

Editor's acknowledgements

I wish to thank all the colleagues who have made this project possible by making their knowledge and expertise available to the IMFANAG, and also to thank each of my previous co-editors for the enthusiasm and valuable efforts they have given the project.

This project might never had come into existence without the efforts of William C. Steere. At the time of his resignation from the project in 1982, he and I had already raised the basic funding needed, and much of the work was well under way. During his period of co-editorship, William C. Steere generously contributed much wisdom and advice, and I thank him for his good help and guidance.

I owe sincere thanks to Lewis E. Anderson, Duke University, Durham, to Howard Crum, University of Michigan, Ann Arbor, and to Rolf Dahlgren and Bertel Hansen, both Botanical Museum, University of Copenhagen, for support and advice during the initial period of the project.

I wish to thank Thomas Bernth, who wrote all the programs needed for my data processor as well as most of the different versions of the base map that were produced. Guy R. Brassard, Memorial University of Newfoundland, also helped in preparing an initial version of the final map.

In addition to those already mentioned I owe sincere thanks to Linda Ley, the Natural Museum of Canada, Ottawa and to Elise Alster, Janne Holdgård, Kjeld Jørgensen, Grethe Nielsen, Bente Wennerwald, and Peter Wind, the Botanical Museum, University of Copenhagen; they have all helped me in a variety of ways beyond their formal duties.

A part of this project consists of operational routines and general procedures which are more time-consuming than envisaged when the project was initiated. Some of this work I have done as part of my duties. However, a major part, particularly in illustrating microscopical details of plants, and during the difficult period when routines were to be developed, was carried out at home during spare hours with my family. Over the years, I have never felt fading enthusiasm for this project from my family, Elisabeth, Nis and Rie, no matter how much of my time (and mind) it occupied. For this I want to thank all three of them most sincerely.

Thanks are due also to curators in the following herbaria for arranging loans of specimens or allowing access to collections: ALA, ALTA, B, BM, C, CANM, E, FH, G, H, ICEL, M, MICH, NFLD, NY, S, TRH, UBC, UPS.

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Botanical Museum, Copenhagen,
September 6th., 1985.

Gert Steen Mogensen

Editor's foreword

The Illustrated Moss Flora of Arctic North America and Greenland (IMFANAG) treats all mosses present north of the tree-line in Alaska and Canada, and in the whole of Greenland. The need for an up-to-date flora dealing with the approx. 500 species of mosses present in this area has been apparent for many years. Biologists working in applied sciences such as environmental studies, in wild-life and fresh-water fisheries, in general ecology, *etc.*, are all too familiar with the abundance of mosses in the arctic ecosystems and the difficulties in having them identified. In fact, most workers seem to have given up. This is most unfortunate because many moss species show a more precise response to small differences in the environment than do most flowering plants. Thus, a better understanding of the mosses could contribute much information of general value.

In publishing this new moss flora the foremost hope is that a group wider than the relatively few bryologists will find it possible and worthwhile to identify mosses. Further hopes are that IMFANAG will serve as a platform for taxonomy and bryogeography, and facilitate and stimulate future research in the Arctic.

The project

The Illustrated Moss Flora of Arctic North America and Greenland is a result of mutual efforts of bryologists in several - at present eight - countries. Treatments of genera, families and orders will be published largely in the sequence they are accomplished rather than in taxonomic order (Table 1). It is planned to re-publish all families in taxonomic order once the work is complete.

This project was originally conceived by William C. Steere, President Emeritus, the New York Botanical Garden, and Kjeld A. Holmen, the Botanical Museum, University of Copenhagen. After the sudden death of Kjeld A. Holmen, the project was re-started in 1976-78 by William C. Steere and the editor.

Several co-editors have greatly facilitated the work on IMFANAG during the years, viz. William C. Steere, the New York Botanical Garden, Robert R. Ireland, the Museum of Natural Sciences, National Museum of Canada, Ottawa, Barbara M. Murray, the Museum, University of Alaska Fairbanks, Fairbanks and Guy R. Brassard, Memorial University of Newfoundland, St. John's (the latter two from 1982 to 1985). In 1985 it was decided that the present editor should continue alone.

A general introduction to IMFANAG will appear in Volume 1 and inform in details about its outlines. However, a number of treatments of families will be published prior to the introductory volume and therefore it seems appropriate here to give a brief comment about maps and illustrations.

