

## Lichens and vascular plants in Duvefjorden area on Nordaustlandet, Svalbard

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### Abstract

Floristic check-lists were compiled for the first time for Duvefjorden Bay on Nordaustlandet, Svalbard, based on field work in July 2012 and on data from literature and herbaria. The check-lists include 172 species of lichens and 51 species of vascular plants. Several species rare in Svalbard and in the Arctic were discovered: *Candelariella borealis* was new to Svalbard. 51 lichen species were newly recorded on Nordaustlandet and 131 lichen species were observed in the Duvefjorden area for the first time. Among lichen species rare in Svalbard and in the Arctic the following can be mentioned: *Caloplaca magni-filii*, *C. nivalis*, *Lecidea silacea*, *Phaeophyscia nigricans*, *Polyblastia gothica*, *Protothelenella sphinctrinoidella*, *Rinodina conradii*, *Stenia geophana*, and *Tetramelas pulverulentus*. Two species of vascular plants, *Saxifraga svalbardensis* and *S. hyperborea*, were found new to the Duvefjorden area. The investigated flora is represented mostly by species widespread in Svalbard and in the Arctic. Although Duvefjorden area is situated in the northernmost part of Svalbard, its flora is characterized by relatively high diversity of vascular plants and lichens. Apparently this is due to the influence of the warm North Atlantic Current.

**Key words:** Arctic, vascular plants, lichen biota, new records, rare species

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## Introduction

Duvefjorden is situated in the northern part of Nordaustlandet (Fig. 1). Nordaustlandet is the second largest island in Svalbard archipelago with an area of 14.443 square kilometres. It is situated north east of West Spitsbergen Island. The north-eastern part of Svalbard including Nordaustlandet constitutes the Nordaust-Svalbard Nature Reserve. The majority of Nordaustlandet territory is covered with large ice caps, mainly Austfonna and Vestfonna, the remaining parts being polar desert. The rock types date back to various geological eras. There are volcanic rocks in the east of Lady Franklinfjorden, on peninsula Botniahalvøya and east of Duvefjorden. Svalbard belongs to the High Arctic which is characterized by severe climate. Due to the effect of the North Atlantic Sea Current

the highest summer temperatures occur in the interior of Svalbard. Thus, the climate becomes colder not only northward, but also west-, east- and southward.

According to the official weather station within the arctic polar desert zone located on Hopen Island, the average July temperature reaches only 1.7°C. The arctic polar desert zone is characterized by dwarf vegetation; vascular plants normally cover less than 1%, while lichens and bryophytes may occupy about 20% of the ground. Although the dense vegetation of moist depressions is dominated by bryophytes, peat does not form. A *Papaver dahlianum* community is considered to be characteristic of Svalbard and to represent zonal vegetation (Elvebakk 1985).

## Materials and Methods

This work is a part of a comprehensive study conducted in Svalbard by the Avrorin Polar-Alpine Botanical Garden-Institute Kola SC RAS. The research materials that consist of lichens and vascular plants were collected by Liudmila Konoreva in the area of Duvefjorden Bay (Damflya) on Nordaustlandet in July 2012. About 900 lichen specimens and 30 specimens of vascular plants were collected. Samples were collected in all the different community types. Morphological and anatomical features of lichens were analyzed by standard light microscopy and chemical tests (Smith *et al.* 2009). Sequences of mitochondrial small subunit rRNA gene (mtSSU) were used to aid identification in some cases. Sequences of mtSSU were obtained by amplification with primers, mrSSU1 and mrSSU3R (Zoller *et al.* 1999). Closely related species were searched by blast analysis against those stored in the GeneBank. Sequences obtained in this study were deposited in GenBank database under accession numbers MN262084, MN267046,

MN267047. Voucher lichen specimens are deposited in the herbarium of Avrorin Polar-Alpine Botanical Garden-Institute (KPABG) and the specimens of vascular plants are stored in the herbaria of University of Helsinki (H) and Lomonosov Moscow State University (MW). As a result of species identification, the entire checklist was compiled and species distribution across Svalbard was specified. For the species records the lichen specimens and the vascular plants were cited with their herbarium acronyms and numbers as well as their herbarium acronyms and collector's numbers, respectively. We used the 'Svalbard Lichen Database' (SLD, [1]) hosted by the University of Oslo, which at present includes collections from BG, O and TROM to search for specimens from the study area. To specify the distribution of vascular plants in Svalbard we consulted the following databases: 'Norwegian Biodiversity Information Center' ([2]) and 'The flora of Svalbard' ([3]) comprising collections in BG, O, TRH and TROM.



**Fig. 1.** Map of the investigated area.

**List of localities:**

1. Duvefjorden, Sætherbukta, Orvinland Peninsula, Damflya, Polarklubben, 80°15'55.5" N, 23°59'12.2" E, alt 2 m, stony tundra, 26.07.2012.
2. *ibid*, 80°16'01.2" N, 23°57'50.5" E, alt 13 m, small mountain, rocky outcrops, 26.07.2012.
3. *ibid*, 80°16'31.8" N, 23°58'16.3" E, alt 11 m, shore of the bay, large-blocked scree, southwest exposure, 28.07.2012.
4. *ibid*, 80°16'34.9" N, 23°58'12.3" E, alt 21 m, shore of the bay, large-blocked scree, southwest exposure, at the stream, a small meadow with mosses and *Ranunculus sulphureus* between the stones, 28.07.2012.
5. *ibid*, 80°16'45.6" N, 23°57'35.7" E, alt 17 m, sea-rounded rocks, sometimes wet, with mosses and *Salix polaris*, 29.07.2012.
6. *ibid*, 80°16'04.1" N, 23°59'25.1" E, alt 11 m, slope with rocks, 29.07.2012.
7. *ibid*, 80°16'10.1" N, 23°59'39.7" E, alt 41 m, rise to the waterfall, 29.07.2012.
8. *ibid*, 80°16'12.2" N, 24°00'05.4" E, alt 99 m, stream in front of a waterfall, 30.07.2012.
9. *ibid*, 80°15'47.5" N, 23°59'58.8" E, alt 4 m, large boulder off the coast, 30.07.2012.
10. *ibid*, 80°15'37.9" N, 24°01'37.8" E, alt 25 m, on the coast before climbing to the seashore colony of birds, near the stream, mossy lawn between large boulders, 30.07.2012.
11. *ibid*, 80°15'29.5" N, 24°02'35.4" E, alt 101 m, on the coast, climbing reindeer trails to the seashore bird rookery, 30.07.2012.
12. *ibid*, 80°16'07.5" N, 23°59'04.9" E, alt 3 m, shore of the bay, driftwood on the shore, 31.07.2012.
13. *ibid*, 80°16'00.0" N, 23°59'10.0" E, alt 1 m, shore of shallow brook with boulders covered by mosses, 31.07.2012.

## Results and Discussion

At present 172 species of lichens are included in the check-list.

Based on Øvstedal *et al.* (2009) and herbarium data, 41 lichen species were previously known for the Duvefjorden area.

