

**LICHENS FROM THREE LOCALITIES IN CENTRAL WEST GREENLAND WITH NOTES ON THEIR CLIMATIC PREFERENCES****Eric Steen HANSEN**

Natural History Museum of Denmark of Copenhagen University,  
Herbarium, Botanical Garden, Øster Farimagsgade 2 C, DK-1123 Copenhagen, Denmark;  
e-mail: erich@snm.ku.dk

**Abstract**

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A total of 165 lichen taxa collected from three localities in Central West Greenland in summer 2012 were reported and categorized toward their climatic preferences. Specimens of 68 lichen taxa were collected in Ilimanaq/Claushavn, 62 specimens – in Oqaatsut/Rodebay and 159 – in Ilulissat/Jakobshavn. Thirty four lichen taxa were recorded for the first time from Ilulissat, while all recorded lichens from Ilimanaq and Oqaatsut are new to those localities. More than 70% of the 165 lichens are more or less equally distributed in continental and oceanic areas of Greenland. About 20% of the lichens occur most frequently in oceanic areas and more rarely in continental areas, while a little more than 7% of the lichens occur frequently in continental areas and more rarely in oceanic areas. Two lichens are distinctly oceanic and one is distinctly continental. The climate of the three localities is low arctic, continental. As regards the distribution of the lichens, the results are in good accordance with those obtained from similar investigations in more southern areas of West Greenland.

**Keywords:** distribution types, ecology, lichenized ascomycetes.

**INTRODUCTION**

Recently K. Hansen's investigation on the distribution and ecology of lichens in South Greenland (HANSEN, 1962) has been repeated in South East Greenland and South West Greenland (HANSEN, 2010, 2012a, b). The author includes both micro- and macrolichens in his studies, while K. Hansen deals with macrolichens only. Extensive lichen collecting in many parts of Greenland during the last 40 years has necessitated a revision of the distribution types originally defined by E.S. HANSEN (2010). The present paper adds information about the climatic distribution types of Greenland lichens and aims to stimulate future research on the occurrence and distribution of lichens toward climate change.

**Short historical survey**

The Danish botanists K. Hansen and B. Fredskild collected lichens (mainly macrolichens) in Ilulissat in 1958 and 1959, respectively. HANSEN (1962) collected about a dozen species of lichens, and FREDSKILD (1961) collected 49 species of lichens in Ilulissat. During the study on the lichen flora of the coastal areas of Central West Greenland in summer 1992, the author collected more than 200 species of macro- and microlichens in Ilulissat (HANSEN, 1997). A similar number of lichens were collected by the author in Qeqertarsuaq/Godhavn on Disko just opposite Ilulissat (HANSEN, 1999). All lichens mentioned by B. Fredskild and K. Hansen were found again by the author in 1992 and 2012. This also applies to a few lichens collected in Ilulissat by P. Gelting in 1952.

The lichen flora of Central West Greenland has been treated by LYNGE (1937), but he has not dealt with the lichens of Ilulissat. BÖCHER (1963) has previously outlined the phytogeography of this region.

## STUDY AREA

The lichens were collected from three localities in Disko Bugt in Central West Greenland, Ilimanaq/Claushavn, Ilulissat/Jakobshavn and Oqaatsut/Rodebay. Ilimanaq/Claushavn (69° 05' N, 51° 06' W) is a small settlement situated in a small bay c. 10 km south of the entrance of Ilulissat Icefjord. The fjord was declared a UNESCO World Heritage Site in 2004. Ilulissat/Jakobshavn (69° 13' N, 51° 06' W) is an enterprising town with a very active harbour and modern hotels, tourism, shops and industries. It is located on the coast just north of Icefjord. Oqaatsut/Rodebay (69° 20' N, 51° 00' W) is a small settlement situated on a small peninsula between Disko Bugt and Rodebay Bugt 18 km north of Ilulissat. Lichenological investigations and collecting were carried out in the immediate surroundings of the town and settlements. The rocks are composed of gneiss and amphibolite. No meteorological data are available from the two settlements, but their climate is presumably comparable with that of Ilulissat. According to measurements carried out in 2000 by ASIAQ/Grønlands Forundersøgelser (ASIAQ, 2001), the mean temperature of July is c. 8°C in Ilulissat, while the mean temperature of the coldest month, February, is -15°C. The annual precipitation in Ilulissat is 252 mm.

