

# The lichen flora of the outer Hvalfjörður area in West Iceland

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**ABSTRACT:** The foliose and fruticose lichens were studied in a small area in West Iceland. 100 species are recorded in an annotated list, and their distribution within the area is given, based on 1x1 km grid.

In the summer 1975 botanical investigations were started in the outer part of the Hvalfjörður Area in West Iceland. This project was planned with the aim to establish a basis to observe and measure the influence of possible sulphur dioxide emissions or other pollutants from the iron smelter factory at Grundartangi on the surrounding vegetation. The factory has now been operated since 1979. A report was published on these studies 1983 (H. KRISTINSSON, B. JÓHANNSSON & E. EINARSSON 1983) in Icelandic.

## METHODS

As far as lichens were concerned, two different approaches were made to record the present condition of the area before the factory was operated: The area around the factory was systematically surveyed on the basis of one by one km grid system, for all species of foliose and fruticose lichens, and 52 permanent squares were selected and marked on rock outcrops distributed throughout the whole Hvalfjörður Region.

An annotated list of the species is presented here, with distribution maps of all species based on the 1 km grid system. The study area covers 121 km<sup>2</sup> with the factory in the center (fig 1). Of these squares 32 are in water, and excluded from this study. The species were to great extent identified in the field, but some specimens were collected for identification in the laboratory.

The permanent squares were of the size 50 x 50 cm, their vegetation was analysed by cover estimates of the species, and they have been photographed periodically since 1976. Their vegetation consists mainly of lichens, with crustose species predominating, and mosses. Vascular plants were only in a few cases present. This

part of the project was carried out in cooperation with Bergþór Jóhannsson, Museum of Natural History, Reykjavík, and the results await for later publication.

#### ANNOTATED LIST OF SPECIES

100 species of foliose and fruticose lichens were recorded in the 11 x 11 km area. This represents about the half of the known species of this lichen group in Iceland. In general the species composition is typical for the more oceanic parts of the country, except that a few of the most southern species are missing. Four of the species are very rare in Iceland, found only in one or two localities outside the area. A few species, which have been considered common throughout the country, were not found here. Some of these may be rare in the southern lowlands, like *Cetraria hepatizon*, *Cladonia macrophyllodes*, *C. mitis* and *Umbilicaria hyperborea*, and others, like *Cladonia cariosa*, *Nephroma parile*, *Peltigera aphthosa* and *Solorina spongiosa* should, according to their general distribution, be expected in the area, but have possibly been overlooked.

#### *ALECTORIA NIGRICANS* (Ach.) Nyl.

Rather rare and sparse. Mainly found in the mountains, but also on rock outcrops in the lowland.

#### *ALECTORIA SARMENTOSA* (Ach.) Ach. ssp. *VEXILLIFERA* (Nyl.) Hawksw.

Very rare, only in few localities in Mt. Eyrarfjall, and one in Mt. Akrafjall, on the ground. Ssp. *sarmentosa* has not been recorded from Iceland.

#### *BAEOMYCES PLACOPHYLLUS* Ach.

Rather common in the lowland around Lake Eiðisvatn in Leirársveit, mainly on the vertical soil banks of drainage ditches. This species has only been found in the southern and southwestern parts of Iceland.

#### *BAEOMYCES ROSEUS* Pers.

In a few localities on soil, always sterile.

#### *BAEOMYCES RUFUS* (Huds.) DC.

Very common throughout the area on soil, mainly along drainage ditches, but also on eroded hummocks.

#### *CETRARIA DELISEI* (Bory) Th.Fr.

Common above 400 m elevation in Mt. Akrafjall, not found elsewhere. This species is in general only found in the mountains in Iceland.

#### *CETRARIA ISLANDICA* (L.) Ach.

Very common everywhere, both in the lowlands and in the mountains.

#### *CLADONIA ACUMINATA* (Ach.) Norrl.

Only found in one locality, along Lake Eiðisvatn.

#### *CLADONIA ARBUSCULA* (Wallr.) Rabenh.

Very common both in the lowland and in the mountains, growing in heathland. This species can not be separated from *Cladonia mitis* Sandst. in Iceland, without the PD-test. This test was made on

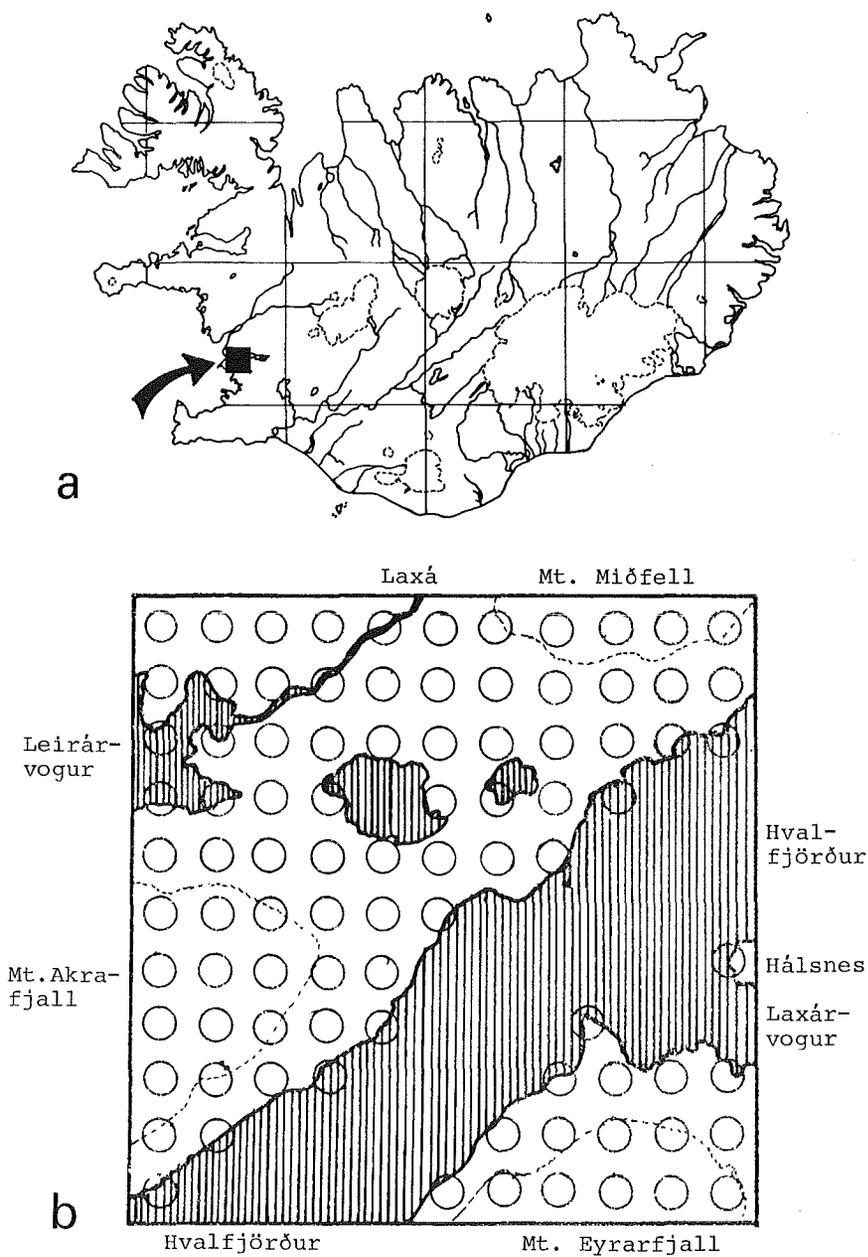


Fig. 1. Location of the investigated area (a), and position of dots in the distribution maps (b).

many specimens, and turned always out to be positive. It was therefore concluded, that *Cladonia mitis* is lacking in the area, or at least quite rare, and all field notes without collected samples were referred to *C. arbuscula* on the map.

