

Lichens from Simeonof Wilderness, Shumagin Islands, Southwestern Alaska

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Abstract. *One hundred eighty-eight taxa of lichens are reported from Simeonof Island in the Shumagin Islands of southwestern Alaska. Wide-ranging arctic-alpine and boreal species dominate the lichens; a coastal element is moderately represented, while amph-Beringian species form a minor element. The lichen component of Empetrum nigrum dwarf shrub heath, the dominant vegetation type, was analyzed to identify the most frequently occurring lichens within this community.*

Simeonof Wilderness, located within the Shumagin Islands south of the Alaska Peninsula, Alaska, includes Simeonof Island and the Murie Islets and lies within the Western Pacific Coast phytogeographic district of Hultén (1941–1950) (Fig. 1). The Simeonof landscape is diverse with small mountains, oceanic heaths, meadows, deciduous thickets, lakes, streams, poor fens, and sandy and cobbly beaches (Fig. 2). As part of the Alaska Maritime National Wildlife Refuge managed by the U.S. Fish and Wildlife Service, Simeonof Wilderness is a Class I air quality area (Clean Air Act, 42 U.S. Code 7401 et seq.). It is also a National Natural Landmark administered by the U.S. National Park Service (Swain 1990). In accordance with its responsibility for ensuring high air quality standards in Simeonof Wilderness, the Service sought to assess the existing condition of wilderness resources of these islands relative to air quality using the guidelines proposed by Fox et al. (1987), in which the first step in characterizing the biological components is to document the lichens with habitat and distributional information. As the lichen diversity of Simeonof Wilderness—and of the islands south of the Alaska Peninsula region—is virtually unknown (Krog 1968; Thomson 1984, 1997), the primary objective of the present study was to list the lichens, including habitat and distribution information, for Simeonof Wilderness.

STUDY AREA

The Shumagin Islands are situated about 900 km southwest of Anchorage south of the Alaska Peninsula. From east to west, the islands span 100 km and include Unga, Popof, Korovin, Nagai, Chernabura, Big and Little Konuji, and Simeonof Island plus other smaller islands. Simeonof Island is located in the southeastern corner of the Shumagin Islands group at 54°54' N, 159°18' W. Radiocarbon dating of peat from Unga and Popof Island suggests that deglaciation probably dates from 12,000 to 10,000 yr BP (Heusser 1983).

The Shumagin Islands are mountainous, with peaks of the largest islands averaging 506 m elevation (698 m maximum on Unga Island). Unlike most of the mountains of the Shumagin Islands whose steep slopes arise abruptly from the sea, the mountains of Simeonof Island arise from extensive lowlands dotted with numerous ponds and wetlands. The largest of the three mountains is 438 m high.

Bedrock of the northern and central Shumagin Islands is of sandstone and conglomerate, some of which is volcanic and other plutonic rock, while the southern islands, including Simeonof, are of granodiorite (Burk 1965). Between 12,000 to at least 9,000 B.P., the Shumagin Islands formed a single, circular peninsula on the Shumagin Shelf extending southeastward from the Alaska Peninsula. The Shumagin Group became insular about 8,000 to 6,000 B.P. (Winslow 1992).

The climate of the Shumagin Islands is maritime with considerable wind and cool humid and cloudy conditions (Heusser 1983). There are no available long-period climatological records for the Shumagin Islands. However, the climatological records for a 42-yr period from Cold Bay (55°12' N, 162°42' W), approximately 180 km west northwest of Simeonof, indicate a mean annual temperature of 3.3°C and a mean annual precipitation is 871 mm

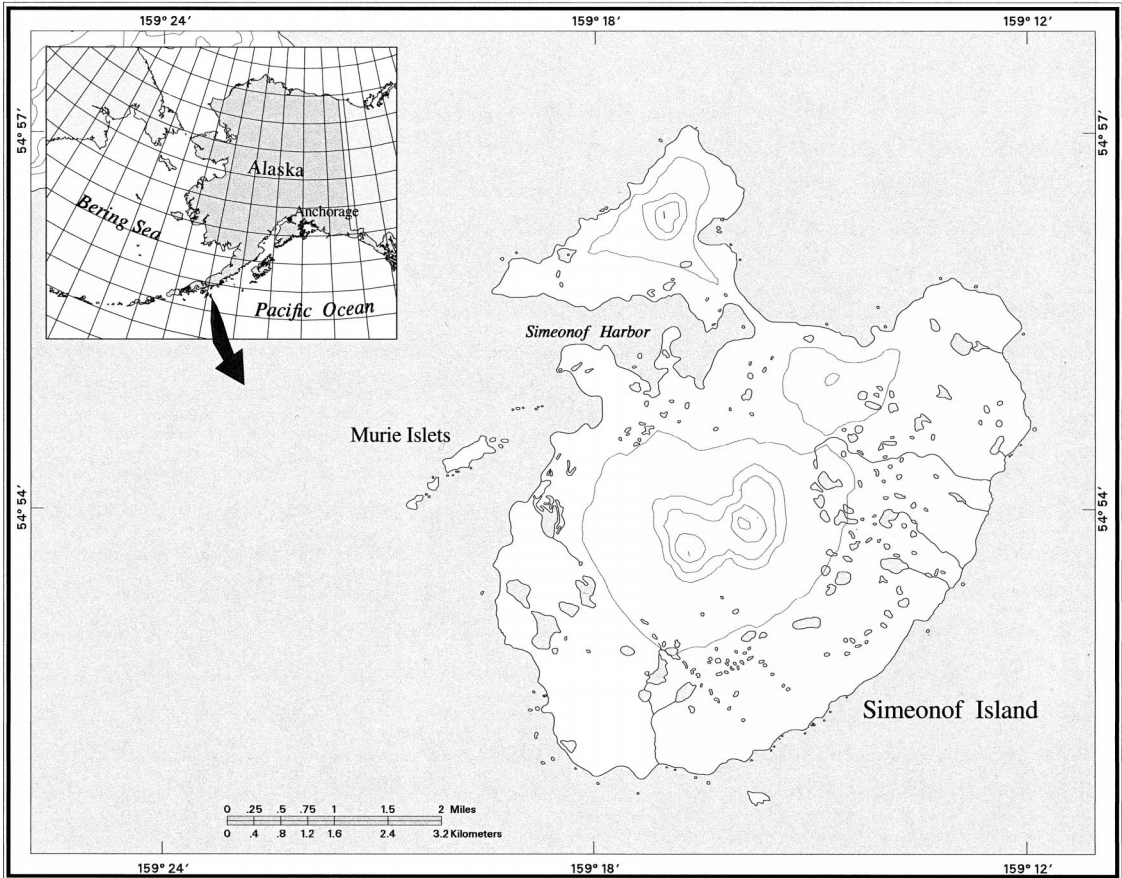


FIGURE 1. Location of Simeonof Island, Alaska, and the general geography of the island. Contour interval is 75 m. The elevation of the highest mountain is 508 m.

(Leslie 1989). Monthly maximum and minimum temperature variations average less than 12°C and the moderating effect of the ocean results in indistinct seasonal changes (Searby 1959). Using the ecoclimatic-phytogeographical system of Tuhkanen (1984), Cold Bay is in the northern boreal subzone, hyperoceanic (O_2) sector, and humid (h) province. Climatic data for a shorter period (7 yr) are available from Sand Point, Popof Island, Alaska (55°20' N, 160°30' W), approximately 100 km northwest of Simeonof Island; these data show a warmer and wetter climate: mean annual temperature, 4.7°C, and mean annual precipitation, 1,199 mm (Leslie 1989). According to the system of Tuhkanen (1984), Simeonof Island is located in the middle boreal subzone, hyperoceanic (O_2) sector, and humid (h) province. This indicates that Simeonof Island occurs in a warmer subzone than Cold Bay and accordingly has a longer growing season.