Climatically and floristically, the three localities are situated in the low arctic, continental region (JENSEN, 1999). Mixed dwarf shrub heaths dominated by *Betula nana*, *Ledum palustre*, *Vaccinium uliginosum* and *Empetrum hermaphroditum* occur abundantly in somewhat moist and marshy places around Ilulissat. Heath patches with *Cassiope tetragona* are restricted to north-facing slopes in the area. Similar types of dwarf shrub heaths occur around the two settlements. Patches with *Rhododendron lapponicum* and *Dryas* spp. occur more or less scattered on dry soil near Ilulissat. South-facing steppe-like slopes with *Carex rupestris* and *Kobresia myosuroides* occur in many places near Icefjord. Moist snow-patches with *Salix herbacea* and other dwarf shrub species oc-

cur mainly on north-facing slopes at the three localities. A few corticolous lichens and lichens growing on wood were found near Ilulissat. Different types of saxicolous lichen communities occur abundantly at the three localities. A detailed description of their lichen content can be found in HANSEN (1997).

## MATERIALS AND METHODS

The lichen collections that form the basis of the present paper were made by the author in July 2012. Lichens were collected from numerous sampling plots mainly in the lowland (< 200 m a. s. l.) in Ilimanaq/Claushavn, Ilulissat/Jakobshavn and Oqaatsut/Rodebay. The collected material, a total of 432 lichen specimens, was studied using Zeiss light microscopes and identified by the author. The nomenclature in the list follows SANTESSON et al. (2004) when appropriate.

The substrate preference and the main plant communities in which lichens occur were noted for all collected specimens. The material is deposited at the Herbarium of the Botanical Garden of the University of Copenhagen (C).

The type of distribution toward oceanicity or continentality was estimated for all lichens by all available information about their total distribution in Greenland including monographs such as KÄRNEFELT (1979), MOBERG & HANSEN (1986), HANSEN et al. (1987) and BREUSS & HANSEN (1988). The maps and description of Greenland vegetation belts follow BÖCHER et al. (1968), THOMSON (1984, 1997) and JENSEN (1999).

The following oceanicity-continentality indices originally defined by K. HANSEN (1971) with later modifications (HANSEN, 2010, 2012a) were used:

- CC – distinctly continental lichens occurring exclusively in continental areas.
- CCO – somewhat continental lichens occurring most frequently in subcontinental and continental areas and more rarely in oceanic areas.
- CO – lichens with almost equally high frequency in continental and oceanic areas.
- COO – somewhat oceanic lichens occurring most frequently in oceanic areas and more rarely in continental areas.
- OO – distinctly oceanic lichens occurring exclusively in oceanic areas.

## RESULTS

The following list represents 165 lichen taxa. Of these, 159 taxa were collected in Ilulissat, 68 taxa – in Ilimanaq, just south of Ilulissat and 62 taxa – in Oqaatsut, north of Ilulissat. The collections distributed from the Herbarium C as part of Lichenes Groenlandici Exsiccati (LGE) are stated by their numbers.

## ANNOTATED LIST OF SPECIES

Abbreviations: 1 – Ilimanaq/Claushavn, 2 – Ilulissat/Jakobshavn, 3 – Oqaatsut/Rodebay. An asterisk (\*) in front of the name in the list of lichens indicates that the taxon is an addition to the lichen flora of Ilulissat. The collections distributed from the Herbarium C as part of Lichenes Groenlandici Exsiccati (LGE) are stated by their numbers.

