.) Funck – **33, 39, 50 (Fig. 2).

P. cf. membranacea (Ach.) Nyl. – LITERATURE REPORTS: Northbrook Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014).

P. polydactylon* (Neck.) Hoffm. – **31 (Fig. 2).

P. ponojensis* Gyeln. – **28, 44, 45 (Fig. 2).

P. rufescens (Weiss) Humb. – **2, 28, 33, 41, 42, 47, 48** (Fig. 2). LITERATURE REPORTS: Northbrook Island (Elenkin and Savichz 1912); Georg Land Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1983); Northbrook Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. scabrosa Th.Fr. – LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014).

P. venosa (L.) Hoffm. – Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz. LITERATURE REPORTS: Scott Keltie Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014).

Pertusaria coriacea (Th.Fr.) Th.Fr. – LITERATURE REPORT: Alexandra Land Island (Alexandrova 1969).

P. glomerata (Ach.) Schaer. – LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1969, 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. octomela (Norman) Erichsen – LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1969; 1977); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. oculata (Dicks.) Th.Fr. – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Phaeorrhiza nimbose (Fr.) H.Mayrhofer *et* Poelt – LITERATURE REPORT: Hooker Island (Zhurbenko and Santesson 1996).

Physcia caesia (Hoffm.) Fűrnr. [syn. *P. teretiuscula* (Ach.) Lyngé] – McClintock Island, 30 July 1930, V.P. Savichz. LITERATURE REPORTS: Rudolf Island (Mattirolo and Belli 1903); Northbrook Island (Elenkin and Savichz 1912); Georg Land Island, Bell Island, Alger Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. dubia (Hoffm.) Lettau – Hooker Island, Rubini Rock, 23 July 1930, V.P. Savichz; Scott Keltie Island, 25 July 1930, V.P. Savichz. LITERATURE REPORTS: Georg Land Island, Northbrook Island (Lyngé 1931); Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Physconia muscigena (Ach.) Poelt [syn. *Physcia muscigena* (Ach.) Nyl.] – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz; Scott Keltie Island, 25 July 1930, V.P. Savichz 207, 945; Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 1985; McClintock Island, 30 July 1930, V.P. Savichz; **27, 46, 64** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); Alexandra Land Island (Alexandrova 1983); Scott Keltie Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**Placopsis lambii* Hertel *et* V.Wirth – Alger Island, 1 August 1930, V.P. Savichz.

Polyblastia sendtneri Kremp. – Scott Keltie Island, 25 July 1930, V.P. Savichz 934. LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

Porpidia crustulata (Ach.) Hertel *et* Knoph [syn. *Lecidea laurentiana* Ny1.] – LITERATURE REPORTS: Bell Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. flavicunda (Ach.) Gowan [syn. *P. flavocoerulescens* (Hornem.) Hertel *et* A.J.Schwab, *Lecidea flavocoerulescens* (Hornem.) Lyngé] – LITERATURE REPORT: Alexandra Land Island (Lyngé 1931).

P. macrocarpa (DC.) Hertel *et* A.J.Schwab [syn. *Lecidea macrocarpa* (DC.) Steud.] – LITERATURE REPORTS: Alger Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. melinodes (Körb.) Gowan *et* Ahti – **97** (Fig. 2). LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Protomicarea limosa* (Ach.) Hafellner – **41, 79 (Fig. 2).

Protopannaria pezizoides (Weber) P.M.Jørg. *et* S.Ekman [syn. *Pannaria pezizoides* (Weber) Trevis.] – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz 484; Scott Keltie Island, 25 July 1930, V.P. Savichz 1264; Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz 1742, 1963; Alger Island, 1 August 1930, V.P. Savichz 1867; **18, 19, 41, 43, 44, 57, 72, 71, 82** (Fig. 2). LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1977, 1981, 1983); Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**Protoparmelia badia* (Hoffm.) Hafellner – Hooker Island, Rubini Rock, 27 July 1930, V.P. Savichz.

Protothelenella sphinctrinoidella* (Nyl.) H.Mayrhofer *et* Poelt – Scott Keltie Island, 25 July 1930, V.P. Savichz 981; **46, 87 (Fig. 2).