They mostly represent lichens widespread in the archipelago and were often cited without specifying the exact localities. We found 131 lichen species as new to the Duvefjorden area. Almost all the literature data were confirmed by our records. The list of lichens of Nordaustlandet is supplemented by 51 new species; at present it includes 287 species. Therefore, the lichen biota of Duvefjorden includes 59% of the species known from Nordaustlandet. *Candelariella borealis* is here reported for Svalbard for the first time. The second locality in Svalbard were found for three lichen species: *Cetraria nigricans* (previously known from Duvefjorden), *Helocarpon crassipes* (previously known from Hornsund), and *Lecidea plana* (previously known from Isfjorden). Rare lichens for Svalbard and the Arctic include *Caloplaca magni-filii*, *C. nivalis*, *Lecidea silacea*, *Phaeophyscia nigricans*, *Polyblastia gothica*, *Protothelenella sphinctrinoidella*, *Rinodina conradii*, *Steinia geophana*, and *Tetramelas pulverulentus*. Sometimes lichens rare for Svalbard are widely distributed in the Arctic and *vice versa*. This could be explained by the lack of data and the geographical position of Svalbard. Species unusual in the Arctic are present in

Svalbard due to the warming effect of the North Atlantic Current (Engelskjøn *et al.*, 2003).

Our check-list of Duvefjorden includes 51 species of vascular plants comprising about 60% of those known from Nordaustlandet.

Neilson (1968) reported 83 species to Nordaustlandet, of these 36 species were from the Polarklubben area, and 49 species from the Duvefjorden area. *Saxifraga svalbardensis* and *S. hyperborea* are new to the Duvefjorden area as they are not previously reported in the literature (Neilson 1968, Elven and Elvebakk 1996, Rønning 1996). *Luzula nivalis* and *Deschampsia alpina* are new to the Polarklubben area. Our data suggest that the vascular plant flora of the Polarklubben area comprises 41 species. In this respect the Polarklubben is similar to Nordvikka and Kinnvika in the Murchisonfjord area, Nordauslandet, where 39 species (Matveeva 2010) and 36 species (Cooper 2011) were reported, respectively. The majority of species are widespread in the Svalbard and in the Arctic (Rønning 1996, Matveeva 2010). Although Duvefjorden area is situated in the northernmost part of Svalbard, its vascular plant diversity is relatively high. However, most thermophilous species in Svalbard are absent there as the territory is no largely affected by the warm North Atlantic Current (Engelskjøn *et al.* 2003).

### Annotated check-list of lichens and vascular plants in Duvefjorden area, Nordaustlandet

The following abbreviations and notation are in the list:

\* – new record for Nordaustlandet

O – herbarium of the University of Oslo

H – herbarium of the University of Helsinki

MW – herbarium of Lomonosov Moscow State University

KPABG – herbarium of the Poar-Alpine Botanical Garden-Institute.

**List of lichen species**

- Acarospora veronensis* A. Massal. — **12** (KPABG 12992), on gravel. Widely distributed throughout Svalbard.
- Alectoria nigricans* (Ach.) Nyl. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-138260); *ibid* (OL-138264); **1** (KPABG 13027), **2** (KPABG 13000), **3** (KPABG 13128), **8** (KPABG 13055), on gravel under the rocks, on soil, on stone, on soil in scree. Widely distributed throughout Svalbard.
- Alectoria ochroleuca* (Hoffm.) A. Massal. — In the inner part on the west side of Duvefjorden, 78°05'N, 20°59'E, 16.08.1936, leg. E. Dahl, det. D.O. Øvstedal, 2000 (OL-150729); **3**, on soil in the crevices between the stones. Sporadic findings in the north-east part of the archipelago.
- Allanthoparmelia alpicola* (Th. Fr.) Essl. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal 2000 (OL-131819); **1** (KPABG 12971, 12974, 13007, 13015, 13017, 13021), **3** (KPABG 12982), **4** (KPABG 12961, 13101, 13110, 13113), **5** (KPABG 12949), **6** (KPABG 12952, 13087), **8** (KPABG 13060), **12** (KPABG 12988), on gravel, stone. Widely distributed throughout Svalbard.
- \**Amandinea punctata* (Hoffm.) Coppins & Scheid. — **3**, **5** (KPABG 12946), **6** (KPABG 13086), on soil in the crevices between the stones, on soil under rock. Widely distributed throughout Svalbard. In other parts of Svalbard the ecology of the species may be different. So, Øvstedal *et al.* (2009) report this species from wood, bryophytes and rock.
- Arctoparmelia incurva* (Pers.) Hale — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1931, leg. P.F. Scholander, conf. D. O. Øvstedal 2000 (OL-131822). Sporadically distributed throughout Svalbard. Known from the north and north-west parts of the archipelago.
- Arthrorhaphis alpina* (Schaer.) R. Sant. — **8** (KPABG 13058), on soil. Sporadically distributed throughout Svalbard.
- \**Bacidia bagliettoana* (A. Massal. & De Not.) Jatta — **1** (KPABG 13009, 13010), on soil. Widely distributed throughout Svalbard.
- \**Baeomyces rufus* (Huds.) Rebent. — **1**, **5** (KPABG 13140), **6**, on soil, gravel. Sporadically distributed throughout Svalbard.
- Biatora cuprea* (Sommerf.) Fr. — **4** (KPABG 12956), on soil. Widely distributed throughout Svalbard.
- \**Biatora subduplex* (Nyl.) Räsänen ex Printzen — **5** (KPABG 12947), **12** (KPABG 12925), on soil near the Lake shore among mosses. Sporadically distributed throughout Svalbard.
- \**Bilimbia lobulata* (Sommerf.) Hafellner & Coppins — **1** (KPABG 12911, 12969), on soil. Sporadically distributed throughout Svalbard.
- Bryocaulon divergens* (Ach.) Kärnefelt — **10** (KPABG 13067), on soil. Widely distributed throughout Svalbard.
- Bryonora septentrionalis* Holt.-Hartw. — **4** (KPABG 13105), **5** (KPABG 12946, 12948, 12950), on soil on stone, on soil under rock. Widely distributed throughout Svalbard.
- Bryoplaca tetraspora* (Nyl.) Søchting *et al.* — **4** (KPABG 12964), **8** (KPABG 12909), on soil among mosses. Widely distributed throughout Svalbard.
- Buellia aethalea* (Ach.) Th. Fr. — **9** (KPABG 12939), on stone. Widely distributed throughout Svalbard.