- COO *Acarospora molybdina* (Wahlenb.) A.Massal. – 2. On manured gneissic seashore rocks, together with *Caloplaca alcarum*, *Candelariella arctica*, *Lecanora contractula* and *Xanthoria elegans*.
- CO *A. smaragdula* (Wahlenb.) A.Massal. – 2. On somewhat moist gneissic rocks, together with *Placynthium asperellum*, *Rhizocarpon badiotratrum*, *R. grande* and *R. viridiatrum*.
- CO *Alectoria ochroleuca* (Hoffm.) A.Massal. – 1, 2, 3. On soil in dwarf shrub heaths. LGE 1132, 1157.
- COO *Allantoparmelia alpicola* (Th.Fr.) Essl. – 2. On gneissic rock, together with *Melanelia hepatizon*.
- COO *Amandinea coniops* (Wahlenb.) M.Choisy ex Scheid. & H.Mayrhofer – 2. On manured gneissic seashore rocks, together with *Caloplaca alcarum*, *Candelariella vitellina* and *Phyiscia caesia*.
- CO \* *A. punctata* (Hoffm.) Coppins & Scheid. – 2. On wood, together with *Lecanora varia*.
- COO *Arctocetraria andrejevii* (Oxner) Kärnefelt & A.Thell – 1, 2, 3. On soil in moist depressions in dwarf shrub heaths and at the border of fens, together with *Arctocetraria nigricascens*, *Cetraria islandica* and *Cetrariella delisei*. LGE 1140, 1144.
- CCO *A. nigricascens* (Nyl.) Kärnefelt & A.Thell – 2. On soil in moist dwarf shrub heaths and in the surroundings of fens. LGE 1137.
- CO *Arctoparmelia centrifuga* (L.) Hale – 1, 2. On gneissic rocks.
- CO *A. incurva* (Pers.) Hale – 1, 2, 3. On gneissic rocks.
- CC \* *A. separata* (Th.Fr.) Hale – 2. On mosses.
- COO \* *Arctopeltis thuleana* Poelt – 2. On manured gneissic seashore rocks, together with *Caloplaca alcarum* and *Xanthoria candelaria*.
- CCO \* *Arthrorhaphis alpina* (Schaer.) R.Sant. – 1, 2. On mineral soil in open dwarf shrub heaths and on steppe-like slopes, together with *Candelariella canadensis* and *Thamnolia vermicularis*.
- CO \* *Aspicilia berntii* A.Nordin, Tibell & Owe-Larss. – 2, 3. On gneissic rocks.
- CO *Brodoa oroarctica* (Krog) Goward – 1, 2. On gneissic rocks, together with *Pseudophebe minuscula*. LGE 1148.
- CO *Bryocaulon divergens* (Ach.) Kärnefelt – 1, 2, 3. On soil in open dwarf shrub heaths, together with *Alectoria ochroleuca* and *Gowardia nigricans*. LGE 1160, 1173.
- CO *Bryonora castanea* (Hepp) Poelt – 1, 2. On plant remains, together with *Buellia papillata* and *Rinodina turfacea*.
- CO *Bryoria chalybeiformis* (L.) Brodo & D.Hawksw. – 1, 2, 3. On soil in dwarf shrub heaths and on vertical faces of gneissic rocks. LGE 1141 1163.
- CO *B. nitidula* (Th.Fr.) Brodo & D.Hawksw. – 1, 2, 3. On soil in open dwarf shrub heaths, together with *Alectoria ochroleuca*, *Cetraria islandica*, *C. nigricans*, *Flavocetraria nivalis* and *Cladonia arbuscula* ssp. *mitis*. LGE 1133, 1142, 1156, 1171.
- CO *Buellia papillata* (Sommerf.) Tuck. – 2. On plant remains in dwarf shrub heaths, together with *Leptogium lichenoides*.
- COO *Caloplaca alcarum* Poelt – 1, 2. On manured gneissic seashore rocks.
- CO *C. castellana* (Räsänen) Poelt – 1, 2. On *Placynthium asperellum* on gneissic rocks.
- CO *C. cerina* (Ehrh. ex Hedw.) Th.Fr. – 2. On dead lichens.

