MEDDELELSER OM GRØNLAND
UDGIVNE AF
KOMMISSIONEN FOR VIDENSKABELIGE UNDERSØGELSER I GRØNLAND
Bd. 204 · Nr. 3

A COMPARISON BETWEEN THE LICHEN FLORA OF COASTAL AND INLAND AREAS IN THE JULIANEHÅB DISTRICT, SOUTH GREENLAND

BY

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WITH 1 FIGURE, 4 MAPS, 3 TABLES AND 1 PLATE

Nyt Nordisk Forlag Arnold Busck
København 1978

Abstract

In 1969 a total of 1200 collections of 201 species of macro- and microlichens were made in eight localities in the Julianehåb District in South West Greenland. Four of the species, viz. *Caloplaca flavovirescens* (Wulf.) Dalla Torre & Sarnth., *Candelariella coralliza* (Nyl.) Magn., *Lecidea symmicta* (Ach.) Ach. and *Rhizocarpon eupetraeum* (Nyl.) Arn., are new additions to the lichen flora of Greenland. These species as well as other lichens of particular interest are discussed separately.

The distribution and occurrence of the species is outlined. In regard to the number of species there is a clear difference between localities far off the coast and localities near the coast: The former regions have a much richer lichen flora than the latter. Climatic and geological conditions are of great importance for the distribution of a large number of the lichen species.

The distribution of four species are mapped.

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Manuscript received November 24th, 1976.
Revised Manuscript received July 1st, 1977.

ISBN 87-17-2522-2
Bianco Lunos Bogtrykkeri A/S

Contents

Introduction

In the summer of 1969 JØRGEN ANDERSEN, member of the staff of the Botanical Museum of the University of Copenhagen, and the author of this paper participated in the floristic investigations of the Julianehåb District in South West Greenland carried on by the Greenland Botanical Survey (G.B.U.). The main objective of our expedition was to collect lichens for "*Lichenes Groenlandici Exsiccati*", Fasc. no. 1 and 2, which have been distributed by now. Moreover, a great many samples of macrolichens as well as microlichens were collected at eight localities with the intention to compare the lichen flora in the inland part of our investigation area with that of the coastal area. These collections of lichens (c. 1200 numbers) are deposited at the Botanical Museum, the University of Copenhagen.

The lichen flora of South West Greenland has previously received relatively much attention, and a large number of collections from this region are available at the Botanical Museums in Copenhagen and Oslo. DAHL (1950), in his large work of the macrolichens of South West Greenland, has given a survey of the earlier collectors of lichens in the area, and since then large collections have been made by K. HANSEN (1971). As microlichens are often omitted in these investigations, it was decided to pay special attention to this difficult, but intriguing plant group during our expedition in 1969.

Climatic conditions at two stations in the Julianehåb District

Several authors (BÖCHER 1949, 1954; DAHL 1950; K. HANSEN 1962, 1971) have stressed the importance of the climatic factors for the distribution of plant species, inclusive of lichens, in Greenland.

Observations of temperatures and precipitation at meteorological stations in South Greenland indicate that climatic factors vary with the distance from the outer coast. Thus Table 1 shows that the summer temperature is higher and the winter temperature somewhat lower at Narssarssuaq, which is situated 70 km from the outer coast (loc. 1, Fig. 1), than at the coastal station, Julianehåb (loc. 8, Fig. 1). The annual temperature amplitude is c. 16°C at Narssarssuaq and c. 12°C at

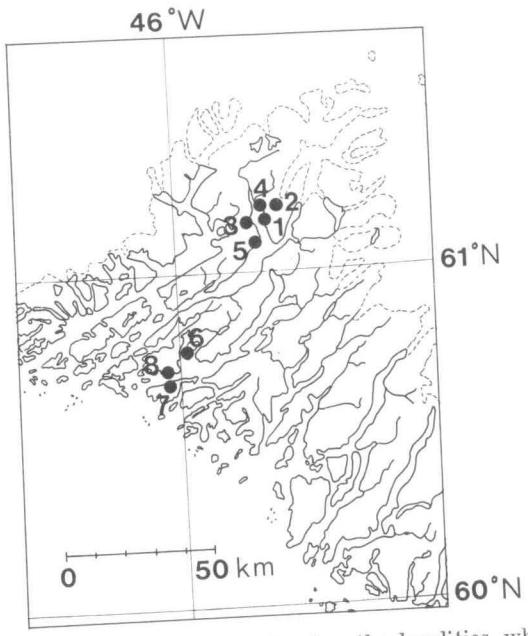


Fig. 1. Part of the Julianehåb District, showing the localities, where collections of lichens were made in 1969. Meteorological stations at Narssarssuaq (loc. 1) and Julianehåb (loc. 8).

Julianehåb. The annual precipitation is higher at Julianehåb (870.7 mm; cf. Table 2) than at Narssarssuaq (609.2 mm).

Information about microclimatic conditions, which are even more relevant to the lichens as regards their distribution, is very sparse (cf. p. 21).

Situation and geological conditions of eight localities in the Julianehåb District

The localities, where collections of lichens were made in 1969, are indicated in Fig. 1.

Locality 1. Narssarssuaq. 61°10′ lat. N., 45°26′ long. W. (8.–9., 11., 14., 18., 22. July 1969). The locality is situated close to the head of the large inlet Tunugdliarfik, c. 70 km from the outer coast. The bedrock around Narssarssuaq is composed of Mid-Precambrian granite formations (Julianehåb Granite) overlain by sandstones and basic lavas of the Eriksfjord formation and intruded by younger Gardar intrusions. The latter consist of alkaline magmatic complexes and dykes, many of which are rich in comparatively rare elements such as uranium, thorium, beryllium and niobium.

Table 1. *Mean temperatures of the months in Narssarssuaq and Julianehåb (according to measurements made by the Danish Meteorological Institute 1961–1973). °C.*

	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Narssarssuaq	÷ 5.3	÷ 5.6	÷ 4.2	0.5	5.3	8.3	10.1	9.4	5.6	0.5	÷ 3.4	÷ 6.2	1.3
Julianehåb	÷ 4.2	÷ 4.4	÷ 3.5	0.1	3.5	5.3	7.1	7.4	5.2	1.3	÷ 1.8	÷ 4.3	1.0

Table 2. *Precipitation of the months in Narssarssuaq and Julianehåb (according to measurements made by the Danish Meteorological Institute 1961–1973). mm.*

	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Narssarssuaq	39.2	38.8	47.1	22.2	29.5	39.9	63.2	69.2	63.2	53.6	76.4	66.9	609.2
Julianehåb	64.6	66.0	53.4	39.5	51.6	66.6	98.2	93.2	94.6	79.2	85.9	77.9	870.7

Locality 2. Kiagtût sermiat. 61°12′ lat. N., 45°20′ long. W. (9. July 1969). The locality is situated, where the glacier Kiagtût sermiat terminates to the north of Narssarssuaq. The basement geology is similar to this described at Narssarssuaq, although further away from a major Gardar intrusion.

Locality 3. Angmagssiviup qáqâ. 61°08′ lat. N., 45°31′ long. W. (12. July 1969). The locality is situated just to the south of Qagssiarssuk (Brattahlid). The bedrock is composed mainly of dark lava extrusions interlayered with sandstone.

Locality 4. Iterdlak. 61°11′ lat. N., 45°27′ long. W. (16. July 1969). The locality is situated just north of Narssarssuaq and the bedrock is similar to that of Narssarssuaq.

The area is rich in Mid-Precambrian (Gardar) carbonatite intrusions.

Locality 5. Mâjût. 61°05′ lat. N., 45°31′ long. W. (17. July 1969). The locality is situated c. 10 km to the south of Qagssiarssuk on the border between the Ketilidian Julianehåb Granite and the Eriksfjord (Gardar) sandstones and lavas.

Locality 6. Arpatsivik. 60°46′ lat. N., 45°57′ long. W. (24. July 1969). This island is situated to the north west of Julianehåb. The bedrock is composed of Mid-Precambrian Julianehåb Granite intersected by basic dykes.

Locality 7. Akia. 60°41′ lat. N., 46°04′ long. W. (25., 28. July 1969). This island is situated just to the south of Julianehåb. The bedrock is largely Julianehåb Granite intersected by basic dykes.

Locality 8. Harefjeld, Julianehåb. 60°43′ lat. N., 46°04′ long. W. (29. July 1969). The geology of the area agrees with that of Akia.

For further information about the geological conditions at the localities the reader is referred to BRIDGWATER (1965), WALTON (1965) and ESCHER & STUART WATT (1976).