*CLADONIA CHLOROPHAEA* (Somm.) Spreng.

Common, in great quantities on the soil banks of the drainage ditches, but also on hummocks in the heathland.

*CLADONIA COCCIFERA* (L.) Willd.

Very common, usually infertile. Richly fertil in the bogs NE of Lake Eiðisvatn.

*CLADONIA ECMOCYNA* (S.Gray) Leight.

Rather common on Mt. Akrafjall, usually in depressions with prolonged snow cover, not found in the lowlands.

*CLADONIA FURCATA* (Huds.) Schrad.

Very common, mainly on mossy knolls, in heathland and on vegetated soil over rock outcrops.

*CLADONIA GRACILIS* (L.) Willd.

Rather common throughout the area, but not in great quantities. More frequent around the Lakes Eiðisvatn and Hólmavatn than elsewhere.

*CLADONIA MACILENTA* Hoffm.

Very rare, only found at the NE end of Lake Eiðisvatn, on mossy hummocks. This species has only once been found in Iceland before, collected by H. Mölholm-Hansen in 1925 (LYNGE 1940). Last summer (1983, unpublished) it was collected by the author in Norðtunguskógur. All three localities are in the western part of the country.

*CLADONIA MEROCHLOROPHAEA* Asah.

Very rare, found only in one locality at the NE-end of Lake Eiðisvatn, on mossy knolls.

*CLADONIA PHYLLOPHORA* Hoffm.

Rare, found in two localities, at the northeastern end of Lake Eiðisvatn, and in Mt. Eyrarfjall south of Hvalfjörður.

*CLADONIA POCILLUM* (Ach.) O.J.Rich

Very common, on mossy knolls, on the vertical side of ditch banks and in heathland.

*CLADONIA PYXIDATA* (L.) Hoffm.

Common on soil over rocks and rock outcrops, and in heathland.

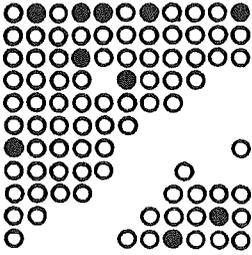
*CLADONIA RANGIFERINA* (L.) G.Web.

Rather common on the top of the Plateau of Akrafjall in heathland and among mosses, rare elsewhere. On hummocks in the meadows in Lambhaganes and around Lake Hólmavatn.

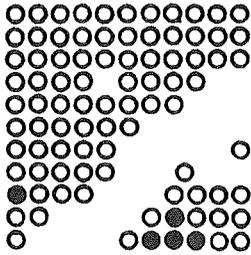
*CLADONIA RANGIFORMIS* Hoffm.

Common near the seashore, and also rather common on hummocks on

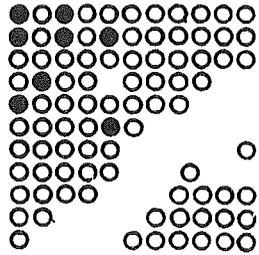
ALECTORIA NIGRICANS



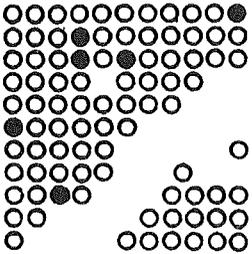
ALECTORIA SARMENTOSA



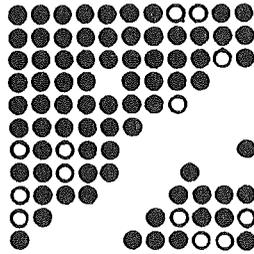
BAEOMYCES PLACOPHYLLUS



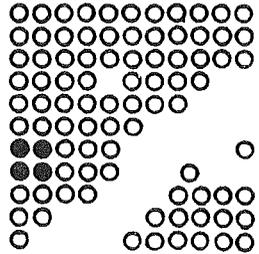
BAEOMYCES ROSEUS



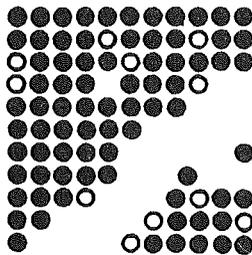
BAEOMYCES RUFUS



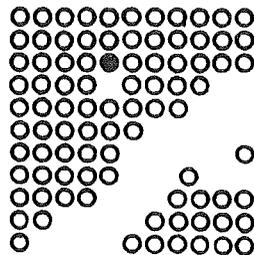
CETRARIA DELISEI



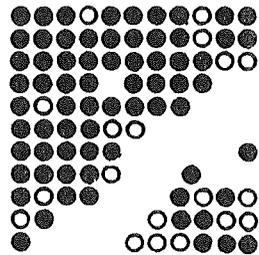
CETRARIA ISLANDICA



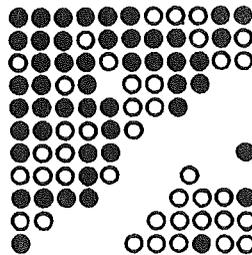
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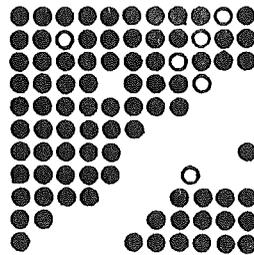
CLADONIA ARBUSCULA



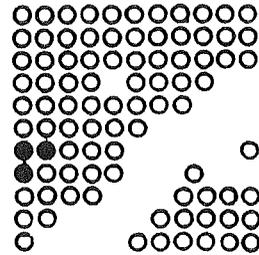
CLADONIA CHLOROPHAEA



CLADONIA COCCIFERA



CLADONIA ECMOCYNA



the plain around Lakes Eiðisvatn and Hólmavatn. Rare elsewhere.

*CLADONIA SQUAMOSA* (Scop.) Hoffm.

Very rare, only found at the northeastern side of Lake Eiðisvatn. This species has only once been collected in Iceland before, in Siglufjörður 1939 (B. LYNGE 1940). Other samples, also mentioned by LYNGE, were not correctly identified (KRISTINSSON 1972).