Soils of Simeonof Island are mainly Typic Cryandpts (Rieger et al. 1979). These are well-drained, silt loam soils with a dark-colored surface horizon ranging from seven to 37 cm thick. Most of these soils have a smeary, loam-textured subsoil developed over stratified sandy and cindery volcanic deposits. They support both grass-alder and shrubby tundra vegetation. Other soil types include Fluvaquentic Cryofibrists on very poorly drained organic soils in depressions and broad valley bottoms, Lithic Cryofolists on high ridges, and Typic Cryopsamments on ex-

cessively drained soils on coastal dunes. If disturbed, the latter are subject to wind erosion.

The vegetation of Simeonof Island is naturally treeless ('maritime tundra') and primarily consists of natural coastal cliff-, meadow-, and dune-vegetation and maritime and alpine dwarf shrub tundra vegetation. A variety of wetland communities and forb-, willow- and alder vegetation grow in sheltered sites. The zonal vegetation of Simeonof Island is *Empetrum nigrum* dwarf shrub heath. An overview of the vegetation is given in Daniëls et al. (1998).

METHODS

Lichen taxa.—Field studies were conducted during September 1981, July 1995, and July 1996. A total of 781 specimens were collected. Most determinations were made by the third author (JWT) and these are given first in the list of lichens; some others were determined by FJAD and these follow a semi-colon in the list. Voucher specimens are deposited in the University of Wisconsin Herbarium (WIS) and Westfälische Wilhelms-Universität (MSUN). Nomenclature follows Esslinger and Egan (1995) with Internet updates (Esslinger 1998).

Lichen collections were made in conjunction with other botanical studies during the three summer sampling periods. In 1981, our primary duty was to assess the range condition; in 1995, it was to monitor vegetation change



FIGURE 2. View of the northern portion of Simeonof Island, Alaska, from the alpine zone of a mountain in the center of the island. This image shows Simeonof Island composed of two separate main portions which remain connected by a sandy isthmus at the head of Simeonof Harbor. The elevation of the mountain on the north side of Simeonof Harbor is 311 m. Other islands of the Shumagin Islands are seen in the background.

following the cattle removal; and in 1996, to collect lichen and moss samples for elemental analysis in relation to air quality and to describe and classify heath plant communities. During each of the three periods, collections of macro- and microlichens were made to develop a baseline list of taxa as we explored the island and traveled on foot to randomly selected sample sites. In collecting lichens, an attempt was made to include a representative spectrum of habitat types over complex topographic gradients.

World distribution patterns are assigned to each taxon using the following geographic categories (many have combinations of these): A, arctic-alpine, north of the latitudinal treeline south into the mountains of the east (Adirondak and White Mountains) and west (Rocky Mountain and Cascade Ranges) (Thomson 1984); B, boreal, latitudinal treeline to the southern limit of the closed coniferous forest with some species also common in the temperate regions; C, coastal, present in a strip along the maritime coast and reflecting a maritime climate; M, amphi-Berian, western American Arctic and also in eastern Asia; W, widespread, present in many or most of the other categories; T, temperate; U, unclear distributions, either under study or too poorly known taxonomically to be confident of published maps. We assigned these phytogeographic categories based on Ahti (1980), Arup (1994), Culberson and Culberson (1968, 1978), Dibben (1980), Geiser et al. (1994), Gould (1994), Goward et al. (1994), Jahns (1981), Söchting and Olech (1995), Talbot et al. (1991, 1992, 1997), and Thomson (1984, 1997).

Lichen components of heath vegetation.—Oceanic crowberry (*Empetrum nigrum*) heaths are the dominant plant community type of Simeonof Island (Daniëls et al. 1998). To identify lichens of high presence within crowberry heaths, we described the diversity of lichen composition along mesotopographic gradients from lowlands to alpine. The study is based on a set of 30 relevés made

according to the Braun-Blanquet approach (Westoff & van der Maarel 1973). Plots were laid out in units of homogeneous crowberry heath vegetation so as to represent conspicuous environmental variation of the heath vegetation from lowlands to alpine. Relevé size, 25 m², approximately equaled the minimal area for comparable types (Westoff & van der Maarel 1973).

RESULTS

One hundred eighty-eight taxa were found in Simeonof Wilderness Area. We were unable to find any references in the published literature regarding the lichens of Simeonof. Thus, all 188 species are new reports for the wilderness area. Of nine species reported by previous authors from the Shumagin Islands (Cummings 1910; Rothrock 1884; Thomson 1984), five, *Micarea lignaria* (Ach.) Hedl. (= *Biatora milliaria* Fr.), *Nephroma bellum* (Sprengel) Tuck., *Pertusaria octomela* (Norman) Erichsen, *Physcia stellaris* (L.) Nyl., and *Ramalina farinacea* (L.) Ach., were not collected by the present authors. The remaining four species were collected by the present authors: *Mycoblastus alpinus* (Schaerer) Schauer (= *Heterothecium sanguinarium* (Fl.) Tuck. var. *alpinum* Fr.), *Ochrolechia tartarea* (L.) Mass. (= *Lecanora tartarea* (L.) Ach.), *Peltigera aphthosa* (L.) Willd., and *Sphaerophorus globosus* (Hudson) Vainio.

The distribution patterns for lichens from Simeonof Island are similar to those from Izembek

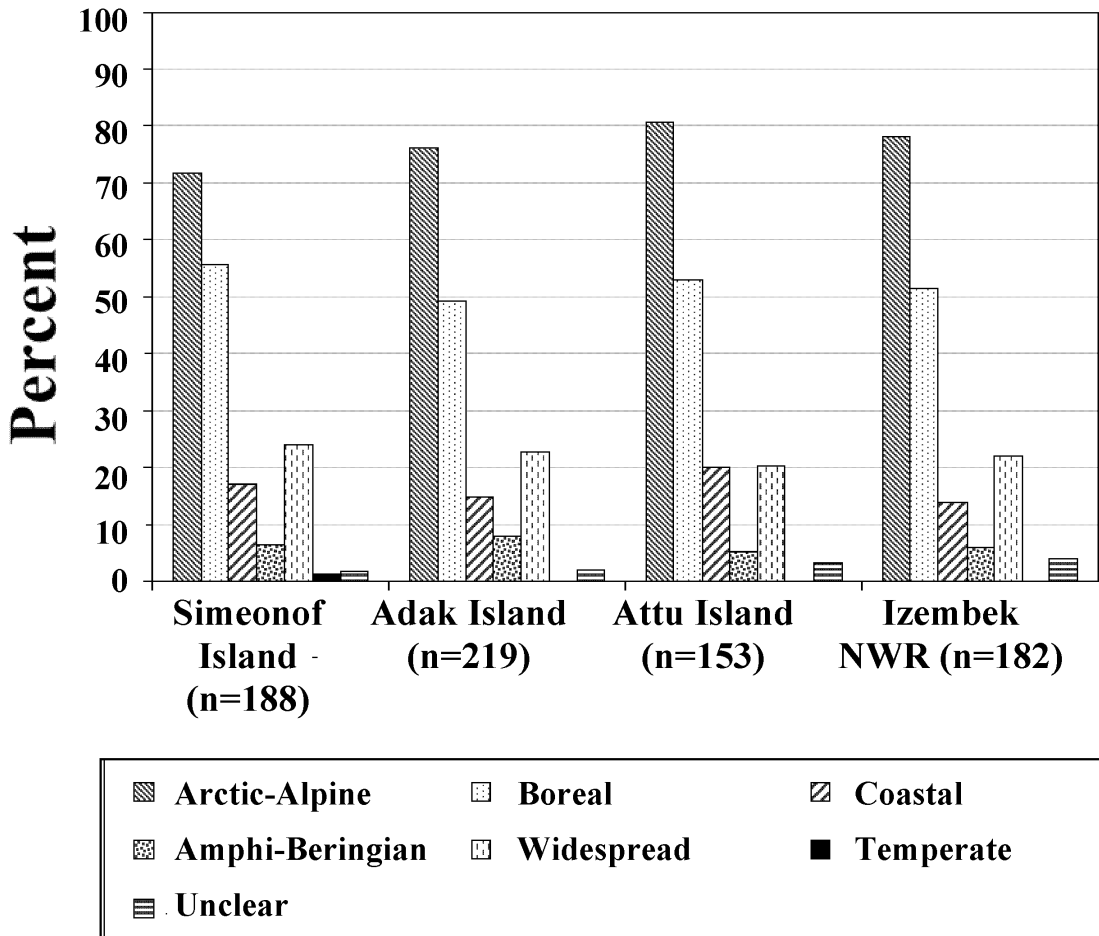


FIGURE 3. Geographic distribution patterns of lichens of Simeonof Island, Alaska in relation to other western Alaska sites. Percent values indicate the presence of each taxon occurring within each category; some taxa are shared among categories; n = total number of lichens (in parentheses) from Adak Island (Talbot et al. 1997), Attu Island (Talbot et al. 1991), and Izembek National Wildlife Refuge (NWR) (Talbot et al. 2000).