The maps

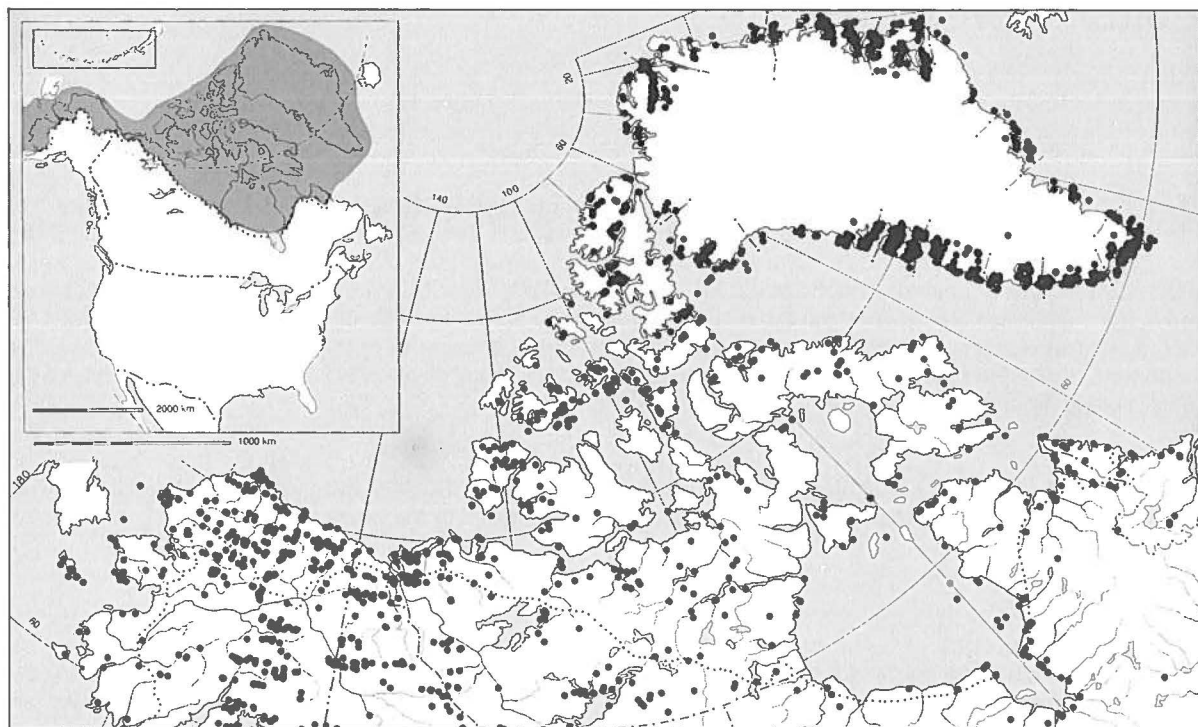
Knowledge of the geographic distribution of species is important in a wide spectrum of research fields. For this reason maps are provided for many species.

Each map consists of a dot map plus an insert map (Map 1). The dot map shows the distribution of a taxon within the area, as reflected by localities from which specimens have been seen by the respective authors; symbols indicate whether a taxon at a given locality is known in the gametophytic (○) or sporophytic (●) condition.

The insert map shows the approximate distribution in North America and Greenland, as assumed from literature reports and from knowledge of the respective authors at the time of completing the manuscripts.

In addition to the national boundaries, those of the Canadian Provinces are also given. Greenland is divided into 14 districts according to current curatorial practice established at in the Botanical Museum, University of Copenhagen (Map 2).

The tree-line is indicated on both maps as the line that delimits the area treated by IMFANAG southwards. In the field the tree-line is usually a zone of considerable width rather than a narrow line easy to define; therefore the position of this line on the maps is somewhat arbitrary. For this reason it was felt natural to include mosses from the whole of Greenland, although a few isolated valleys have local tree vegetation.



Map 1. Localities from which mosses have been identified for IMFANAG, status of July 1985. The map shows c. 3200 dots representing c. 14 000 specimens belonging to c. 300 species of mosses.
The insert map shows the geographic area covered by IMFANAG.

Good arguments could also be given for the inclusion of Iceland in this series, since some of the northern parts of the island can be considered arctic as well as alpine. On the whole the moss flora of Iceland is, however, closer to the temperate flora of northwestern Europe than it is to the arctic- and the North American temperate floras.