*CLADONIA STRICTA* (Nyl.) Nyl.

This mountain species was only found in Mt. Akrafjall, where it was quite common.

*CLADONIA SUBCERVICORNIS* (Vain.) Kernst.

Very common over rocks or rock outcrops, mainly on dry soil in rock crevices. The species has very distinct oceanic distribution in Iceland.

*CLADONIA SUBULATA* (L.) Wigg.

Rather common, but not in quantities. Mainly found on hummocks, both in meadows and dry heaths, also along ditchbanks.

*CLADONIA TURGIDA* (Ehrh.) Hoffm.

Rather rare, mainly on hummocks in the plains around the lakes. Very sparse in Miðfells múli.

*CLADONIA UNCIALIS* (L.) Wigg.

Very common throughout the area, both in the lowlands and in the mountains. Found in heathland, in *Racomitrium*-carpets or on hummocks in the meadows.

*CLADONIA VERTICILLATA* (Hoffm.) Schaer.

Rather common on rock outcrops and on hummocks.

*COLLEMA FLACCIDUM* (Ach.) Ach.

In several localities on rocky walls in cliffs and ravines.

*COLLEMA GLEBULENTUM* (Cromb.) Degel.

Widespread in cliffs, usually among mosses on wet rocky walls.

*COLLEMA UNDULATUM* Flot. var. *GRANULOSUM* Degel.

Rather rare, over mosses and soil in ravines and rock crevices.

*CORNICULARIA ACULEATA* (Schreb.) Ach.

Common in dry habitats on vegetated soil.

*CYSTOCOLEUS NIGER* (Huds.) Hariot

Common over soil in rock crevices and ravines.

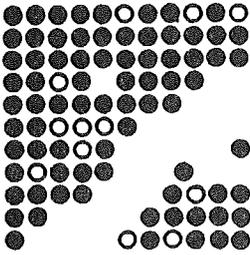
*DERMATOCARPON CINEREUM* (Pers.) Th.Fr.

Rather common on wet soil, especially on rock shelves and rock crevices, sometimes in great quantities on vertical banks above seashore rocks.

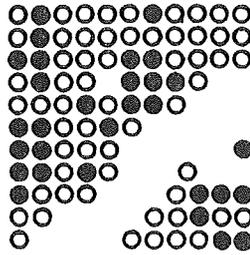
*DERMATOCARPON INTESTINICORME* (Körb.) Hasse.

Rather frequent on rocky walls, especially if they are periodically watered.

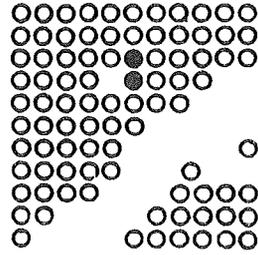
CLADONIA FURCATA



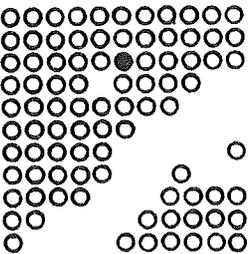
CLADONIA GRACILIS



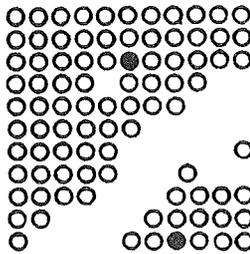
CLADONIA MACILENTA



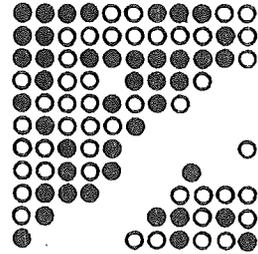
CLADONIA MEROCHLOR.



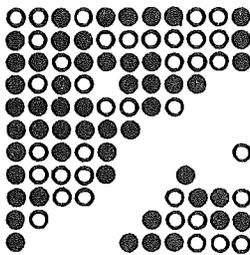
CLADONIA PHYLLOPHORA



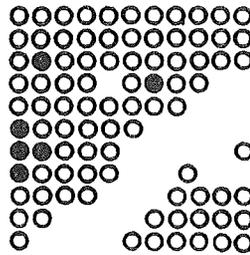
CLADONIA POCILLUM



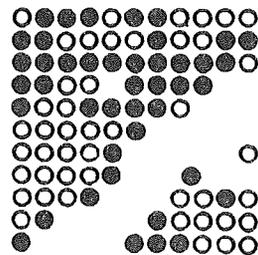
CLADONIA PYXIDATA



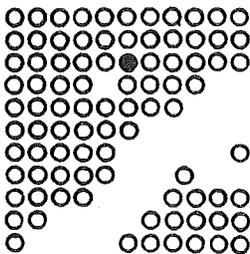
CLADONIA RANGIFERINA



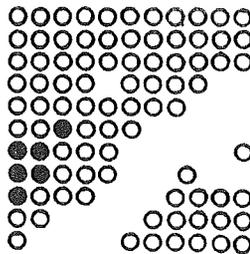
CLADONIA RANGIFORMIS



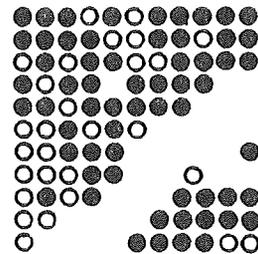
CLADONIA SQUAMOSA



CLADONIA STRICTA



CLADONIA SUBCERVICORNIS



*DERMATOCARPON RIVULORUM* (Arn.) Dt. & Sarnth.

Very rare, only in one locality near Kúludalur, on sloping rock face along a creek. This is the first find of this species, that I have been able to verify from Iceland (KRISTINSSON 1981). B. Lynge mentioned young and unmaturing specimens from Egilsstaðir, NE-Iceland, which possibly could be this species (LYNGE 1940). Later this same species was found in quantities in fresh-water tides at Straumsvík, SW-Iceland (KRISTINSSON 1981).

*DERMATOCARPON RUFESCENS* (Ach.) Th.Fr.

Rather common on soil, especially in rather wet habitats, on rock shelves.

*EPHEBE LANATA* (L.) Vain.

Common throughout the area, on soil over rocks, or on bare rocks, especially along pools or channels of rain water on the top of rocks.

*LEMPHOLEMMA MYRIOCOCCUM* (Ach.) Th.Fr.

Probably rather common throughout the area, over mosses in cliffs and ravines.

*LEPTOCHIDIUM ALBOCILIATUM* (L.) Zahlbr.

Rather rare species, over mosses in cliffs.

*LEPTOGIUM LICHENOIDES* (L.) Zahlbr.

Common over mosses in cliffs.

*LEPTOGIUM SINUATUM* (Huds.) Mass.

Rare, found in one locality over mosses in the cliffs of Merkjagil near Kúludalsá.

*LICHINA CONFINIS* (O.Müll.) Ag.

Rather common on marine rocks in the *Verrucaria maura* zone.

*MASSALONGIA CARNOSA* (Dicks.) Koerb.