National Wildlife Refuge in the westernmost portion of the Alaska Peninsula that extends to the Aleutian Islands (Talbot et al. 2000), Adak Island in the central Aleutian Islands (Talbot et al. 1997), and Attu Island in the westernmost Aleutian Islands (Talbot et al. 1991) (Fig. 3). The lichens of these areas are characterized by wide-ranging, arctic-alpine and boreal species with a moderately well-represented coastal element. Amphi-Beringian species form a minor element.

The name of each taxon is followed by habitat information which is in turn followed by elevational range and collection number. Vascular plant taxonomy follows USDA, NRCS (2001). Collection numbers are of the first author (SST), except after a semicolon, where they are those of the fourth author (FJAD). This sequence is followed by the phylogeographic distribution class.

Alectoria nigricans (Ach.) Nyl., *Empetrum nigrum* heaths,

windswept knoll, on *Rhododendron camtschaticum* over rock outcrop, 93–170 m, 06-32, 07-55, 13-57, 14-67;070796-004.1. A.

Alectoria ochroleuca (Hoffm.) A. Massal., on rock and gravelly *Empetrum nigrum* tundra in along mountain ridge, 80–300 m, 040, 062A, 099, S1-1; 0796-005.1. A.

Allantoparmelia alpicola (Th. Fr.) Essl., on boulder in *Salix arctica* meadow, 230 m, 402. A.

Anaptychia setifera Räsänen, on talus at base of talus slope, 113 m, 169W. A, B.

Arthrorhaphis alpina (Schaerer) R. Sant., meadow above sea cliffs; 060796-491.1. A.

Asahinea chrysantha (Tuck.) Culb. & C. Culb., *Empetrum nigrum-Cladonia* heath on mountain ridge, on mosses over boulder, 200–280 m, 24-31, 344. A, M.

Bacidia sp., on coastal rock, 2 m, 153. U.

Baeomyces carneus (Retz.) Flörke, on earth in *Empetrum nigrum*-lichen heath; 070796-492.1. A.

Baeomyces rufus (Hudson) Rebt., in moist rock crevices, 200 m; 140796-022.1. B.

Brigantiaea fuscolutea (Dickson) R. Sant., on mosses at cliff base and over boulder face, 300–370 m, 376, 387. A.

Brodoa oroarctica (Krog) Goward, on boulder in *Salix barclayi* thicket, 60 m, 142. A.

- Bryocaulon divergens* (Ach.) Kärnefelt, *Empetrum nigrum*-moss and *Empetrum nigrum*-*Cladonia* tundra of upper mountain slope, boulder, 225–410 m, 105, 207, 329, 23–39, 24–32, 26–43, 27–43. B.
- Bryoria capillaris* (Ach.) Brodo & D. Hawksw., on boulder in *Heracleum maximum*-*Chamerion angustifolium* meadow, 100–170 m, 322; 070796-493.1. B.
- Bryoria nitidula* (Th. Fr.) Brodo & D. Hawksw., on mineral soil and *Empetrum nigrum* twigs, *Empetrum nigrum*-*Cladonia* heath, on boulders and rock cliffs, 170–300 m, 041, 064A, 07-39, 13-47, 30-32, 319, 361; 0707796-027.1, 0707796-027.2, 140796-027.3. A.
- Bryoria tenuis* (E. Dahl) Brodo & D. Hawksw., *Empetrum nigrum* dwarf willow heath, on mosses over boulder in *Salix barclayi* thicket, 60–230 m, 14-53, 149, 404. B, C.
- Caloplaca scopularis* (Nyl.) Lettau, on coastal rock, 2 m, 312A. A, B, C.
- Cetraria aculeata* (Schreber) Fr., *Empetrum nigrum*-dwarf willow heath, on mosses over rock outcrops, 113–300 m, 14-64, 175, 374. A.
- Cetraria ericetorum* Opiz, *Salix arctica*-feathermoss hummock in wet gravelly fen, *Empetrum nigrum*-*Cladonia* and *Empetrum nigrum*-moss heath, on mosses, 20–440 m, 005, 06-56, 07-38, 107A, 112, 123, 213, 341A, 398, 13-46, 14-39, 23-35, 24-35, 24-38, 25-40, 26-25, 26-31, 27-22. A, B.
- Cetraria islandica* (L.) Ach., *Empetrum nigrum*-*Salix arctica* heath of upper mountain slope, 250 m, 119; 160996-068.1. A, B.
- Cetraria laevigata* Rass., beneath boulder on upper mountain slope, *Empetrum nigrum* heath, 400 m, 271; 070796-495.1, 130796-170.8, 0796-495.3. A, B, M.
- Cetraria muricata* (Ach.) Eckfeldt, on mosses in *Anemone narcissiflora* meadow, *Empetrum nigrum*-*Arctostaphylos uva-ursi* heath, *Empetrum nigrum*-moss heath, on mosses over boulder, epiphytic on *Alnus viridis*, 45–407 m, 071, 405, 13-55, 23-43, 25-39, 26-46, S15-8; 140796-071.1, 190796-071.2, 160796-071.3, 070796-071.4, 120796-071.5. C.
- Cetraria nigricans* (Retz.) Nyl., on boulder ridge in dwarf willow-moss tundra, *Empetrum nigrum*-*Arctostaphylos uva-ursi* heath, 225–260 m, 134, 23-36. A.
- Cetrariella delisei* (Schaerer) Kärnefelt & Thell, on rock in *Empetrum nigrum* heath, 400 m; 200796-066.1. A.
