

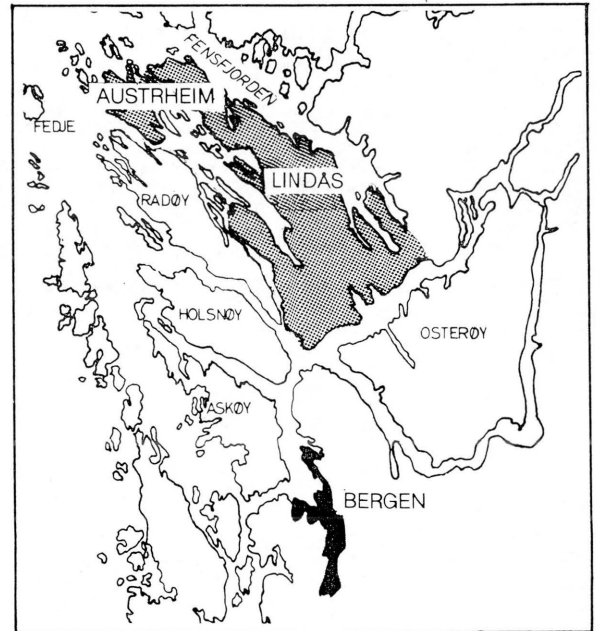
LINDÅS PROSJEKTET

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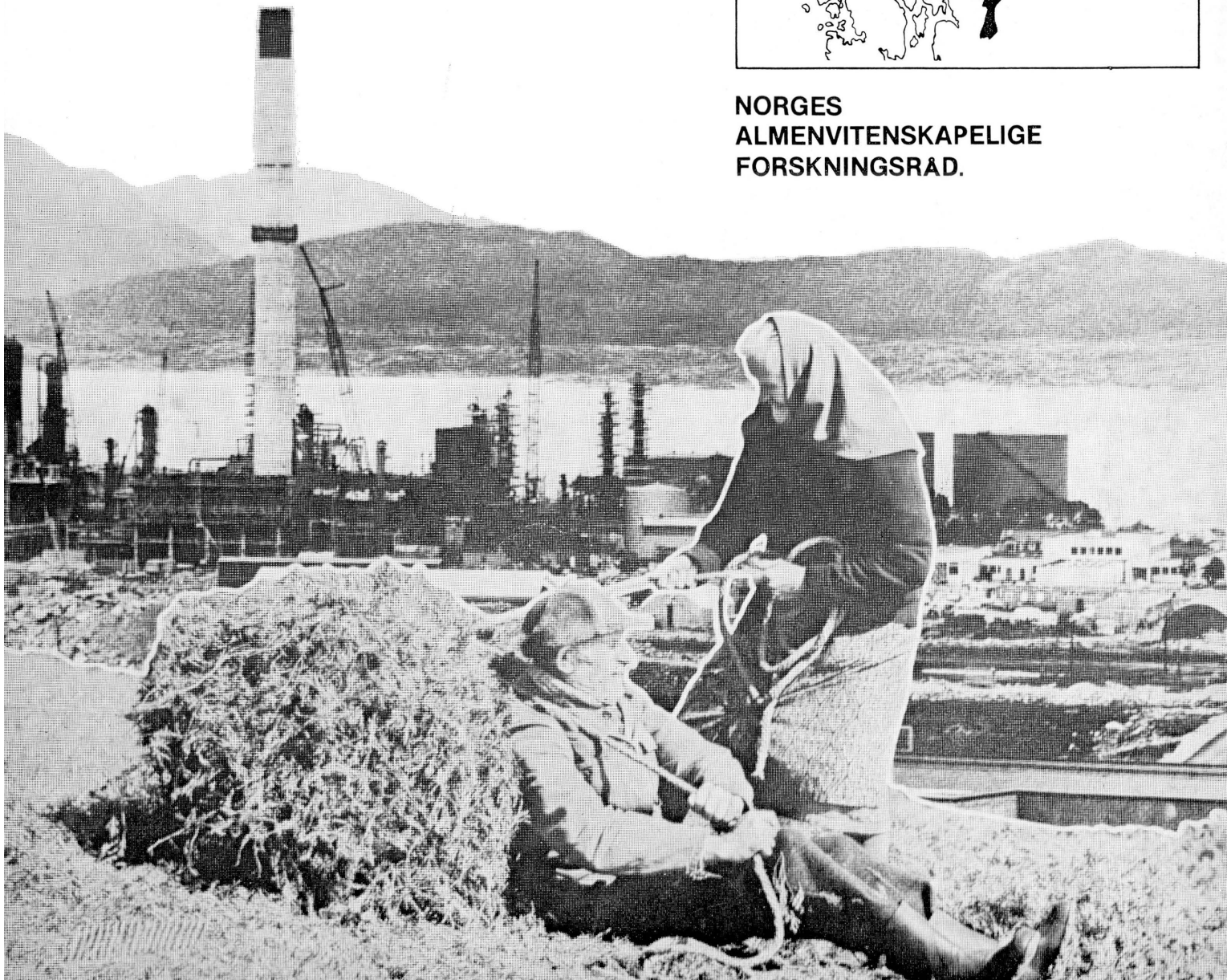
Dag Olav Øvstedal

**Contributions to the lichen
flora of Lindås and Austrheim,
Western Norway**

Bergen 1979



**NORGES
ALMENVITENSKAPELIGE
FORSKNINGSRÅD.**



CONTRIBUTIONS TO THE LICHEN FLORA OF
LINDÅS AND AUSTRHEIM, WESTERN NORWAY

D. O. Øvstedal
Lindåsprosjektet
Botanical museum
Bergen
1978

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Western Norway.