- CO *C. jungermanniae* (Vahl) Th.Fr. – 2. On plant remains and mosses on steppe-like slope, together with *Peltigera rufescens*, *Physconia muscigena* and *Rinodina archaea*.
- CO *C. psoricida* E.S. Hansen, Poelt & Söchting – 2. On *Psora rubiformis* on soil.
- CO *C. tetraspora* (Nyl.) H.Olivier – 2. On plant remains, together with *Cladonia cyanipes*, *C. fimbriata* and *Psoroma tenue* var. *boreale*.
- CO *C. tirolensis* Zahlbr. – 2, 3. On mosses, together with *Candelariella canadensis*, *Peltigera rufescens* and *Phaeophyscia sciastra*.
- COO *C. tornoënsis* H.Magn. – 1. On mosses, together with *Bryonora castanea*, *Psoroma tenue* var. *boreale* and *Rinodina turfacea*.
- CO *Calvitimela armeniaca* (DC.) Hafellner – 2. On gneissic rocks, together with *Pseudophebe minuscula*, *Rhizocarpon geographicum*, *R. superficiale*, *Sporastatia testudinea* and *Umbilicaria lyngei*.
- OO *Candelariella arctica* (Körb.) R.Sant. – 2. On manured gneissic seashore rocks, together with *Xanthoria elegans*.
- CCO \* *C. canadensis* H.Magn. – 1, 2, 3. On soil and mosses in open dwarf shrub heaths and on steppe-like slopes. LGE 1151, 1165.
- COO \* *C. dispersa* (Räsänen) Hakul. – 2, 3. On *Placynthium asperellum* on gneissic rocks.
- CO *C. vitellina* (Hoffm.) Müll.Arg. – 1, 2, 3. On manured gneissic rocks and on wood.
- CO \* *Catapyrenium cinereum* (Pers.) Körb. – 2. On mineral soil on steppe-like slopes.
- CO *Cetraria aculeata* (Schreb.) Fr. – 3. On soil in dwarf shrub heath, together with *C. islandica* and *Flavocetraria nivalis*.
- CO *C. islandica* (L.) Ach. – 1, 2, 3. On soil in dwarf shrub heaths; one specimen with sorelia. LGE 1159, 1172.
- CO *C. muricata* (Ach.) Eckfeldt – 1, 2. On soil in dwarf shrub heaths.
- CO *C. nigricans* Nyl. – 2, 3. On soil in dwarf shrub heaths.
- CO *Cetrariella delisei* (Bory ex Schaer.) Kärnefelt & A.Thell – 1, 2, 3. On soil in moist dwarf shrub heaths and near fens. LGE 1136.
- COO *Chaenotheca furfuracea* (L.) Tibell – 2. On plant remains in somewhat shady place under overhanging rock.
- CCO \* *Cladonia alaskana* A.Evans – 2. On soil in dwarf shrub heaths.
- CO *C. amaurocraea* (Flörke) Schaer. – 1, 2, 3. On soil in dwarf shrub heaths.
- CO *C. arbuscula* (Wallr.) Flot. ssp. *mitis* (Sandst.) Ruoss – 1, 2, 3. On soil in dwarf shrub heaths. LGE 1131.
- COO *C. bellidiflora* (Ach.) Schaer. – 2. On soil in dwarf shrub heaths.
- CO *C. borealis* S.Stenroos – 1, 2, 3. On soil in dwarf shrub heaths.
- CO *C. chlorophaea* (Flörke ex Sommerf.) Spreng. s. lato – 2, 3. On soil in dwarf shrub heaths.
- CO *C. cornuta* (L.) Hoffm. – 2. On soil among grasses.
- CO *C. cyanipes* (Sommerf.) Nyl. – 2. On soil rich in humus and on plant remains.
- CO *C. fimbriata* (L.) Fr. – 2. On soil rich in humus in area rich in grasses.
- CO \* *C. macroceras* (Delise) Hav. – 1, 2, 3. On soil in dwarf shrub heaths.
- CO *C. macrophylla* (Schaer.) Stenh. – 2. On soil in dwarf shrub heaths.
- CO \* *C. macrophyllodes* Nyl. – 1, 2, 3. On soil in dwarf shrub heaths.
- COO \* *C. phyllophora* Hoffm. – 1, 2, 3. On soil in moist places in dwarf shrub heaths.
- CO *C. pleurota* (Flörke) Schaer. – 2, 3. On soil in dwarf shrub heaths, together with *Cladonia sulphurina*.
- CCO *C. pocillum* (Ach.) O.J.Rich. – 1, 2, 3. On soil in dwarf shrub heaths and on steppe-like slopes, together with *Physconia muscigena*.
- CO *C. pyxidata* (L.) Hoffm. – 1, 2, 3. On soil rich in humus in dwarf shrub heaths.
- CO *C. rangiferina* (L.) F.H.Wigg. – 1, 2, 3. On soil in dwarf shrub heaths.
- CO \* *C. scotteri* Ahti & E.S.Hansen – 2. On soil, together with *Peltigera malacea*.
- CO *C. squamosa* Hoffm. – 2. On soil in dwarf shrub heaths.
- COO *C. sulphurina* (Michx.) Fr. – 2. On soil in dwarf shrub heaths. LGE 1150.
- COO \* *C. trassii* Ahti – 2, 3. On soil in moist places in dwarf shrub heaths.
- CO *Dimelaena oreina* (Ach.) Norman – 2. On manured gneissic rocks, together with *Sporastatia testudinea*.