- Cetrelia alaskana* (Culb. & C. Culb.) Culb. & C. Culb., on boulder on mountain ridge, 250–300 m, 042, 318. A, M.
- Cetrelia cetrarioides* (Duby) Culb. & C. Culb., on mosses under cliff overhang below mountain ridge on south-facing slope, 250 m, 072. B (disjunctly circumpolar; montane, Europe, E. Asia, Appalachians).
- Cladina arbuscula* (Wallr.) Hale & Culb., on mosses over boulder in *Salix arctica*-*Empetrum nigrum* heath, 200–477 m, 349A; 140796-083.1, 110796-083.2, 160796-083.3, 0796-082.4. A, B.
- Cladina mitis* (Sandst.) Hustich, on mosses in *Empetrum nigrum*-*Cladina* heath, *Betula nana*-*Sphagnum* poor fen 10–312 m, 003, 003A, 004, 009, 010, 012, 107, 01-25, 02-45, 03-45, 06-57, 21-33, 30-19. A, B, W.
- Cladina portentosa* (Dufour) Follmann subsp. *pacifica* (Ahti) Ahti, *Empetrum nigrum*-*Arctostaphylos uva-ursi* heath, 200 m, 30-29; 110796-497.1, 090796-497.2, 060797-497.3, 0796-497.4, 0796-497.5, 0796-497.6. C (NW North America).
- Cladina rangiferina* (L.) Nyl., on mosses in *Betula nana* poor fen, *Empetrum nigrum*-*Vaccinium vitis-idaea* heath, on mosses over boulder, 14–250 m, 183, 342, 6017, S3-1, S3-2; 060796-164.1, 190796-164.2, 110796-164.3, 060796-164.4, 090796-164.5, 0796-164.6. A, B, W.
- Cladina stellaris* (Opiz) Pouz. & Vezda, *Empetrum nigrum* heath, bog, 20–400 m; 100796-172.1, 070796-172.2, 190796-172.3. A, B.
- Cladonia amaurocraea* (Flörke) Schaerer, on mosses over cliff face, wind-exposed heath, 230–300 m, 131, 369; 190796-080.1, 120796-080.2, 070796-080.3, 0796-080.4. A, B.
- Cladonia bellidiflora* (Ach.) Schaerer, on mosses over boulder in *Rubus spectabilis* thicket and *Rhododendron camtschaticum* heath, *Empetrum nigrum* heath, 15–330 m, 075, 091, 092, 109A, 125, 179, 6004, S3-5; 070796-088.4, 180796-088.5, 200796-088.6, 0796-088.7. A, B, C.
- Cladonia borealis* S. Stenroos, on mosses in *Empetrum nigrum*-*Arctostaphylos uva-ursi* heath, *Rubus spectabilis* meadow, on mossy rocky, 50–250 m, 066, 073, 199, 279, 339; 140796-089.1, 070796-089.2, 070796-089.3, 120796-089.4, 140796-089.5, 160796-089.6, 0796-089.7. A, B, W.
- Cladonia cariosa* (Ach.) Sprengel, on rock along coast, meadow above sea cliffs, 5 m; 060796-093.1, 240796-093.2. A, B, W.
- Cladonia carneola* (Fr.) Fr., on spruce driftwood along coast, 2 m; 0796-094.1. A, B, W.
- Cladonia chlorophaea* (Sommerf.) Sprengel s.str., meadow above sea cliffs, on driftwood logs and wood of old ranch building, coastal rocks in epilittoral zone, 2–200 m; 060796-098.1, 120796-098.2, 160796-098.3, 060796-098.4, 180796-098.5. W.
- Cladonia coccifera* (L.) Willd., *Empetrum nigrum*-*Cladina* hummocky heath, *Empetrum nigrum*-*Arctostaphylos uva-ursi* heath, 30–170 m, 02-31, 06-69, 07-51, 10-35. A, B, W.
- Cladonia coniocraea* (Flörke) Sprengel, *Empetrum nigrum* heath, 100 m; 140796-112.1. B.
- Cladonia cornuta* (L.) Hoffm. subsp. *cornuta*, on earth between rocks, on sandy sea cliff, 20–140 m; 140796-115.2, 070796-115.3. A, B, W.
- Cladonia cornuta* subsp. *groenlandica* (E. Dahl) Ahti, on earth in middle mountain slope, *Empetrum nigrum* heath, 30–200 m; 070796-117.1, 100796-117.2. A, B.
- Cladonia crispata* (Ach.) Flotow, *Empetrum nigrum*-*Cladina* hummocky heath, 30 m, 02-46. W.
- Cladonia crispata* (Ach.) Flotow subsp. *cetrariformis* (Delise) Vainio, *Empetrum nigrum* heath, on earth below summit, 150–400 m; 190796-119.2, 120796-119.1, 0796-119.3. A, B.
- Cladonia cyanipes* (Sommerf.) Nyl., *Empetrum nigrum* heath, on moss hummock in *Betula nana* poor fen, 5–25 m, 087, 184. A, B.
- Cladonia decorticata* (Flörke) Sprengel, on rock in *Empetrum nigrum* heath, 120 m, 14-81. B.
- Cladonia deformis* (L.) Hoffm., on mosses over moist rock of cliff face, on mosses in poor fen, *Empetrum nigrum* heath, coastal driftwood log, 2–230 m, 125, 180, 182, 2046, 13-62. A, B, W.
- Cladonia ecmocyna* Leighton, *Empetrum nigrum*-*Arctostaphylos uva-ursi* hummocky heath, on mosses in *Empetrum nigrum*-dwarf willow heath, 30–120 m, 11-37, 14-83; 070796-128.1, 0796-128.2. A, B, W.
- Cladonia fimbriata* (L.) Fr., *Empetrum nigrum*-*Cladina* hummocky heath, on mosses at cliff base, on mosses over rock, *Leymus mollis* sandy beach, 5–300 m, 086, 368, 02-29, 22-36, S3-4; 060796-129.1, 070796-129.1, 100796-129.3, 140796-129.4. A, B, W.
- Cladonia furcata* (Hudson) Schrader, *Empetrum nigrum*