Introduction.

During the years 1976 and 1977, intensive collecting of lichens took place in the parishes Lindås and Austrheim in the county Hordaland in Western Norway (fig. 1).

Earlier, stray collections have been made since 1971 there, and also collections by J.J. Havaas, (deposited in BG), are included in the list, indicated by J.J.H.

The lichenological investigation has been a part of the Lindåsproject, which had as its aim to study the whole coastal landscape, with special emphasis on the Calluna heath ecosystem. As possible future air pollution has been a part of the project, a study of changes in the lichen flora may be important for monitoring the pollution.

The area.

The investigated area comprises about 300 km², all of the parish Austrheim and the western part of the parish Lindås (fig. 1), in Hordaland, Western Norway. The outer (NW) part is lowland, with altitudes seldom more than 40-50 m, while in the inner part a system of ridges and valleys are found, mostly rising as high as 200-400 m. Sometimes they converge to large plateau-like areas.

Geology.

Two areas of very different geology is found in the area. In the SE part (fig. 1), the bedrock is Cambrosilurian containing much mica schists. In some places it contains much CaCO₃. It weathers early and leaves a fertile soil. In some places within this Cambrosilurian zone, there are outcrops of the ultrabasic rock serpentine, which has its own flora.

The major part of the area consists of hard bedrock of different kinds: anorthosite, gabbro, mangerite, trondhjemite and gneisses. Some of these may contain dark minerals that weather readily and give fertile soils. However, much of the rocks are acid and resistant against weathering.

Vegetation.

Three different major plant communities are found. One is the heath formation, which occupies the outer lowlands, and the tops of the central massif. Dry heath, wet heath and different kinds of bogs dominate the outfields. Planted conifers (Pinus silvestris, P. mugo, Picea abies, P. sitchensis and others) are found several places and scattered trees of different deciduous species occur. In some S-faced hillsides, small coppices of Corylus avellana are found.

A second formation is the native Pinus silvestris forest, which occupies much of the central and eastern part of the area. Small areas of different deciduous forests are sometimes met within the pine forest.

A third formation is found mainly in the middle and inner part, namely deciduous forests. Most of them are Betula pubescens forests, but there are also forests of Fraxinus exelsior-Tilia cordata-Ulmus glabra-Corylus, of Alnus glutinosa and A. incana, of Quercus robur and of Fagus.

Climate.

The climate is oceanic, with relatively cool summers and mild winters. Most of the area lies between the + 2 and 0° C January mean temperature isotherms, and between the 14 and 16° C July mean temperature isotherms. There are great local differences within the area (Førland in prep.). The precipitation rises from about 1200 mm/year in the outermost part to about 2000 mm in the inner, mountainous part. Mostly there is snow only a few days in winter.

Nomenclature.

The nomenclature follows principally Santesson (1975). For those species that are not found there, the nomenclature follows James (1965), with the following exceptions:

Alectoria nadvornikiana Gyeln. (Dahl and Krog 1973), Arthopyrenia myricae (Nyl.) Zahlbr. and Catillaria bahusiensis (Blomb.) Th. Fr. (Degelius 1939), Buellia erubescens Arnold (Poelt 1969), Cladonia leucophaea des Abb. (Poelt 1969), Cladonia metacorallifera Asah. (Tønsberg 1975), Fuscidea spp. (Wirth and Vězda 1972), Huillia spp., Lecidella spp. and Trapelia spp. (Hertel 1970, 1975, Hertel and Leuchert 1969), Micarea spp. (Vězda and Wirth, 1975), Opegrapha hysteriiformis Nyl. (Poelt 1969), Pannaria and Parmelella spp. (Jørgensen in prep.), Parmelia pastillifera (Harm.) Klem. (Fletcher 1975), Physconia spp. (Moberg 1977), Ramalina spp. (Krog and James 1977), Caloplaca sect. Gasparriana (Nordin 1972), Chaenothecopsis viridireagens (Nädv.) Schmidt (Tibell 1975), Lecania dubitans (Nyl.) A. L. Sm. (B. Coppins in litt.), Polychistes nivalis (Hertel 1974) and Rinodina efflorescens Malme (Poelt 1969). Aspicilia is kept within Lecanora.

Phytogeographical aspects.

One small group among lichens presented in this work has a clearly alpine-subalpine main distribution. Here belong Nephroma arcticum, Alectoria nadvornikiana and Parmelia stygia. Typically they only occur in the eastern and highermost part of the area, at an altitude of about 350 m a.s.l., together with phanerogams like Juncus trifidus, Carex bigelowii and Salix herbacea. There is also an unexpected occurrence of Alectoria ochroleuca in heath at an altitude of about 250 m on one of the central ridges.

There is also another group of not strongly defined alpine-subalpine species, which obviously profit from the open heath landscape with much nude rock. Here belong many lithophilic species, like some Umbilicaria spp. and Parmelia pubescens. Ceraria islandica may belong to the same group, although it grows on soil.

Parmelia revoluta and Menegazzia terebrata, the last one in large quantities, are both almost only found on Alnus glutinosa in N-exposed or sheltered swamp forests. This is at present the northernmost locality close to the coast for Menegazzia terebrata (see map in Østhagen 1976), and for Parmelia revoluta the locality is at the northern limit for the species in Norway. The same is the case for Sphaerophorus melanocarpus, which is growing on peat in the heath area.

