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Lichen Mapping in Iceland

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With 4 figures

1. The Icelandic grid system

Since 1970 most data on the distribution of plants in Iceland have been collected on the basis of an Icelandic national grid system proposed by KRISTINSSON & JÓHANNSSON (1970). This grid system was based on the division of the country into atlas sheets (scale 1 : 100.000) originally published by the Geodætisk Institut in Copenhagen (Fig. 1). This choice was made since these were the only available large scale maps covering the whole country at that time.

The 40 km \times 44 km division of these maps was subdivided into 10 km \times 10 km squares, which were numbered by a four digit number as shown in Fig. 2. These square numbers have been increasingly used as part of the location data on herbarium labels and on cards for the collection of botanical data in the field.

The whole of Iceland is covered by 1.138 squares, of which 86 are almost entirely glaciated. Consequently about 1.050 squares are to be recorded.

2. Mapping progress

In the years after 1970, the grid system was used for several detailed local studies: Þjórsárver (JÓHANNSSON et al. 1974), Hvalfjörður (KRISTINSSON et al. 1983), Audkúluheiði (KRISTINSSON & HALLGRÍMSSON 1977), Vesturöræfi and Eyjabakkar (GUTORMSSON et al. 1981). All these publications contain large scale distribution maps of vascular plants, some of them also maps of lichens or mosses. For many of these studies the squares were further subdivided into 2 km \times 2 km squares or 1 km \times 1 km squares.

In the years 1974–1978 all squares in Þingeyjarsýsla, (NE Iceland) were systematically investigated for vascular plants. This work resulted in manually prepared distribution maps for that area (unpubl.), showing interesting distribution patterns, most of which could be correlated to certain climatic factors. As a result of this interest grew to extend the work to cover the whole country. In the following years, serving as a professor of botany at the Institute of Biology, University of Iceland, the author made some excursions every summer to uninvestigated or badly investigated areas in Iceland, usually assisted by some botany students. In connection with botanical field work made for various other purposes, information on plant distribution was recorded and gradually added to the card file, both by the author and by several other botanists.

In 1983 a computer program was developed by ÞORVALDUR GUNNLAUGSSON to process these data in a VAX 11/780 computer owned by the University of Iceland. In the same year a project was started to feed the field data into the computer, and in addition literature records were analysed and added to the data bank. In 1985 the first distribution maps for all species of vascular plants were printed. Only dots were

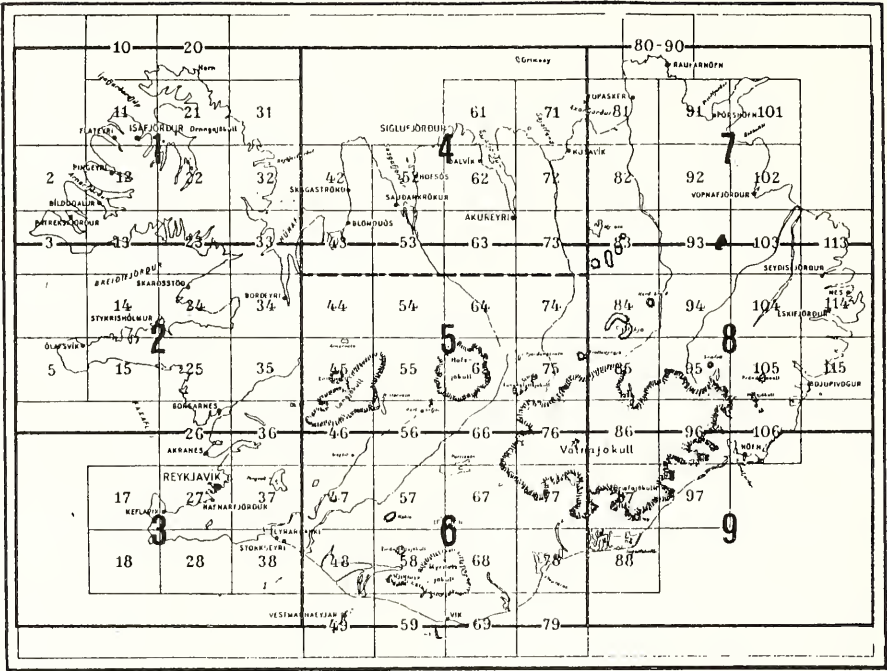


Fig. 1. Division of Iceland on the Atlas sheets in the scale 1 : 100.000, originally published by the Geodætisk Institut in Copenhagen.