- heath, 70–300 m; 140796–134.1, 140796–129.4, 0796–136.3, 0796–134.4. B.
- Cladonia gracilis* (L.) Willd. subsp. *gracilis*, *Empetrum nigrum* heath, on mosses over boulder and over mosses in *Empetrum nigrum*-dwarf willow heath, 5–400 m, 038, 089, 401, 06–77, 09–58, 10–22, 13–44, 13–45, 20–26, 53–3. A, B, W.
- Cladonia gracilis* subsp. *vulnerata* Ahti, over mosses in dwarf willow-*Empetrum nigrum* heath of upper mountain slope, 250 m, 117. A, B.
- Cladonia luteoalba* Wheldon & A. Wilson, on earth, 200 m, 190796–494.1. B (interrupted circumpolar).
- Cladonia maxima* (Asah.) Ahti, *Empetrum nigrum*-*Chamerion angustifolium* hummocky heath, on mosses over boulder, *Calamagrostis canadensis*-*Salix arctica* meadow, 10–200 m, 176, 185, 01–27, 02–30, 05–33, 349, 01–34, 05–41, 30–35; 070796–136.1, 0796–136.3, 070796–496.4, 0796–496.5, 0796–496.6, 140796–496.1, 120796–496.2, 140796–496.3, 160796–136.2. A, B, C.
- Cladonia merochlorophaea* var. *novochlorophaea* Sipman, *Empetrum nigrum* heath, 200 m; 120796–150.1. A, B.
- Cladonia pleurota* (Flörke) Schaerer, on mosses over moist rock of cliff face, 230 m, 127A. A, B, W.
- Cladonia phyllophora* Hoffm., on mosses over rocks, 50–100 m; 160796–155.1, 100796–155.2. A, B.
- Cladonia pocillum* (Ach.) Grognot, epiphytic on base of *Alnus viridis* trunk, 50 m, 081. A.
- Cladonia pyxidata* (L.) Hoffm., on earth in *Empetrum nigrum* heath, 20 m; 160796–162.1. A, B, W.
- Cladonia ramulosa* (With.) J. R. Laundon, *Empetrum nigrum* heath, on earth near sea, 5–200 m; 190796–163.1, 140796–163.2. B, T.
- Cladonia scabriuscula* (Delise) Nyl., on mosses over boulder in *Salix arctica*-*Empetrum nigrum* heath, 200 m, 347. B, C, W.
- Cladonia squamosa* Hoffm., *Empetrum nigrum*-*Cladina* hummocky heath, on mosses over rocks, *Calamagrostis canadensis*-*Salix arctica* meadow, 30–300 m, 276, 338, 371, 380, 6017A, 02–39, 09–53; 160796–170.1, 060796–170.2, 070796–170.3, 140796–170.4, 120796–170.5, 140796–170.6, 060796–170.7, 130796–170.8, 0796–170.9. A, B, W.
- Cladonia stricta* (Nyl.) Nyl., *Empetrum nigrum*-*Cladina*/moss hummocky heath, on rock in *Empetrum nigrum*-dwarf willow heath, on humus, 30–170 m, 084, 02–37, 10–37, 14–80, 20–25, 21–23. A.
- Cladonia subfurcata* (Nyl.) Arnold, *Empetrum nigrum*-*Cladina* heath, on moss hummock in *Betula nana* poor fen, 25–93 m, 184A, 06–68. A, B, C.
- Cladonia uncialis* (L.) F. H. Wigg., *Empetrum nigrum* heath, *Salix arctica*-moss poor fen, 20–200 m, 013; 060796–187.1, 070796–187.2, 190796–187.3, 0796–187.4, 0796–187.5, 120796–186.1. A, B, W.
- Collema tenax* (Sw.) Ach., *Empetrum nigrum*-*Salix arctica* hummocky heath, on mosses at cliff base, 107–300 m, 372, 09–41. A, B, W.
- Cornicularia divergens* Ach., *Empetrum nigrum* heath, 100 m; 0796–197.1. A.
- Ephebe lanata* (L.) Vainio, epiphytic on moss hummock, 150 m, 6023. A.
- Flavocetraria cucullata* (Bellardi) Kärnefelt, *Salix arctica*-feathermoss hummock in wet gravelly fen, *Empetrum nigrum*-moss heath, on mosses over boulder, 20–200 m, 341B, 006, 12–34; 060796–065.1, 160796–065.2. A, B.
- Fulgensia bracteata* (Hoffm.) Räsänen, on wooden ranch house shingles surrounded by *Empetrum nigrum*-*Salix arctica* hummocky heath, 6 m, 268B. A, B, W.
- Fuscopannaria praetermissa* (Nyl.) P. M. Jørg., on moist cliffs, 100 m; 070796–001B.1. A, B.
- Hypogymnia physodes* (L.) Nyl., over mosses on rocks, 400 m; 140796–225.2. W.
- Hypogymnia subobscura* (Vainio) Poelt, on mosses over rock in *Salix arctica*-*Rhododendron camtschaticum* heath, 250 m, 032. A.
- Hypogymnia vittata* (Ach.) Parrique, moist rock of cliff face, on mosses over rocks, 230–300 m, 122, 363; 160796–228.1, 160796–228.2. A.
- Lecanora beringii* Nyl. (“behringii”), on coastal boulder in splash zone, 2 m, 160. A.
- Lecanora epibryon* (Ach.) Ach., over mosses and *Empetrum nigrum* in *Empetrum nigrum* heath of upper mountain slope, 330 m, 111. A.
- Lecanora orae-frigidae* R. Sant., xylicolous on wooden fence, 13 m, 137, 138. A, B.
- Lecanora symmicta* (Ach.) Ach., epiphytic on *Alnus viridis* on south-facing lower mountain slope, 50 m, 079. B.
- Lecidea lapicida* (Ach.) Ach., on boulder on mountain ridge and *Angelica lucida*-*Carex macrochaeta* meadow, on stones in gravelly tundra of upper mountain slope, 170–400 m, 046, 108, 209A, 330, 07–80X. A, B, C.
- Lecidea plebeja* Nyl., on wooden ranch house shingles surrounded by *Empetrum nigrum*-*Salix arctica* hummocky heath, 6 m, 268C. B (NA & Europe).
- Lecidella anomaloides* (A. Massal.) Hertel & R. Kilius (= *Lecidea goniophila* auct.), on boulder on mountain ridge, 250 m, 050. U.
- Lecidella stigmatea* (Ach.) Hertel & Leuckert, epilithic on boulder mid-slope mountain canyon, 170 m, 6030. A.
- Leptogium corniculatum* (Hoffm.) Minks, on mosses over wind protected rock in *Geranium erianthum* meadow, on rock outcrop, on mosses over moist shady rock of cliff face, 113–370 m, 024, 128, 171, 203; 070796–269.1. A & B (w NA & w e Eurasia), C.
- Lobaria* cf. *isidioides* (Müll. Arg) Vainio, epiphytic on *Alnus viridis*, 40 m, S15–6. U (Not in NA).
- Lobaria hallii* (Tuck.) Zahlbr., epiphytic on *Alnus viridis* in *Alnus viridis* thicket, 40–66 m, S10–2, S15–2, S15–4, S15–5; 140796–498.1. C (disjunct: w NA & Greenland)
- Lobaria kurokawae* Yoshim., on mosses over moist shaded boulder in *Carex* meadow, 370 m, 206. M.
- Lobaria limitata* (Ach.) Rabenh., *Empetrum nigrum*-moss heath from sea level to upper mountain slopes, on mosses over coastal cliff, 2–280 m, 021, 313, 334, 357, 24–44, S3–7; 120796–499.1, 190796–499.2, 140796–499.3, 060796–499.4, 070796–499.5, 160796–499.6, 0796–499.7. A, C.
- Lobaria scrobicularia* (Scop.) DC., on willow, 70 m; 0796–278.4. B, C.
- Melanelia elegantula* (Zahlbr.) Essl., epiphytic on *Alnus viridis* in *Alnus viridis* thicket, 100 m, 190. A, B.
- Melanelia hepatizon* (Ach.) Thell, on rock in *Empetrum nigrum*-moss tundra, *Geranium erianthum* meadow, *Salix barclayi*, and *Angelica lucida*-*Carex macrochaeta* meadow, 60–310 m, 030, 106, 135, 145, 146, 178, 328. A, B, W.
- Melanelia stygia* (L.) Essl., on boulder on stone-stripe mountain ridge, 250 m, 056, 059. A, B.
- Mycoblastus alpinus* (Schaerer) Schauer, on boulder on mountain ridge in *Arctostaphylos alpina*-*Vaccinium vitis-idaea* heath, 200–250 m, 049, 332. A, B. Reported by Rothrock (1884) as *Heterothecium sanguinarium* (Fl.) Tuck. var. *alpinum* Fr. for the Shumagin Islands.
- Nephroma arcticum* (L.) Torss., *Loiseleuria procumbens*-