- CO *Flavocetraria cucullata* (Bellardi) Kärnefelt & A.Thell – 1, 2, 3. On soil in dwarf shrub heaths. LGE 1135, 1155, 1168.
- CO *F. nivalis* (L.) Kärnefelt & A.Thell – 1, 2, 3. On soil in dwarf shrub heaths. LGE 1130, 1169.
- COO \* *Frutidella caesioatra* (Schaer.) Kalb. – 2. On mosses on siliceous rocks, together with *Leprocaulon subalbicans*.
- CO *Fuscopannaria praetermissa* (Nyl.) P.M.Jørg. – 2. On mosses on soil.
- CO *Gowardia nigricans* (Ach.) P. Halonen, L.Myllus, S.Velmala & H.Hyvärinen – 1, 2, 3. On soil in dwarf shrub heaths. LGE 1170.
- CO *Hypogymnia austerodes* (Nyl.) Räsänen – 1, 2. On manured gneissic rocks.
- CO \* *Ionaspis lacustris* (With.) Lutzoni – 2. On temporarily moist gneissic rocks, together with *Rhizocarpon badioatrum*.
- COO *Lecanora chloroleprosa* (Vain.) H.Magn. – 2. On temporarily moist gneissic rocks, together with *Phylliscum demangeonii* and *Pyrenopsis rhodosticta*.
- COO *L. contractula* Nyl. – 1, 2. On manured gneissic seashore rocks.
- CO *L. fuscescens* (Sommerf.) Nyl. – 2, 3. On twigs of *Betula nana* and *Salix glauca*.
- CO *L. intricata* (Ach.) Ach. – 2. On gneissic rocks, together with *Rhizocarpon geographicum* and *Sporastatia testudinea*.
- CO *L. polytropa* (Ehrh. ex Hoffm.) Rabenh. – 2. On gneissic rocks.
- CO *L. swartzii* (Ach.) Ach. ssp. *swartzii* – 2. On vertical gneissic rocks.
- CO \* *L. varia* (Hoffm.) Ach. – 2. On wood.
- CO *Lecidea atrobrunnea* (Ramond ex Lam. & DC.) Schaer. – 2, 3. On manured gneissic rocks, together with *Rhizocarpon geminatum*.
- COO *L. lapicida* (Ach.) Ach. var. *pantherina* Ach. – 2. On gneissic rocks.
- CO \* *L. tessellata* Flörke – 2. On gneissic rocks.
- CO \* *Lecidella bullata* Körb. – 2. On manured gneissic rock, together with *Phaeophyscia sciastra*, *Rhizocarpon geminatum* and *Xanthoria elegans*.
- COO *Lecidoma demissum* (Rutstr.) Gotth. Schneid. & Hertel – 1. On soil near snow-patches.
- CO *Leprocaulon subalbicans* (I.M.Lamb & A.M.Ward – 2, 3. On mosses, together with *Massalongia carnosa*. LGE 1152.
- CCO \* *Leptogium lichenoides* (L.) Zahlbr. – 2. On plant remains in dwarf shrub heaths.
- CO *Lichenomphalia hudsoniana* (H.S.Jenn.) Red-head et al. – 2. On mosses in dwarf shrub heaths.
- CCO *Lobaria scrobiculata* (Scop.) DC. – 2. On vertical gneissic rocks, together with *Peltigera collina* and *Physconia detersa*.
- CO \* *Lopadium pezizoideum* (Ach.) Körb. – 2. On plant remains in dwarf shrub heaths.
- CO *Massalongia carnosa* (Dicks.) Körb. – 2. On mosses in dwarf shrub heaths. LGE 1138.
- CO \* *Melanohalea elegantula* (Zahlbr.) O.Blanco et al. – 2. On manured gneissic rocks, together with *Umbilicaria arctica*.
- CO *M. hepatizon* (Ach.) A.Thell – 2. On gneissic rocks.
- CO *M. stygia* (L.) Essl. – 1, 3. On gneissic rocks.
- CO *Miriquidica atrofulva* (Sommerf.) A.J.Schwab & Rambold – 2. On gneissic rocks.
- CO *Montanelia disjuncta* (Erichsen) Divakar et al. – 1, 3. On manured siliceous rocks, together with *Xanthoria elegans*.
- CO \* *Ochrolechia alaskana* (Verseghy) Kukwa – 1, 2. On plant remains, mosses and soil in dwarf shrub heaths.
- COO *O. grimmiae* Lyngé – 2. On *Racomitrium lanuginosum* in dwarf shrub heaths.
- COO *O. tartarea* (L.) A.Massal. – 2. On gneissic rocks.
- CO *Ophioparma ventosa* (L.) Norman – 1, 2, 3. On gneissic rocks.
- CO *Orphniospora moriopsis* (A.Massal.) D.Hawksw. – 1, 2, 3. On gneissic rocks.
- CO *Parmelia omphalodes* (L.) Ach. – 1, 2, 3. On gneissic rocks and on soil in dwarf shrub heaths, together with *Sphaerophorus fragilis*.
- CO *P. saxatilis* (L.) Ach. – 1, 2, 3. On gneissic rocks. LGE 1145.
- CO *P. sulcata* Taylor – 2. On manured gneissic rocks.
- CO *Peltigera aphthosa* (L.) Willd. – 2. On mosses in moist places in dwarf shrub heaths.
- CCO *P. collina* (Ach.) Schrad. – 2. On vertical gneissic rocks.
- CO *P. didactyla* (With.) J.R.Laundon – 1, 2, 3. On