A number of microlichens probably have a more or less oceanic distribution in Norway. To these belong Tomasellia gelatinosa (see Jørgensen and Øvstedal 1975), T. ischnobela, Porina chlorotica v. carpenia, Pachyphiale cornea, Catillaria sphaeroides, P. pulverea, Arthopyrenia myricae and Dimerella diluta. However, the distribution of most microlichens in Norway is poorly known.

List of specimens.

+++ indicates that the species is commonly found,
 ++ sparsely found,
 + rarely found and
 1 only found once, in which case UTM grid reference is given.

SPECIES	OCCURRENCE	HABITAT
<u>Absconditella</u> cf <u>sphagnorum</u>	1	UTM KN 975385. On <u>Sphagnum papillosum</u> . R.S. det.
<u>Acarospora fuscata</u>	++	Ornithocoprophilous. On cliffs and stone fences.
<u>A. smaragdula</u>	+	Shaded fissures in rock.
<u>Alectoria bicolor</u>		Vertical rocks.
<u>A. capillaris</u>	+	On pine in the central area.
<u>A. fuscescens</u>	+++	On trees, cliff-tops and fences.
<u>A. nadvornikiana</u>	+	Among bryophytes on rock at 350 m altitude in the easternmost part of the area.
<u>A. nidulifera</u>	+	On pine in the central area.
<u>A. ochroleuca</u>	1	UTM KN 980240. In heath, 350 m alt.
<u>A. smithii</u>	1	UTM KN 814471. On steep, NE-facing rock.
<u>A. subcana</u>	+	On deciduous trees, very often <u>Sorbus aucuparia</u> .
<u>Anaptychia fusca</u>	+++	Very common
<u>Arthonia cinnabarina</u>		On <u>Corylus</u> . Probably overlooked, but certainly rare.

<i>A. didyma</i>	+	On old oaks.
<i>A. granitophila</i>	1	UTM KN 930285. On hard rock. J.J.H. leg.
<i>A. lapidicola</i>	1	UTM KN 725505. On anorthositic rock on a small island in the outermost part of the area.
<i>A. lurida</i>	1	UTM KN 930285. <u>On Fagus.</u> J.J.H. leg.
<i>A. punctiformis</i>	+	On birch.
<i>A. radiata</i>	+++	On deciduous trees.
<i>Arthopyrenia</i>	1	UTM LN 067276. On old pollarded <u>Fraxinus excelsior.</u>
<i>A. antecellans</i>	+	On deciduous trees, mainly <u>Corylus.</u>
<i>A. fallax</i>	++	On deciduous trees.
<i>A. myricae</i>	+	On <u>Myrica gale.</u>
<i>A. punctiformis</i>	++	On deciduous trees.
<i>Arthroraphis citrinella</i>	+	On bryophytes and soil in fissures in rock and stone fences.
<i>Bacidia absistens</i>	+	Overgrowing mosses on bark, mainly on <u>Alnus glutinosa.</u> B.C. det.
<i>B. chlorococca</i>	+	On bark of <u>Juniperus communis</u> and <u>Pinus silvestris.</u> B.C. det.
<i>B. inundata</i>	1	UTM KN 930285. On stone in brook. J.J.H. leg.
<i>B. naegelii</i>	1	UTM KN 983243. On bark of <u>Alnus glutinosa.</u>
<i>B. umbrina</i>	1	UTM KN 930285. On rock. J.J.H. leg.
<i>Baeomyces roseus</i>	1	UTM LN 056268. On soil in rock fissure.
<i>B. rufus.</i>	++	Common on soil in the <u>Calluna</u> heath area.

<i>Buellia atrata</i>	1	UTM KN 985380. On vertical rock.
<i>B. disciformis</i>	+	On oak, <u>Fagus</u> and <u>Sorbus aucuparia</u> .
<i>B. erubescens</i>	+	On <u>Alnus incana</u> .
<i>B. griseovirens</i>	+	On old oaks and <u>Alnus glutinosa</u> . Once found fertile.
<i>B. leptocline</i>	1	UTM KN 775483. On fissures in vertical rock.
<i>B. punctata</i>	+	On rock and wood.
<i>Calicium glaucellum</i>	++	On wood and bark of different kinds. L.T. det.
<i>Caloplaca aurantiaca</i>	1	UTM KN 930285. On mortar.
<i>C. cf caesiorufa</i>	++	On rocks at the shore.
<i>C. cerina</i>	+	Found on <u>Populus tremula</u> .
<i>C. citrina</i>	+	On serpentine rock.
<i>Caloplaca ferruginea</i>	1	UTM KN 798470. On <u>Populus tremula</u> .
<i>C. marina</i>	+++	The most common of the marine <u>Caloplacas</u> .
<i>C. microthallina</i>	1	UTM KN 910395. In fissures in shore cliffs.
<i>C. obliterans</i>	1	UTM LN 067276. On Cambro-silurian, overhanging rock.
<i>C. saxicola</i>	1	UTM KN 725505. On siliceous rock.
<i>C. scopulorum</i>	+	Sparse on shore cliffs in the outer district.
<i>C. thalliicola</i>	+	Sparse on shore cliffs in the outer district.
<i>C. verruculifera</i>	+	Rare, on shore cliffs in the outer district.
<i>Candelaria concolor</i>	1	UTM KN 963385. Small specimens on an old ash at the roadside.
<i>Candelariella coralliza</i>	+	Sparse, on stone fences and cliffs. <i>Ornithocoprophilus?</i>
<i>C. reflexa</i>	+	Scattered, mainly on large deciduous trees at the roadside.