- Carex* heath, on boulder, *Carex*-moss meadow, 300–400 m, 186, 320, 395; 140796–288.1. A, B.
- Nephroma parile* (Ach.) Ach., epiphytic on alder, *Empetrum nigrum-Salix arctica* hummocky heath 20–50 m 083, 09–39. B.
- Ochrolechia frigida* (Sw.) Lyngé, *Empetrum nigrum-Cladina* hummocky heath, on boulder on mountain ridge, moss-*Empetrum nigrum* tundra, on mosses in *Empetrum nigrum* heath, 20–440 m, 008, 052, 057, 058, 063A, 064B, 208, 03–46, 06–64, 09–37, 25–45, 27–23; 070796–296.1, 070796–296.2, 060796–296.3, 190796–296.4, 140796–296.5, 190796–296.6, 060796–296.7. A.
- Ochrolechia frigida* fo. *gonatodes* (Ach.) Lyngé, epilithic on boulder in *Empetrum nigrum* heath, 200 m, 340. A.
- Ochrolechia subplicans* (Nyl.) Brodo, on coastal boulder in splash zone, 2 m, 164. A.
- Ochrolechia tartarea* (L.) A. Massal., on boulder in *Salix arctica-Empetrum nigrum* heath, 200 m, 345B. A, B, C. Reported by Cummings (1910) as *Lecanora tartarea* (L.) Ach. for the Shumagin Islands.
- Ochrolechia upsaliensis* (L.) A. Massal., on humus over boulder, 300 m, 316. A.
- Ochrolechia xanthostoma* (Sommerf.) K. Schmitz & Lumbsch, epiphytic on *Salix glauca* and *Alnus viridis*, 20–50 m, 017, 077, 082. A, B, C.
- Ophioparma lapponica* (Räsänen) Hafellner & R. W. Rogers, on boulder on mountain ridge and in *Arctostaphylos alpina-Vaccinium vitis-idaea* heath, 200–250 m, 051, 331, 353. A.
- Omphalina hudsoniana* (H. S. Jenn.) H. E. Bigelow, on soil on hillside, 200 m; 1140796–500.220796–500.1., B.
- Pannaria conoplea* (Ach.) Bory, on mosses and lichens over boulder in *Salix arctica-Empetrum nigrum* heath, 200 m, 350. B.
- Pannaria pezizoides* (Weber) Trevisan, *Empetrum nigrum-Cladina* heath, on mosses over rock face in cliff chimney, on soil in meadow above sea cliffs, 93–300 m, 06–58, 365; 060796–306.1. A, B, C.
- Parmelia fraudans* (Nyl.) Nyl., epiphytic on *Alnus viridis* in *Alnus viridis* thicket and on introduced *Picea sitchensis*, 100–265 m, 191, 265. A, B.
- Parmelia omphalodes* (L.) Ach., on rock in *Empetrum nigrum-Salix arctica* heath, on wind-protected boulder on mountain ridge, talus, *Empetrum nigrum-Arctostaphylos alpina* heath, epiphytic on *Alnus viridis*, *Rhododendron camtschaticum*, and mosses, 47–300 m, 036, 048, 053, 116, 169, 177, 23–58, 270, 272, 346, 375, 381; 140796–323.1. A, B.
- Parmelia saxatilis* (L.) Ach., on rock outcrop in mid-slope mountain canyon wall, boulders in *Salix barclayi* thicket, *Carex* meadows, *Heracleum maximum-Chamerion angustifolium* meadow, *Salix arctica-Carex* meadows, epiphytic on *Alnus viridis*, epilittoral rocks, on old wood of ranch house, 6–370 m, 097, 143, 170, 173, 202, 269, 317, 326, 406A, S15–1, S9–1; 060796–326.1, 180796–326.2, 0796–326.3. A, B, W.
- Parmelia squarrosa* Hale, on boulder in *Geranium erianthum* meadow, 250 m, 029. B.
- Parmelia sulcata* Taylor, epiphytic on *Salix glauca*, *Alnus viridis*, and introduced *Picea sitchensis*, on boulder in *Geranium erianthum* meadow and on mosses over boulder, coastal driftwood log, *Empetrum nigrum* heath, *Rubus spectabilis-Calamagrostis canadensis* meadow, on wood of old ranch house, 2–250 m, 019, 027, 078, 165, 196, 253, 257, 267, 337, B3, C1, S10–3, S15–3; 120796–331.4, 180796–331.5. A, B, W.
- Peltigera aphthosa* (L.) Willd., *Empetrum nigrum* heaths, *Alnus viridis* thickets, on mosses, 12–370 m, 02–16, 04–30, 05–42, 07–53, 08–28, 09–35, 090, 095, 11–28, 12–31, 13–38, 168W, 21–29, 23–42, 25–43, 29–26, S10–1, S3–8; 070796–335.1, 120796–335.2, 140796–335.3, 100796–335.4, 0796–335.5. Reported by Thomson (1984) for the Shumagin Islands. A, B, W.
- Peltigera britannica* (Gyelnik) Holt-Hartw. & Tønsgberg, on mossy boulder in *Heracleum maximum-Chamerion angustifolium* meadow, *Empetrum nigrum* heath, on mosses over rock face in cliff chimney, 100–300 m, 323, 335, 362, 366A, 370. C, M.
- Peltigera canina* (L.) Willd., *Empetrum nigrum* heaths, on cliffs near sea, on mosses, 30–225 m, 06–78, 14–68, 21–25, 22–37, 23–57; 070796–336.1, 200796–336.3, 160796–336.4, 060796–339.5. A, B, W.
- Peltigera collina* (Ach.) Schradler, epiphytic on *Salix glauca*, *Alnus viridis*, and *Sambucus racemosa*, *Empetrum nigrum-Salix arctica* heath, coastal driftwood log, 20–200 m, 016, 020, 080, 09–46, 09–56, 174, 359, 2045, 6021. A, B.
- Peltigera didactyla* (With.) J. R. Laundon, *Leymus mollis* sandy bench, 5 m, 085. A, B, W.
- Peltigera leucophlebia* (Nyl.) Gyelnik, on mosses in meadows, 113–250 m 070, 167; 140796–341.1. A, B, W.
- Peltigera malacea* (Ach.) Funck, *Empetrum nigrum-Arctostaphylos uva-ursi* hummocky heath in depression, 30 m, 11–80. A, B, W.
- Peltigera membranacea* (Ach.) Nyl., *Empetrum nigrum* heaths, on mosses over wind-protected rock, epiphytic on *Sambucus racemosa*, 5–370 m, 01–33, 023, 04–26, 05–35, 08–19, 09–23, 10–38, 11–41, 12–32, 13–35, 159, 201, 28–27, 29–29, 30–22, 30–34A, 321, 367, 6020, S3–6, 069, 074; 0796–343.1, 0796–343.2, 0796–343.3. B, C, W.
- Peltigera neckeri* Müll. Arg., on cliffs along the coast, *Leymus mollis* meadow, 4 m; 060796–002B.1, 240796–002B.2. B.
- Peltigera polydactylon* (Necker) Hoffm., *Empetrum nigrum* heaths, on mosses over moist cliff, 225–440 m, 23–56, 24–45, 27–53, 378, 13–63. B, C, W.
- Peltigera rufescens* (Weiss) Humb., *Rubus spectabilis-Calamagrostis canadensis* thicket, *Leymus mollis* meadow, 2–40 m, B1; 240796–346.1. A, B.
- Peltigera scabrosa* Th. Fr., on mosses over moist rock of cliff face, *Empetrum nigrum* heaths, 170–370 m, 093, 121, 124, 126, 129, 131A, 25–49, 25–51, 366; 140796–347.1, 100796–347.2, 120796–347.3. A, B, C, W.
- Peltigera scabrosella* Holt-Hartw., on mosses, 65 m; 140796–003B.1. A, B (interrupted circumpolar).
- Peltigera venosa* (L.) Hoffm., on eroding sea bluffs on mineral soil and mosses, 4 m, 273. A, B.
- Pertusaria alaskensis* Erichsen, on humus over boulder, 300 m, 315. M.
- Pertusaria bryonantha* (Ach.) Nyl., *Empetrum nigrum-Cladina* heath, 170 m, 07–58. A.
- Pertusaria coriacea* (Th. Fr.) Th. Fr., on boulder in *Empetrum nigrum*-moss tundra, *Empetrum nigrum*-dwarf willow heath, 120–310 m, 106A, 14–65, 345A. A.
- Pertusaria dactylina* (Ach.) Nyl., *Empetrum nigrum-Cladina* heath, 93 m, 06–71. A.
- Pertusaria panyrga* (Ach.) A. Massal., epiphytic on *Salix glauca*, on rock, 20–53 m, 018, 197A. A.
- Pertusaria subobduces* Nyl., epiphytic on *Alnus viridis*, 100–200 m, 187, 358. A.
- Physcia adscendens* (Fr.) H. Olivier, on introduced *Picea sitchensis* surrounded by *Empetrum nigrum-Salix arctica* hummocky heath 6 m, 259, 263. A, B, W.
- Physcia caesia* (Hoffm.) Furnr., on rocks, gravestone of John C. Smith (1815–1917), epiphytic on *Picea sitchensis*, on wooden ranch house, on driftwood, 2–300 m,