Number of lichen species found in the inland and coastal areas

Table 3 shows in which localities each of the 201 species of lichens was collected. It appears that a total of 184 species were found in the inland region (loc. 1, 2, 3, 4 and 5), whereas no more than 105 species occur in the coastal. 88 species are common to the two regions. Thus only 17 species of lichens were collected exclusively in the coastal region, while 96 species were found exclusively in the inland area.

It is not possible to draw any unambiguous conclusions from these figures, as more time was spent by collecting lichens in the last-mentioned region, and as a larger number of localities were visited here. The author of this paper has, however, an impression that the lichen flora of the coastal region is not nearly so rich as that of the inland area.

Table 3. *List of 201 species of lichens collected in 8 localities in South West Greenland (*I = *Inland area;* II = *coastal area; cf. text p. 8).*

Acarospora chlorophana (Wahlenb. ex Ach.) Mass. I: 1
A. molybdina (Wahlenb. ex Ach.) Trev. I: 3; II: 6
A. peliocypha (Wahlenb.) Arn. I: 1, 4
A. smaragdula (Wahlenb. ex Ach.) Mass. I: 1, 3; II: 6
Alectoria chalybeiformis (L.) S. Gray I: 1
A. minuscula Nyl. I: 1, 4, 5; II: 7, 8
A. nigricans (Ach.) Nyl. I: 1; II: 6, 7, 8
A. nitidula (Th. Fr.) Vain. I: 1
A. ochroleuca (Hoffm.) Mass. I: 1
A. pubescens (L.) R. H. Howe I: 1, 3, 4, 5; II: 6, 7, 8
A. simplicior (Vain.) Lynge I: 1
Arthrorhaphis citrinella (Ach.) Poelt I: 1, 2, 5
Baeomyces rufus (Huds.) Rebent. I: 1; II: 8
Buellia atrata (Sm.) Anzi II: 6
B. disciformis (Fr.) Mudd. I: 1; II: 7
B. margaritacea (Somm.) Lynge I: 1
Caloplaca cinnamomea (Th. Fr.) Oliv. I: 1
C. flavovirescens (Wulf.) Dalla Torre & Sarnth. I: 4
C. lithophila Magn. I: 4
C. marina (Wedd.) Zahlbr. I: 5
C. scopularis (Nyl.) Lett. I: 3
C. stillicidiorum (Vahl) Lynge I: 1, 4
C. subolivacea (Th. Fr.) Lynge I: 1
Candelariella aurella (Hoffm.) Zahlbr. I: 4
C. canadensis Magn. I: 1
C. coralliza (Nyl.) Magn. I: 4
C. vitellina (Ehrh.) Müll. Arg. I: 1, 2, 3, 4, 5; II: 6, 7
Catillaria groenlandica Lynge I: 4
Cetraria andrejevii Oxn. II: 7
C. commixta (Nyl.) Th. Fr. II: 6, 7
C. cucullata (Bell.) Ach. I: 1, 2, 5; II: 6, 7, 8
C. delisei (Bory ex Schaer.) Th. Fr. I: 1, 2; II: 6, 7, 8
C. ericetorum Opiz I: 1; II: 8
C. hepatizon (Ach.) Vain. I: 1, 3, 4; II: 6, 7, 8
C. islandica (L.) Ach. I: 1, 2; II: 6, 7, 8
C. nigricans (Retz.) Nyl. I: 1; II: 7
C. nivalis (L.) Ach. I: 1, 2, 5; II: 6, 7
C. pinastri (Scop.) S. Gray I: 1
C. sepincola (Ehrrh.) Ach. I: 1
C. simmonsii Krog II: 7
Cladonia acuminata (Ach.) Norrl. I: 1
C. amaurocraea (Flörke) Schaer. I: 1, 2; II: 7, 8
C. arbuscula (Wallr.) Rabenh. I: 1; II: 7
C. bellidiflora (Ach.) Schaer. I: 1; II: 6, 7, 8
C. cariosa (Ach.) Spreng. I: 1
C. carneola (Fr.) Fr. I: 1; II: 7
C. cenotea (Ach.) Schaer. I: 1, 5; II: 8
C. chlorophaea (Flörke ex Somm.) Spreng. s. str. I: 1; II: 6, 7, 8
C. coccifera (L.) Willd. I: 1, 5; II: 6, 7, 8

Table 3. *Continued.*

Cladonia cornuta (L.) HOFFM. I: 1; II: 6, 7
C. crispata (ACH.) FLOT. II: 6, 7, 8
C. cyanipes (SOMM.) NYL. I: 1; II: 7
C. ecmocyna (ACH.) NYL. I: 2; II: 7, 8
C. fimbriata (L.) FR. I: 1
C. floerkeana (FR.) FLÖRKE II: 6, 7, 8
C. gonecha (ACH.) ASAH. I: 1; II: 7, 8
C. gracilis (L.) WILLD. I: 1, 2, 3, 5; II: 6, 7, 8
C. lepidota NYL. I: 2; II: 7, 8
C. macrophylla (SCHAER.) STENHAM. II: 6, 7, 8
C. macrophyllodes NYL. II: 8
C. mitis SANDST. I: 1, 2, 5; II: 6, 7, 8
C. phyllophora HOFFM. I: 1, 2; II: 7
C. pleurota (FLÖRKE) SCHAER. I: 1, 2, 5; II: 6, 7, 8
C. pocillum (ACH.) O. RICH. I: 1
C. pyxidata (L.) HOFFM. I: 1, 5; II: 6, 7, 8
C. rangiferina (L.) WIGG. I: 1, 2, 5; II: 6, 7, 8
C. squamosa (SCOP.) HOFFM. I: 1, 5; II: 6, 7, 8
C. stellaris (OPIZ.) POUZ. et VĚZDA I: 1; II: 7, 8
C. subcervicornis (VAIN.) KERNST. I: 5
C. uncialis (L.) WIGG. I: 1, 5; II: 6, 7
C. verticillata (HOFFM.) SCHAER. II: 8
Coriscium viride (ACH.) VAIN. II: 7, 8
Cornicularia muricata (ACH.) ACH. I: 1, 3, 5; II: 6, 7, 8
Dermatocarpon rufescens (ACH.) TH. FR. I: 1
Diploschistes scruposus (SCHREB.) NORM. I: 4
Gyalecta foveolaris (ACH.) SCHAER. I: 5
Haematomma ventosum (L.) MASS. I: 1
Hypogymnia austerodes (NYL.) RÄS. I: 1, 4
H. oroarctica KROG II: 6
H. physodes (L.) W. WATS. I: 1
Lasallia pensylvanica (HOFFM.) LLANO I: 1
Lecanora albescens (HOFFM.) FLÖRKE I: 1, 3
L. arctica LYNGE I: 1, 4
L. badia (HOFFM.) ACH. I: 4; II: 6
L. cinerea (L.) SOMM. I: 1, 4, 5
L. cinereorufescens (ACH.) HEPP. I: 1
L. epibryon (ACH.) ACH. I: 1
L. frustulosa (DICKS.) ACH. I: 1, 4
L. mastoidea LYNGE I: 1
L. melanophthalma (RAM.) RAM. I: 1, 4; II: 6
L. muralis (SCHREB.) RABENH. I: 1, 4, 5; II: 6, 7
L. polytropa (EHRH.) RABENH. I: 1, 3, 4, 5; II: 6, 7
L. rubina (VILL.) ACH. I: 4
L. straminea (WAHLENB.) ACH. I: 1, 3, 4, 5; II: 6
Lecidea aglaea SOMM. I: 1
L. atrobrunnea (RAM.) SCHAER. I: 1, 4; II: 6, 7
L. berengeriana (MASS.) NYL. I: 1
L. decipiens (HEDW.) ACH. I: 1; II: 7
L. demissa (RUTSTR.) ACH. I: 1; II: 6
L. dicksonii (GMEL.) ACH. I: 1; II: 7