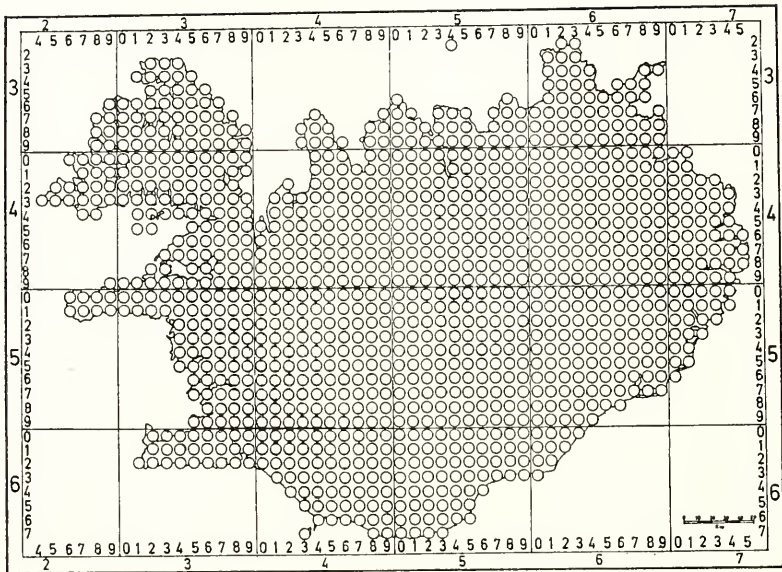
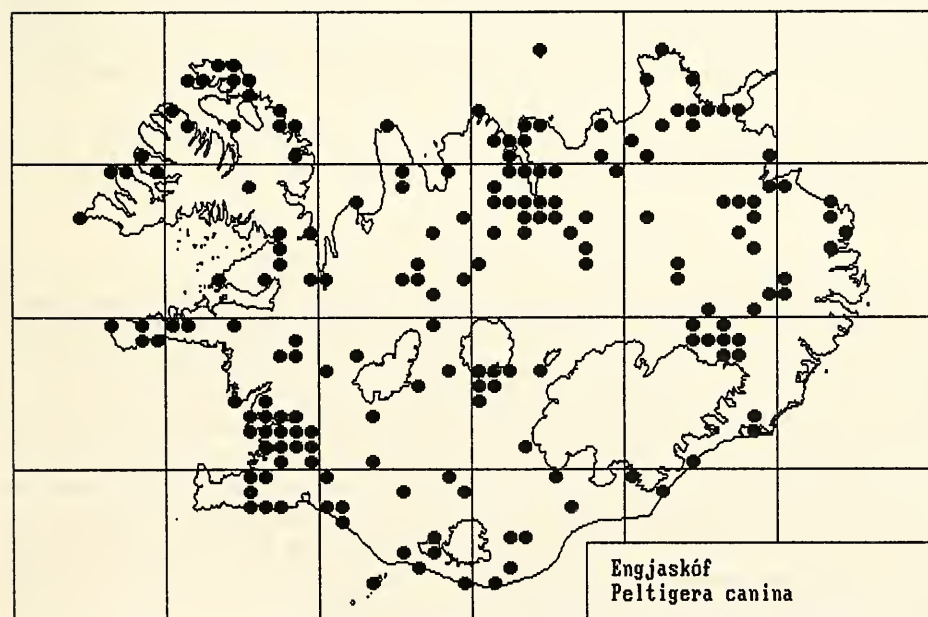
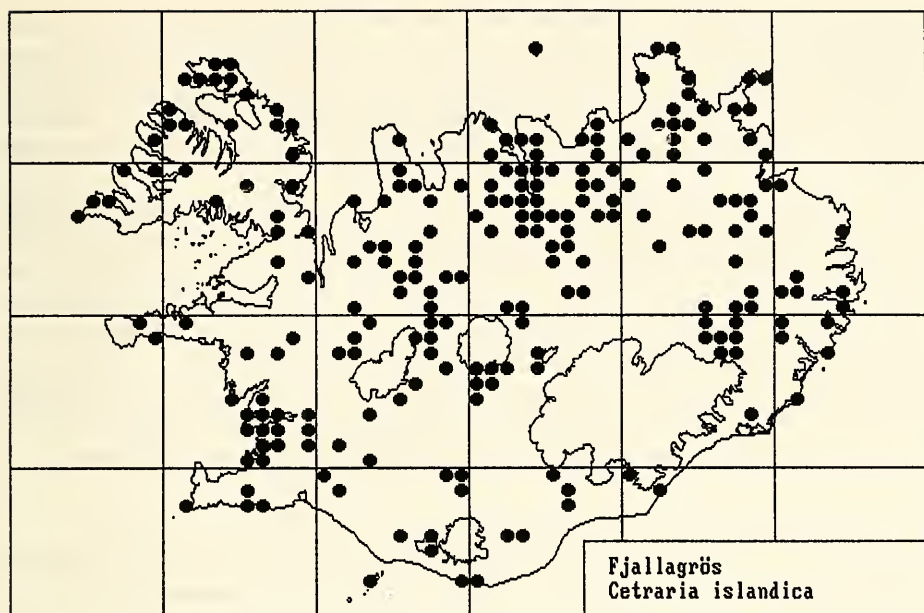