- 136, 152, 154, 162, 252, 254, 262, 266, 311, 314, 336; 120796–370.1. A, B, W.
- Physconia muscigena* (Ach.) Poelt var. *muscigena*, meadow above sea cliffs, 15 m; 060796–004B.1. A, B, W.
- Pilophorus acicularis* (Ach.) Th. Fr., on rocks in *Geranium erianthum* meadow, *Empetrum nigrum* heaths, *Rhododendron camtschaticum*-moss heath, *Calamagrostis canadensis-Salix arctica* meadow, 93–250 m, 022, 06–90X, 118, 118A, 274, 6003, 6018. C, M.
- Pilophorus robustus* Th. Fr., on stones and rocks, 200 m; 160796–005B.1, 160796–005B.2, 140796–005B.3. A.
- Placopsis gelida* (L.) Lindsay, over rock in *Empetrum nigrum-Carex* heath of upper mountain slope, on soil, 300 m, 115; 180796–384.1. A, B, C, W.
- Platismatia glauca* (L.) Culb. & C. Culb., on introduced *Picea sitchensis*, on boulders near summit, 6–410 m, 261; 190796–388.1. B.
- Platismatia lacunosa* (Ach.) Culb. & C. Culb., epiphytic on *Alnus viridis*, on rock in *Empetrum nigrum* heath, 33–100 m, 195, S17–2; 190796–006B.1, 070796–006B.2, 060796–006B.3, 060796–006B.4. C (NA endemic).
- Porpidia flavocaerulescens* (Hornem.) Hertel & A. J. Schwab, on rock in *Empetrum nigrum* heaths along mountain ridge, 250–370 m, 063, 114, 383. A.
- Porpidia grisea* Gowan, epilithic on stones and boulders in *Empetrum nigrum* gravelly heath of upper-mountain slope, also on boulder in *Arctostaphylos alpina-Vaccinium vitis-idaea* heath, 200–330 m, 110, 333. A, B.
- Pseudephebe pubescens* (L.) Choisy, on boulder in *Geranium erianthum* meadow and mountain ridges, also on rock in *Eriophorum angustifolium* peatland, 3–370 m, 026, 047, 382, S5–1; 190796–395.1, 070796–395.2. A, B.
- Pseudocypbellaria anomala* Brodo & Ahti, epiphytic on *Alnus viridis*, on rock in *Empetrum nigrum-Arctostaphylos uva-ursi* hummocky heath, 12–100 m, 076, 189B, 193, 277; 190796–008B.1, 190796–008B.2. C (w NA endemic).
- Pseudocypbellaria anthraspis* (Ach.) H. Magn., on mosses over rock in *Salix arctica-Rhododendron camtschaticum* heath, on mosses in *Empetrum nigrum* heath, 250 m, 033, 037, 067. C (w NA endemic).
- Pseudocypbellaria crocata* (L.) Vainio, epiphytic on *Alnus viridis*, 40–100 m, 189A, S15–7; 190796–007B.1. B (incompletely circumpolar).
- Psoroma hypnorum* (Vahl.) Gray, *Empetrum nigrum-Arctostaphylos uva-ursi/Cladina* heath, epiphytic on *Salix glauca*, 45 m, 13–64, 360; 140796–009B.1. A, B, C.
- Ramalina almqvistii* Vainio, on rocks and boulders in heaths, meadows, and ridges, 80–250 m, 044, 034, 324, S1–2. M.
- Ramalina scoparia* Vainio, xylicolous on wooden fence, 13 m, 140. M.
- Rhizocarpon anseris* Lynge, on rock on mountain ridge in *Loiseleuria procumbens*-moss heath, 400 m, 209B. A.
- Rhizocarpon disparum* (Hepp) Müll. Arg., on boulder in *Heracleum maximum-Chamerion angustifolium* meadow, on rock cliff, 100–300 m, 325, 370A. A.
- Rhizocarpon eupetraeoides* (Nyl.) Blomb. & Forss., boulder face, 370 m, 385. A.
- Rhizocarpon geographicum* (L.) DC., on boulders, 200–250 m, 045, 352. A, B, W.
- Rhizocarpon obscuratum* (Ach.) A. Massal., boulder face, 370 m, 386. A, B, C.
- Rhizocarpon polycarpum* (Hepp) Th. Fr., on rock in *Carex*-moss meadow, 400 m, 397. A, B.
- Siphula ceratites* (Wahlenb.) Fr., on rocks in *Arctostaphylos alpina-Vaccinium vitis-idaea* heath, 200 m, 331A. A.
- Solorina crocea* (L.) Ach., *Empetrum nigrum* gravelly tundra of upper mountain slope, on mineral soil on coastal wind-eroded terrace, 8–300 m, 104, 275. A, C.
- Sphaerophorus fragilis* (L.) Pers., *Empetrum nigrum-Salix arctica* hummocky heath, on rocks in heaths and *Eriophorum angustifolium* peatland, 3–280 m, 09–57, 24–80, S5–2; 070796–101B.1. A.
- Sphaerophorus globosus* (Hudson) Vainio, on hummock in wet gravelly fen, on boulder on mountain ridge, 20–250 m, 011, 043; 070796–423.1, 060796–423.2, 140796–423.3. Reported by Cummings (1910) and Rothrock (1884) for the Shumagin Islands (Little Konuiji Island). A.
- Stereocaulon alpinum* Funck, *Empetrum nigrum* tundra of upper mountain slope, on mosses in *Fragaria chiloensis-Empetrum nigrum* meadow, 5–00 m, 102, 158. A.
- Stereocaulon arenarium* (Savicz) Lamb, on rock outcrop, boulder on mountain ridge, on rock in gravelly fen streamlet, on mosses over boulder, 20–400 m, 001, 007, 028, 035, 039, 055, 060, 062, 094, 098, 103, 109, 198, 210, 351, 354, 384, 389, 394, 408. M.
- Stereocaulon coniophyllum* Lamb, on rock in *Empetrum nigrum* heath, 30 m, S9–3. A.
- Stereocaulon grande* (H. Magn.) H. Magn., on mosses in *Empetrum nigrum*-moss heath, on gravelly tundra of upper mountain slope, 250–300 m, 031, 101. A, B.
- Stereocaulon intermedium* (Savicz) H. Magn., on mosses over cliff face, on rock in *Empetrum nigrum* heath, 113–230 m, 127, 130, 14–82, 172, 355. C, M.
- Stereocaulon paschale* (L.) Hoffm., *Empetrum nigrum* heaths, on mosses in *Empetrum nigrum* heaths, *Carex macrochaeta*-moss meadow, 14–440 m, 06–54, 07–46, 09–36, 12–48, 13–23, 14–34, 214, 23–41, 24–21, 25–56, 27–30, 396, 400, S3–9; 0796–437.1, 0796–437.2. A, B, W.
- Stereocaulon saxatile* H. Magn., on boulder in *Angelica lucida-Carex macrochaeta* meadow, 100 m, 327. A, B.
- Stereocaulon subcoralloides* (Nyl.) Nyl., over rock in *Empetrum nigrum* heath of upper mountain slope, on mosses over rock face in cliff chimney, 300–330 m, 113, 364. B.
- Stereocaulon tomentosum* Fr., on mosses in *Empetrum nigrum-Arctostaphylos uva-ursi* heath below mountain ridge, 250 m, 068. A, B.
- Sticta arctica* Degel., *Empetrum nigrum* heath, on mosses and liverworts over boulder and moist cliffs, 113–300 m, 07–40, 133, 167W, 204, 343, 345, 346A, 348, 356, 377; 070796–011B.1, 070796–011B.2. M.
- Sticta limbata* (Sm.) Ach., epiphytic on *Salix glauca*, 20 m, 014, 015. W.
- Sticta weigelii* (Ach.) Vainio, on mosses over boulder on lower mountain slope, 50 m, 083B; 120796–012B.1, 0796–12B.2. W (Tropical to Temperate, disjunct in Alaska).
- Thamnomlia subuliformis* (Ehrh.) Culb., *Empetrum nigrum* heath along mountain ridge, 250 m, 061, 064, 065; 140796–453.1, 0796–453.2. A.
- Thamnomlia vermicularis* (Sw.) Schaeerer, *Empetrum nigrum* hummocky heaths, on pebbles and rocks on mountain ridge, 33–440 m, 03–29, 06–30, 07–30, 09–27, 13–29, 14–28, 16–30, 211, 212, 23–20, 24–17, 25–29, 26–13, 27–17, S17–1; 140796–454.1, 0796–454.2. A.
- Trapeliopsis granulosa* (Hoffm.) Lumbsch, humus on *Empetrum nigrum* heath hummock, 5 m, 088. A, B.
- Tuckermannopsis chlorophylla* (Willd.) Hale, on mosses over boulder in *Salix barclayi* thicket, on coastal rock, 2–370 m, 148, 205, 302; 040796–063.1. A.
- Tuckermannopsis platyphylla* (Tuck.) Hale, epiphytic on *Alnus viridis*, 100 m, 192. B, T (w NA).