- \**Caloplaca magni-filii* Poelt — **6** (KPABG 12953, 13096), on thallus of *Miriquidica nigroleprosa*. Known from Amsterdamøya (Hertel & Ullrich 1976).
- \**Caloplaca nivalis* (Körb.) Th. Fr. — **4** (KPABG 12962), on mosses. Rare throughout Svalbard.
- Caloplaca spitsbergensis* H. Magn. — Duvefjorden, on plant debris, 16.08.1936, leg. E. Dahl, det. E. Dahl, O; **3, 6** (KPABG 13086), **9** (KPABG 13049), **12** (KPABG 12989), on driftwood, on soil in the crevices between the stones. Sporadically distributed throughout Svalbard.
- \**Caloplaca stillicidiorum* (Vahl) Lyngbe — **4** (KPABG 12963), **12** (KPABG 12989), on driftwood, on reindeer antlers.
- \**Caloplaca tornøensis* H. Magn. — **6** (KPABG 13089), on soil. Rare in Svalbard. In other parts of Svalbard the ecology of the species may be different. So, Øvstedal *et al.* (2009) report this species from mosses *Andraea* and *Grimmia* spp.
- \**Candelariella borealis* M. Westb. — **1** (KPABG 12970), **2** (KPABG 12996), **7** (KPABG 12938), **8** (KPABG 12943), **9** (KPABG 12940), on soil, in late snow-beds on the coast. New to Svalbard. Closely related to *C. placodizans* (Nyl.) H. Magn. from which it differs in the larger and darker yellow thallus with a smooth surface (Westberg 2007). Apothecia not found in the specimens from Svalbard. This species has a circumpolar Arctic distribution extending into the alpine regions of North America. It has a more pronounced Arctic distribution and is more common than *C. placodizans* at high latitudes (Westberg 2007, Kristinsson *et al.* 2010).
- Candelariella vitellina* (Ehrh.) Müll. Arg. — **6** (KPABG 13086), **7** (KPABG 13070), **12** (KPABG 12992), on soil in the crevices between stones, on gravel and on soil. Widely distributed throughout Svalbard.
- \**Candelariella xanthostigma* (Ach.) Lettau — **12** (KPABG 12921, 12932), on driftwood. Sporadically distributed throughout Svalbard.
- Cetraria aculeata* (Schreb.) Ach. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, det. D.O. Øvstedal, 2000 (OL-131826); **1** (KPABG 13020), on gravel. Widely distributed throughout Svalbard.
- Cetraria ericetorum* Opiz — **1** (KPABG 12968, 13023), **2** (KPABG 13134), **8** (KPABG 12909), on gravel, on soil, among mosses. Rare in Svalbard.
- Cetraria islandica* (L.) Ach. — **3** (KPABG 13119), **4, 10** (KPABG 13064), **12**, on soil among mosses, on driftwood. Widely distributed throughout Svalbard.
- Cetraria muricata* (Ach.) Eckfeldt — **1** (KPABG 12928), **12** (KPABG 12919), on soil. KPABG. Widely distributed throughout Svalbard.
- Cetraria nigricans* Nyl. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl (OL-141774); Duvepynten, on soil, 1936, leg. E. Dahl, det. E. Dahl, O, **1, 3** (KPABG 13128), **5** (KPABG 13077), on soil. Not known elsewhere in Svalbard.
- Cetrariella delisei* (Bory ex Schaer.) Kärnefelt & Thell — **3** (KPABG 13128), **4** (KPABG 12961), **6** (KPABG 13088), on soil on stone, among mosses. Widely distributed throughout Svalbard.
- Cladonia acuminata* (Ach.) Norrl. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl (OL-148497). Rare in Svalbard.
- Cladonia amaurocraea* (Flörke) Schaer. — **2** (KPABG 13139), **5** (KPABG 12948, 13079), **6** (KPABG 12955), **10** (KPABG 13064), on soil, on soil on stone, on plant debris. Widely distributed throughout Svalbard.

- Cladonia bellidiflora* (Ach.) Schaer. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 18.08.1936, leg. E. Dahl (OL-148506); **2** (KPABG 13000, 13001), on soil. Widely distributed throughout Svalbard.
- Cladonia borealis* S. Stenroos — **3** (KPABG 12914), on stone among mosses. Widely distributed throughout Svalbard.
- Cladonia coccifera* (L.) Willd. — **1, 2** (KPABG 13001, 13131), **3** (KPABG 12931, 12984), **4** (KPABG 12958), **8** (KPABG 12910), on soil, among mosses. Widely distributed throughout Svalbard.
- Cladonia digitata* (L.) Hoffm. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 18.08.1936, leg. E. Dahl (OL-148438). Rare in Svalbard.
- Cladonia gracilis* (L.) Willd. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. & det. E. Dahl, 2002, conf. Øvstedal, D.O., OL-127009. **2** (KPABG 13130, 13134, 13136, 13139), **3** (KPABG 12914, 12983, 13116), **5** (KPABG 13077, 13141), **8** (KPABG 13055), **9** (KPABG 12940), on soil, in the crevices between the stones, under rock. Widely distributed throughout Svalbard.
- Cladonia macrophylla* (Schaer.) Stenh. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl (OL-148501); *ibid.*, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-150538); *ibid.*, 78°05'N, 20°59'E, 16.08.1936, leg. E. Dahl, det. T. Tønsberg, 2006 (OL-157114). Widely distributed throughout Svalbard.
- Cladonia mitis* (Sandst.) Ruoss — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl (OL-148465); **2** (KPABG 13133, 13139), **5** (KPABG 13081, 13141), on soil, among mosses. Rare in Svalbard.
- \**Cladonia pleurota* (Flörke) Schaer. — **3** (KPABG 12983), on soil on stone. Widely distributed throughout Svalbard.
- Cladonia pocillum* (Ach.) O. J. Rich. — **1** (KPABG 13023), on soil. Widely distributed throughout Svalbard.
- Cladonia pyxidata* (L.) Hoffm. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl (OL-148466). **2** (KPABG 13001, 13135, 13139), **3** (KPABG 12931, 13126, 13128), **4** (KPABG 12960, 13114), **5** (KPABG 13072), **8** (KPABG 13059), **9** (KPABG 13046), **10** (KPABG 13065), **12** (KPABG 12919, 13041), on soil, among mosses, on stone. Widely distributed throughout Svalbard.
- Cladonia stricta* (Nyl.) Nyl. s. lat. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl (OL-148458); **4** (KPABG 12923), on soil. Sporadically distributed throughout Svalbard.
- Cladonia uncialis* (L.) Wigg. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl (OL-148483). Widely distributed throughout Svalbard.
- \**Dacampia hookeri* (Borrer) Massal. — **1** (KPABG 13010), on soil. Sporadically distributed throughout Svalbard.
- Dactylina ramulosa* (Hook.) Tuck. — **1** (KPABG 13032), on soil. Sporadically distributed throughout Svalbard in the north and north-west parts.
- \**Dactylospora deminuta* (Th. Fr.) Triebel — **1** (KPABG 12918, 12967), on thallus of *Japewia tornoënsis*, *Ochrolechia frigida*. Sporadically distributed throughout Svalbard.
- Flavocetraria cucullata* (Bellardi) Kärnefelt & Thell — **3, 10** (KPABG 13062), on soil, in the crevices between stones. Widely distributed throughout Svalbard.
- Flavocetraria nivalis* (L.) Kärnefelt & Thell — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1934, leg. E. Dahl, conf. D.O. Øvstedal, 2000