Rather common on mosses growing on rocks, quite frequent on rock outcrops on the plain N of Akrafjall.

*NEPHROMA EXPALLIDUM* (Nyl.) Nyl.

Rare, found in Leirársveit on two rock outcrops on vegetated soil, and in one locality in Mt. Eyrarfjall. Grows in dry heath.

*NEPHROMA LAEVIGATUM* Ach.

Very rare, in one locality on the edge of Mt. Eyrarfjall.

*PANNARIA HOOKERI* (Sm.) Nyl.

Rather common in cliffs, especially in the mountains, and in Laxárgil Gorge.

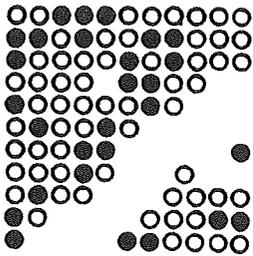
*PANNARIA PEZIZOIDES* (G.Web.) Trev.

Commonly found on soil throughout the area.

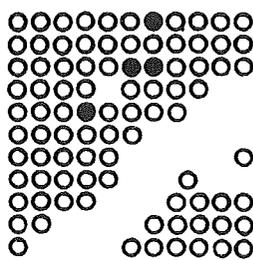
*PANNARIA PRAETERMISSA* Nyl.

Rather common, found in Jötnaberg, Miðfellsmúli, Eyrarfjall and Akrafjall, in rock crevices.

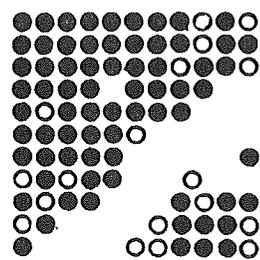
CLADONIA SUBULATA



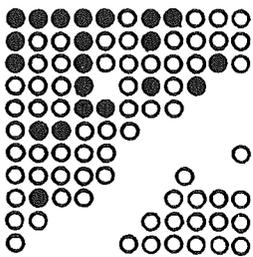
CLADONIA TURGIDA



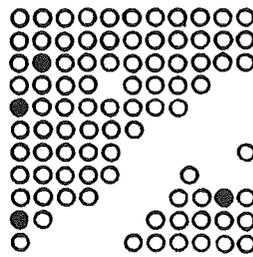
CLADONIA UNCIALIS



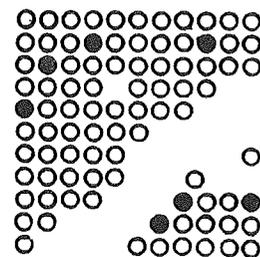
CLADONIA VERTICILL.



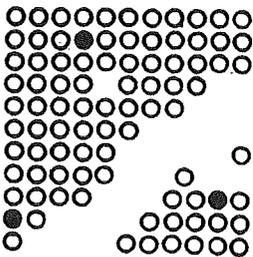
COLLEMA FLACCIDUM



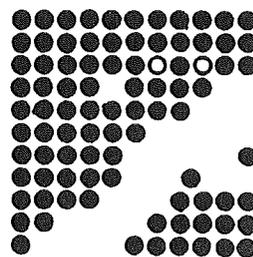
COLLEMA GLEBULENTUM



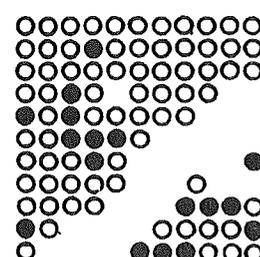
COLLEMA UNDULATUM



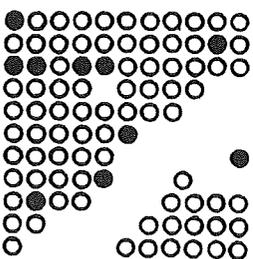
CORNICULARIA ACUL.



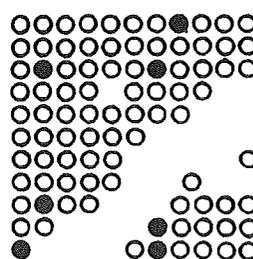
CYSTOCOLEUS NIGER



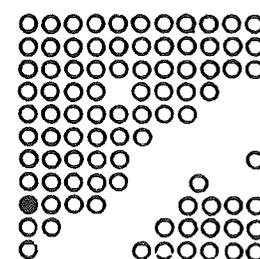
DERMATOCARPON CINER.



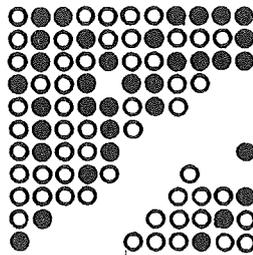
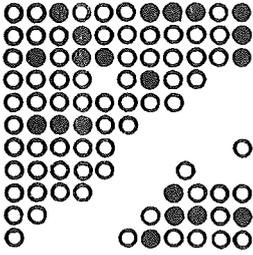
DERMATOCARPON INTEST.



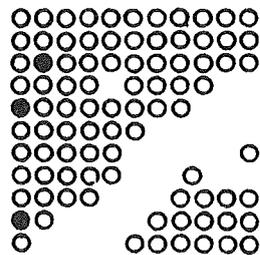
DERMATOCARPON RIVULORUM



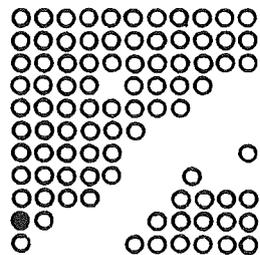
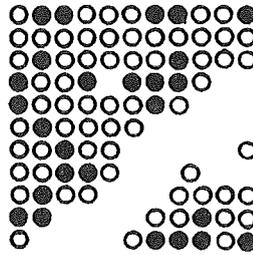
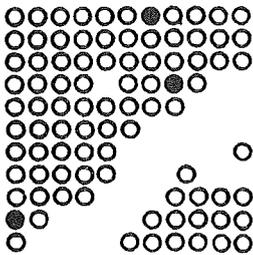
DERMATOCARPON RUFESC. EPHEBE LANATA