Fig. 2. Icelandic 10 km × 10 km grid used for mapping distribution of plants and animals. The four digit grid numbers include two digits for the vertical column, followed by two digits for the horizontal line.



Figs. 3–4. The distribution of two common lichens, *Cetraria islandica* and *Peltigera canina*. It gives some idea about the density of records for lichens in Iceland.

located and printed by the computer; the background maps in the same scale were copied onto the sheets. These prints made it easy to locate the underrecorded areas for later investigation. They were used as a basis for the distribution maps of vascular plants in Iceland published in *Plöntuhandbókin* (KRISTINSSON 1986) and its English translation „A Guide to the Flowering Plants and Ferns of Iceland“ (KRISTINSSON 1987).

In 1987 the head-quarters of the mapping project moved from the Institute of Biology in Reykjavík to the Museum of Natural History in Akureyri. At the same time a new program called FLORA was developed by GUNNLAUGUR PÉTURSSON to process additional botanical data on IBM/PC computer, and print improved distribution maps. This new program works in combination with dBASE III PLUS files, and processes information from such files. The last two years have been used to visit areas not recorded before, to fill up the last gaps in the maps. At present, vascular plants have been recorded in more than 1000 squares, and there are only about 30 single squares without any records at all, distributed throughout the country.

3. The lichen flora of Iceland

Lichens were collected in Iceland already in the last century, mainly by CHRISTIAN GRÖNLUND and ÓLAFUR DAVIDSSON. These records were summarized by DEICHMANN-BRANDT (1903), and again with some additions by GALLÖE (1920). BERT LYNGE and GUNNAR DEGELIUS contributed a great deal of information on the lichen flora of Iceland in this century (LYNGE 1940, DEGELIUS 1957). In 1967 and 1968 the author made extensive collections in all regions of Iceland. New species for the Icelandic flora discovered in this collection have been published by KRISTINSSON (1972, 1981). Many of the crustose lichens from these collections have still not been identified.

Altogether about 530 species of lichens are known from Iceland at present, and as a result of the relatively low atmospheric pollution, no species are extinct or even endangered.

4. Distribution maps of lichens

Some of the local, large scale mapping projects mentioned above include lichen maps (JÓHANSSON et al. 1974, GUTTORMSSON et al. 1981, KRISTINSSON et al. 1983). On a country-wide basis the recording of lichen distribution is far behind that of vascular plants. This is caused by the fact that there are very few resident botanists in Iceland collecting or recording lichens. Distribution maps of common lichen species like *Cetraria islandica* or *Peltigera canina* (Fig. 3 and 4) give some idea on the status of mapping. The most common lichens are recorded in about 150–200 squares out of 1050. Nevertheless, these records are rather evenly distributed throughout the country and give a fairly good idea of the real distribution pattern. At present, the lichen records are being processed by the same method and the same grid system as already described for the distribution of vascular plants.

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