- (OL-138411); **1** (KPABG 12974, 13014, 13020), **2** (KPABG 13133, 13134), **3**, on soil. Widely distributed throughout Svalbard.
- \**Helocarpon crassipes* Th. Fr. — **2** (KPABG 12935, 12994, 12997), **5** (KPABG 12946), on soil. The second record in Svalbard.
- \**Henrica melaspora* (Taylor) Savić & Tibell (syn. *Polyblastia melaspora* (Taylor) Zahlbr.) — **1** (KPABG 12912, 12975, 12976), **7** (KPABG 13071), on soil, on gravel. Widely distributed throughout Svalbard.
- \**Illosporium carneum* Fr. — **4** (KPABG 12960), on thallus of *Peltigera didactyla*. Sporadically distributed throughout Svalbard.
- Ionaspis lacustris* (With.) Lutzoni — Damflya, without locality (KPABG 13003), on stone. Widely distributed throughout Svalbard.
- \**Japewia tornoënsis* (Nyl.) Tønsberg — **1** (KPABG 12918), **2** (KPABG 12998), on soil, on driftwood. Sporadically distributed throughout Svalbard.
- Lecania subfuscula* (Nyl.) S. Ekman — **12** (KPABG 12989), on driftwood. Widely distributed throughout Svalbard.
- Lecanora atrosulphurea* (Wahlenb.) Ach. — Duvefjorden, on stone, 16.08.1936, leg. & det. E. Dahl (O). Sporadically distributed throughout Svalbard.
- \**Lecanora cenisia* Ach. — **6** (KPABG 13083), on gravel. Sporadically distributed throughout Svalbard.
- Lecanora epibryon* (Ach.) Ach. — **1** (KPABG 12926), **12** (KPABG 12991), on soil. Widely distributed throughout Svalbard.
- \**Lecanora hadacii* Lyngé — **2** (KPABG), on soil. Sporadically distributed throughout Svalbard.
- \**Lecanora intricata* (Ach.) Ach. — **1** (KPABG 12971), **8** (KPABG 13060), on gravel. Sporadically distributed throughout Svalbard.
- \**Lecanora orae-frigidae* R. Sant. — **9**, **12**, on driftwood. Sporadically distributed throughout Svalbard.
- Lecanora polytropa* (Hoffm.) Rabenh. — **1** (KPABG 12966, 12971, 12973, 13008, 13018, 13019, 13031), **3** (KPABG 12982), **4** (KPABG 13110, 13113), **6** (KPABG 13090), **7** (KPABG 13070), **8** (KPABG 13060), **10** (KPABG 13067), **12** (KPABG 12921, 12932, 12933, 12986, 12988, 12992, 12993, 13033, 13039, 13040), on gravel. Widely distributed throughout Svalbard.
- Lecidea alpestris* Sommerf. — **9**, **12** (KPABG 12919, 13037), on soil. Sporadically distributed throughout Svalbard.
- Lecidea atrobrunnea* (Ram. ex Lam. & DC) Schaer. — **1** (KPABG 12927, 13030), on stone. Widely distributed throughout Svalbard.
- Lecidea auriculata* Th. Fr. — **1** (KPABG 13024), **9** (KPABG 13051), on gravel. Sporadically distributed throughout Svalbard.
- Lecidea lapicida* (Ach.) Ach. — **1**, **12** (KPABG 12985), on stone. Widely distributed throughout Svalbard.
- \**Lecidea plana* (J. Lahm) Nyl. — **12** (KPABG 12993), on stone. The second record in Svalbard.
- Lecidea ramulosa* Th. Fr. — **1** (KPABG 12911, 12920, 12972), **3**, **12** (KPABG 13034), on soil, on soil in the crevices between the stones. Widely distributed throughout Svalbard.
- Lecidea silacea* (Ach.) Ach. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-140545). Rare in Svalbard.



- \**Lecidea swartzioidea* Nyl. — Duvefjorden, without locality (KPABG 13003), on stone. Sporadically distributed throughout Svalbard.
- \**Lecidella elaeochroma* (Ach.) M. Choisy — **12**, on driftwood. Widely distributed throughout Svalbard.
- \**Lecidella euphorea* (Flörke) Hertel — **12**, on driftwood. Rare in Svalbard. Genbank No MN262084, MN267046, MN267047.
- Lecidoma demissum* (Rutstr.) G. Schneid. & Hertel — **3** (KPABG 12984), **4** (KPABG 12916, 12922, 13098), **8** (KPABG 12909), on soil among mosses, on soil on stone, on soil. Sporadically distributed throughout Svalbard.
- Leciophysma finmarkicum* Th. Fr. — Duvefjorden, 80°22'N, 23°40'E, leg. 16.08.1936, E. Dahl, conf. 2000, D.O. Øvstedal, (OL-125405). Widely distributed throughout Svalbard.
- Lepraria gelida* Tønsberg & Zhurb. — **3** (KPABG 12981, 13115), **4** (KPABG 12965), **6** (KPABG 12954), **9** (KPABG 12940), on soil, among mosses, in the crevices between the stones. Sporadically distributed throughout Svalbard and rare in the Arctic (Tønsberg and Zhurbenko, 2006).
- \**Lepraria neglecta* (Nyl.) Lettau — **3** (KPABG 12915, 12924), **5** (KPABG 12889), on stone. Widely distributed throughout Svalbard.
- Lobaria linata* (Ach.) Rabenh. — **5** (KPABG 13078), **8** (KPABG 12942), on soil among mosses, on soil on stone. Widely distributed throughout Svalbard.
- Lopadium coralloideum* (Nyl.) Lynge — **3** (KPABG 12931), **8** (KPABG 12910, 12944), **9** (KPABG 12940), without locality (KPABG 13002), on soil among mosses, on soil by sea shore. Widely distributed throughout Svalbard.
- Lopadium pezizoideum* (Ach.) Körb. — **1** (KPABG 12974), **5** (KPABG 13073), **10** (KPABG 13065), on wet soil. Widely distributed throughout Svalbard.
- Melanelia hepatizon* (Ach.) Thell — **1** (KPABG 13012), **3** (KPABG 12982), **4** (KPABG 13104, 13113), **9** (KPABG 13052), **10** (KPABG 13066, 13067), on stone. Widely distributed throughout Svalbard.
- Melanelia stygia* (L.) Essl. — **1** (KPABG 12977), **4** (KPABG 12957, 12959), **6** (KPABG 13085, 13095), on gravel. Sporadically distributed throughout Svalbard.
- Melanohalea infumata* (Nyl.) Essl. — **9** (KPABG 13050, 13052), on stone. Widely distributed throughout Svalbard.
- \**Micarea incrassata* Hedl. — **8** (KPABG 13058), on soil. Sporadically distributed throughout Svalbard.
- Miriqidica atrofulva* (Sommerf.) Schwab & Rambold — **4** (KPABG 13112), on stone. Widely distributed throughout Svalbard.
- \**Miriqidica griseoatra* (Flotow) Hertel & Rambold — **6** (KPABG 13084), on gravel. Widely distributed throughout Svalbard.
- Miriqidica lulensis* (Hellb.) Hertel & Rambold — **4** (KPABG 12959), on gravel. Widely distributed throughout Svalbard.
- Miriqidica nigroleprosa* (Vain.) Hertel & Rambold — Nordaustlandet, on soil and plant debris, leg. 1947, A. H. Magnusson (O); **6** (KPABG 12953, 13096), on gravel. Sporadically distributed throughout Svalbard.
- Myriolecis zosteræ* (Ach.) Śliwa *et al.* — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2002 (OL-128305); **12** (KPABG 12989), on driftwood. Widely distributed throughout Svalbard.
- Ochrolechia frigida* (Sw.) Lynge — **1** (KPABG 12929, 12967, 12968, 12970, 12974, 12977, 12979, 13012, 13013, 13023, 13025), **2** (KPABG 12997, 12998, 13000, 13001, 13129, 13133, 13134, 13135, 13138, 13139), **3** (KPABG 12931, 12980,

12984, 13115, 13116, 13120, 13121, 13123, 13124, 13128), **4** (KPABG 12958, 12960, 12964), **5** (KPABG 12946, 12948, 13072, 13077, 13080, 13141), **6** (KPABG 12955, 13091), **8** (KPABG 12910, 12941, 13059), **9**, **10** (KPABG 13064, 13066), **12** (KPABG 13037), on soil, among mosses, on driftwood on mosses, on stone, on plant debris. Widely distributed throughout Svalbard.

\**Ochrolechia grimmiae* Lyngbe — **3**, **6** (KPABG 13093), on soil in the crevices between the stones, on mosses. Widely distributed throughout Svalbard.

*Orphniospora moriopsis* (A. Massal.) D. Hawksw. — Duvefjorden, without locality (KPABG 13004), on stone. Widely distributed throughout Svalbard.

*Pannaria hookeri* (Borrer ex Sm.) Nyl. — **7** (KPABG 13068, 13070), on soil. Widely distributed throughout Svalbard.