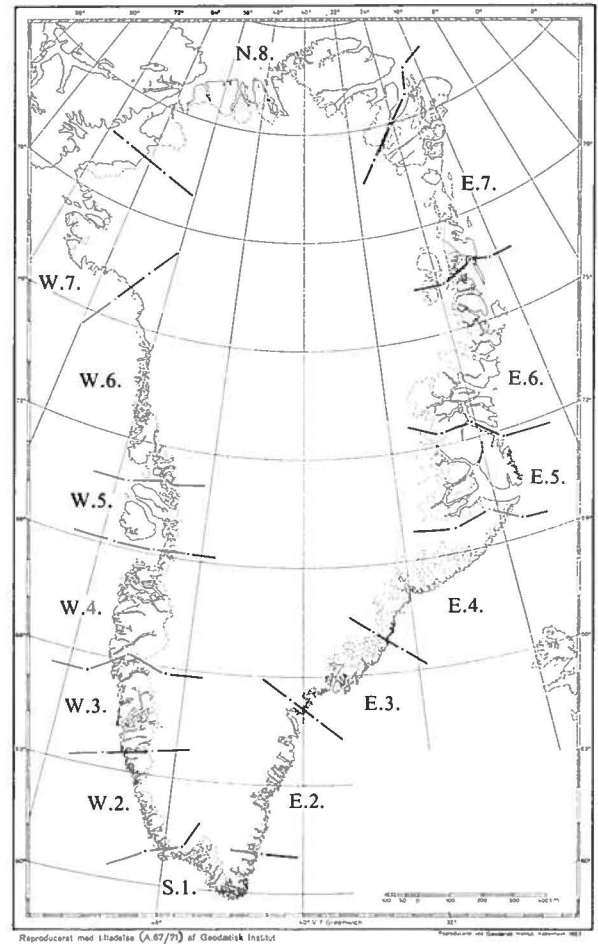
The maritime climate of western and southwestern Alaska greatly affects the tree-line and there some types of arctic tundra merge with maritime treeless vegetation. Therefore, the southern extension of the predominantly arctic area in Alaska is drawn somewhat arbitrarily.

Preparation of maps has been done by the editor and his staff unless otherwise stated; authors have supplied coordinates of localities or photocopies of specimens labels. Up to the present approx. 14 000 specimens have been entered into the data processor, representing more than 3200 localities (see Map 1). For a significant number of labels the editor supplied longitude and latitude as well as researching dubious locality names; much of this work was made possible by consulting historic sources of information, collector's field-notes, *etc.* The previous co-editors have also helped to identify incompletely labelled specimens.

Illustrations of mosses

All drawings are originals made from plants collected in the Arctic; voucher data for identification of the specimens are given under the respective species.

Map 2. Districts of Greenland referred to in the text.



The illustrations were made by Victoria Gordon Friis and myself in cooperation with the respective authors, who have approved the final plates. This work was initiated in 1979, and at the present about 300 plates have been completed or drafted. Hopefully, microscopical details of all taxa can be illustrated and habit-drawings of about 80 % of the specific taxa.

Key to illustrations

Each moss illustrated is shown at life size in the upper left-hand corner.

In composing the individual plate we have striven to use as few symbols and explanations as possible.

p	perichaetial or perigonal leaf
pe	peristome
p st	sterile plant
sp	spore(s)
x	cross-section; xc of costa; xl of leaf; xm of margin; xs of stem.

Table 1. Families of mosses to be treated in Illustrated Moss Flora of Arctic North America and Greenland arranged in taxonomic order.

Vol. 1:

Introduction
Key to genera

Indices
Bibliography

Vol. 2:

Sphagnaceae
Andreaeaceae
Andreaebryaceae
Buxbaumiaceae
Diphyssiaceae
Tetraphidaceae
Polytrichaceae - MOG, Bioscience Vol. 17, 1985.

Fissidentaceae
Ditrichaceae
Seligeriaceae
Dicranaceae
Archidiaceae
Bryoxiphiaceae

Vol. 3:

Encalyptaceae
Pottiaceae
Grimmiaceae
Funariaceae
Oedipodiaceae
Splachnaceae
Pseudoditrichaceae
Bryaceae

Mniaceae
Aulacomniaceae
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Leucodontaceae
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Neckeraceae

Theliaceae
Fabroniaceae
Leskeaceae
Thuidiaceae

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Brachytheciaceae
Entodontaceae
Plagiotheciaceae

Hypnaceae
Rhytidiaceae
Hylocomiaceae