Table 3. *Continued.*

Lecidea globifera Ach. I: 1
L. lapicida (Ach.) Ach. I: 1, 4, 5; II: 6
L. limosa Ach. I: 1
L. macrocarpa (Dc.) Steud. I: 1, 3; II: 7
L. pantherina (Hoffm.) Th. Fr. I: 1, 4, 5; II: 6
L. rubiformis (Wahlenb. ex Ach.) Wahlenb. I: 1
L. symmicta (Ach.) Ach. I: 1
L. tornoensis Nyl. II: 6
L. vernalis (L.) Ach. I: 1; II: 7
Lepraria arctica (Lynge) Wetm. I: 1
L. neglecta (Nyl.) Lett. I: 1; II: 6, 7, 8
Leprocaulon subalbicans (Lamb) Lamb et Ward (Strain IV) I: 1; II: 6
Leptogium lichenoides (L.) Zahlbr. I: 1
L. saturninum (Dicks.) Nyl. I: 1
Lobaria scrobiculata (Scop.) Dc. I: 1, 5
Massalongia carnosa (Dicks.) Körb. I: 1, 5; II: 6, 7
Nephroma arcticum (L.) Torss. I: 1; II: 6, 7, 8
N. bellum (Spreng.) Tuck II: 6
N. expallidum (Nyl.) Nyl. I: 1
N. parile (Ach.) Ach. I: 1, 3; II: 7
Ochrolechia alboflavescens (Wulf.) Zahlbr. I: 1
O. frigida (Sw.) Lynge I: 5; II: 6, 7
O. geminipara (Th. Fr.) Vain. I: 1, 2; II: 6, 7
O. grimmiae Lynge I: 1
O. upsaliensis (L.) Mass. I: 1, 4
Pannaria pezizoides (G. Web.) Trev. II: 7
Parmelia centrifuga (L.) Ach. I: 1, 4; II: 6, 7, 8
P. conspersa (Ach.) Ach. I: 1, 4
P. disjuncta Erichs. I: 4
P. incurva (Pers.) Fr. I: 1; II: 7, 8
P. infumata Nyl. I: 1, 4
P. omphalodes (L.) Ach. I: 1; II: 6, 7, 8
P. pulla (Schreb.) Ach. I: 1
P. saxatilis (L.) Ach. I: 1, 3, 5; II: 6, 7, 8
P. septentrionalis (Lynge) Ahti I: 1
P. sulcata Tayl. I: 1, 4, 5; II: 6, 8
Parmeliopsis ambigua (Wulf.) Nyl. I: 1
P. hyperopta (Ach.) Arn. I: 1
Peltigera aphthosa (L.) Willd. I: 1, 2; II: 7
P. canina (L.) Willd. I: 1, 2; II: 6
P. collina (Ach.) Ach. I: 1
P. malacea (Ach.) Funck I: 1, 2; II: 6
P. polydactyla (Neck.) Hoffm. I: 5
P. rufescens (Weis.) Humb. I: 1; II: 7, 8
P. scabrosa Th. Fr. I: 1
P. spuria (Ach.) Dc. I: 1, 2
P. venosa (L.) Baumg. I: 1
Pertusaria bryontha (Ach.) Nyl. I: 1
P. dactylina (Ach.) Nyl. II: 7, 8
P. oculata (Dicks.) Th. Fr. II: 6, 7, 8
P. panyrga (Ach.) Mass. I: 1

Table 3. *Continued.*

Physcia aipolia (EHRH.) HAMPE I: 1, 4
P. caesia (HOFFM.) HAMPE I: 1, 3, 4, 5; II: 6
P. dubia (HOFFM.) LETT. I: 1, 5; II: 6
P. orbicularis (NECK.) POETSCH I: 1, 5
P. sciastra (ACH.) DU RIETZ I: 1, 4
P. subobscura (NYL.) NYL. I: 5
Physconia muscigena (ACH.) POELT I: 1, 4
Placopsis gelida (L.) LINDS. I: 1
Polyblastia theleodes (SOMM.) TH. FR. I: 1
Psoroma hypnorum (VAHL) S. GRAY I: 1, 3, 5; II: 6, 7, 8
Rhizocarpon badioatrum (FLÖRKE ex SPRENG.) TH. FR. I: 1, 3
R. chionophilum TH. FR. I: 1, 4
R. copelandii (KÖRB.) TH. FR. I: 1, 4
R. crystalligenum LYNGE I: 4
R. disporum (NAEG. ex HEPP.) MÜLL. ARG. I: 1, 4; II: 6
R. distinctum TH. FR. I: 1
R. eupetraeum (NYL.) ARN. I: 1
R. geographicum (L.) DC. I: 1, 3, 4, 5; II: 6, 7, 8
R. grande (FLÖRKE ex FLOT.) ARN. I: 1, 3, 4; II: 6
R. hochstetteri (KÖRB.) VAIN. I: 1
R. jemtlandicum MALME I: 1, 3; II: 7
R. obscuratum (ACH.) MASS. I: 1
R. polycarpum (HEPP.) TH. FR. I: 1
R. rittokense (HELLB.) TH. FR. I: 1, 4; II: 6
Rinodina milvina (WAHLENB. ex ACH.) TH. FR. I: 1
R. turfacea (WAHLENB.) KÖRB. I: 1, 5; II: 6
Solorina crocea (L.) ACH. I: 1, 3; II: 6, 8
Sphaerophorus fragilis (L.) PERS. I: 1, 2, 5; II: 6, 7, 8
S. globosus (HUDS.) VAIN I: 1, 3, 5; II: 6, 7, 8
Sporastatia testudinea (ACH.) MASS. I: 4
Stereocaulon alpinum LAUR. I: 1, 2; II: 7
S. arenarium (SAV.) LAMB I: 1
S. glareosum (SAV.) MAGN. I: 1
S. paschale (L.) HOFFM. I: 1, 2; II: 6, 7
S. rivulorum MAGN. I: 1
S. vesuvianum PERS. I: 1; II: 7
Thamnolia vermicularis (SW.) ACH. ex SCHAER. I: 1, 2
Umbilicaria arctica (ACH.) NYL. I: 1, 5; II: 6, 7
U. cinereorufescens (SCHAER.) FREY I: 1
U. cylindrica (L.) DEL. I: 1, 3; II: 6, 7, 8
U. decussata (VILL.) FREY I: 1
U. hirsuta (SW. ex WESTR.) ACH. II: 7
U. hyperborea (ACH.) ACH. I: 1, 5; II: 6, 7, 8
U. polyphylla (L.) BAUMG. I: 1, 4
U. proboscidea (L.) Schrad. I: 1
U. torrefacta (LIGHTF.) SCHRAD. I: 1, 3; II: 6, 7, 8
U. vellea (L.) ACH. I: 1, 4; II: 6, 7
Xanthoria candelaria (L.) TH. FR. I: 1, 3, 4, 5; II: 6
X. elegans (LINK) TH. FR. I: 1, 3, 4, 5; II: 6, 8
X. sorediata (VAIN.) POELT I: 1

Ecological preferences of the lichen species

In regard to their occurrence in the localities visited the lichens can be divided into the following main groups. Because of variation in substrate specificity some species can be found in more than one group.

Group 1. Lichens growing on lower parts of trunks (1) and branches (2) of *Betula pubescens* Ehrh. and *Salix glauca* L.

Alectoria simplicior 2
Cetraria pinastri 2
– *sepincola* 2
Cladonia carneola 1
Hypogymnia austerodes 2
– *physodes* 2
Lecidea symmicta 2
Nephroma parile 2
Parmelia centrifuga 1
– *incurva* 1
– *septentrionalis* 2
– *sulcata* 2
Parmeliopsis ambigua 2
– *hyperopta* 2

This group of lichens is characteristic by containing many species occurring only in the inland part of the investigated area, where *Betula pubescens* is most wide-spread and especially on S-facing slopes makes copses up to three m high. While some of the species are exclusively corticolous, e.g., *Cetraria pinastri*, *C. sepincola*, *Lecidea symmicta* and *Parmelia septentrionalis*, other species are more commonly found growing on other kinds of substrates, *Cladonia carneola* on soil rich in humus and *Parmelia centrifuga* and *P. incurva* on rocks.

Group 2. Lichens growing on dead plant fragments under shrubs of *Betula pubescens* Ehrh. and *Salix glauca* L.

Buellia disciformis
Caloplaca cinnamomea
– *stillicidiorum*
– *subolivacea*
Cladonia fimbriata
Lecanora epibryon
Lecidea berengeriana
Lecidea limosa
– *vernalis*
Ochrolechia alboflavescens
– *upsaliensis*
Pertusaria bryontha
– *panyrga*
Rinodina turfacea

Like a large part of the corticolous lichen species mentioned in Group 1, many of the lichens growing directly on dead mosses or decaying branches and twigs under the shrubs are found in the inland area only. All but one species, viz. *Cladonia fimbriata*, belong to the category of crustaceous lichens, characterized by being in intimate contact with the substrate.

Group 3. Lichens occurring among mosses under shrubs of *Betula pubescens* Ehrh. and *Salix glauca* L.