*Parmelia omphalodes* (L.) Ach. — Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, det. D.O. Øvstedal, 2000 (OL-125433); **1** (KPABG 12930), **9** (KPABG 13050), on stone. Widely distributed throughout Svalbard.

*Parmelia saxatilis* (L.) Ach. — **1** (KPABG 13029), **9** (KPABG 13043), on stone. Widely distributed throughout Svalbard.

*Parmelia skultii* Hale — **1** (KPABG 12918, 13027), **6** (KPABG 13092), **9** (KPABG 13042), **12** (KPABG 13035), on soil on stone. Sporadically distributed throughout Svalbard.

*Parvoplaca tiroliensis* (Zahlbr.) Arup *et al.* (syn. *Caloplaca tiroliensis* Zahlbr.) — In the inner part on the west side of Duvefjorden, 78°05'N, 20°59'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-150818); **12** (KPABG), on driftwood. Widely distributed throughout Svalbard.

*Peltigera aphthosa* (L.) Willd. — **4** (KPABG 13111), on soil. Widely distributed throughout Svalbard.

\**Peltigera canina* (L.) Willd. — **4** (KPABG 13108), **5** (KPABG 13074), **8** (KPABG 13053), on soil among mosses. Widely distributed throughout Svalbard.

*Peltigera didactyla* (With.) J. R. Laundon — **4** (KPABG 12960, 13106), **10** (KPABG 13063), on soil among mosses. Sporadically distributed throughout Svalbard.

\**Peltigera leucophlebia* (Nyl.) Gyeln. — **4** (KPABG 13107, 13114), **8** (KPABG 13057), on soil among mosses, on wet soil under stone. Sporadically distributed throughout Svalbard.

*Peltigera malacea* (Ach.) Funck. — **3** (KPABG 13123), **8** (KPABG 12943), on soil in late snow-beds, on soil among mosses. Sporadically distributed throughout Svalbard.

*Peltigera rufescens* (Weiss.) Humb. — **4** (KPABG 13102, 13109, 13111, 13114), **8** (KPABG 13056), **12** (KPABG 13036), on soil among mosses, on wet soil under stone. Widely distributed throughout Svalbard.

*Peltigera scabrosa* Th. Fr. — **5** (KPABG 13075), **10** (KPABG 13064), on soil among mosses, on plant debris. Widely distributed throughout Svalbard.

\**Peltigera venosa* (L.) Hoffm. — **7** (KPABG 13069), on soil under rock. Widely distributed throughout Svalbard.

*Pertusaria geminipara* (Th. Fr.) C. Knight ex Brodo — **11** (KPABG 12936), on soil under rock. Widely distributed throughout Svalbard.

*Pertusaria oculata* (Dicks.) Th. Fr. — **3** (KPABG 12981, 13012, 13115, 13122), **4**, **8** (KPABG 12910, 12941), **12** (KPABG 12919), on soil among mosses, on soil in the crevices between the stones, on soil on stone. Widely distributed throughout Svalbard.

\**Phaeophyscia nigricans* (Flörke) Moberg — **5**, on soil on stone. Rare in Svalbard.

\**Phaeophyscia sciastra* (Ach.) Moberg — **11** (KPABG 12937), on soil, on stone. Widely distributed throughout Svalbard.

- Physcia caesia* (Hoffm.) Fűrnr. — **1** (KPABG 12927), **9** (KPABG 13052), on stone.  
Widely distributed throughout Svalbard.
- Physcia dubia* (Hoffm.) Lettau — **4** (KPABG 12963, 12964), on stone, on reindeer antlers. Rather common in Svalbard.
- Physconia muscigena* (Ach.) Poelt — **12** (KPABG 12991), on soil by lake shore. Widely distributed throughout Svalbard.
- \**Placidium norvegicum* (Breuss) Breuss — **1** (KPABG 12920), on soil. Sporadically distributed throughout Svalbard.
- Polyblastia gothica* Th. Fr. — **1** (KPABG 13009), on soil. Rare in Svalbard.
- \**Polychidium muscicola* (Sw.) Gray — **5** (KPABG 12950), on soil. Rare in Svalbard.
- Porpidia melinodes* (Körber) Hertel — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-140544), **6** (KPABG 12917, 13084, 13094), **8** (KPABG 12945), on gravel. Widely distributed throughout Svalbard.
- \**Protopannaria pezizoides* (Weber) P.M. Jørg. & S. Ekman — **4** (KPABG 13114), on soil among mosses. Widely distributed throughout Svalbard.
- Protoparmelia atriseda* (Fr.) R. Sant. & V. Wirth — **1** (KPABG 12927), on stone.  
Sporadically distributed throughout Svalbard.
- Protoparmelia badia* (Hoffm.) Hafellner — **1** (KPABG 12977, 13006, 13007, 13016, 13024, 13028, 13031), on gravel. Widely distributed throughout Svalbard.
- Protothelenella sphinctrinoidella* (Nyl.) H. Mayrh. & Poelt — **8** (KPABG 13054), on soil. Rare in Svalbard.
- Pseudephebe minuscula* (Nyl. ex Arnold) Brodo & D. Hawksw. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 1999 (OL-126655); **1** (KPABG 12966, 12973, 13008), **5** (KPABG 13072), **6** (KPABG 12955), **12** (KPABG 12992), on soil, on stone. Widely distributed throughout Svalbard.
- Pseudephebe pubescens* (L.) M. Choisy — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl (OL-126616); **1** (KPABG 12974, 13007, 13018, 13019, 13020), **2** (KPABG 13001, 13134), **3** (KPABG 12982), **4** (KPABG 12959, 13110), **5** (KPABG 12949), **6** (KPABG 13085, 13087), **7** (KPABG 12938), **8**, **10** (KPABG 13066), **12** (KPABG 13041), without locality (KPABG 13004), on stone, on soil in the crevices between the stones, on gravel.  
Widely distributed throughout Svalbard.
- Psoroma hypnorum* (Vahl) Gray — **3** (KPABG 12931), **4** (KPABG 13142), **9** (KPABG 12940), on soil on sea shore, on soil among mosses. Widely distributed throughout Svalbard.
- \**Rhexophiale rhexoblephara* (Nyl.) Hellb. — **1** (KPABG 12978), on soil among gravel.  
Widely distributed throughout Svalbard.
- Rhizocarpon badioatrum* (Flörke ex Spreng.) Th. Fr. — **12** (KPABG 12992, 13040), on gravel. Sporadically distributed throughout Svalbard.
- Rhizocarpon cinereovirens* (Müll. Arg.) Vain. — **1** (KPABG 13001), **6**, on stone.  
Sporadically distributed throughout Svalbard.
- Rhizocarpon copelandii* (Körb.) Th. Fr. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2002 (OL-126335); **2** (KPABG 12999), **3** (KPABG 12982), **4** (KPABG 12957, 13101, 13110), **5** (KPABG 12949, 13072), **6** (KPABG 13087), **8** (KPABG 13061), **12** (KPABG 12985), without locality (KPABG 13004), on gravel. Sporadically distributed throughout Svalbard.