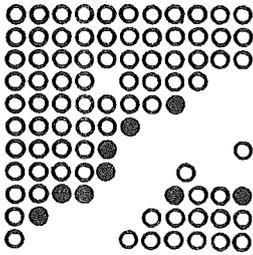
LEMPHOLEMMA MYRIOCOCCUM



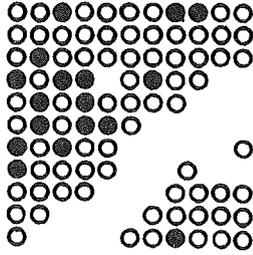
LEPTOCHIDIUM ALBOCIL. LEPTOGIUM LICHENOID. LEPTOGIUM SINUATUM



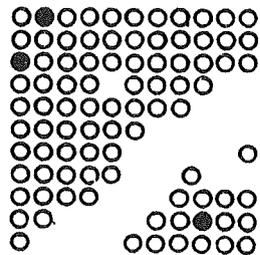
LICHINA CONFINIS



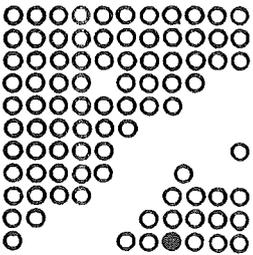
MASSALONGIA CARNOSA



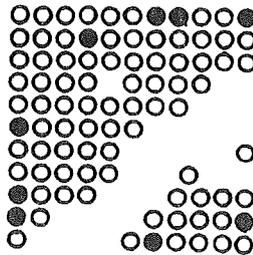
NEPHROMA EXPALLIDUM



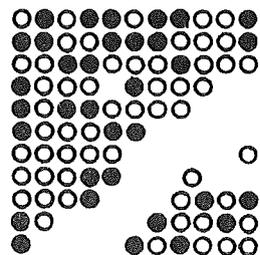
NEPHROMA LAEVIGATUM



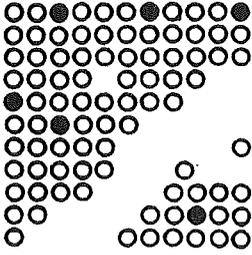
PANNARIA HOOKERI



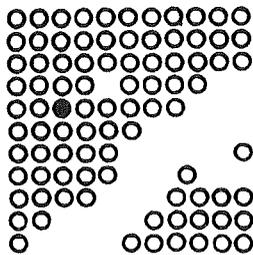
PANNARIA PEZIZOIDES



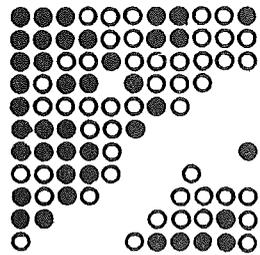
PANNARIA PRAETERM.



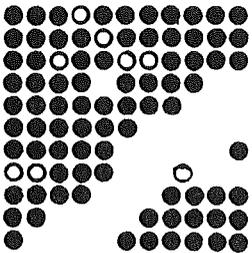
PARMELIA EXASPERATA



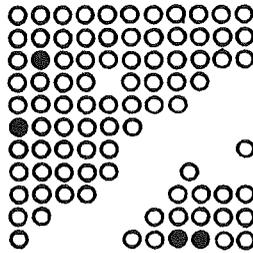
PARMELIA OMPHALODES



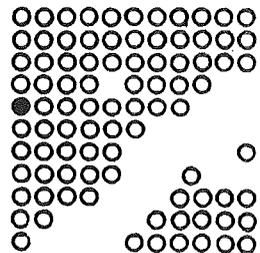
PARMELIA SAXATILIS



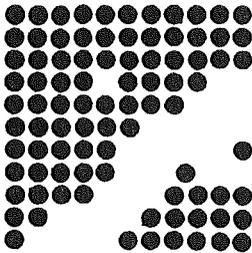
PARMELIA SULCATA



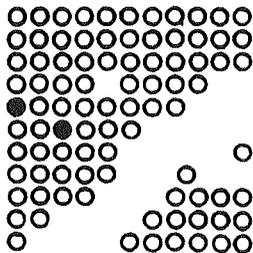
PARMELIELLA TRIPTOPH.



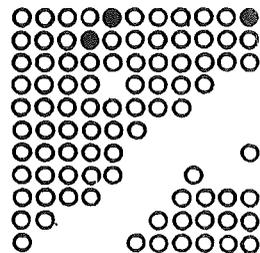
PELTIGERA CANINA



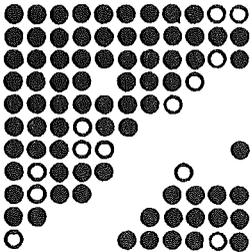
PELTIGERA COLLINA



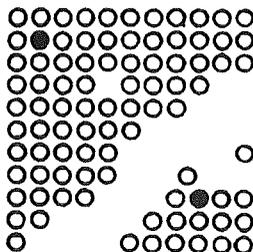
PELTIGERA LEPIDOPHORA



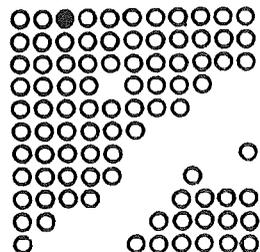
PELTIGERA LEUCOPH.



PELTIGERA MALACEA



PELTIGERA OCCIDENTALIS



*PARMELIA EXASPERATA* de Not.

On branches of birch in a plantation at the community house near Stóra Fellsöxl. Also found in a plantation near Kúludalsá, just outside the investigated area.

*PARMELIA OMPHALODES* (L.) Ach.

Common in most localities, mainly growing on rocks. Occurs in greatest quantities around the breeding areas of *Larus fuscus* in Mt. Akrafjall and Mt. Eyrarfjall.

*PARMELIA SAXATILIS* (L.) Ach.

Very common on rocks.

*PARMELIA SULCATA* Tayl.

Rather rare, on rocks.

*PARMELIELLA TRIPTOPHYLLA* (Ach.) Müll.-Arg.

Found in one locality below Mt. Akrafjall near Litla Fellsöxl, growing on rock.

*PELTIGERA CANINA* (L.) Willd.

Very common in all kinds of uncultivated grasslands and heath. No species is found in such quantities as this one, both in the mountains and in the lowlands, on rock outcrops as well as on hummocks in the bogs.

*PELTIGERA COLLINA* (Ach.) Schrad.

Rare, only in two localities below Mt. Akrafjall on mossy rocks.

*PELTIGERA LEPIDOPHORA* (Nyl.) Bitt.

Rare, in Laxárgil Gorge, and in Mjóidalur near Kalastaðir.

*PELTIGERA LEUCOPHLEBIA* (Nyl.) Gyeln.

Very common in all kinds of grasslands, but in less quantities than *P. canina*.

*PELTIGERA MALACEA* (Ach.) Funck.

Rare, in dry heath near Beitistaðir and near Eyri.

*PELTIGERA OCCIDENTALIS* (Dahl) Krist.

Rare, only found near Beitistaðaholt. This species is restricted to areas with more persistent snow cover, than is found here.

*PELTIGERA POLYDACTYLA* (Neck.) Hoffm.

Found throughout the area, but sparse, mainly on dry heath.

*PELTIGERA PRAETEXTATA* (Sommerf.) Zopf

Rather common in ravines and cliffs, grows mainly over mosses on steep or overhanging rocks.

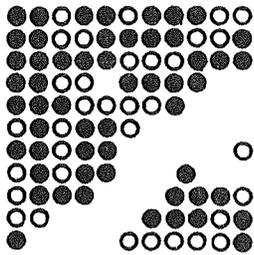
*PELTIGERA RUFESCENS* (Weiss) Humb.

Common, mainly in dry heath, along rock outcrops, hills and mountainsides.