**P. sphinctrinoides* (Nyl.) H.Mayrhofer *et* Poelt – Hooker Island, 24 July 1930, V.P. Savichz 434.

Pseudephebe minuscula (Nyl. *ex* Arnold) Brodo *et* D.Hawksw. [syn. *Parmelia minuscula* Nyl.] – Scott Keltie Island, 25 July 1930, V.P. Savichz; Aagaard Island, 31 July 1930, V.P. Savichz 10300; **10, 11, 94, 99** (Fig. 2). LITERATURE REPORTS: Bell Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. pubescens (L.) M.Choisy [syn. *Parmelia pubescens* (L.) Vain.] – Bell Island, on soil, 28 July 1930, V.P. Savichz; **10, 11, 17, 20, 21, 53, 56, 77, 80, 81, 91, 94, 99** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912; Lyngé 1931); Northbrook Island (Elenkin and Savichz 1912; Lyngé 1931; Savichz 1932) Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Psora rubiformis (Ach.) Hook. – Hooker Island, Cape Sedov, 23 July 1930, V.P. Savichz. LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014).

Psoroma hypnorum (Vahl) Gray – **5, 16, 30, 33, 35, 39, 44, 45, 71, 79, 82, 98** (Fig. 2). LITERATURE REPORTS: Hooker Island, Scott Keltie Island, Northbrook Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

P. tenue Henssen var. *boreale* Henssen – Hooker Island, Cape Sedov, 1930, V.P. Savichz; Scott Keltie Island, 25 July 1930, V.P. Savichz 1278; Bell Island, 28 July 1930, V.P. Savichz 1308. LITERATURE REPORTS: Alger Island, Scott Keltie Island (Zhurbenko 2009).

Rhizocarpon copelandii* (Körb.) Th.Fr. – Bell Island, 28 July 1930, V.P. Savichz; **70 (Fig. 2).

R. disporum (Nägeli ex Hepp) Müll.Arg. – Scott Keltie Island, 25 July 1930, V.P. Savichz 92; Hooker Island, Rubini Rock, 2 August 1930, V.P. Savichz. LITERATURE REPORTS: Georg Land Island, Bell Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

R. eupetraeum (Nyl.) Arnold – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

R. geminatum* Körb. – **11 (Fig. 2).

R. geographicum (L.) DC. – Scott Keltie Island, 25 July 1930, V.P. Savichz; Hooker Island, Rubini Rock, 27 July 1930, V.P. Savichz; Cape Sedov, 2 August 1930, V.P. Savichz; Bell Island, 28 July 1930, V.P. Savichz 10267; **11, 70** (Fig. 2). LITERATURE REPORTS: without localities (Fischer 1896); Hochstetter Island (Elenkin and Savichz 1912); Alexandra Land Island, Bell Island, Alger Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

R. grande (Flörke) Arnold – LITERATURE REPORTS: Bell Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

R. inarense* (Vain.) Vain. – **11 (Fig. 2).

**R. intermediellum* Räsänen – Hooker Island, Cape Sedov, 1 August 1930, V.P. Savichz; Rubini Rock, 2 August 1930, V.P. Savichz.

R. jemtlandicum Malme – Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz. LITERATURE REPORTS: Bell Island, Alger Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

R. lecanorinum Anders – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

R. viridiatrum (Wulfen) Körb. – LITERATURE REPORTS: Rudolf Island (Mattiolo and Belli 1903); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Rhizoplaca chrysoleuca (Sm.) Zopf – Northbrook Island, Cape Flora, 28 July 1930, V.P. Savichz. LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

R. melanophthalma (Ram.) Leuckert et Poelt [syn. *Lecanora melanophthalma* (DC). Ramond] – Hooker Island, Rubini Rock, 23 July 1930, V.P. Savichz 63; 27 July 1930, V.P. Savichz 250; McClintock Island, 30 July 1930, V.P. Savichz; **20, 23** (Fig. 2). LITERATURE REPORTS: Northbrook Island (Mattiolo and Belli 1903; Elenkin and Savichz 1912; Lyngé 1931); Georg Land Island (Lyngé 1931); Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**Rinodina milvina* (Wahlenb.) Th.Fr. – Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz.

R. mniaraea (Ach.) Körb. – **96** (Fig. 2). LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

**R. mniaraea* var. *cinnamomea* Th.Fr. – Hooker Island, Cape Sedov, 24 July 1930, V.P. Savichz 432; Alger Island, 1 August 1930, V.P. Savichz 1843.