- Rhizocarpon dispersum* Runemark — Duvefjorden, 16.08.1936, leg. E. Dahl (O); without locality (KPABG 13004), on stone. Sporadically distributed throughout Svalbard.
- Rhizocarpon disporum* (Nägeli ex Hepp) Müll.Arg. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2002 (OL-128321). Rare in Svalbard.
- \**Rhizocarpon eupetraeoides* (Nyl.) Blomb. & Forssell — **4** (KPABG 13100), **6** (KPABG 12951), **12** (KPABG 12988), on gravel. Rare in Svalbard.
- Rhizocarpon eupetraeum* (Nyl.) Arnold — **4** (KPABG 12957, 13110), on gravel. Sporadically distributed throughout Svalbard.
- Rhizocarpon ferax* H. Magn. — **1** (KPABG 12966, 12971, 12974), **12** (KPABG 12933), on gravel. Sporadically distributed throughout Svalbard.
- Rhizocarpon geminatum* Körb. — The top of mountain east of Bränvinsbay, leg. A. J. Malmgren (OL-128169); in the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2002 (OL-127839, OL-127839); **1** (KPABG 12966, 12971, 13011), **2** (KPABG 13001), **6** (KPABG 13097), **9** (KPABG 13048, 13052), **12** (KPABG 12921, 12987, 12993), on stone, on gravel on the shore. Widely distributed throughout Svalbard.
- Rhizocarpon geographicum* (L.) DC. — **1** (KPABG 12912, 12966, 12973, 13008, 13015, 13022, 13028), **4** (KPABG 12957), **6** (KPABG 13090), **8** (KPABG 12945, 13060), **9** (KPABG 13045, 13048, 13052), **10** (KPABG 13067), **12** (KPABG 12921, 12932, 12985, 12986, 12987, 12992, 12993, 13033, 13038, 13039, 13040), without locality (KPABG 13003), on stone, on driftwood. Widely distributed throughout Svalbard.
- Rhizocarpon grande* (Flörke) Arnold — **4** (KPABG 12959), **10** (KPABG 13067), **12** (KPABG 12986), on stone. Widely distributed throughout Svalbard.
- Rhizocarpon inarense* (Vain.) Vain. — **4** (KPABG 13101, 13110, 13113), **6** (KPABG 13085, 13097), on gravel. Sporadically distributed throughout Svalbard.
- Rhizocarpon intermediellum* Räsänen — **1** (KPABG 12971), on gravel. Scattered distributed in Svalbard.
- \**Rinodina archaea* (Ach.) Arnold — **10** (KPABG 12934), on driftwood. Very rare in Svalbard.
- Rinodina conradii* Körber — Nordaustlandet, on soil and plant debris, 1947, leg. A. H. Magnusson (O). Rare in Svalbard.
- \**Rinodina milvina* (Wahlenb.) Th. Fr. — **12** (KPABG 12987), on gravel. Sporadically distributed throughout Svalbard.
- \**Rinodina mniaraea* (Ach.) Körb. — **12** (KPABG 12991), on soil at lake shore. Sporadically distributed throughout Svalbard.
- \**Rinodina olivaceobrunnea* C. W. Dodge & G. E. Baker — **9** (KPABG 12940), on soil on the sea shore. Sporadically distributed throughout Svalbard.
- \**Rinodina roscida* (Sommerf.) Arnold — **4** (KPABG 13142), on soil. Widely distributed throughout Svalbard.
- Rinodina turfacea* (Wahlenb.) Körb. — **4** (KPABG 12960), **9** (KPABG 13050, 13052), **10** (KPABG 13065), on soil, among mosses. Widely distributed throughout Svalbard.
- \**Romjularia lurida* (Ach.) Timdal — **4** (KPABG 12958), on soil among mosses. Sporadically distributed throughout Svalbard.
- Rusavskia elegans* (Link) S. Y. Kondr. & Kärnefelt (syn. *Xanthoria elegans* (Link) Th. Fr.) — **1** (KPABG 12912, 13018, 13026, 13031), **9** (KPABG 13044, 13051), **12** (KPABG 12993), on stone, on soil on stone. Widely distributed throughout Svalbard.

- Rusavskia sorediata* (Vain.) S.Y. Kondr. & Kärnefelt (syn. *Xanthoria sorediata* (Vain.) Poelt — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-125898); *ibid.*, det. B.P. Løfall & E. Timdal, 2004 (OL-126955); **1** (KPABG 13011), **4** (KPABG 12964), **12** (KPABG 12992), on stone. Widely distributed throughout Svalbard.
- Solorina bispora* Nyl. — **1** (KPABG), on soil. Widely distributed throughout Svalbard.
- Solorina crocea* (L.) Ach. — **2** (KPABG 13137, 13138), **3** (KPABG 13118), **5** (KPABG 13082), **8** (KPABG 13059), on soil, among mosses. Widely distributed throughout Svalbard in areas with calcareous rocks.
- Sphaerophorus fragilis* (L.) Pers. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-125871); **1** (KPABG 13007, 13023), **2** (KPABG 13139), **3** (KPABG 13125), **8** (KPABG 13055), **9**, **10** (KPABG 13066), on soil, in the crevices between the stones, on soil on stone. Sporadically distributed throughout Svalbard, mainly in the north part of the archipelago.
- Sphaerophorus globosus* (Huds.) Vain. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, det. D.O. Øvstedal, 2000 (OL-125954); **1** (KPABG 13012), **2** (KPABG 13133), on soil. Widely distributed throughout Svalbard.
- Sporastatia testudinea* (Ach.) A. Massal. — **9** (KPABG 13052), on stone. Widely distributed throughout Svalbard.
- \**Sporodictyon terrestre* (Th. Fr.) Savić & Tibell — **1** (KPABG 12913), on soil. Sporadically distributed throughout Svalbard.
- \**Stenia geophana* (Nyl.) Stein — **1** (KPABG 12979), on soil among gravel. Rare in Svalbard.
- Stereocaulon alpinum* Laurer — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, leg. 16.08.1936, E. Dahl, conf. D. O. Øvstedal, 2000, (OL-130261); **2** (KPABG 12995, 13130), on soil. Widely distributed throughout Svalbard.
- Stereocaulon arcticum* Lyngby — In the inner part and on the west side of Duvefjorden, 80°22'N, 23°40'E, leg. 16.08.1936, E. Dahl, conf. D. O. Øvstedal, 2000, (OL-138339, OL-131873, OL-150528); **2** (KPABG 13138, 13139), **6**, on soil among mosses, on stone. Widely distributed throughout Svalbard.
- Stereocaulon botryosum* Ach. em. Frey — In the inner part and on the west side of Duvefjorden, 80°22'N, 23°40'E, leg. 16.08.1936, E. Dahl, conf. D. O. Øvstedal, 2001, (OL-126570). Widely distributed throughout Svalbard.
- \**Stereocaulon capitellatum* H. Magn. — **2** (KPABG 13132, 13138), **3** (KPABG 13117, 13127), **6** (KPABG 13091), **8** (KPABG 13059), on soil, among mosses, on stone. Rare in Svalbard.
- \**Stereocaulon glareosum* (L. I. Savicz) H. Magn. — **2** (KPABG 13129), **3** (KPABG 12914), on soil, on stone. Rare in Svalbard.
- Stereocaulon rivulorum* H. Magn. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-125898); **1** (KPABG 13001), **2** (KPABG 13001), **3** (KPABG 12980, 12981), **6** (KPABG 12954), on soil among mosses, on soil in the crevices between the stones. Widely distributed throughout Svalbard.
- Tetramelas insignis* (Nägeli ex Hepp) Kalb — **2** (KPABG 12996), **3** (KPABG 12931), **4** (KPABG 12965, 13099), **6** (KPABG 12955, 13089), **8** (KPABG 12910, 12943), **9** (KPABG 12940), without locality (KPABG 13002), on soil and mosses, on soil in late snow-beds and by the stream. Widely distributed throughout Svalbard.