<i>C. vitellina</i>	+++	Common, in many kinds of habitat.
<i>Catillaria atropurpurea</i>	1	UTM KN 930285. On <u>Fagus</u> .
<i>C. bahusiense</i>	++	On hard rock.
<i>C. chalybeia</i>	+	On rock at the sea.
<i>C. griffithii</i>	+	On bark of deciduous trees. F.R. det.
<i>C. lightfootii</i>	+++	On bark of deciduous trees. Mostly sterile, the most common of the sterile sorediate crustose lichens on bark. Contains gyrophoric acid. P.W.J. det.
<i>C. pulverea</i>	+	On bark of deciduous trees.
<i>C. sphaeroides</i>	+	Growing over bryophytes, on soil or trees.
<i>Cavernularia hulteni</i>	1	UTM KN 920350. On <u>Sorbus aucuparia</u> in damp pine forest, (see Jørgensen & Øvstedal 1976).
<i>Cetraria chlorophylla</i>	+	Sparse, on twigs and clifftops.
<i>C. islandica</i>	+	Sparse in heathland.
<i>C. pinastri</i>	+	Rare, on pine and juniper.
<i>Cetrelia olivetorum</i>	+	Very rare, on juniper and <u>Sorbus aucuparia</u> .
<i>Chaenothecopsis viridireagens</i>	+	On rotten wood of <u>Alnus glutinosa</u> . L.T. det.
<i>Cladonia arbuscula</i>	++	Scattered in heaths, mires and different kinds of woods.
<i>C. caespiticia</i>	+	On peat and among mosses on tree boles.
<i>C. chlorophaea</i>	+++	On soil and tree-trunks.
<i>C. coccifera</i>	+++	On soil, rock and tree-trunks.
<i>C. bellidiflora</i>	++	On peat and soil on rock.
<i>C. coniocraea</i>	+++	On tree-trunks and soil.
<i>C. cornuta</i>	++	Mainly among bryophytes on steep cliff-sides.
<i>C. crispata</i>	+	On soil on heath.
<i>C. deformis</i>	+	On peat in pine forest.

<i>Cladonia digitata</i>	++	On pines.
<i>C. flabelliformis</i>	++	Mainly on peat, but also on rotten wood.
<i>C. fimbriata</i>	+	On tree-trunks.
<i>C. floerkeana</i>	+++	On peat, soil and rotten wood.
<i>C. furcata</i>	+++	In all kind of vegetation.
<i>C. gonecha</i>	+	On peat in heath.
<i>C. impexa</i>	+++	In heaths ; mires and pine-forests.
<i>C. leucophaea</i>	++	Mostly in heaths and mires.
<i>C. luteoalba</i>	1	UTM KN 983236. In a fissure in a cliff.
<i>C. macilenta</i>	+	On rotten wood.
<i>C. macrophylla</i>	++	On peat and soil.
<i>C. mitis</i>	1	UTM KN 850477. In bog
<i>C. rangiformis</i>	+	On soil on rocks.
<i>C. scabriuscula</i>	1	UTM KN 930285. On bryophytes growing on <u>Fagus</u> .
<i>C. metacorallifera</i>	+	On peat and rotten wood.
<i>C. squamosa</i>	+	Very variable.
<i>C. strepsilis</i>	++	On peat and soil on rock.
<i>C. subcervicornis</i>	+++	On wet rock, sometimes on peat.
<i>C. subfurcata</i>	+	In open places in wet heath.
<i>C. subulata</i>	++	In peat and soil on rock.
<i>C. tenuis</i>	+++	In heath and poor forests.
<i>C. uncialis</i>	+++	In heath, mires and poor forests.
<i>C. verticillata</i>	+	On soil in heath and on stone fences.
<i>Collema flaccidum</i>	+	
<i>C. nigrescens</i>	1	UTM LN 067276. On old pollared <u>Fraxinus</u> .
<i>C. subfurvum</i>	++	On rocks and deciduous trees.
<i>Cornicularia aculeata</i>	+	In heaths.
<i>C. muricata</i>	+	In heaths.

<i>Cornicularia normoerica</i>	+	On rock in the outer districts.
<i>Dermatina quercus</i>	1	UTM KN 910395. On old oak.
<i>Dermatocarpon fluviatile</i>	+	On wet rock.
<i>D. miniatum</i>	+	On rock.
<i>Dimerella diluta</i>	+	On old oaks and <u>Populus tremula</u> .
<i>Diploschistes scruposus</i>	+	On rock.
<i>Ephebe lanata</i>	+	On wet rock.
<i>Evernia prunastri</i>	++	On several kinds of deciduous- trees.
<i>Fusscidea gothoburgensis</i>	+	Under overhanging rock.
<i>F. cyathoides</i>	+++	Under overhanging rock.
<i>F. kochiana</i>	+++	On exposed rock, very abundant in the heath area.
<i>Graphis scripta</i>	+++	Abundant on several kinds of deciduous trees.
<i>Gyalecta jenensis</i>	+	On schistose rock.
<i>Haematomma coccineum</i>	+++	Shaded rocks.
<i>H. elatium</i>	+	On pine.
<i>H. ventosum</i>	+	On rock.
<i>Huilia albocoerulescens</i>	+	On vertical rock. Also collected by J.J.H.
<i>H. glaucophaea</i>	++	On rock.
<i>H. hydrophila</i>	+	In brooks.
<i>H. macrocarpa</i>	+	On exposed rock and wet rock.
<i>L. panaeola</i>	+	On rock.
<i>Hypogymnia bitteriana</i>	1	UTM KN 775434. On old <u>Acer</u> <u>pseudoplatanus</u> at the road.
<i>H. physodes</i>	+++	On trees and on soil on exposed hilltops.
<i>H. tubulosa</i>	++	Mainly on conifers, but also on rock on exposed hilltops.
<i>Icmadophila ericetorum</i>	++	On peat.
<i>Lecania dubitans</i>	1	UTM KN 930390. On <u>Populus</u> <u>tremula</u> . B.C. det.
<i>Lecanora atra</i>	++	On shore cliffs and also more inland.
<i>L. badia</i>	+	On hard rock.
<i>L. caesiocinerea</i>	++	Ornithocoprophilous. On stonefences and hilltops.