Cetraria cucullata
– *islandica*
Cladonia acuminata
– *arbuscula*
– *bellidiflora*
– *cenotea*
– *cornuta*
– *cyanipes*
– *ecmocyna*
– *gonecha*
– *gracilis*
Cladonia pleurota
– *stellaris*
Lobaria scrobiculata
Nephroma arcticum
– *parile*
– *expallidum*
Peltigera aphthosa
– *canina*
– *malacea*
– *scabrosa*
– *spuria*

These species occur in the inland area in moist, somewhat shady places below large shrubs of *Betula pubescens* and *Salix glauca*, often together with such mosses as *Hylocomium splendens*, *Pleurozium schreberi* and *Rhytidium rugosum*.

Some of the species, e.g., *Cladonia bellidiflora*, *C. gonecha*, *C. pleurota*, *C. stellaris* and *Nephroma arcticum*, also occur nearer to the outer coast, where they usually grow in depressions in dwarf shrub heaths dominated by *Empetrum hermaphroditum* and *Vaccinium uliginosum*.

Group 4. Lichens occurring in herb slopes

Peltigera aphthosa
– *canina*

Only a few species of lichens with a relatively fastgrowing thallus are able to compete successfully with the many dicotyledonous herbs on the herb slopes.

Group 5. Lichens associated with snowbeds or growing on N-facing slopes with a snow cover of long duration

Cetraria delisei
Cladonia bellidiflora
– *ecmocyna*
– *gonecha*
– *lepidota*
Cladonia macrophyllodes
– *verticillata*
Peltigera rufescens
Pertusaria oculata
Solorina crocea

The snowbeds are characterized by having a protecting snow cover during winter and spring. Close to the snowbeds, the lichens are found growing on open, moist soil, often together with *Salix herbacea*, *Harrimanella hypnoides* and *Anthelia juratzkana*. All of the above-mentioned species of lichens are most frequent in the coastal area.

Group 6. Lichens growing in sheltered places among boulders and stones in talus slopes

Cetraria ericetorum
Cladonia bellidiflora
– *cenotea*
– *coccifera*
– *macrophylla*
– *pleurota*
– *rangiferina*
– *squamosa*
– *stellaris*
Cladonia subcervicornis
– *verticillata*
– *uncialis*
Cornicularia muricata
Nephroma arcticum
Ochrolechia grimmiae
Peltigera aphthosa
– *rufescens*
Psoroma hypnorum

Most of these species are equally distributed in the inland and coastal areas. Five species, however, are most common in the coastal area, viz. *Cladonia bellidiflora*, *C. macrophylla*, *C. rangiferina*, *C. stellaris* and *Nephroma arcticum*. *Ochrolechia grimmiae* lives as a parasite on the moss *Racomitrium lanuginosum* in talus slopes close to Narssarssuaq.

Group 7. Lichens occurring in open, gravelly fell-fields (lichens usually covering the stones in the fell-fields are mentioned under group 12)

Alectoria nigricans
– *ochroleuca*
– *pubescens*
Candelariella canadensis
Cetraria cucullata
– *hepatizon*
– *islandica*
– *nigricans*
– *nivalis*
Cladonia amaurocraea
– *cariosa*
– *coccifera*
Cladonia gracilis
– *mitis*
– *pyxidata*
– *rangiferina*
Cornicularia muricata
Lecidea demissa
Ochrolechia frigida
Peltigera malacea
– *rufescens*
Pertusaria dactylina
Sphaerophorus globosus
Thamnolia vermicularis

The climate in the fell-fields is often very arid because of exposure to heavy winds. During winter the vegetation of the fell-fields does not have any protective cover of snow. Therefore, the vegetation of higher plants is usually rather scanty, whereas the lichens are of great importance. The great majority of the lichen species occurring in the fell-fields are equally distributed in the inland and coastal areas.

Group 8. Species occurring in lichen heaths

Alectoria nigricans 3
– *ochroleuca* 3
Cetraria cucullata 2
– *islandica* 2
Cetraria nivalis 2
Cladonia amaurocraea 2
– *coccifera* 2
– *gracilis* 2

Cladonia mitis 1
– *pyxidata* 3
– *rangiferina* 1
– *stellaris* 1
– *uncialis* 2
Cornicularia muricata 3
Ochrolechia frigida 3
Parmelia saxatilis 3
Pertusaria dactylina 3
Psoroma hypnorum 3
Sphaerophorus globosus 3
Stereocaulon alpinum 1
– *paschale* 1

Rather small and weakly developed lichen heaths are found in the lowland in the inner part of Tunugdliarfik (Kiagtût sermiat). The lichen heaths are much better developed at the outer coast, where most of the dominant species (1) are found in extensive, almost pure associations (the northern part of Akia).

The other species occur in lesser quantity in the lichen heaths. Some of these species (2) are constant components of the dense lichen carpet, while others (3) usually are found growing in open, rather arid places in the lichen heath. A large part of the last-mentioned species also occur in the fell-fields.

Group 9. Lichens growing in moist dwarf shrub heaths dominated by *Empetrum hermaphroditum* (LGE.) HAGERUP

Alectoria nigricans 3
Cetraria andrejevii 1
– *cucullata* 2
– *delisei* 1
– *islandica* 3
– *nivalis* 3
– *simmonsii* 1
Cladonia amaurocraea 3
– *arbuscula* 1
– *bellidiflora* 1
– *carneola* 2
– *cenotea* 2
– *chlorophaea* 2
– *coccifera* 2
– *cornuta* 1
– *crispata* 1
– *cyanipes* 1
– *ecmocyna* 1
– *floerkeana* 2
– *gonecha* 1
– *gracilis* 3
Cladonia lepidota 1
– *macrophylla* 2
– *mitis* 3
– *pleurota* 1
– *pyxidata* 3
– *squamosa* 1
– *stellaris* 2
Coriscium viride 2
Cornicularia muricata 3
Lecidea demissa 3
– *tornoensis* 2
– *vernalis* 2
Nephroma arcticum 2
Ochrolechia frigida 3
– *geminipara* 2
Pannaria pezizoides 1
Peltigera aphthosa 2
– *canina* 2
– *polydactyla* 1
Rinodina turfacea 3
Sphaerophorus globosus 3

The *Empetrum* heaths attain their optimum development along the outer coast, where in some places they form an almost continuous cover only interrupted by bare rock. Usually this moist type of heath is very rich in species of lichens. The ecological preferences of these species, however, are quite variable.

A number of species with a main distribution in the coastal area around Julianehåb are found in moist depressions in the heaths (1). Some of these species, for example *Cetraria delisei*, *Cladonia lepidota*, *Pannaria pezizoides* and *Peltigera polydactyla*, also occur along watercourses, on the border of pools and in bogs dominated by *Salix arctophila*, *Eriophorum angustifolium* or *Vaccinium uliginosum*.

Some species, which also are most widely distributed in the coastal area, occur on soil with a high content of humus in somewhat dry, but sheltered places and on hummocks in dwarf shrub heaths (2).

Finally, some of the species usually occurring in open places in lichen heaths and in fell-fields are found among stones and boulders in more exposed places, often where dwarf shrub heaths border on fell-fields or lichen heaths (3).

Group 10. Lichens occurring as pioneers on open, bare, mineral soil

Arthrorhaphis citrinella
Baeomyces rufus
Candelariella canadensis

These are found in places, where new soil is laid bare on account of landslide or erosion caused by wind.

Group 11. Lichens growing on basic soil near magmatic dykes and intrusions

Cladonia pocillum
Dermatocarpon rufescens
Gyalecta foveolaris
Lecidea decipiens
Lecidea globifera
– rubiformis
Peltigera venosa
Physconia muscigena

It is characteristic that all of these species are most frequently found in the inland area, where we find the largest occurrences of Gardar intrusions.

Group 12. Saxicolous lichens

The lichen species occurring on rocks, boulders and stones are divided into three sub-groups according to a) pH of the rock substrate and b) ± occurrence of bird excrements (guano). Furthermore a subdivision is made on the basis of the growth form of the lichens. For that purpose a slightly modified version of the system of biological types used by Massé (1964) is adopted (cf. also Klement (1955)).

Sub-group a. Lichens growing mainly or exclusively on calcareous sediments and diabasic intrusions and dykes or rock fragments originated in these geological formations

Buellia margaritacea
Caloplaca flavovirescens
– lithophila
Candelariella aurella
Catillaria groenlandica
Lecanora albescens
Polyblastia theleodes

All of the mentioned lichens are characteristic by having a crustose, epilithic thallus without soredia. They are found growing around Narssarssuaq and Iterdlak and are completely absent in the coastal localities.