- \**Tetramelas pulverulentus* (Anzi) A. Nordin & Tibell — **10** (KPABG 13065), on thallus of *Rinodina turfacea*. Rare in Svalbard.
- Thamnotia vermicularis* var. *subuliformis* (Ehrh.) Schaerer — **1** (KPABG 13023), on soil. Widely distributed throughout Svalbard and in the Arctic (Onut-Brännström *et al.*, 2018).
- Tremolecia atrata* (Ach.) Hertel — In the inner part on the west side of Duvefjorden, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2005 (OL-150199); **1** (KPABG 12973), **6** (KPABG 13084, 13095), without locality (KPABG 13003), on gravel. Widely distributed throughout Svalbard.
- Umbilicaria arctica* (Ach.) Nyl. — **5** (KPABG), on stone. Widely distributed throughout Svalbard.
- Umbilicaria cylindrica* (L.) Delise ex Duby — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-126951); **1** (KPABG 12929), **2** (KPABG 13001, 13130, 13132, 13138), **3** (KPABG 13121), **4** (KPABG 12961), **5** (KPABG 13080), **10** (KPABG 13067), on stone, on soil, on soil in the crevices between the stones. Widely distributed throughout Svalbard.
- Umbilicaria decussata* (Vill.) Frey — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, det. B.P. Løfall & E. Timdal, 2004 (OL-126955). Widely distributed throughout Svalbard.
- Umbilicaria deusta* (L.) Baumg. — **5** (KPABG 13076), on stone. Widely distributed throughout Svalbard.
- Umbilicaria hyperborea* (Ach.) Hoffm. — **1** (KPABG 13022), **12** (KPABG 12933, 12986), without locality (KPABG 13004), on gravel. Widely distributed throughout Svalbard.
- Umbilicaria lyngei* Schol. — **1** (KPABG 12930), on stone. Widely distributed throughout Svalbard.
- Umbilicaria proboscidea* (L.) Schrad. — In the inner part on the west side of Duvefjorden, 80°22'N, 23°40'E, 16.08.1936, leg. E. Dahl, conf. D.O. Øvstedal, 2000 (OL-126972, OL-126615). Widely distributed throughout Svalbard.
- Umbilicaria torrefacta* (Lightf.) Schrad. — **2** (KPABG 13001), **3** (KPABG 12982), **4** (KPABG 12957), **5** (KPABG 13080), **6** (KPABG 13096, 13097), **8** (KPABG 13061), on gravel, on soil. Widely distributed throughout Svalbard.
- \**Xanthomendoza borealis* (Poelt & R. Sant.) Søchting *et al.* — **1** (KPABG 13018), **4** (KPABG 13103), **8** (KPABG 13055), **12** (KPABG 12990), on stone, on soil on scree. Widely distributed throughout Svalbard.

### List of vascular plants

- Alopecurus ovatus* Trin. — **11** (#Sval-0001, H), climb to bird rookery. Occurs sporadically on Nordaustlandet, especially rare in the east part. Widely distributed throughout Svalbard.
- Bistorta vivipara* (L.) Delarbre — **4, 5, 10**, the coast before climbing the bird rookery, cobble rocks with mosses and *Salix polaris*, large boulder scree with meadow sites. Occurs frequently in polar deserts, wet mossy sites and tundra meadows with soil of Duvefjorden area. Widely distributed throughout Svalbard.
- Cardamine bellidifolia* L. ssp. *bellidifolia* — **1, 13**, polar deserts on the fine scree, mossy brookside near mouth. Grows commonly in dry places. Occurs sporadically on Nordaustlandet, especially rare in the east part.

- Carex fuliginosa* Schkuhr ssp. *misandra* (R.Br.) Nyman — **3**, meadow patches with fine earth sites among stone field. Occurs sporadically in Svalbard.
- Carex nardina* Fr. ssp. *hepburnii* (Boott) Å. Löve, D. Löve & B.M. Kapoor. — on calcareous substrates in the open. Extremely rare species in Duvefjorden (only one locality — Louise Richardfjellet) and rare on Nordaustlandet (Neilson 1968). Occurs sporadically in the north part of Svalbard.
- Cerastium arcticum* Lange — **4** (#Sval-0006, H), **8**, **10** (#Sval-0009, H), the coast before climbing the bird rookery, by the stream, a mossy lawn among large boulders and meadow among the stones, wet mossy and meadowy sites along brooks, and polar deserts. Common and widespread in Svalbard.
- Cerastium regelii* Ostenf. — **1**, polar deserts on the fine scree. Not rare in Duvefjorden and Nordaustlandet (Neilson 1968), widespread in Svalbard.
- Cochlearia groenlandica* L. — **1**, **9** (#Sval-0012, H, #Sval-0009, MW), **13**, polar deserts on the fine scree, among boulders near the marine coast, mossy brookside near mouth. Widely distributed throughout Svalbard.
- Deschampsia alpina* (L.) Roem & Schultes — **5** (#Sval-0019, H), cobble rocks with mosses and *Salix polaris*. Occurs sporadically on Nordaustlandet, frequently in Svalbard.
- Draba alpina* L. — moist sites among polar deserts. Not searched for the Polarklubben area. Occurs from sporadically to rare in Duvefjorden and Nordaustlandet (Neilson 1968), frequently in Svalbard.
- Draba lactea* Adams — moist sites among tundra and polar deserts. Occurs sporadically in Duvefjorden and Nordaustlandet (Neilson 1968), frequently in Svalbard.
- Draba micropetala* Hook. — moist open ground and moss communities and in gravel sites. Occurs sporadically on Nordaustlandet, frequently in Svalbard.
- Draba nivalis* Lilj. — sites with scare vegetation and rock outcrops. Spreads sporadically in Duvefjorden and Nordaustlandet, frequently in Svalbard.
- Draba norvegica* Gunnerus — gravelly slopes and polar deserts. Extremely rare species on Nordaustlandet and recorded only to the Polarklubben (Neilson 1968). Distributed sporadically throughout Svalbard.
- Draba oxycarpa* Sommerf. — grows in moist and dry places in the south part of Duvefjorden. Not observed in the Polarklubben area (Neilson 1968). Common and widespread in Svalbard.
- Draba subcapitata* Simmons — rock outcrops, crevices of boulders. Occurs sporadically in Duvefjorden and Nordaustlandet, frequently in Svalbard.
- Eriophorum scheuchzeri* Hoppe ssp. *arcticum* Novoselova — moist sites. Extremely rare species in Duvefjorden (only one record — Dokken) and rare on Nordaustlandet (Neilson 1968). Widely distributed throughout Svalbard.
- Festuca viviparoides* Krajina ex Pavlick — dry stone slopes and near snowbeds. Rare on Nordaustlandet, especially in the west part. Common in Svalbard, however majority record was known from the middle and the inner parts of the major fjords in Svalbard.
- Huperzia arctica* (Grossh. ex Tolm.) Sipliv. — favorable habitats. Occurs sporadically in Duvefjorden and Nordaustlandet (Neilson 1968), seem frequent in Svalbard.
- Juncus biglumis* L. — moist fine earth sites and muddy places among polar desert, moist sparse meadows along brooks. Widely distributed throughout Svalbard.
- Luzula confusa* Lindeb. — **4** (#Sval-0038, H, #Sval-0039, MW), **8**, **10** (#Sval-0033, H, #Sval-0034, MW), the coast before climbing the bird rookery, large boulder scree with meadow sites, by the stream, meadow among the stones on the slope, mesic sites among stone fields. Widely distributed throughout Svalbard.