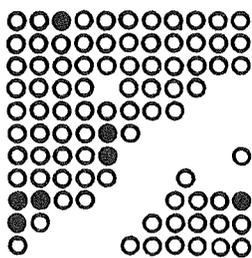
*PELTIGERA SPURIA* (Ach.) DC.

Rather common, mainly on the banks of drainage ditches, or on hum-

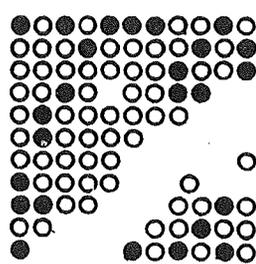
PELTIGERA POLYDACT.



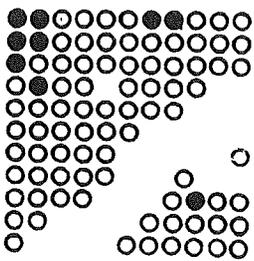
PELTIGERA PRAETEXT.



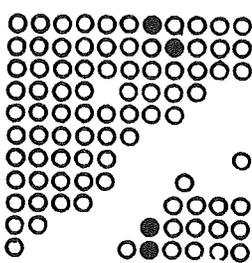
PELTIGERA RUFESCENS



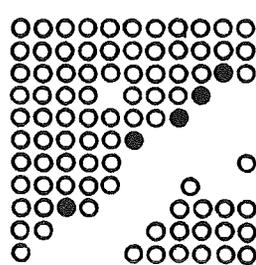
PELTIGERA SPURIA



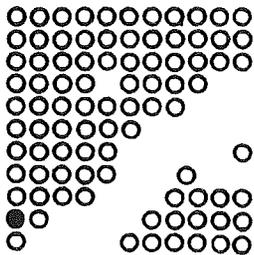
PELTIGERA VENOSA



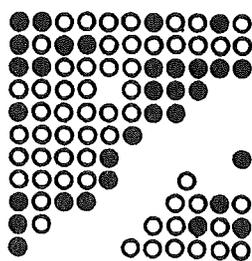
PHAEOPHYSCIA ORBICUL.



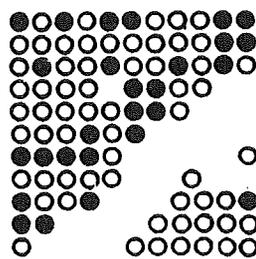
PHAEOPHYSCIA SCIAST.



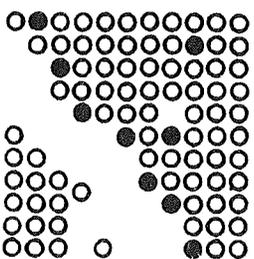
PHYSICIA CAESIA



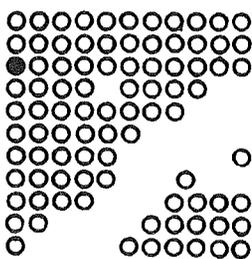
PHYSICIA DUBIA



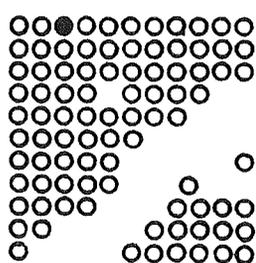
PHYSICIA TENELLA



PHYSCONIA MUSCIGENA



PLACYNTHIUM ASPRATILE



mocks in the meadows.

*PELTIGERA VENOSA* (L.) Hoffm.

Rather rare, in ravines, on the vertical side of steep soil banks, and in caves or on overhanging rock.

*PHAEOPHYSCIA ORBICULARIS* (Neck.) Moberg.

Rather common on rocks along the northern shore of Hvalfjörður, not found elsewhere.

*PHAEOPHYSCIA SCIASTRA* (Ach.) Moberg

Collected in one locality in Merkjagil near Kúludalsá, also found outside the area near Ós by Akranes. Grows on soil over rocks. This species is easily overlooked, and is probably more common than these finds suggest.

*PHYSCIA CAESIA* (Hoffm.) Fűrnrrohr.

Common, mainly on the top of rocks and hills near the sea.

*PHYSCIA DUBIA* (Hoffm.) Lett.

Very common on the top of rocks or hills where birds are resting. This species is more evenly spread further away from the shore, than *P. caesia*.

*PHYSCONIA MUSCIGENA* (Ach.) Nyl.

Rare, only found in Álftangi in Leirársveit, on the top of rock outcrops.

*PLACYNTHIUM ASPRATILE* (Ach.) Henssen.

Rare, on the rocky walls of Jötnaberg.

*PLACYNTHIUM NIGRUM* (Huds.) S. Gray.

Rare, on rocky walls in the Laxárgil Ravine.

*POLYCHIDIUM MUSCICOLA* (Sw.) S. Gray.

Common throughout the area, mainly found growing on mosses on the top of rocks.

*PSEUDEPHEBE MINUSCULA* (Nyl. ex Arn.) Brodo & Hawksw.

Rare, on basalt rock. Found in two localities, on rocky hill in Hrossatangi, and in a ravine in the mountainside above Litla Fellsöxl.

*PSEUDEPHEBE PUBESCENS* (L.) Choisy.

Rather common on basalt rock in the mountains, in a few places in the lowlands on gravel hill or rock outcrops.

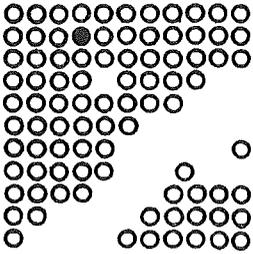
*PSOROMA HYPNORUM* (Vahl) S. Gray.

Common on mosses or soil on hummocks. Var. *paleaceum* was found near Litla Fellsöxl and in Mt. Eyrarfjall.

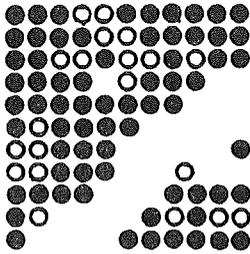
*RAMALINA SUBFARINACEA* (Cromb.) Nyl.

In several localities on the sides of projecting cliffs. Jötnaberg, Lambhaganes, Klafastaðir and two localities in Mt. Akrafjall.

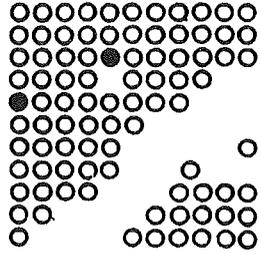
PLACYNTHIUM NIGRUM



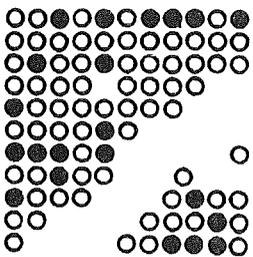
POLYCHIDIUM MUSCIC.



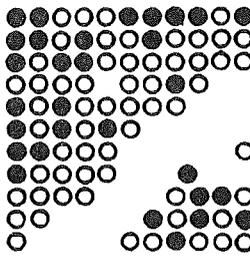
PSEUDEPHEBE MINUSCULA



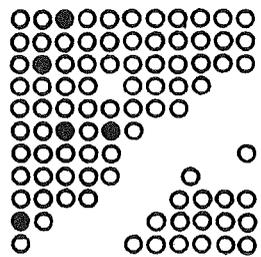
PSEUDEPHEBE PUB.