Sub-group b. Lichens occurring mainly or exclusively on "bird stones" or "bird rocks" (i.e., boulders and projecting rocks with a thin cover of guano on the top) mainly composed of granite

1. Species with crustose, epilithic thallus. Soredia absent

Acarospora peliocypha
Candelariella coralliza
– vitellina
Lecanora badia
Lecidea atrobrunnea

Most of these lichens preferably grow on horizontal or somewhat sloping rock surfaces. The two first-mentioned species occur in the inland area only, whereas the three others are found to be equally distributed in the inland and coastal areas.

2. Species with placodioid thallus, i.e., crustose in the centre and lobate at the margin, the lobes lacking a lower cortex

Caloplaca scopularis
Lecanora melanophthalma
– muralis
Lecanora rubina
– straminea

While *Caloplaca scopularis* and *Lecanora straminea* are found growing exclusively on maritime rocks near sea level, *Lecanora melanophthalma*, *L. muralis* and *L. rubina* also occur on rocks situated some distance away from the coast line. *Caloplaca scopularis* and *Lecanora rubina* occur in the inner part of Tunugdliarfik only; the other are found to be equally distributed in the inland and coastal areas.

3. Species with foliose thallus and rhizinal attachment

Parmelia infumata
– sulcata
Physcia aipolia
– caesia
– dubia
Physcia orbicularis
– sciastra
Xanthoria candelaria
– elegans
– sorediata

Five of these species, viz. *Parmelia infumata*, *Physcia aipolia*, *P. orbicularis*, *P. sciastra* and *Xanthoria sorediata*, are found in the inland area only. Three species, viz. *Physcia caesia*, *P. dubia* and *Xanthoria candelaria*, occur most abundantly in the inland area, but are also found in the coastal region. Only two species, *Parmelia sulcata* and *Xanthoria elegans*, are equally distributed in the two regions.

While most of the species belonging to this group grow mainly on horizontal or somewhat sloping rock surfaces, a few species, e.g., *Xanthoria sorediata*, are usually found growing on vertical surfaces.

4. Species with foliose, umbilicate thallus

Umbilicaria arctica
– *decussata*
– *hirsuta*

Umbilicaria arctica, which frequently occurs in large growths on the top of bird stones, is found in both regions, whereas *Umbilicaria decussata* occurs exclusively in the inland area and *U. hirsuta* exclusively in the coastal one. The two last-mentioned species grow preferably on vertical rock surfaces.

Sub-group c. Lichens mainly growing on rocks, boulders and stones composed of granite and without visible influence of bird excrements

1. Species with crustose, epilithic thallus. Soredia absent

Acarospora smaragdula
Buellia atrata
(Caloplaca marina)
Diploschistes scruposus
Haematomma ventosum
Lecanora arctica
– *cinerea*
– *cinereorufescens*
– *frustulosa*
– *mastoidea*
– *polytropa*
Lecidea aglaea
– *dicksonii*
– *lapicida*
– *macrocarpa*
– *pantherina*
Rhizocarpon badioatrum
– *chionophilum*
– *copelandii*
– *crystalligenum*
– *disporum*
– *distinctum*
– *eupetraeum*
– *geographicum*
– *grande*
– *hochstetteri*
– *jemtlandicum*
– *obscuratum*
– *polycarpum*
– *rittokense*
Rinodina milvina

The majority of the saxicolous lichens belonging to this group (27 species) occur most abundantly in the inland region, and many of them are not at all found in the coastal area. Two species, *Lecanora polytropa*

and *Rhizocarpon geographicum*, are practically ubiquitous on granite rocks in the investigated areas. *Buellia atrata* is found in the coastal area only.

A few specimens of *Caloplaca marina* have rather short and broad lobes, but most frequently a distinct marginal lobation is lacking. For that reason *Caloplaca marina* occurs both in this group and in Group 3.

2. Species with leprose (i.e., entirely sorediate), crustose and epilithic thallus

Lepraria arctica
– *neglecta*

While *Lepraria arctica* is found at Narssarssuaq only, *Lepraria neglecta* occurs in both areas, but is, however, most frequent in the coastal area.

3. Species with placodioid thallus

Acarospora chlorophana
– *molybdina*
Caloplaca marina
Placopsis gelida
Sporastatia testudinea

All of these species except one, *Acarospora molybdina*, occur exclusively in the inland area. Two species, viz. *Acarospora molybdina* and *Caloplaca marina*, are restricted to maritime rocks near sea level (1–6 m a.s.l.).

Acarospora chlorophana is found on overhanging (inclination > 90°) rock surfaces at Narssarssuaq.

4. Species with squamulose thallus, attached by a hypothallus

Massalongia carnosa

Massalongia carnosa occurs both in the inland area and in the coastal one. It grows preferably on sloping surfaces of boulders and rocks periodically moistened by trickling water, often together with *Leprocaulon subalbicans*, species of *Lepraria* and mosses.

5. Species with foliose thallus and rhizinal attachment

Cetraria commixta
– *hepatizon*
Lobaria scrobiculata
Nephroma expallidum
– *parile*
Parmelia centrifuga
– *conspersa*
– *disjuncta*
Parmelia incurva
– *omphalodes*
– *pulla*
– *saxatilis*
Peltigera collina
– *malacea*
Physcia subobscura
Physconia muscigena

Half of the species belonging to this group (8) are found exclusively in the inland region. Seven species are distributed in both areas, but only two of these species, viz. *Cetraria hepatizon* and *Parmelia saxatilis*, are practically omnipresent. One species, *Cetraria commixta*, is found in the coastal area only.

Some of the species, which are restricted to the inland area, e.g., *Lobaria scrobiculata* and *Peltigera collina*, occur on boulders situated in high, but rather open copses dominated by *Betula pubescens* EHRH. and *Salix glauca* L. on S- and SV-facing slopes. Unfortunately we have no microclimatic measurements from this type of biotope in the inner part of Tunugdliarfik, but presumedly the above-mentioned lichen species are exposed to rather high temperatures during summer in some of these places. Microthermic measurements have, however, been made by K. HANSEN & HAGEMANN (1967); cf. also K. HANSEN (1973)) in an open scrub dominated by *Salix glauca* L. and *Juniperus communis* L. on a dry slope with southern exposure in the inner part of Nigerdleq Fjord (62°04′ lat. N., 49°20′ long. W.), situated northwest of our investigation area. These measurements showed that the daily absolute maximum temperature recorded in the mentioned biotope in a short summer period (6.7–12.7.1965) was as high as 57°C.

While the species belonging to the genera *Cetraria*, *Parmelia* and *Physcia* mentioned in the present group are in rather close contact with the firm rock substrate, the species of *Peltigera*, *Physconia*, *Lobaria* and *Nephroma* mentioned occur upon a thin cover of gravelly soil, humus or among mosses on the rock. Some of these species, e.g., *Peltigera malacea* and *Nephroma expallidum*, are also found growing among mosses on the ground in willow scrubs (p. 14).

6. Species with foliose thallus, attached to the rock surface by adhesive discs, or by the whole of the lower surface

Hypogymnia austerodes
– *oroarctica*
– *physodes*

Hypogymnia austerodes and *H. physodes* occur in the inland area, *H. oroarctica* in the coastal one. The two first mentioned species are also found growing on branches and trunks of *Betula pubescens* and *Salix glauca* in the inner part of Tunugdliarfik.

7. Species with foliose, umbilicate thallus

Lasallia pensylvanica
Umbilicaria cinereorufescens
– *cylindrica*
– *hyperborea*
Umbilicaria polyphylla
– *proboscidea*
– *torrefacta*
– *vellea*

The majority of these species are most frequently or exclusively found in the inland area. Three species, however, viz. *Umbilicaria cylindrica*, *U. hyperborea* and *U. torrefacta*, occur most abundantly in the coastal area.

While some species, e.g., *Lasallia pensylvanica*, preferably grow on horizontal or on slightly sloping surfaces of the rocks, other species, e.g., *Umbilicaria vellea*, are found mainly on strongly sloping or on vertical (inclination 75–90°) rock surfaces. Like the nitrophilous species *Umbilicaria hirsuta*, *U. vellea* usually occurs on damp, shady rock surfaces.

8. Species with foliose, gelatinous thallus
Leptogium lichenoides
– *saturninum*

Both of these species are found at Narssarssuaq only. Here they grow among mosses on dry surfaces of rocks.

9. Species with fruticose thallus

Cladonia gracilis	*Sphaerophorus globosus*
Leprocaulon subalbicans	*Stereocaulon vesuvianum*
Sphaerophorus fragilis	

Cladonia gracilis and the two species of *Sphaerophorus* are equally distributed and common in the inland and coastal areas. The remaining species also occur in both of these regions, but more rarely. It is characteristic that *Cladonia gracilis*, *Sphaerophorus globosus* and *Leprocaulon subalbicans* grow on a thin cover of soil, humus or upon mosses on the rock, whereas *Sphaerophorus fragilis* and *Stereocaulon vesuvianum* are in more intimate contact with the firm rock surface.