TABLE 1. Frequently occurring lichens in the crowberry (*Empetrum nigrum*) heaths of Simeonof Island, Alaska, based on their presence in 30 relevés. To be included a species must occur in at least two relevés. Key to presence classes: I, 1–20%; II, 21–40%; III = 41–60%; IV, 61–80%; V, 81–100%.

<i>Cladina rangiferina</i>	IV	<i>Cladonia amaurocraea</i>	II
<i>Cladina mitis</i>	IV	<i>Ochrolechia frigida</i>	II
<i>Cladonia gracilis</i>	IV	<i>Cetraria ericetorum</i>	II
<i>Lobaria linita</i>	IV	<i>Alectoria nigricans</i>	II
<i>Peltigera membranacea</i>	III	<i>Alectoria ochroleuca</i>	II
<i>Peltigera aphthosa</i>	III	<i>Cladonia crispata</i>	II
<i>Cladonia maxima</i>	III	<i>Stereocaulon paschale</i>	II
<i>Cladina stellaris</i>	III	<i>Cladonia bellidiflora</i>	II
<i>Cladonia uncialis</i>	III	<i>Peltigera canina</i>	II
<i>Thamnolia vermicularis</i>	III	<i>Cladina</i> cf. <i>stellaris</i>	II
<i>Flavocetraria cucullata</i>	II	<i>Cladonia coccifera</i>	II
<i>Sphaerophorus globosus</i>	II	<i>Cladonia squamosa</i>	II

Species occurring with a presence of less than 20%: *Bryocaulon divergens*, *Bryoria nitidula*, *Cladina pacifica*, *Cladonia chlorophaea*, *C. deformis*, *C. fimbriata*, *C. furcata*, *C. stricta*, *Cetraria muricata*, *Parmelia omphlodes*, *Peltigera polydactylon*, *P. scabrosa*, *Pertusaria dactylina*, *Psoroma hypnorum*, *Sticta arctica*, *S. weigelii*, and *Thamnolia subuliformis*.

Umbilicaria angulata Tuck., chimney cliff, 200 m, 280. A (w NA endemic).

Umbilicaria arctica (Ach.) Nyl., on boulder in *Arctostaphylos alpina*-*Vaccinium vitis-idaea* heath, 200 m, 332A. A.

Umbilicaria havaasii Llano, on boulders in *Cladina* lichen meadow and *Salix arctica*-*Carex macrochaeta* meadow, 53–400 m, 197, 399, 403, 406, 407. A (amphiatlantic species with broad disjunctions).

Umbilicaria hyperborea (Ach.) Hoffm., on mosses over wind-protected rock in a *Geranium erianthum* meadow, on rock in *Empetrum nigrum* heath, 30–250 m, 025, 59–2; 070796–470.1. A, B, W.

Umbilicaria proboscidea (L.) Schrader, on boulder on mountain ridge and in *Salix barclayi* thicket, 60–370 m, 054, 144, 392; 140796–473.1, 070796–473.2, 070796–473.3. A.

Umbilicaria scholanderi (Llano) Krog, on cliff face, 300 m, 373. M (disjunct locations in NA).

Umbilicaria torrefacta (Lightf.) Schrader, on stones, 100 m; 070796–476.2. A.

Umbilicaria vellea (L.) Hoffm., dry exposed rock of cliff face and on wind-protected boulder, 230–370 m, 120, 200; 070796–477.1, 070796–477.2, 070796–477.3. A, B.

Verrucaria aethiobola Wahlenb., on rock in stream where stream enters harbor, 2 m, 290A, 290B. C, W.

Verrucaria arctica Lynge, on coastal rock, 2 m, 151. A.

Verrucaria ceuthocarpa Wahlenb., on coastal rock, 2 m, 312B. A, C.

Verrucaria maura Wahlenb., on coastal rock, 2 m, 155. C, W.

Xanthoria candelaria (L.) Th. Fr., on coastal boulder in splash zone, on coastal driftwood log in *Leymus mollis* beach meadow, on wooden ranch house, 2–12 m, 161, 166, 250, 268A, 278. A, B, W.

Xanthoria elegans (Link) Th. Fr., on coastal rock, 2 m, 150, 156, 163. A, B, W.

Xanthoria sorediata (Vainio) Poelt, xylicolous on wooden fence, 13 m, 139. A, B.

Lichen components of the vegetation.—Common lichen species occurring in oceanic crowberry (*Empetrum nigrum*) heaths are shown in Table 1. The most frequent lichens (occurring with a presence of 40% or greater) are listed in decreasing order of presence: *Cladina rangiferina*, *C. mitis*, *Cladonia*

gracilis, *Lobaria linita*, *Peltigera aphthosa*, *P. membranacea*, *Cladina stellaris*, *Cladonia maxima*, *C. uncialis*, and *Thamnolia vermicularis*.

DISCUSSION

The high percentage of arctic-alpine and boreal elements reflects the northern geographical location of Simeonof Island. Similarly, the moderately abundant coastal element is reflected in the maritime climate. It is of considerable interest that the proportionate representation of phytogeographic categories is similar between the sites listed for western Alaska in Figure 3. This is also the pattern for both Kodiak Island (Talbot 1998) and Tuxedni Wilderness Area (Talbot et al. 1992).

Our data on frequently occurring lichens in *Empetrum nigrum* dwarf shrub heath present basic information for comparison with other northern areas. Comparable data from along a lowland to alpine mesotopographic gradient on Mount Simeon in Izembek National Wildlife Refuge show close similarity in the common species present. Seventy-one percent of the frequently occurring lichens on Izembek (Talbot et al. 2000; Table 2, community types 5, “*Empetrum nigrum*-*Chamerion angustifolium* heath” and community type 6, “*Empetrum nigrum*-*Loiseleuria procumbens* heath”) were also important in the heath vegetation of Simeonof Island. Important lichens on Izembek listed in decreasing order of presence include *Cladina rangiferina*, *C. mitis*, *Cladonia gracilis*, *Lobaria linita*, *Peltigera aphthosa*, *P. membranacea*, *Cladonia uncialis*, *Thamnolia vermicularis*, *Flavocetraria cucullata*, *Sphaerophorus globosus*, *Cladonia amaurocraea*, *Ochrolechia frigida*, *Cetraria ericetorum*, *Alectoria nigrescens*, *A. ochroleuca*, *Stereocaulon paschale*, *Nephroma arctica*, and *Cladonia squamosa*. Similarly, data from along a lowland to al-

pine mesotopographic gradient on Kodiak Island (Talbot 1998, Table 1, community type 1, “*Empetrum nigrum-Oxytropis nigrescens* heath” and community type 2, “*Empetrum nigrum-Festuca altaica* heath”), show close similarity in the common species present, but differences in the percent presence of each. Common lichens of western Kodiak Island arranged in order of decreasing presence include: *Peltigera membranacea*, *P. aphthosa*, *Sphaerophorus globosus*, *Stereocaulon alpinum*, *Cladonia gracilis*, *Cladina rangiferina*, *Lobaria linita*, *Cladina mitis*, *Cladonia coccifera*, *Thamnolia subuliformis*, *Ochrolechia frigida*, *Cladina stellaris*, *Cetraria laevigata*, *Cladonia uncialis*, *Alectoria nigricans*, *Peltigera malacea*, and *Cetraria muricata*. The observed importance of frequently occurring lichens on Simeonof Island was consistent with data from similar heath vegetation from Izembek (Talbot et al. 2000) and Kodiak (Talbot 1998). Similar studies (SST) are underway to determine if this pattern applies to the central and eastern portions of the Alaska Peninsula.

In discussing lichen communities on heath lands, Ahti and Oksanen (1990) noted that they contain mainly oceanic, circumpolar species. Four of the five taxa listed by Ahti and Oksanen (1990) as preferring oceanic heaths are common on Simeonof Island, coinciding with their observation—*Cetraria aculeata* (common in study area heaths but recorded in one relevé), *Cladonia gracilis* subsp. *gracilis*, *Ochrolechia frigida*, and *Sphaerophorus globosus*; a fifth, *Hypogymnia physodes*, was not collected.

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