**R. mniaraea* var. *mniaraeiza* (Nyl.) H.Magn – Scott Keltie Island, 25 July 1930, V.P. Savichz 919.

R. olivaceobrunnea C.W.Dodge *et* G.E.Baker – Scott Keltie Island, 25 July 1930, V.P. Savichz 1252; Hooker Island, Cape Sedov, 26 July 1930, V.P. Savichz 1415; Bell Island, 28 July 1930, V.P. Savichz; **16, 41, 51, 54, 57, 65, 69, 72, 76, 78, 79, 85** (Fig. 2). LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

R. roscida (Sommerf.) Arnold – Hooker Island, Cape Sedov, 1914, V.Yu. Vize 19; **13**. LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**R. terrestris* Tomin – Scott Keltie Island, 25 July 1930, V.P. Savichz 207.

R. turfacea (Wahlenb.) Körb. *s. l.* [syn. *R. turfacea* var. *ecrustacea* Vain., *R. turfacea* var. *nuda* Körb.] – McClintock Island, Cape Dillon, 30 July 1930, V.P. Savichz 724; **3, 22, 40, 41, 44, 46, 53, 69, 68, 76** (Fig. 2). LITERATURE REPORTS: Hochstetter Island (Elenkin and Savichz 1912); Northbrook Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1977, 1981, 1983); Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Rostania ceranisca (Nyl.) Otálora *et al.* [syn. *Collema ceraniscum* Nyl.] – **95** (Fig. 2). LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Rusavskia elegans (Link) S.Y.Kondr. *et* Kärnefelt [syn. *Caloplaca elegans* (Link) Th.Fr.] – **20** (Fig. 2). LITERATURE REPORTS: Northbrook Island, Rudolf Island (Mattirolo and Belli 1903); Northbrook Island, Hochstetter Island (Elenkin and Savichz 1912); Georg Land Island, Bell Island, Northbrook Island, Alger Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1981, 1983); without localities (Fisher 1896; Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**R. soreliata* (Vain.) S.Y.Kondr. *et* Kärnefelt – Scott Keltie Island, 25 July 1930, V.P. Savichz 92.

Sagedia mastrucata (Wahlenb.) A.Nordin *et al.* [syn. *Aspicilia mastrucata* (Wahlenb.) Th.Fr., *Lecanora mastrucaia* (Wahlenb.) Th.Fr.] – LITERATURE REPORTS: Bell Island (Lyngé 1931); without localities (Andreev *et al.* 1996).

Schadonia alpina* Körb. – Bell Island, 28 July 1930, V.P. Savichz 1304; **40, 41 (Fig. 2).

S. fecunda* (Th.Fr.) Vězda *et* Poelt – **41 (Fig. 2).

**Scytinium tenuissimum* (Dicks.) Otálora *et al.* – Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz 9.

Solorina bispora Nyl. – Scott Keltie Island, 25 July 1930, V.P. Savichz 934; **38** (Fig. 2). LITERATURE REPORTS: Alexandra Land Island (Alexandrova

1983); Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

S. crocea (L.) Ach. – Alger Island, 1 August 1930, V.P. Savichz 1830; **14, 33, 97, 99** (Fig. 2). LITERATURE REPORTS: Alger Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014).

S. saccata (L.) Ach. – Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz 9; **2** (Fig. 2). LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

S. spongiosa (Ach.) Anzi – Scott Keltie Island, 25 July 1930, V.P. Savichz 934; Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz 6, 9. LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014).

Sphaerophorus fragilis (L.) Pers. – **10, 53, 56, 65, 70, 91, 97, 99** (Fig. 2). LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1983); Scott Keltie Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014).

S. globosus (Huds.) Vain. – Rudolf Island, 1914, J.J. Present; Scott Keltie Island, 25 July 1930, V.P. Savichz 932, 977; McClintock Island, 30 July 1930, V.P. Savichz; Hooker Island, Cape Sedov, 1930, V.P. Savichz; 2 August 1930, V.P. Savichz 7; Alger Island, 1 August 1930, V.P. Savichz 1884; **12, 15–17, 29, 37, 57, 98, 99** (Fig. 2). LITERATURE REPORTS: Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1977, 1981, 1983); Hooker Island (Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Sporastatia testudinea (Ach.) A.Massal. [syn. *Biatorella coracina* (Schaer.) Lyngé] – Heiss Island, 15 August 1957, L.S. Govorukha; **99** (Fig. 2). LITERATURE REPORTS: Alexandra Land Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Sporodictyon terrestre (Th.Fr.) Savić *et* Tibell [syn. *Polyblastia terrestris* Th.Fr.] – **41, 82** (Fig. 2). LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

Steinia geophana* (Nyl.) Stein – **72 (Fig. 2).