<i>L. campestris</i>	1	UTM KN 775483. On sheltered rock.
<i>L. chlarona</i>	+	On deciduous trees. <u>L.c.f. pinastri</u> on pines.
<i>L. chlarotera</i>	+	On deciduous trees.
<i>L. chloropolia</i>	1	UTM KN 983243. On <u>Alnus glutinosa</u> .
<i>Lecanora dispersa</i>	+	On rocks at the seashore.
<i>L. expallens</i>	+	On oak and ash.
<i>L. fugiens</i>	+	On rocks at the shore. Ornithocoprophilous.
<i>L. helicopis</i>	+	On rocks at the shore.
<i>L. intricata</i>	+	On rock. Also found by J.J.H.
<i>L. jamesii</i>	+	On <u>Sorbus aucuparia</u> and <u>Salix aurita</u> .
<i>L. lacustris</i>	++	On rocks in brooks and on lake shores.
<i>L. leproscens</i>	+	On rock on sea shores.
<i>L. pallida</i>	+	On oak.
<i>L. polytropa</i>	++	On rock.
<i>L. pulicaris</i>	++	On <u>Myrica gale</u> and <u>Salix aurita</u> . O.V. det.
<i>L. berengeriana</i>	1	On old oaks. P.W.J. det.
<i>L. cinnabarina</i>	++	On various deciduous trees.
<i>L. demissa</i>	+	On soil in heaths.
<i>L. diducens</i>	+	On rock.
<i>L. fuscoatra</i>	+	On exposed rock.
<i>L. granulosa</i>	++	On trees and soil. P.W.J. det.
<i>L. lactea</i>	++	On rock. Also collected by J.J.H.
<i>L. lithophila</i>	+++	On rock. Also collected by J.J.H.
<i>L. ochrococca</i>	+	On pine.
<i>L. orosthaea</i>	+	Under overhanging rock.
<i>L. pelobotrya</i>	+	On rock. Also collected by J.J.H.

<i>Lecidea phaeops</i>	+	On rock.
<i>L. sulphurea</i>	+	On sheltered rock.
<i>L. symmicta</i> agg.	+	On bark and twigs of different trees and also fence posts. B.C. det.
<i>L. templetonii</i>	+	Overgrowing mosses.
<i>L. tenebrosa</i>	++	On exposed rock. Also collected by J.J.H.
<i>L. tenebricosa</i>	+	On <u>Salix aurita</u> in wet heath.
<i>L. turgidula</i>	+	On pine and rotten wood.
<i>L. uliginosa</i>	+	On rotten wood, bark and peat.
<i>L. wallrothi</i>	+	On soil and peat.
<i>Lecidella elaeochroma</i>	+++	On various deciduous trees.
<i>L. scabra</i>	+	On exposed rock.
<i>L. subincongrua</i>	++	On rocks at the sea.
<i>Lepraria chlorina</i>	+	Under overhanging rock.
<i>L. incana</i>	+++	On trees and stones.
<i>L. membranacea</i>	+++	On trees and sheltered rock.
<i>Leptocaulon microscopicum</i>	+	On old pollared ashes and fissures in rock.
<i>Leptogium cyanescens</i>	+	On somewhat base-rich rock. One form growing closely adpressed to twigs of <u>Corylus</u> .
<i>L. lichenoides</i>	++	Many forms.
<i>L. palmatum</i>	+	On rock in rich deciduous forests.
<i>L. saturninum</i>	++	On <u>Populus tremula</u> and <u>Fraxinus</u> .
<i>Leptorhaphis epidermidis</i>	1	UTM KN 930285. On birch. J.J.H. leg.
<i>Lichina confinis</i>	++	On rocks at the shore.
<i>Lobaria amplissima</i>	+	On rock and <u>Populus tremula</u> .
<i>L. laetevirens</i>	+	On rock in rich deciduous forests.
<i>L. pulmonaria</i>	+	In oak and ash forests.
<i>L. scrobiculata</i>	++	On various deciduous trees and rock all over the district, but scattered.