- soil and mosses in dwarf shrub heaths. LGE 1161, 1174.
- CO *P. malacea* (Ach.) Funck – 1, 2, 3. On mosses and soil in dwarf shrub heaths. LGE 1149.
- CO *P. rufescens* (Weiss) Humb. – 1, 2, 3. On mosses and soil in dwarf shrub heaths. LGE 1154.
- CO *P. scabrosa* Th.Fr. – 2. On mosses in dwarf shrub heaths.
- CO *Pertusaria dactylina* (Ach.) Nyl. – 2. On soil in dwarf shrub heaths.
- CO *P. geminipara* (Th.Fr.) C.Knight ex Brodo – 2. On mosses in dwarf shrub heaths. LGE 1166.
- CO \* *P. panyrga* (Ach.) A.Massal. – 2. On soil in dwarf shrub heaths.
- COO *P. oculata* (Dicks.) Th.Fr. – 2. On soil and mosses in dwarf shrub heaths.
- CCO *Phaeophyscia sciastra* (Ach.) Moberg – 1, 2. On manured gneissic rocks.
- COO \* *Phylliscum demangeonii* (Moug. & Mont.) Nyl. – 2. On temporarily moist gneissic rocks.
- CO *Physcia caesia* (Hoffm.) Fűrnr. – 2. On manured gneissic rocks.
- CO *P. dubia* (Hoffm.) Lettau – 1, 2, 3. On manured gneissic rocks.
- CO *Physconia detersa* (Nyl.) Poelt – 2. On vertical gneissic rocks.
- CCO *P. muscigena* (Ach.) Poelt – 2. On vertical gneissic rocks and on soil.
- CO *Placidium lachneum* (Ach.) de Lesd. – 2. On mineral soil on steppe-like slopes.
- CO *Placynthium asperellum* (Ach.) Trevis. – 1, 2. On gneissic rocks.
- CO *Polychidium muscicola* (Sw.) Gray – 2. On mosses on gneissic rocks.
- CO *Protoparmelia badia* (Hoffm.) Hafellner – 1, 2. On manured gneissic rocks.
- CO *Pseudephebe minuscula* (Nyl. ex Arnold) Brodo & D.Hawksw. – 1, 2, 3. On gneissic rocks.
- CO *P. pubescens* (Vahl) Gray – 1, 2, 3. On gneissic rocks.
- CO *Psora rubiformis* (Ach.) Hook. – 2. On mineral soil on steppe-like slopes.
- CO \* *Psoroma tenue* Henssen var. *boreale* Henssen – 1, 2, 3. On mosses in dwarf shrub heaths.
- CO \* *Pyrenopsis rhodosticta* (Taylor) Müll.Arg. – 2. On temporarily moist gneissic rocks.
- COO *Rhizocarpon badioatrum* (Flörke ex Spreng.) Th.Fr. – 1, 2. On somewhat moist gneissic rocks.
- COO *R. bolanderi* (Tuck.) Herre – 2, 3. On temporarily moist gneissic rocks, together with *Phylliscum demangeonii*, *Tremolecia atrata* and *Umbilicaria virginis*.
- COO \* *R. copelandii* (Körb.) Th.Fr. – 2. On gneissic rocks, together with *Lecanora intricata* and *Rhizocarpon viridiatrum*.
- CO *R. geminatum* Körb. – 2, 3. On manured gneissic rocks.
- CO *R. geographicum* (L.) DC. – 1, 2. On gneissic rocks.
- CO *R. grande* (Flörke) Arnold – 1, 2, 3. On manured gneissic rocks, together with *Xanthoria elegans*.
- CO *R. inarense* (Vain.) Vain. – 2, 3. On gneissic rocks, together with *Orphniospora moriopsis*, *Pseudephebe minuscula* and *Rhizocarpon jemtlandicum*.
- CO *R. jemtlandicum* (Malme) Malme – 3. On gneissic rocks.
- CO \* *R. superficiale* (Schaer.) Vain. – 1, 2. On gneissic rocks.
- CO \* *R. viridiatrum* (Wulfen) Körb. – 2. On *Rhizocarpon copelandii* on gneissic rocks.
- CO *Rhizoplaca melanophthalma* (DC.) Leuckert & Poelt – 2. On manured gneissic rocks.
- COO \* *Rinodina archaea* (Ach.) Arnold – 2. On twigs of *Salix glauca*, together with *Lecanora fuscescens*.
- CO *R. turfacea* (Wahlenb.) – 1, 2, 3. On plant remains and mosses in dwarf shrub heaths.
- CO *Solorina crocea* (L.) Ach. – 1, 2. On soil near snow-patches.
- CO *Sphaerophorus fragilis* (L.) Pers. – 1, 2, 3. On soil in dwarf shrub heaths. LGE 1143.
- CO *S. globosus* (Huds.) Vain. – 1, 2. On soil in dwarf shrub heaths. LGE 1162.
- CCO *Sporastatia testudinea* (Ach.) A.Massal. – 2. On gneissic rocks.
- CO *Stereocaulon alpinum* Laurer – 1, 2. On soil in dwarf shrub heaths. LGE 1134 1158.
- CO *S. arenarium* (L.I.Savicz) I.M.Lamb – 2. On gravelly soil in dwarf shrub heaths.