10. Species with fruticose, filamentous thallus

Alectoria chalybeiformis	*Alectoria nitidula*
– *minuscula*	– *ochroleuca*
– *nigricans*	– *pubescens*

Only one of the species belonging to this group, viz. *Alectoria pubescens*, is equally distributed and common in the inland and coastal area. *Alectoria minuscula* and *A. nigricans* also occur in both of these areas, but they are not so abundantly occurring as *A. pubescens*. Three species, viz. *Alectoria chalybeiformis*, *A. nitidula* and *A. ochroleuca*, are found exclusively at Narssarssuaq in the inland area.

While *Alectoria minuscula* and *A. pubescens* grow in rather close contact with the rock surface, all of the other species are usually attached to mosses or lichens on boulders and rocks. Some of the species, e.g., *Alectoria nigricans* and *A. ochroleuca*, also occur on the ground in fell-fields and lichen heaths.

Lichens of particular interest

Below, a number of species, which are either new to the lichen flora of Greenland or are considered to be interesting from a phytogeographical, ecological or taxonomical point of view, are discussed. Most of the species are distributed mainly or exclusively in the inland area. Two species, *Cetraria simmonsii* and *Coriscium viride*, are found in the coastal area only. *Lecanora muralis* is approximately equally distributed in the inland and coastal areas.

A. Microlichens

Acarospora peliocypha (Wahlenb.) Arn.: In Greenland the species is previously known only from a few localities in West Greenland (Nanortalik, Julianehåb, Okivisekan, Holsteinsborg) and in North East Greenland (Danmark Ø, Kap Humboldt) (cf. Lynge 1940; A. H. Magnusson 1935).

The plants collected in 1969 were found at Narssarssuaq and on a point at Iterdlak in the inner part of Tunugdliarfik. The species occurred on manured rocks together with *Lecanora muralis* and *Candelariella vitellina*. The collections are richly fertile.

Caloplaca flavovirescens (Wulf.) Dalla Torre & Sarnth.: New to the lichen flora of Greenland. The specimens, which are richly fertile (Plate I, Fig. 1), were found growing on a calcareous rock at Iterdlak together with *Candelariella aurella*, *Catillaria groenlandica* and *Rhizocarpon disporum*. *Caloplaca flavovirescens* is sometimes considered as a variety of *Caloplaca aurantiaca* (Lightf.) Th. Fr., which has not been reported from Greenland, however. Prof. Dr. J. Poelt, Graz, has kindly verified my identifications of the specimens from Iterdlak. In his opinion (personal communication) *Caloplaca aurantiaca* s. lat. consists of a number of different types. This group is really in hard need of revision.

Caloplaca marina (Wedd.) Zahlbr.: The species has not previously been reported from Greenland, it has, however, been collected by P. Gelting in several localities in the Disko-Nûgssuaq region. I have examined all of the specimens referred to *Caloplaca murorum* (Hoffm.) Th. Fr. at the Botanical Museum in Copenhagen and found one of them (leg. Vahl, Holsteinsborg) to belong to *Caloplaca marina*.

In 1969 *Caloplaca marina* was collected on a maritime rock at Mâjût, c. 1 m above sea level.

Caloplaca scopularis (Nyl.) Lett.: The species is reported to be very rare in Greenland (Nordin 1972). It has been collected only in three localities in South West Greenland, viz. Nanortalik (leg. Vahl and Eberlin), Tigssaluk (leg. Vahl) and Angmagssiviup qáqâ (1969).

In the last-mentioned locality, *Caloplaca scopularis* occurred on a bird rock together with *Lecanora straminea*, *Xanthoria elegans*, *Acarospora molybdina* and *Prasiola crispa*.

The plants are well-developed with short, marginal lobes and several, crowded apothecia in the centre of the thallus.

Candelariella coralliza (NYL.) MAGN.: New to the lichen flora of Greenland. The species is distinctly ornithocoprophilous and was found growing on the top of a large bird rock at Iterdlak. Apothecia are not found on the thallus, which characteristically is composed of coralloid clusters of digitiform squamules.

Catillaria groenlandica LYNGE: The species, which was established by LYNGE on the basis of a collection from Atanikerdluk at Nûgssuaq (LYNGE 1937), is very rare in Greenland. It occurred at Iterdlak on a calcareous rock together with *Caloplaca flavovirescens* zand *Candelariella aurella*.

Lecanora muralis (SCHREB.) RABENH.: There are only a few earlier reports of this species from Greenland (DEICHMANN BRANTH & GRØNLUND 1888). In addition P. GELTING has collected *Lecanora muralis* at Kuánerssuit in Disko Fjord (no. 11179). As the species was collected in several localities in the Julianehåb District in 1969, and as there were a considerable number of plants, especially from Iterdlak, *Lecanora muralis* can be regarded as rather frequent in the area of this investigation.

The species is distinctly nitrophilous and was accordingly found growing on bird stones and bird cliffs, often together with *Xanthoria candelaria*, *Lecanora melanophthalma* and *Candelariella vitellina*. Most of the plants are well-developed and richly fertile.

Lecidea globifera ACH.: There are many collections with this name at the Botanical Museum in Copenhagen, but an examination has shown that all of these specimens except two collected by VAHL (DEICHMANN BRANTH & GRØNLUND 1888) at Okivisekan in Sermilik fjord north of Julianehåb belong to *Lecidea rubiformis* (WAHLENB. ex. ACH.) WAHLENB. My collection, which consists of a few plants only, are from a basic soil near an intrusion at Narssarssuaq. Accordingly *Lecidea globifera* can be classified as very rare in Greenland.

The plants are well-developed, the thallus squamules being cochleate, imbricate and entirely chestnut brown, without the white margin, which is always found in *Lecidea rubiformis*.

Lecidea symmicta (ACH.) ACH.: New to the lichen flora of Greenland. The species was collected in several places in the vicinity of Narssarssuaq, where it occurs on thin branches of *Betula pubescens*, often together with *Cetraria sepincola*, *Parmelia septentrionalis* and *Parmeliopsis ambigua*.

Ochrolechia alboflavescens (WULF.) ZAHLBR.: The species, which has not previously been reported from Greenland, was collected at Narssar-

ssuaq. Among the collections of P. GELTING I found another specimen from Tunorssuaq close to Godhavn on Disko (no. 19918), which in my opinion can likewise be referred to *Ochrolechia alboflavescens.*

Polyblastia theleodes (SOMM.) TH. FR.: The species must be regarded as rare in Greenland. It has previously been reported only from Nordfjord on the west coast of Disko in West Greenland (LYNGE 1937) and from Kap Bennet and Moskusoksefjord in North East Greenland (LYNGE 1940).

At Narssarssuaq a few specimens were found on a bird rock together with *Umbilicaria arctica*, *U. proboscidea* and *U. hyperborea.* Several perithecia contained mature, dark, muriform spores.

Rhizocarpon eupetraeum (NYL.) ARN.: New to the lichen flora of Greenland. The species is previously recorded from Fennoscandia and North America (J. W. THOMSEN 1967). It was collected on siliceous rocks at Narssarssuaq, where it occurs together with *Cetraria hepatizon*, *Lecanora polytropa* and *Rhizocarpon geographicum.*

The thallus of *Rhizocarpon eupetraeum* has ashy verrucae. The apothecia, which are situated between the verrucae, are round and black (Plate I, Fig. 2). Exciple, hypothecium and epithecium are reddish-brown. The asci contain 8 dark, muriform spores. Medulla, exciple and hypothecium react K + red. Red acicular crystals are precipitated.

B. Macrolichens

Alectoria simplicior (VAIN.) LYNGE: In Greenland this species has previously been reported only from three localities in the Julianehåb District (DAHL 1950). While DAHL found *Alectoria simplicior* growing between mosses on the earth, my specimens occurred together with *Parmelia sulcata* on branches of *Betula pubescens.*

Alectoria simplicior is distinguished from the closely related species *A. nidulifera* NORRL., which has a similar pattern of distribution in Europe (but is not reported from Greenland), by its farinose soralia without isidia and by lacking P reaction of medulla. *A. nidulifera* has isidiate soralia, and the medulla reacts P + red.