<i>Massalongia carnosia</i>	++	Over bryophytes on rock.
<i>Menegazzia terebrata</i>	+	On <u><i>Alnus glutinosa</i></u> and <u><i>Betula pubescens</i></u> in N- faced forests.
<i>Micarea cinerea</i>	+	On peat and wood. B.C. det.
<i>M. leprosula</i>	+	In fissures on rock. Sterile.
<i>M. lignaria</i>	+++	On wood, soil and plant- remains.
<i>Micarea prasina</i>	+	On rotten wood. B.C. det.
<i>M. umbrosa</i>	1	UTM KN 985380. On vertical rock. A.V. det.
<i>M. violacea</i>	+	On peat and rotten wood. B.C. det.
<i>Mycoblastus affinis</i>	+	On bark of birch.
<i>M. fucatus</i>	1	UTM KN 764462. On <u><i>Calluna</i></u> stem. B.C. det. New to Norway.
<i>M. sanguinarius</i>	++	On various trees and rarely on bryophytes on rock.
<i>Nephroma arcticum</i>	1	UTM LN 075290. Among bryo- phytes at 350 m alt.
<i>N. bellum</i>	++	On deciduous trees.
<i>N. laevigatum</i>	++	On deciduous trees and rock.
<i>N. parile</i>	++	On deciduous trees and rock.
<i>Normandina pulchella</i>	+	On bark, lichens and bryo- phytes.
<i>Ochrolechia androgyna</i>	+++	On different kind of trees.
<i>O. pallescens</i>	+	Deciduous trees, mainly <u><i>Sorbus aucuparia</i></u> .
<i>O. parella</i>	+	On rock.
<i>O. subviridis</i>	+	Only found on <u><i>Fraxinus</i></u> .
<i>O. tartarea</i>	++	Growing over bryophytes and dead plant remains. One peculiar form growing closely adpressed to rock.
<i>O. turneri</i>	+	Found on pine, grey alder and oak.

<i>Opegrapha gyrocarpa</i>	++	Under overhanging rock.
<i>O. cf hysteriiformis</i> Nyl.	1	UTM KN 725505. On hard rock.
<i>O. rufescens</i>	+	On ash and hazel.
<i>O. varia</i>	++	On deciduous trees. Variable.
<i>O. zonata</i>	+	On overhanging rock.
<i>Pannaria pezizoides</i>	+	Growing over bryophytes.
<i>Pachyphiale cornea</i>	+	On oak and <u>Tilia cordata</u> . F.R. det.
<i>Pannaria ignobilis</i>	1	UTM LN 067276. On old pollarded ashes. P.M.J. det.
<i>P. mediterranea</i>	+	Found on old <u>Salix caprea</u> at the edge of pastures and roadsides. P.M.J. det.
<i>P. microphylla</i>	+	Only found on <u>Populus tremula</u> . P.M.J. det.
<i>P. pityrea</i>	+	On ash and hazel.
<i>P. rubiginosa</i>	+	On ash, hazel and <u>Sorbus</u> <u>aucuparia</u> .
<i>P. sampaiana</i>	1	UTM LN 067276. On old pollared ashes. P.M.J. det.
<i>Parmelia conspersa</i>	++	On rock.
<i>P. exasperatula</i>	++	On various deciduous trees.
<i>P. glabratula</i>	++	Both <u>ssp. glabratula</u> (on rock) and <u>ssp. laetevirens</u> (on trees).
<i>P. loxodes</i>	++	On rock.
<i>P. mougeotii</i>	+	On rock in heathland.
<i>Parmelia omphalodes</i>	+++	On rock.
<i>P. pastillifera</i>	+	On coastal rocks, <u>Acer</u> <u>pseudoplatanus</u> and <u>Prunus</u> <u>padus</u> .
<i>P. perlata</i>	1	UTM KN 924383. On oak. F.Rose et. al. leg.
<i>P. prolixa</i>	+	On rock.
<i>P. pubescens</i>	+	Found on a couple of places on stones on top of ridges in the heathland.
<i>P. revoluta</i>	+	On <u>Alnus glutinosa</u> in swamp forest.

<i>Parmelia saxatilis</i>	+++	On trees and stones.
<i>P. soorediosa</i>	+	On stone fences.
<i>P. stygia</i>	1	UTM LN 075290. On rock at 350 m alt.
<i>P. subaurifera</i>	++	On various trees.
<i>P. subrudecta</i>	+	On <u>Acer pseudoplatanus</u> at the roadside.
<i>P. sulcata</i>	+++	On various trees.
<i>P. tiliacea</i>	+	On deciduous trees.
<i>Parmeliella atlantica</i>	+	On rocks near the sea.
<i>P. corallinoides</i>	+	On <u>Tilia cordata</u> , <u>Populus tremula</u> and <u>Fraxinus</u> .
<i>P. jamesii</i> P.M.J. <u>ined.</u>	+	On various deciduous trees.
<i>P. plumbea</i>	++	On rock and deciduous trees.
<i>Parmeliopsis ambigua</i>	++	Mainly on pine.
<i>P. hyperopta</i>	+	Mainly on pine.
<i>Peltigera canina</i>	+++	Mainly among bryophytes on soil, rarely on the base of deciduous trees.
<i>P. collina</i>	+	On <u>Salix caprea</u> and <u>Sorbus aucuparia</u> .
<i>P. degenii</i>	+	On soil at roadside.
<i>P. horizontalis</i>	++	On rock and various deciduous trees.
<i>P. apthosa</i>	+++	Mainly among bryophytes on soil, rarely on the base of deciduous trees.
<i>P. polydactyla</i>	++	Among bryophytes, mainly on sloping ground.
<i>P. praetextata</i>	+	On rock.
<i>P. scabrosa</i>	+	Among bryophytes on sloping sloping ground.
<i>Pertusaria amara</i>	+	On <u>Alnus glutinosa</u> and <u>Fraxinus</u> .
<i>P. corallina</i>	+++	On hard rock.
<i>P. flavicans</i>	+	On rock.
<i>P. flavida</i>	1	UTM KN 985194. On oak. F.R. det.