- CO *S. botryosum* Ach. – 2. On gneissic rocks.
- CO *S. glareosum* (L.I.Savicz) H.Magn. – 2, 3. On soil in dwarf shrub heaths.
- CO *S. paschale* (L.) Hoffm. – 2, 3. On soil in dwarf shrub heaths.
- CO \* *S. vesuvianum* Pers. – 2. On gneissic rocks.
- CO *Thamnolia vermicularis* (Sw.) Schaer. var. *subuliformis* (Ehrh.) Schaer. – 1, 2. On soil in dwarf shrub heaths, together with *Cetraria muricata*.
- COO *Trapeliopsis granulosa* (Hoffm.) Lumbsch – 2, 3. On soil rich in humus in dwarf shrub heaths. LGE 1164.
- COO *Tremolecia atrata* (Ach.) Hertel – 2. On temporarily gneissic rocks.
- CO *Umbilicaria arctica* (Ach.) Nyl. – 1, 2, 3. On manured gneissic rocks. LGE 1167.
- COO *U. deusta* (L.) Baumg. – 2. On temporarily moist gneissic rocks.
- CCO *U. decussata* (L.) Baumg. – 1, 2. On manured gneissic rocks.
- CO *U. hyperborea* (Ach.) Hoffm. – 1, 2. On gneissic rocks.
- CO *U. lyngei* Schol. – 1, 2, 3. On gneissic rocks. LGE 1139.
- CO \* *U. nylanderiana* (Zahlbr.) H.Magn. – 2, 3. On gneissic rocks.
- CO *U. proboscidea* (L.) Schrad. – 1, 2. On gneissic rocks.
- COO *U. torrefacta* (Lightf.) Schrad. – 2, 3. On gneissic rocks.
- CO *U. vellea* (L.) Hoffm. – 2. On strongly sloping and vertical faces of somewhat moist gneissic rocks. LGE 1146.
- CO *U. virginis* Schaer. – 1, 2, 3. On gneissic rocks. LGE 1147.
- OO *Verrucaria ceuthocarpa* Wahlenb. – 2. On gneissic rocks influenced by sea water.
- CO \* *Xanthoria candelaria* (L.) Th.Fr. – 1, 2, 3. On manured gneissic rocks, together with *Physcia dubia* and *P. caesia*. LGE 1153.
- CO *X. elegans* (Link) Th.Fr. – 1, 2, 3. On manured gneissic rocks.
- COO *X. sorediata* (Vain.) Poelt – 2. On strongly sloping and vertical faces of manured gneissic rocks.