Cetraria simmonsii KROG: The species, which has recently been established by KROG (1968), is closely related to *Cetraria andrejevii* OXN., but is rarer in Greenland than the latter, being only reported from a few localities in the Godthåb and Disko Districts. In 1976 *C. simmonsii* was found at Kangerdluarssuk (60°53′ lat. N., 45°51′ long. W.) and Dyrnæs (60°57′ lat. N., 46°03′ long W.) in the Julianehåb District by JON FEILBERG (det. by the present author).

On Akia the species was found growing in a moist depression in a dwarf shrub heath dominated by *Empetrum hermaphroditum* and *Vac-*

cinium uliginosum. It occurred together with the likewise oceanic species *Cetraria andrejevii* and *C. delisei*.

Coriscium viride (ACH.) VAIN.: The species is rather frequent in the Julianehåb District. In South Greenland it has, however, only rarely been found together with the fruiting body of *Omphalina luteolilacina* (FAVRE) HENDERSON.

The fruiting body of the fungal component of *Coriscium viride* is present on a specimen collected at Akia in 1969.

Leprocaulon subalbicans (LAMB) LAMB et WARD: The species, which has previously been reported from two localities in South and West Greenland (LAMB & WARD 1974), was collected at Narssarssuaq (five specimens) and Arpatsivik (one specimen).

At both of the last-mentioned localities *Leprocaulon subalbicans* was found growing on rock surfaces together with *Umbilicaria vellea*, *Parmelia omphalodes*, *Massalongia carnosa*, species of *Lepraria* and mosses. Beside these collections several specimens belonging to this species are kept at the Botanical Museum in Copenhagen, all of them collected by P. GELTING at Godhavn and Tupilak island (Egedesminde) respectively.

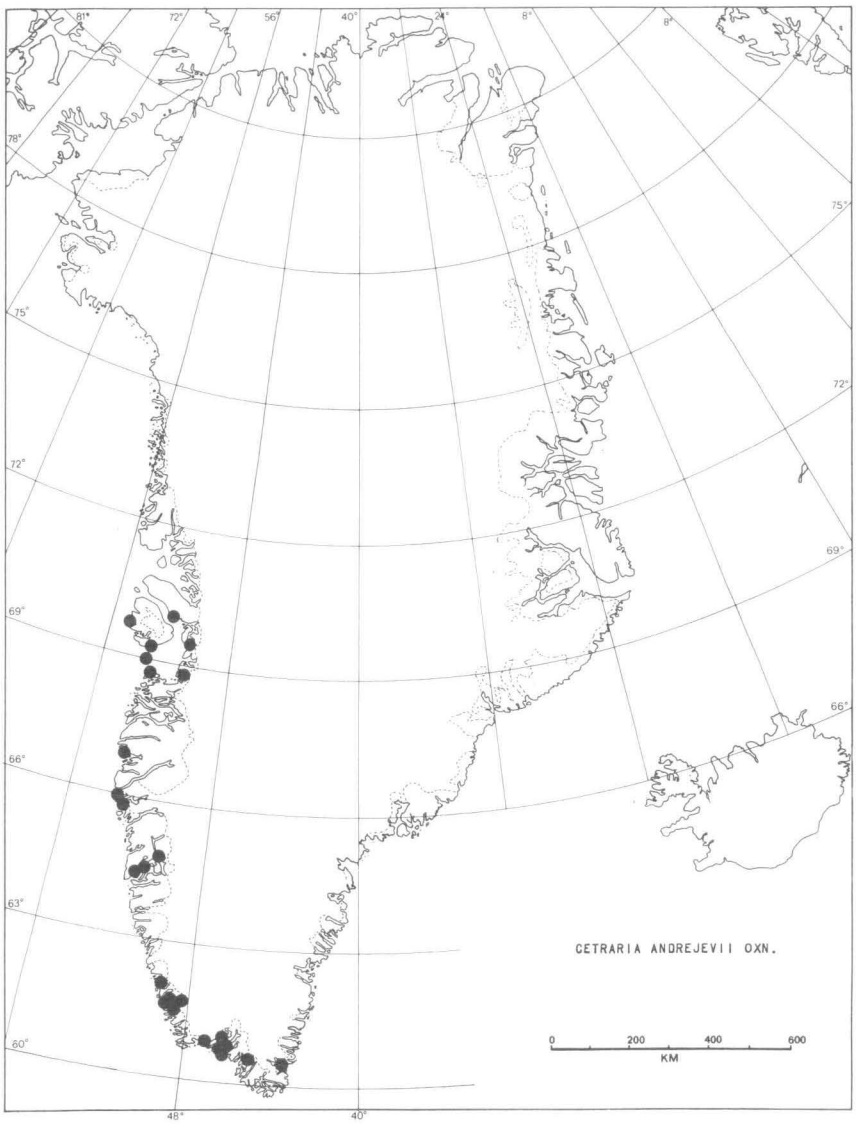
The plants collected in 1969 lack distinct phyllocladial granules and no central axis is differentiated. Reproductive sexual structures are likewise lacking. Thallus reacts P + intense persistent golden-yellow, indicating Strain IV (LAMB & WARD 1974). A chromatographic investigation of the specimens has shown that all of them contain atranorin, squamatic acid and baeomycesic acid.

Parmelia pulla (SCHREB.) ACH.: In Greenland the species is previously known only from a few localities in South East Greenland (DAHL, E., LYNGE, B. & SCHOLANDER, P. F. 1937). Like the two above-mentioned species, *Parmelia pulla* is a southern element in the lichen flora of Greenland. The species was found growing on a large granite boulder close to Narssarssuaq. It is without apothecia.

Distribution maps of lichens in Greenland

Until recently information on the occurrence and distribution of lichens in Greenland in relation to climatic and geological factors has been too scant to permit any classification of distributional patterns and distribution maps. The intensive lichenological, geological and meteorological research work in many parts of Greenland during the last decades leaves out only relatively small areas that can be considered completely unexplored (e.g., Melville Bugt in North West Greenland and parts of the north coast of Greenland). Thus the above-mentioned compilatory work may begin.

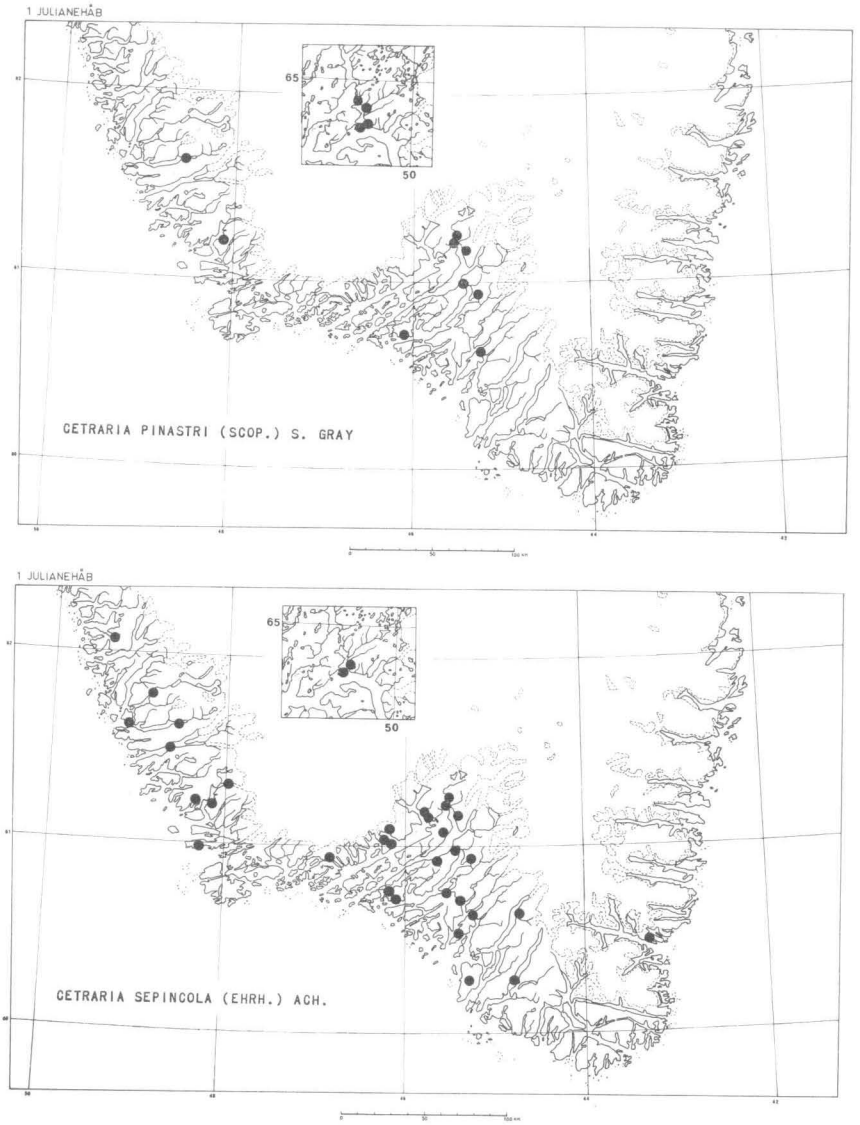
Among the many difficulties connected with this work are the fact



Map 1.

that the majority of collections of microlichens and a large part of the macrolichens are in need of taxonomical revision. The lichens presented here can be regarded as distinct and present no taxonomical problems. It is supposed that their occurrence in Greenland is reasonably well covered.