<i>Pertusaria hemisphaerica</i>	1	UTM KN 930285. On <u>Fagus</u> . (Almborn 1948, p. 71).
<i>P. hymenea</i>	+	On <u>Populus tremula</u> , <u>Tilia cordata</u> and <u>Corylus</u> .
<i>P. lactea</i>	+	Mainly on <u>Corylus</u> , but also on <u>Alnus incana</u> and oak.
<i>P. pertusa</i>	+	On various deciduous trees.
<i>P. pseudocorallina</i>	+	On rock.
<i>P. multipuncta</i>	1	UTM LN 080280. On <u>Alnus incana</u> .
<i>Phlyctis argena</i>	+	On various deciduous trees and spruce.
<i>Physcia aipolia</i>	++	On various deciduous trees.
<i>P. dubia</i>	++	On cliffs at the shore and bird stones.
<i>P. semipinnata</i>	1	UTM KN 815477. On <u>Populus tremula</u> . O.Balle leg.
<i>P. stellaris</i>	+	On various deciduous trees.
<i>P. tenella</i>	++	Including both <u>v.tenella</u> (on trees) and <u>v.marina</u> (on shore cliffs).
<i>P. caesia</i>	+	On <u>Fraxinus</u> (as. <u>P. Wainioi</u>).
<i>Phaeophyscia endococcina</i>	1	UTM KN 888402. On wet cliffs.
<i>P. orbicularis</i>	+	On <u>Populus tremula</u> and <u>Acer pseudoplatanum</u> .
<i>Physconia perisidiosa</i>	1	UTM KN 935125. On <u>Acer pseudo-platanus</u> . (R.M. det.)
<i>Pilophorus strumaticus</i>	+	On stones in heath.
<i>Placopsis gelida</i>	+++	On rock.
<i>Plastismatia glauca</i>	+++	On rocks and trees.
<i>P. norvegica</i>	+	Mostly on N-exposed cliffs, but also on pine.
<i>Polychidium muscicolum</i>	+	Among bryophytes on rock.
<i>Polychistes nivalis</i>	1	UTM LN 867276. On Cambro-silurian rock, together with <u>Caloplaca</u> spp.
<i>Porina chlorotica</i> v. <i>chlorotica</i>	+	On stones in brooks.

<i>Porina chlorotica</i>			
<i>v. carpinea</i>	+	On <u>Corylus</u> .	
<i>P. lectissima</i>	+	On somewhat richer rock. Also collected by J.J.H.	
<i>Pseudovernia furfuracea</i>	+++	On trees, mainly pine, but also on cliff-tops.	
<i>Pseudocyphellaria thouarsii</i>	+	Among bryophytes on N-faced cliffs.	
<i>Pycnocladia papillaria</i>	++	On soil in heathland and open forests.	
<i>Racodium rupestre</i>	+	On wet cliffs.	
<i>Ramalina cuspidata</i>	+	On vertical cliffs in the outer district.	
<i>R. farinacea</i>	++	On various deciduous trees.	
<i>R. pollinaria</i>	+	Under overhanging rock.	
<i>R. siliquosa</i>	++	On vertical cliffs, mainly in the outer district.	
<i>R. subfarinacea</i>	+	On cliffs near the sea.	
<i>Rhizocarpon badioatrum</i>	+	Cliffs near the sea.	
<i>R. geographicum</i>	+++	Variable. Mainly on hard rock.	
<i>R. hochstetteri</i>	+	On shaded rock.	
<i>R. obscuratum</i>	++	On rock. Also collected by J.J.H.	
<i>R. oederi</i>	+	On rock in heathland.	
<i>Rinodina atrocineria</i>	1	UTM KN 930285. On rock. J.J.H. leg. et det.	
<i>Rinodina efflorescens</i>	1	UTM KN 910395. On old oak. New to Norway. B.C. det.	
<i>R. luridescens</i>	1	UTM KN 930285. On rock. J.J.H. leg. et det.	
<i>R. subexigua</i>	+	On shaded rock.	
<i>R. teichophila</i>	+	On rock.	
<i>Sphaerophorus fragilis</i>	++	On rock, rarely on tree boles.	
<i>S. globosus</i>	+++	On rock, sometimes on tree boles.	
<i>S. melanocarpus</i>	+	On exposed peat in the outer districts.	

<i>Staurothele fissa</i>	+	On rock in brooks.
<i>Stenocybe pullatula</i>	+	On <u>Alnus incana</u> and <u>A. glutinosa</u> .
<i>Stereocaulon condensatum</i>	+	On sandy soil in heathland.
<i>S. dactylophyllum</i>	++	On rock and stone fences.
<i>S. delisei</i>	1	UTM KN 764 462. On N-exposed, wet rock in heathland.
<i>S. evolotum</i>	+++	On exposed rock in heaths and open ferests.
<i>S. pileatum</i>	1	UTM KN 851473. On stones in wet heath.
<i>S. subcoralloides</i>	+	On exposed rock.
<i>S. vesuvianum</i>	+++	On rock. Very variable.
<i>Sticta fuliginosa</i>	+	Scattered on trees and among bryophytes on rock.
<i>S. limbata</i>	+	On trees, sometimes rock.
<i>S. silvatica</i>	++	On trees and rock.
<i>Tomasellia gelatinosa</i>	++	On <u>Corylus</u> , <u>Quercus</u> and <u>Alnus incana</u> .
<i>T. ischnobela</i>	1	UTM KN 756464. On <u>Corylus</u> P.W.J. det. New to Norway.
<i>Trapelia coarctata</i>	+	On rock.
<i>Trapelia ornata</i>	+	On stone fences.
<i>T. mooreana</i>	+	On pebbles in depressions in wet heath, also on serpentine.
<i>Umbilicaria cylindrica</i>	+	On recently exposed rock in road cuttings.
<i>U. crustulosa</i>	+	On rock and stone fences.
<i>U. deusta</i>	+	On shaded rock.
<i>U. polyphylla</i>	++	On exposed rock.
<i>U. polyrrhiza</i>	++	On exposed rock.
<i>U. proboscidea</i>	+	On exposed rock in heathland.
<i>U. pustulata</i>	++	On clifftops and near the shore. Ornithocoprophilous.
<i>U. spodochroa</i>	++	Mainly on sloping rock.