Stereocaulon alpestre (Flot.) Domb. – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

S. alpinum Laur. – Hooker Island (Ezhov *et al.* 2014); **7, 8, 16–19, 22, 24, 25, 32, 42, 53, 76, 84, 92, 97** (Fig. 2). LITERATURE REPORTS: Rudolf Island (Mattiolo and Belli 1903); Hochstetter Island (Elenkin and Savichz 1912); Northbrook Island (Mattiolo and Belli 1903; Elenkin and Savichz 1912; Lyngé 1931); Alger Island (Lyngé 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1977, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

S. arcticum Lyngé – **99** (Fig. 2). LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

S. arenarium (L.I.Savichz) I.M.Lamb – LITERATURE REPORT: Hooker Island (Zhurbenko 2009).

S. botryosum Ach. *et* Frey [syn. *S. fastigiatum* Anzi] – **23** (Fig. 2). LITERATURE REPORTS: Alexandra Land Island (Lyngé 1931; Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

S. depressum (Frey) I.M.Lamb – **30, 36** (Fig. 2). LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Kristinsson *et al.* 2010).

S. groenlandicum (E.Dahl) I.M.Lamb – LITERATURE REPORTS: Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Kristinsson *et al.* 2010).

S. rivulorum H.Magn. – LITERATURE REPORTS: Alexandra Land Island, Bell Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1969, 1977, 1981, 1983); Scott Keltie Island, Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

S. vesuvianum Pers. [syn. *S. denudatum* Flörke var. *genuinum* Th.Fr., *S. denudatum* var. *pulvinatum* (Rabenh.) Flot.] – LITERATURE REPORTS: Northbrook Island (Elenkin and Savichz 1912); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1977, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Tetramelas geophilus (Flörke *ex* Sommerf.) Norman – **13, 17, 52, 77** (Fig. 2). LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

T. insignis* (Nägeli *ex* Hepp) Kalb – Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz; **41, 68, 72, 76, 79 (Fig. 2).

T. papillatus* (Sommerf.) Kalb – Scott Keltie Island, 25 July 1930, V.P. Savichz 1257, 1272; **13, 26, 83 (Fig. 2).

Thamnotia subuliformis (Ehrh.) W.L.Culb. *s. str.* – LITERATURE REPORT: Champ Island (Onut-Brännström *et al.* 2018).

T. tundrae Brännström & Tibell – LITERATURE REPORT: La-Ronser Island (Onut-Brännström *et al.* 2018).

Thamnotia spp. [traditionally identified as *T. vermicularis* (Sw.) Schaer. var. *vermicularis*, *T. vermicularis* var. *subuliformis* (Ehrh.) Schaerer] – Scott Keltie Island, 25 July 1930, V.P. Savichz 908, 984; **2, 4, 7, 12, 13, 15, 17, 19–22, 29, 31, 32, 34, 37, 41, 44, 54, 56, 57, 70, 77, 79, 80, 84, 97–100** (Fig. 2). LITERATURE REPORTS: Hooker Island, Rudolf Island (Savichz 1932); Alexandra Land Island (Alexandrova 1969, 1977, 1983); Hooker Island (Zhurbenko and Santesson 1996; Ezhov *et al.* 2014); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010). According to recent phylogenetic study (Onut-Brännström *et al.* 2018), two morphologically cryptic species of *Thamnotia*, viz. *T. subuliformis* *s. str.* and *T. tundrae*, occur in Franz Josef Land. The species can only be confidently identified using molecular data.

Thelidium papulare (Fr.) Arnold – LITERATURE REPORTS: Ziegler Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).



Fig. 5. Lichen vegetation dominated by *Thamnolia* species.

Thrombium epigaeum (Pers.) Wallr. – LITERATURE REPORT: without localities (Kristinsson *et al.* 2010).

Tremolecia atrata (Ach.) Hertel [syn. *Lecidea dicksonii* sensu auct.] – Scott Keltie Island, 25 July 1930, V.P. Savichz 92; Bell Island, 28 July 1930, V.P. Savichz 10267; Hooker Island, Cape Sedov, 1 August 1930, V.P. Savichz; Alger Island, 1 August 1930, V.P. Savichz; **11**, **97** (Fig. 2). LITERATURE REPORTS: Bell Island, Alexandra Land Island, Alger Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Umbilicaria aprina* Nyl. – **14 (Fig. 2).