## DISCUSSION

Thirty four lichen taxa were recorded for the first time from Ilulissat, while all recorded lichens from Ilimanaq and Oqaatsut were new to those localities. More than 70% of the 165 lichens listed above appeared to be more or less equally distributed in continental and oceanic areas of Greenland. This category of climatically indifferent species mainly consists of tolerant lichens with wide environmental amplitude (CO). About 20% of the lichens are distributed mainly in oceanic areas (COO). These species are not particularly threatened in the Ilulissat area, where marshy areas are widely distributed. Only two lichens associated with marine environments (OO), viz. *Candelariella arctica* and *Verrucaria ceuthocarpa*, were recorded. About 7% of the lichens belong to the CCO-category of species with a somewhat continental distribution. The group was expected to be somewhat larger, because of the fairly continental conditions prevailing in the region. However, one species, viz. *Arctoparmelia separata*, belongs to the CC-category. This species is probably an indicator of global warming, which appears to influence the lichens of Greenland. A significantly faster growth of thalli was recorded for six lichen species, viz. *Physcia caesia*, *Pseudephebe minuscula*, *Rhizocarpon geographicum*, *Umbilicaria hyperborea*, *U. virginis* and *Xanthoria elegans*, in 2006–2010 than in 2001–2006 near the Mittivakkat Glacier in the Angmagssalik area in South East Greenland (HANSEN, 2012b). In this context, it is important to monitor the growth of the populations of the rare CCO-species, *Arctocetraria nigricascens*, which still occurs rather abundantly along the border of the marshes in Ilulissat. Lichens associated with steppe-like communities are not particularly common at the three investigated localities, but this element probably will be of greater importance under drier climatic conditions in the future (HANSEN, 2000).

Similar investigations on the climatic preferences of Greenland lichens have previously been carried out in South East and South West Greenland (HANSEN, 2010, 2012a, b).

Compared with lichen flora of South East Greenland it is nothing to be surprised at that the COO-

category is relatively larger and the CCO-category is smaller than in the Ilulissat area. However, the results from the present investigation are in comparatively good accordance with those obtained from the investigated localities south of the Disko Bugt area. At present, the author is planning to continue the investigation on the climatic preferences of the lichens occurring in a low arctic, oceanic Qeqertarsuaq/Godhavn on Disko and those occurring in a low arctic, continental Kangerlussuaq in West Greenland.

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## **TRIJŲ CENTRINĖS VAKARŲ GRENLANDIJOS VIETŲVIŲ KERPĖS IR PASTABOS APIE JŲ KLIMATINES PREFERENCIJAS**

**Eric Steen HANSEN**

### **Santrauka**

Straipsnyje pateikiami duomenys apie 165 taksonų kerpės, surinktas 2012 m. vasarą trijose centrinės vakarų Grenlandijos vietovėse, ir jų suskirstymą pagal klimatinės preferencijas Grenlandijoje. Ilimanaq/Claushavn vietovėje buvo surinkti 68 kerpių taksonai, Oqaatsut/Rodebay vietovėje – 62 ir Ilulissat/Jakobs-havn vietovėje – 159 taksonai. Trisdešimt keturi taksonai aptikti pirmą kartą Ilulissat vietovėje, o Ilimanaq ir Oqaatsut vietovėse visos kerpės buvo surinktos pirmą kartą. Per 70% visų rastųjų kerpių yra daugiau ar

mažiau tolygiai paplitusios tiek kontinentinėse, tiek ir okeaninėse Grenlandijos dalyse. Apie 20% kerpių yra dažnesnės okeaninėse teritorijose ir retesnės kontinentinėse ir tik kiek daugiau nei 7% kerpių yra dažnesnės kontinentinėse nei okeaninėse dalyse. Dvi rūšys yra akivaizdžiai okeaninio paplitimo, o viena akivaizdžiai kontinentinio. Klimatas visose trijose vietovėse yra kontinentinis, žemumų arktinis. Kerpių paplitimo tendencijos sutampa su jų paplitimu labiau į pietus nutolusiose Vakarų Grenlandijos vietovėse.