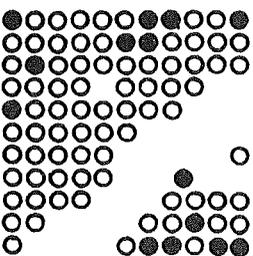
PSOROMA HYPNORUM



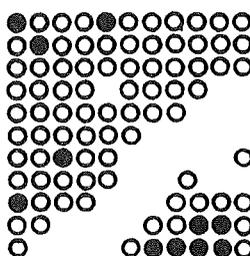
RAMALINA SUBFARINACEA



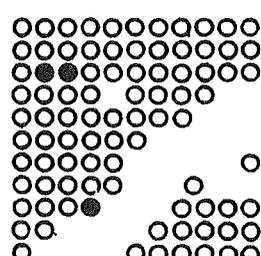
SOLORINA BISPORA



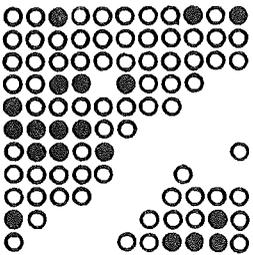
SOLORINA CROCEA



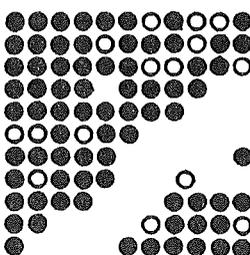
SOLORINA SACCATA



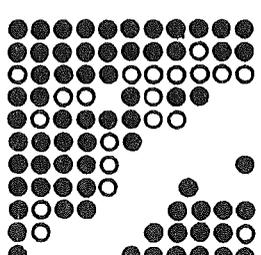
SPHAEROPHORUS FRAG.



SPHAEROPHORUS GLOB.



STEREOCAULON ALPINUM



*SOLOLINA BISPORA* Nyl.

Rather common on soil, in rock crevices as well as in heathland.

*SOLOLINA CROCEA* (L.) Ach.

Rather common in the mountains, Akrafjall and Eyrarfjall. Also found in few localities in the lowland of Leirársveit, which is rather surprising, since this species is generally rather restricted to snowpatches in the mountains.

*SOLOLINA SACCATA* (L.) Ach.

Rare, Lambhaganes, Lambhagamelar and Grafarmelar. Usually on the side of hummocks or on naked soil in heathland.

*SPHAEROPHORUS FRAGILIS* (L.) Pers.

Rather common, mainly near the breeding places in Akrafjall and Eyrarfjall.

*SPHAEROPHORUS GLOBOSUS* (Huds.) Vain.

Very common in the area in grassland and heathland.

*STEREOCAULON ALPINUM* Laur.

Very common on vegetated soil.

*STEREOCAULON ARCTICUM* Lynge.

Commonly found on naked soil in the heathland, or on gravel hills. More common in the mountains than in the lowland.

*STEREOCAULON CAPITELLATUM* Magn.

Very rare, on basalt in rock crevices in Mt. Akrafjall.

*STEREOCAULON DEPRESSUM* (Frey) M. Lamb.

In several localities on rocks in the vicinity of Leirársveit.

*STEREOCAULON RIVULORUM* Magn.

Rather common throughout the area on gravel hills or on vegetated soil.

*STEREOCAULON SPATHULIFERUM* Vain.

Rare, on rocks. Beitistaðaholt, Vogatunga, Mt. Eyrarfjall.

*STEREOCAULON ULIGINOSUM* M. Lamb.

Very rare. Found near Kúludalsá in sloping grassland shortly above the seashore rocks. This species has been found only once in Iceland before, in Sandárás, District of Þistilfjörður, NE-Iceland (the type locality, cf. M. LAMB, 1977). The species resembles *S. alpinum*, except that it is richly sorediate.

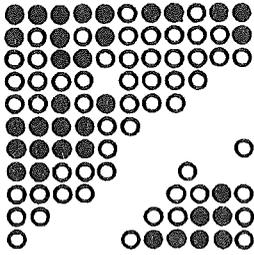
*STEREOCAULON VESUVIANUM* Pers.

Very common in the whole area on basalt rock.

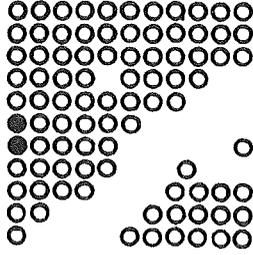
*THAMNOLIA SUBULIFORMIS* (Ehrh.) Culb.

Common in the area, especially on hilltops, rock outcrops or gravelly hills. The thamnolic acid containing strain, *T. vermicularis* s.str. has never been found in Iceland.

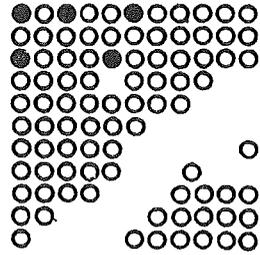
STEREOCAULON ARCTIC.



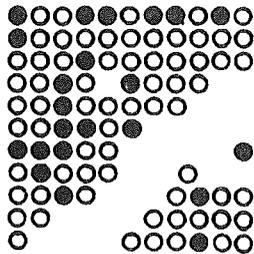
STEREOCAULON CAPIT.



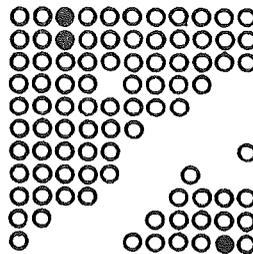
STEREOCAULON DEPRESSUM



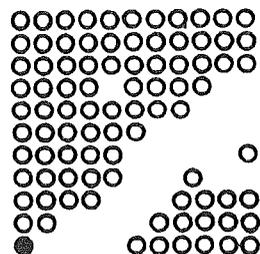
STEREOCAULON RIVUL.



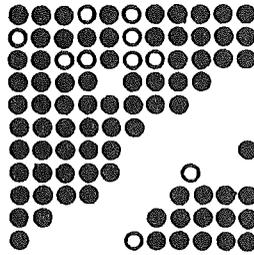
STEREOCAULON SPATH.



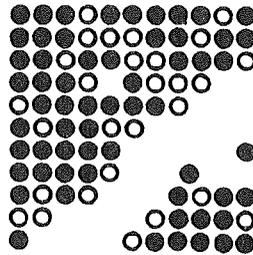
STEREOCAULON ULIGINOSUM



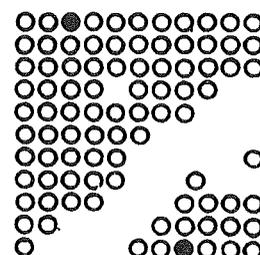
STEREOCAULON VESUV.