<i>U. torrefacta</i>	+	On exposed rock.
<i>Usnea filipendula</i>	++	On various trees.
<i>U. fragilesceus</i>	+	On pine.
<i>U. subfloridana</i>	+++	On various trees and wood.
<i>Verrucaria aethiobola</i>	+	In brooks.
<i>V. maura</i>	+++	On the sea-shore.
<i>V. mucosa</i>	+++	On the sea-shore.
<i>Xanthoria candelaria</i>	++	On stone and various trees.
<i>X. parietina</i>	+++	On stone and trees.
<i>X. polycarpa</i>	1	UTM KN 996267. On large <u><i>Acer pseudoplatanus</i></u> at the roadside.
<i>Xylographa abietina</i>	+	On pine wood.
<i>X. vitilago</i>	+	On pine wood.

Basidiolichenes.

Multiclavula vernalis (Schw.) Petersen + On peat in heaths
Omphalina ericetorum (Pers.) M. Lange ++ On peat and bryophytes.
O. luteolilacina (Favre) Henderson + On peat and rotten wood.
O. luteovitellina (Pilát et Nannfeldt)
M. Lange ++ On peat and bryophytes.

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AUSTRHEIM

10 km

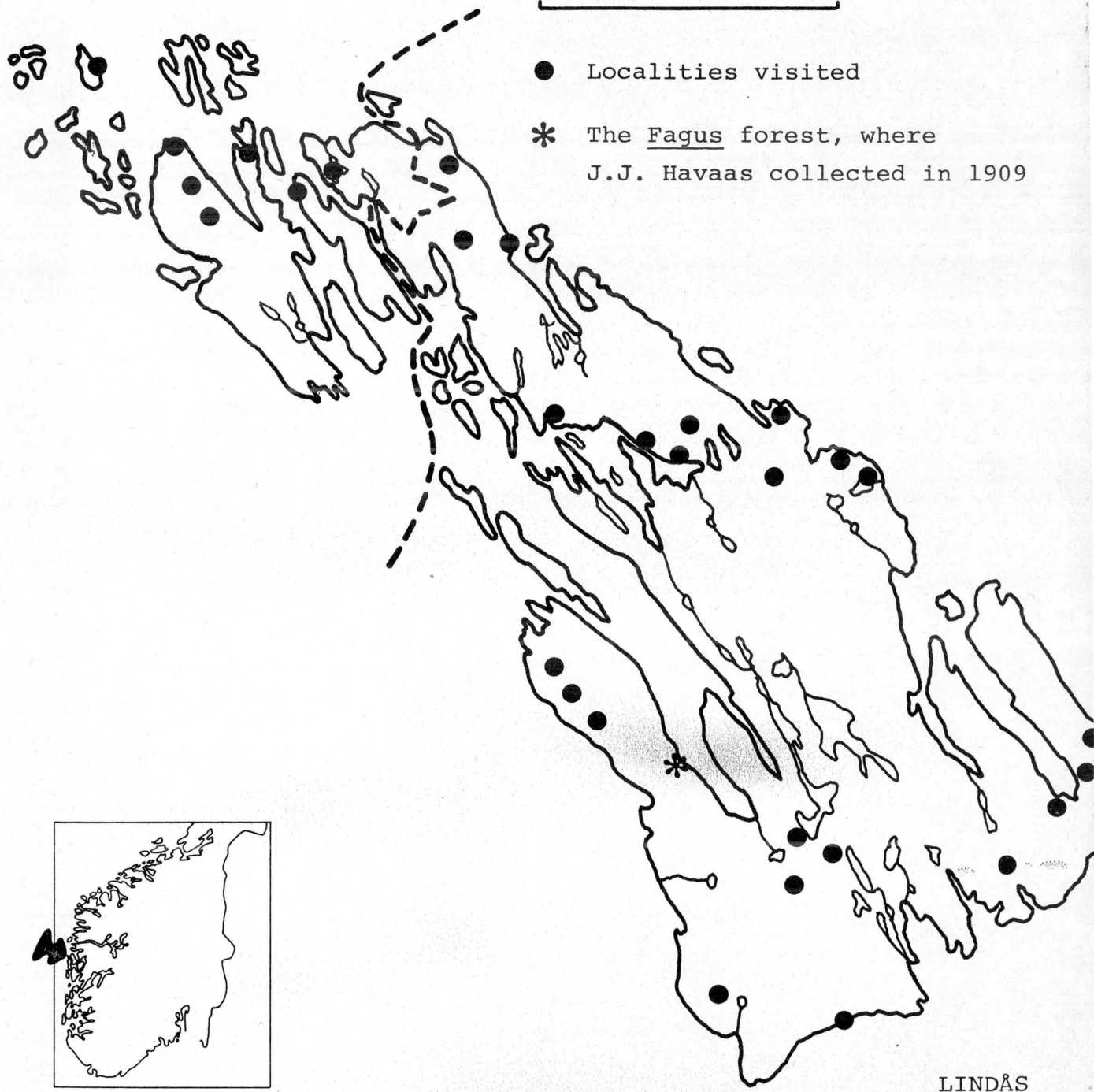


Fig. 1 Map of localities visited in Lindås and Austrheim parishes, Hordaland, Western Norway.