U. arctica (Ach.) Nyl. [syn. *Gyrophora arctica* Ach., *G. arctica* f. *subarctica* (Nyl) Savichz] – Hooker Island, Cape Sedov, 1914, V.Yu. Vize 13; Rubini Rock, 23 July 1930, V.P. Savichz 591; Tikhaya Bay, 13 August 1930, Demme; Scott Keltie Island, 25 July 1930, V.P. Savichz 210; **53** (Fig. 2). LITERATURE REPORTS: Rudolf Island (Mattiolo and Belli 1903); Northbrook Island (Elenkin and Savichz 1912); Bell Island, Georg Land Island, Northbrook Island (Lyngé 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1977, 1981); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

U. cylindrica (L.) Delise *ex* Duby [syn. *Gyrophora cylindrica* (L.) Ach.] – Scott Keltie Island, 25 July 1930, V.P. Savichz 92; Aagaard Island, 31 July 1930, V.P. Savichz 654; Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz; Tikhaya Bay, 16 August 1930, Demme; **10**, **13** (Fig. 2). LITERATURE REPORTS:

Rudolf Island (Mattiolo and Belli 1903), Hochstetter Island, Northbrook Island (Elenkin and Savichz 1912); Georg Land Island (Lyngé 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

U. decussata (Vill.) Frey [syn. *Gyrophora decussata* (Vill.) Zahlbr., *G. reticulata* (Schaer.) Th.Fr.] – Heiss Island, 15 August 1957, L.S. Govorukha; **10, 20, 50, 53, 77, 96, 99** (Fig. 2). LITERATURE REPORTS: Alger Island, Bell Island, Georg Land Island, Northbrook Island, (Lyngé 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

U. hyperborea (Ach.) Hoffm [syn. *Gyrophora hyperborea* Ach.] – **10, 12, 20, 56, 57, 70, 77, 91, 94, 99** (Fig. 2). LITERATURE REPORTS: Alger Island, Bell Island (Lyngé 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

U. krascheninnikovii (Savichz) Zahlbr. – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

U. leiocarpa* DC. – **12 (Fig. 2).

U. cf. lyngei* Schol. – **20 (Fig. 2).

U. polyphylla (L.) Baumg. – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

U. proboscidea (L.) Schrad. [syn. *Gyrophora proboscidea* (L.) Ach.] (Fig. 6) – Hooker Island, Cape Sedov, 2 August 1930, V.P. Savichz; **57, 58, 70, 86, 91, 97, 99** (Fig. 2). LITERATURE REPORTS: Rudolf Island (Mattiolo and Belli 1903), Northbrook Island (Elenkin and Savichz 1912); Georg Land Island (Lyngé 1931); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

U. rigida (Du Rietz) Frey – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

U. torrefacta (Lightf.) Schrad. [syn. *Gyrophora erosa* (Web.) Ach.] – **15, 63** (Fig. 2). LITERATURE REPORTS: Alger Island, Bell Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

U. virginis Schaer. [syn. *Gyrophora virginis* (Schaer.) Frey] – **1, 20, 54** (Fig. 2). LITERATURE REPORTS: Bell Island, Georg Land Island, Northbrook Island (Lyngé 1931); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Usnea sphacelata R.Br. [syn. *U. sulphurea* (Koenig) Th.Fr.] – Scott Keltie Island, 25 July 1930, V.P. Savichz 919; Hooker Island, Cape Sedov, 1930, V.P. Savichz; **12, 54, 77, 97, 99** (Fig. 2). LITERATURE REPORTS: Northbrook Island, Rudolf Island (Mattiolo and Belli 1903); Hochstetter Island (Elenkin and Savichz 1912); Northbrook Island (Elenkin and Savichz 1912; Lyngé 1931); Georg Land Island, Bell Island, Alger Island (Lyngé 1931); Hooker Island (Savichz 1932); Alexandra Land Island (Alexandrova 1977, 1981, 1983); without localities (Fischer 1896; Andreev *et al.* 1996; Kristinsson *et al.* 2010).



Fig. 6. Lichen vegetation dominated by *Umbilicaria* species.

Varicellaria lactea (L.) I.Schmitt et Lumbsch [syn. *Ochrolechia lactea* (L.) Hafellner et Matzer, *Pertusaria lactea* (L.) Arnold] – LITERATURE REPORTS: without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

Verrucaria aethiobola Wahlenb. – LITERATURE REPORTS: Alexandra Land Island, Bell Island (Lynge 1931); Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010).