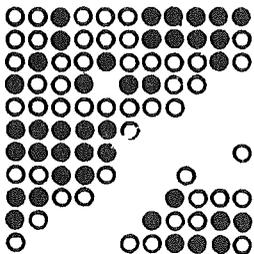
THAMNOLIA SUBULIF.



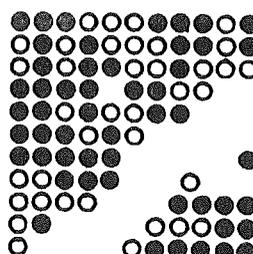
UMBILICARIA ARCTICA



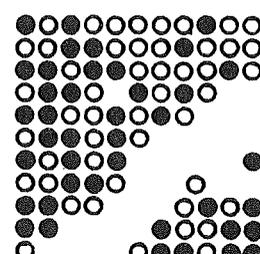
UMBILICARIA CYLINDR.



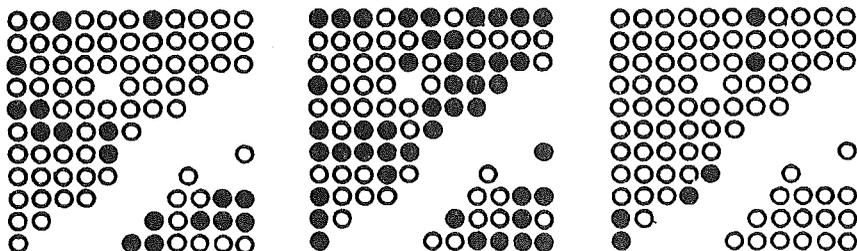
UMBILICARIA PROBOSC.



UMBILICARIA TORREFACTA



VESTERGRENOPSIS ELAEINA XANTHORIA CANDELARIA XANTHORIA ELEGANS



*UMBILICARIA ARCTICA* (Ach.) Nyl.  
Rare, found in two localities on basalt rock, Beitistaðaholt, Eyrarfjall.

*UMBILICARIA CYLINDRICA* (L.) Del.  
Very common on basalt rock throughout the area, more frequent in the mountains than in the lowlands.

*UMBILICARIA PROBOSCIDEA* (L.) Schrad.  
Common on basalt rock.

*UMBILICARIA TORREFACTA* (Lightf.) Schrad.  
Common on basalt rock.

*VESTERGRENOPSIS ELAEINA* (Wahlenb.) Gyeln.  
Rather common on rocks, more frequent in the northern mountain-sides of Akrafjall and Eyrarfjall than elsewhere. Prefers shady and moist habitats.

*XANTHORIA CANDELARIA* (L.) Th.Fr.  
Common on the top of rocks and hummocks where birds are frequently resting.

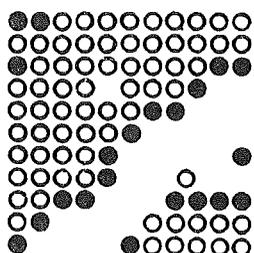
*XANTHORIA ELEGANS* (Link.) Th.Fr.  
Rather rare, in several localities on seashore cliffs in the outer part of Hvalfjörður, one locality near Lake Hólmavatn and on the top of Miðfellsmúli. Even though this species is widely distributed in Iceland, it is much more frequent in the continental inland of the NE, than along the southern and western coasts, where *X. parietina* predominates.

*XANTHORIA PARIETINA* (L.) Th.Fr.  
Common along the shores on rocks. The species was not found at greater distance than 1-2 km from the seashore.

#### DISTRIBUTION

Of the one hundred species present in the region investigated, about 35-40 species can be regarded common, 23 species are quite

XANTHORIA PARIETINA



rare, recorded only in one or two squares. Most of the other species are scattered throughout the area, but a few have rather distinct distribution limits within the area.

There are mainly two factors, that seem to control these limits: The elevation above sea level, and the distance from the sea. The region is too small, only 11 km across, to expect any climatic differences due to geographic position. To facilitate the interpretation of the maps, fig. 2 demonstrates those squares, which surpass 200 m elevation (a), and are adjacent to the sea (b).

Four species were only found in the mountains: *Cetraria delisei*, *Cladonia stricta*, *Cladonia ecmocyna* and *Alectoria sarmentosa* ssp. *vevillifera*. The first three were only found in Mt. Akrafjall, and they are all common mountain species all over Iceland, but the fourth, *Alectoria sarmentosa* was more common in Mt. Eyrarfjall, and can not be regarded as mountain species in Iceland as general. Two more species, *Cladonia rangiferina* and *Solorina crocea*, had their main distribution area in the mountains, but did also occur in the lowlands.

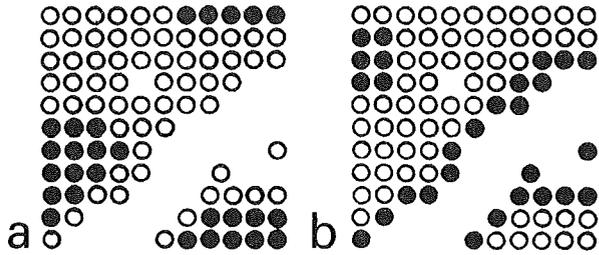


Fig. 2. Squares that surpass 200 m elevation (a), and squares that are adjacent to the sea (b).

Three species, *Lichina confinis*, *Phaeophyscia orbicularis* and *Xanthoria parietina*, are limited to the seashore in their distribution. Of these *L. confinis* is totally confined to marine rocks, like also many crustose species not treated here (*Caloplaca verruculifera* (Vain.) Zahlbr., *Caloplaca marina* (Wedd.) Zahlbr., *Lecanora helicopsis* (Ach.) Ach., *Verrucaria maura* Wahlenb. and *Verrucaria mucosa* Wahlenb.). The other two occur mainly on rocks above the shore, but are also found scattered on rocks further away. Two additional species, *Cladonia rangiformis* and *Physcia tenella* var. *marina*, are found in much greater quantities close to the shore, than further away.

The distribution of *Baeomyces placophyllus* seems to be limited to the plains and the bogs. This is mainly due to its habitat, which are the banks of drainage ditches and other disturbed bog areas with exposed peat.

One locality, a bog at the NE-side of Lake Eiðisvatn, was noticed for its number of rare species and luxurious lichen development. Of the genus *Cladonia* five rare species were recorded on that spot: *Cladonia macilenta*, *C. merochlorophaea*, *C. phyllophora*, *C. squamosa* and *C. turgida*. Two of these, *C. macilenta* and *C. squamosa* are only known from one other locality in Iceland. Besides these species, exceedingly luxurious fruiting of *Cladonia coccifera* and *C. chlorophaea* was observed in this locality, both

species not frequently found richly fertile in Iceland.

It is difficult to give any explanation for the richer lichen vegetation in this bog than elsewhere, but possibly would more frequent local fog formation around the lake during the light summer nights, prolong the photosynthetic activity in this habitat.

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