The literature consulted in connexion with the compilation of the distribution maps is mentioned in the literature list.

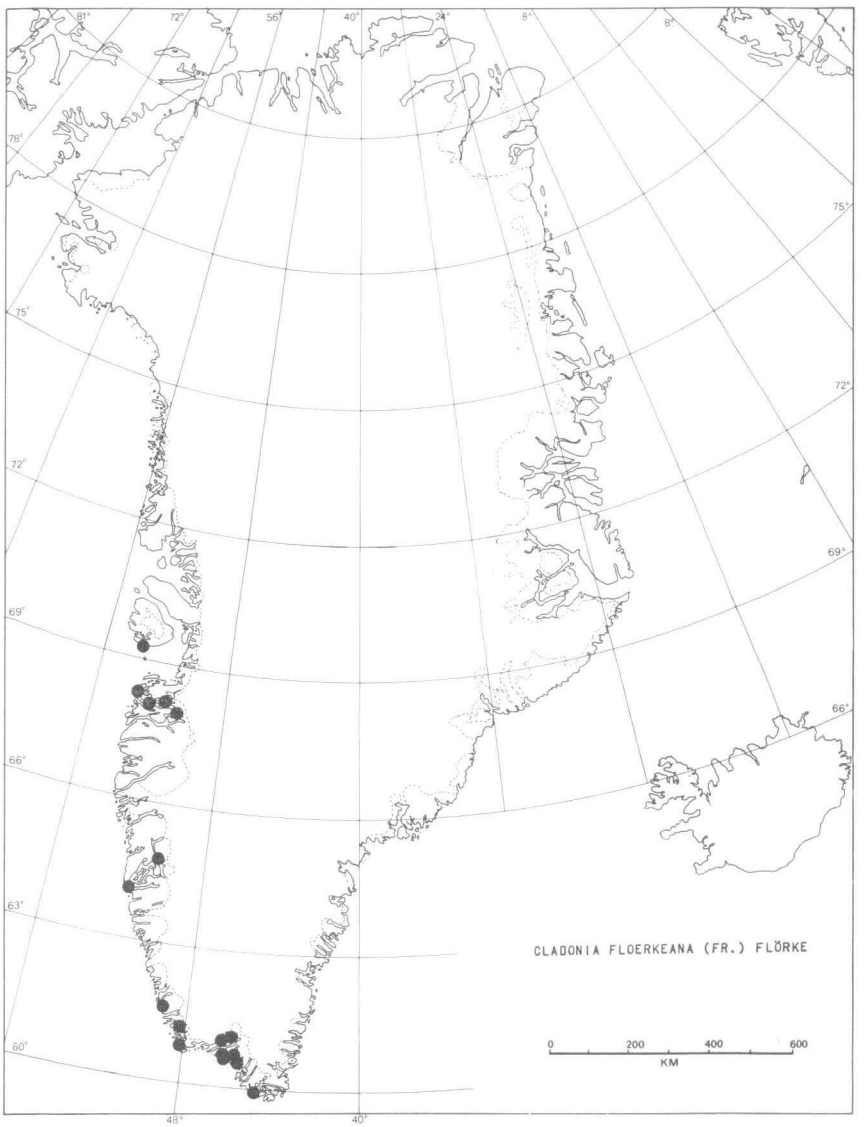


Maps 2 and 3.

Acknowledgements

The present paper is one of the results of the research work carried out in 1969 by the Greenland Botanical Survey (G.B.U.). The author is indebted to the founders of G.B.U., Prof. TH. SØRENSEN, the Institute of Systematic Botany of the University of Copenhagen, and Dr. K. HOLMEN, the Botanical Museum of the University of Copenhagen, for their invitation to participate in this research. Unfortunately both of these men, who founded G.B.U. in 1962, are now dead.

The author also wish to express his thanks to the Ministry of Green-



Map 4.

land, which kindly granted free journey to Greenland and free conveyance in the Julianehåb District.

Furthermore the author wants to thank Prof. Rolf Dahlgren, Dr. M. Skytte Christiansen and Dr. B. Fredskild for reading the manuscript, Mr. Jørgen Andersen for his careful assistance in every way during the expedition and our many good friends in the Julianehåb District for their kind helpfulness. Last not least I thank Dr. K. Hansen for his valuable advice. The maps have been reproduced by permission of The Geodetic Institute, Copenhagen – A 648/71 and A 511/72.

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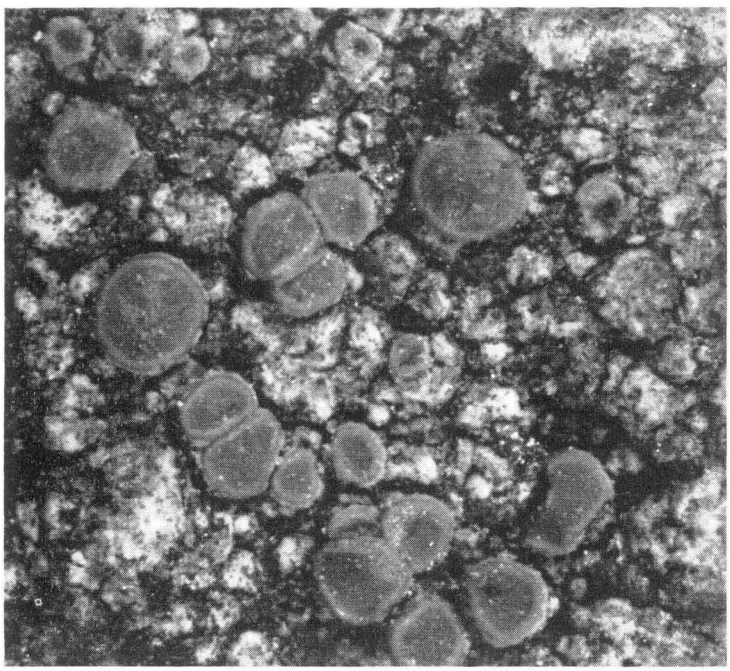

Fig. 1. *Caloplaca flavovirescens* (Wulf.) Dalla Torre & Sarnth. Iterdlak 16.7.1969. × 20.

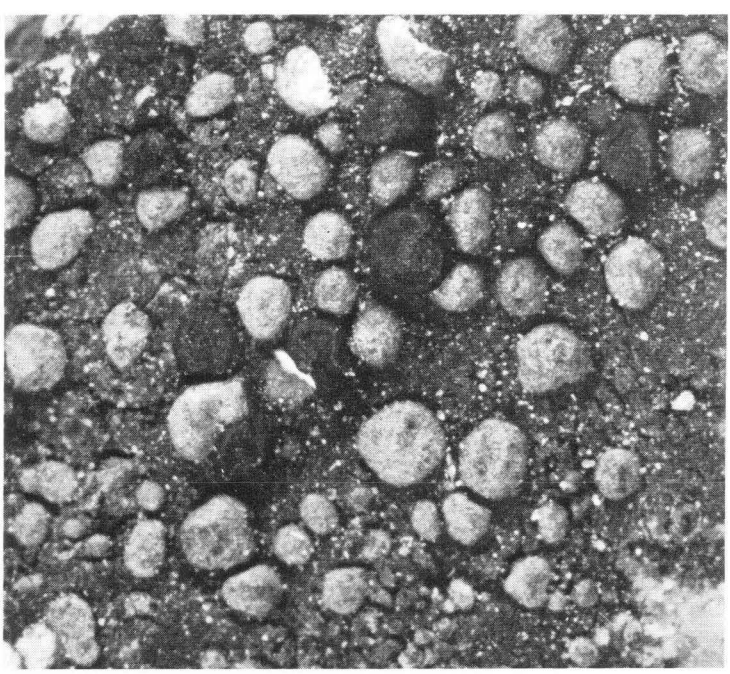

Fig. 2. *Rhizocarpon eupetraeum* (Nyl.) Arn. Narssarssuaq 14.7.1969. × 20.