**Xanthomendoza borealis* (R.Sant. et Poelt) Søchting *et al.* – Hooker Island, Rubini Rock, 23 July 1930, V.P. Savichz; Bell Island, 28 July 1930, V.P. Savichz.

Doubtful and excluded taxa

Brodoa intestiniformis (Vill.) Goward [syn. *Hypogymnia intestiniformis* (Vill.) Räsänen, *H. encausta* (Sm.) W.R.Watson, *Parmelia intestiniformis* (Vill.) Ach.] – LITERATURE REPORTS: Alexandra Land Island (Alexandrova 1983); without localities (Andreev *et al.* 1996). According to Urbanavichus (2001) these records are based on misidentification of *Brodoa oroarctica*.

Platismatia lacunosa (Ach.) W.L.Culb. et C.F.Culb. [syn. *Cetraria lacunosa* Ach.] – LITERATURE REPORTS: Rudolf Island (Mattiolo and Belli 1903); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010). This records must be verified as the only form of *Cetraria lacunosa*, viz. *C. lacunosa* f.

norvegica Lyngé, currently named *Platismatia norvegica* (Lyngé) W.L.Culb. *et* C.F.Culb. is a boreal species (Thell 2011).

Polycauliona candalaria (L.) Frödén *et al.* [syn. *Xanthoria candalaria* (L.) Th.Fr.] – LITERATURE REPORTS: Northbrook Island, Rudolf Island (Mattiolo and Belli 1903); Georg Land Island, Northbrook Island (Lyngé 1931); Northbrook Island (Elenkin and Savichz 1912); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010). According to Zhurbenko and Konoreva (2015) these records probably refer to *Xanthomendoza borealis*.

Stereocaulon paschale (L.) Hoffm. – LITERATURE REPORTS: Northbrook Island and Hochstetter Island (Elenkin and Savichz 1912); without localities (Andreev *et al.* 1996; Kristinsson *et al.* 2010). According to Zhurbenko and Konoreva (2015) this records must be verified, but original material was not found.

Discussion

By the beginning of our research, 170 lichen species were known for the archipelago (Kristinsson *et al.* 2010). As a result of the research, another 59 species were discovered, and thus the total richness of its known lichen flora numbers 229 species. However, this represents only 13% of the Arctic lichen flora richness (Kristinsson *et al.* 2010), which suggests that lichen flora of the archipelago is far from being fully revealed. Indeed, many lichen collections were made by geobotanists, which usually omit species growing on stone and drift-wood.

The most frequently reported lichen species in Franz Josef Land are the following: *Bryocaulon divergens*, *Cetrariella delisei*, *Cladonia coccifera*, *C. gracilis*, *C. pyxidata*, *Ochrolechia frigida*, *Peltigera canina*, *P. rufescens*, *Pseudephebe minuscula*, *P. pubescens*, *Sphaerophorus fragilis*, *S. globosus*, *Stereocaulon alpinum*, *Tremolecia atrata*, *Umbilicaria hyperborea* and *U. proboscidea*. Among the most rarely reported lichen species in the archipelago are *Agonimia gelatinosa*, *Alectoria gowardii*, *Allocetraria madreporiformis*, *Arctocetraria nigricascens*, *Arctomia delicatula*, *Bilimbia microcarpa*, *Bryonora septentrionalis*, *Bryostigma muscigena*, *Buellia badia*, *Catillaria contristans*, *Cladonia libifera*, *Lecania subfuscata*, *Lecanora campestris*, *Lecidella bullata*, *Lichenomphalia alpina*, *Masonhalea inermis*, *Micarea lignaria*, *Multiclavula corynoides*, *M. vernalis*, *Peltigera elisabethae*, *P. lyngéi*, *Placopsis lambii*, *Protothelenella spintrinoidella*, *Rhizocarpon lecanorinum*, *Schadonia alpina*, *Thelidium papulare*, *Umbilicaria aprina* and *U. leiocarpa*. The latter includes species that are difficult to detect in the field, species with obscure taxonomy, and/or species on the border of their range. The lists of common and rare species of Franz Josef Land and the Arctic are generally the same (Kristinsson *et al.* 2010).

According to the results of our research, we can recommend to include the following lichen species in the Red Data Book of the Arkhangelsk Region of Russia: *Alectoria gowardii*, *Alloctraria madreporiformis*, *Arctocetraria nigricascens*, *Masonhalea inermis*, *Peltigera lyngei*, *P. elisabethae*, *Placopsis lambii*, *Umbilicaria aprina* and *U. leiocarpa*.

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