- Luzula nivalis* (Laest.) Spreng. — **4, 8, 5, 13**, wet sites with *Pohlia wahlenbergii*, *Ranunculus sulphureus*, and *Saxifraga cernua* among brook side; large boulder scree with meadow sites, moss-lichen tundras, mossy brookside near mouth. Occurs sporadically on Nordaustlandet, especially frequent in the west part. Widely distributed throughout Svalbard.
- Micranthes foliolosa* (R.Br.) Gornall — moist and wet tundras and polar deserts. This species is common in Duvefjorden (Neilson 1968). Occurs sporadically on Nordaustlandet. Widely distributed throughout Svalbard.
- Micranthes nivalis* (L.) Small — **1**, polar deserts on fine scree. Usually on dry and sometimes quite exposed areas. Frequent in polar deserts on Nordaustlandet. Widely distributed throughout Svalbard.
- Micranthes tenuis* (Wahlenb.) Small — **7, 13**, W-faced rock outcrops with big snowfields in the depressions, mossy brookside near mouth. According to 'The flora of Svalbard' and Neilson (1968), this species is recorded as frequent on Nordaustlandet and in Svalbard.
- Minuartia rubella* (Wahlenb.) Hiern — dry sties among gravelly polar desert. Widely distributed throughout Svalbard.
- Oxyria digyna* (L.) Hill — wet mossy sites. In Duvefjorden, the species is not common. Widely distributed throughout Svalbard.
- Papaver dahlianum* Nordh. ssp. *polare* (Tolm.) Elven et Ö. Nilsson. — **1, 5** (Sval-0047, H), **8**, polar deserts on the fine scree, cobble rocks with mosses and *Salix polaris*; large boulder scree with meadow sites. Widely distributed throughout Svalbard.
- Phippsia algida* (Sol.) R. Br. — wet sites, vicinity of bird rookeries. Widely distributed throughout Svalbard.
- Poa abbreviata* R. Br. — dry stony ground. Not recorded in the Polarklubben area. Occurs sporadically in Duvefjorden and frequently on Nordaustlandet (Neilson 1968). Widespread in Svalbard.
- Poa arctica* R. Br. — in hummocky ground and moss carpet. Not recorded in the Polarklubben area. Occurs frequently in Duvefjorden and Nordaustlandet (Neilson 1968). Widespread in Svalbard.
- Poa pratensis* L. subsp. *colpodea* (Th. Fr.) Tzvelev — moist and dry meadow sites. The commonest grasses in various communities and plant groups. Widely distributed throughout Svalbard.
- Pedicularis hirsuta* L. — **4** (Sval-0047, H), cobble rocks with mosses and *Salix polaris*. Occurs sporadically on Nordaustlandet. Widely distributed throughout Svalbard.
- Potentilla hyperarctica* Malte — **4** (Sval-0058, H; Sval-0059, MW), **8**, meadow among the stones on the slope with a stream, large boulder scree with meadow sites. Occurs sporadically on Nordaustlandet. Widely distributed throughout Svalbard.
- Puccinellia phryganodes* (Trin.) Scribn. & Merr. — Occurs in salt marshes and fine material seashores. Not recorded in the Polarklubben area and occurs sporadically in Duvefjorden and Nordaustlandet (Neilson 1968). Widely distributed throughout Svalbard.
- Ranunculus hyperboreus* Rottb. — wet sites. Not observed in the Polarklubben area. Occurs sporadically in Duvefjorden and Nordaustlandet (Neilson 1968), seem frequent in Svalbard.
- Ranunculus pygmaeus* Wahlenb. — **11** (Sval-0064, H), climb to bird rookery. The species has a luxuriant growth on rookeries near the Polarklubben (Neilson 1968). Spreads sporadically on Nordaustlandet, frequently in Svalbard.



- Ranunculus sulphureus* Sol. — **4** (Sval-0067, H), **8, 10** (Sval-0066, H), wet mossy and meadowy sites along brooks, meadow among the stones, the coast before climbing the bird rookery. Responds well to high nitrogen in rookeries. Spreads frequently in Svalbard.
- Sagina nivalis* (Lindblom) Fr. — **1, 7, 13**, polar deserts on the fine scree, W-faced rock outcrops with big snowfields in the depressions, mossy brookside near mouth. Occurs sporadically among gravelly polar desert and among the cracked rocks. Widely distributed throughout Svalbard.
- Salix polaris* Wahlenb. — **1, 4** (Sval-0068, H; Sval-0072, MW), **8, 10**, moist meadowy sites with mosses, *Ranunculus sulphureus* and grasses, polar deserts, stone fields, cobble rocks with mosses and dwarf shrubs. One of the commonest plant of Duvefjorden. Widespread plant in Svalbard.
- Saxifraga cernua* L. — **1, 4** (Sval-0074, H), **11**, polar deserts on the fine scree, meadow among the stones on the slope with a stream, climb to bird rookery. The species formed rampant groups near bird rookeries. Widely distributed throughout Svalbard.
- Saxifraga cespitosa* L. — **1, 5** (Sval-0079, H), **11**, cobble rocks with mosses and *Salix polaris*, polar deserts on the fine scree, climb to bird rookery. Widely distributed throughout Svalbard.
- Saxifraga hyperborea* R. Br. — **9** (Sval-0080, H), boulders near the coast. Sporadically occur on Nordaustlandet, especially frequent in the west part. Widely distributed throughout Svalbard.
- Saxifraga oppositifolia* L. — **1, 4** (Sval-0081, H), meadow among the stones on the slope with a stream, polar deserts. As reported Neilson (1968), rather surprisingly not the most common species on Nordaustlandet. Widely distributed throughout Svalbard.
- Saxifraga rivularis* L. — **4, 9** (Sval-0085, H), **13**, meadow among the stones on the slope with a stream, boulders near the coast, mossy brookside near mouth. Commonly growth in wet mossy sites along brooks. Very common species with a wide variety of habitat type. Widely distributed throughout Svalbard.
- Saxifraga svalbardensis* Øvstedal — **9** (Sval-0087, H), the coast before climbing the bird rookery, by the stream, a mossy lawn among large boulders. The third record for Nordaustlandet. Occurs frequently in Svalbard, endemic species.
- Silene acaulis* (L.) Jacq. — polar deserts. Not reported to the Polarklubben area. Extremely rare in Duvefjorden and rare on Nordaustlandet (Neilson 1968). Widely distributed in Svalbard.
- Silene uralensis* (Rupr.) Bocquet ssp. *arctica* (Th.Fr.) Bocquet — moist meadow and fine earth. Occurs sporadically on Nordaustlandet, frequently in Svalbard.
- Stellaria humifusa* Rottb. — places near the coastline. Extremely rare species in Duvefjorden (only recorded from Stjerneblomdalen) and rare on Nordaustlandet (Neilson 1968). Widely distributed throughout Svalbard.
- Stellaria longipes* Goldie s.l. — **1**, fine earth sites in polar deserts. Occurs sporadically in Svalbard.
- Taraxacum arcticum* (Trautv.) Dahlst. — **4** (Sval-0091, H), **11** (Sval-0092, H), meadow among the stones on the slope with a stream climb to bird rookery. Occurs sporadically on Nordaustlandet. Widely distributed throughout Svalbard.

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- [1] 'Svalbard Lichen Database' (SLD, <http://www.nhm.uio.no/botanisk/lav>)
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- [3] 'The flora of Svalbard' (<http://svalbardflora.no/>)