

# BRYOPHYTES COLLECTED DURING A DUTCH BOTANICAL EAST GREENLAND EXPEDITION TO THE ANGMAGSSALIK AREA IN 1966.

J. G. DE MOLENAAR

Botanisch Museum en Herbarium, Utrecht

From a bryological point of view Greenland is not well known in detail. Unlike Siberia or Arctic America, it is not known through a few large collections, but through multitudes of mostly relatively small gatherings. In this arctic island that is almost 2000 miles long and extends from below 60° N.lat. to nearly 84° N.lat., travel and logistics are difficult. Consequently no over-all study of the whole island has been made, although many collections have been achieved through casual or intensive studies of small areas. Like the other contributions to the knowledge of the bryoflora of Greenland this paper will only deal with a rather limited area: the Angmagssalik district on the East coast of Greenland, ranging from 65° N.lat. to 67°20' N.lat.

In 1887 LANGE and JENSEN published the first and until now the only comprehensive review of specimens and publications on the Musci of Greenland. In their paper the first moss collection from the Angmagssalik area was reported, made in 1884–1885 in the course of ethnographical studies by Gustav Holm (*Sphagnum girgensohnii* and *Polytrichum juniperinum*), the first European to visit this part of East Greenland.

The geologist Bay, investigating this area in 1892 (67°37'N.lat.–37°38' W. long.) made a small collection of 6 species (JENSEN 1897). The largest contribution to the knowledge of the bryoflora of this part of Greenland is the collection made by KRUISE (1912) around 1900. The Bryales collection was studied by HESSELBO (1907, 77 species), while JENSEN (1906) identified the Sphagnales (7 species) and Hepaticae (40 species). In 1932 the Angmagssalik area was visited again at the end of the Scoresby Sound Committee's 2nd East Greenland Expedition. The entire bryophyte collection of this expedition, made by Böcher, was studied by HARMSSEN (1933), who counted 14 species of Bryales, 2 Sphagnales and 4 Hepaticae from this area. Tinbergen, a Dutch ornithologist, collected one *Drepanocladus* specimen in the area in 1933.

After the Second World War, the Swedish reverend J. Lagerkranz paid a visit to Angmagssalik in 1946. According to PERSSON (1950) his botanical collections included 18 moss species.

LANGE (1952) has given a revision of the collections of Greenland Sphagna in the Botanical Museum of the University of Copenhagen. She distinguished 2 more species in the collections of Böcher (1932) and one more in the collections of Kruse (1900) in this area.

In 1966 the author and two others, at the time students at the State University of Utrecht, made a trip to Angmagssalik to study the flora and vegetation of the district. Two localities were visited, a coastal locality near the settlement of Angmagssalik (loc. I, 65°35'–38' N. lat.– 37°38'–44' W. long.), and an inland area, the inner Tasilaq fjord (loc. II, 66°2'–7'N. lat. – 36°58'–37°3' W. long.).

In the course of this study botanical collections were made, of which the bryophytes are dealt with in this paper. This collection includes at least 79 species of Bryales, 5 Sphagnales and 23 Hepaticae. The material consists partly of a regular moss collection, but mostly of specimens collected in ecological sample-plots. The collection will be incorporated in the Herbarium of the Botanical Museum of the State University of Utrecht.

In spite of the previous investigations the Angmagssalik district still turns out to be rather incompletely known. Almost 40% of the Bryales species collected in 1966 have not been reported from this area before, as were 13% of the Hepaticae. Most specimens were found sterile as is usual in the Arctic. Almost 19% of the listed species of Bryales sporadically bore sporophytes. Hepaticae 17% of the species were occasionally found fertile.

As a result of this study the bryoflora of the Angmagssalik district amounts at present to about 170 species and thus equals the number of species of the phanerogam and vascular cryptogam flora (Hooft, unpublished), an indication of the importance of these plants in the low-arctic vegetation of the area.

The two localities visited are situated in different floristical provinces (cf. BÖCHER *c.s.* 1959). This makes a comparison of the bryofloras possible. Such a comparison may be of interest as locality I is extremely oceanic in climate and locality II continental; however, both are low-arctic. The subsoil in locality I is mainly Precambrian granite, gneiss, schist and here and there amphibolite, but in locality II pure potassium-feldspar predominates.

In the list below the species are listed alphabetically and those new to the Angmagssalik district are marked x. I and II indicate the localities.

The nomenclature of the Musci is in accordance with the Index Muscorum (VAN DER WIJK *c.s.*, 1959–1967, A–S) and ELSA NYHOLM (1954–1965). That of the Hepaticae is after MUELLER (1954–1957) and ARNELL (1956).

#### ACKNOWLEDGEMENTS

The author wishes to express his gratitude to Mrs. Bodil Lange *c.m.* of the Pharmaceutisk Højskole in Copenhagen for her kind introduction to and help in the determination of the Sphagnales, and Prof. Th. Sørensen *Ph. D.*, the director of the Botanical Museum of the University of Copenhagen for providing facilities in the Arctic Herbarium during two weeks in April 1967.

## HEPATICAE

- |   |       |  |       |
|---|-------|--|-------|
| 1 <i>Anthelia juratzkana</i> (Limpr.)<br>Trevis                   | I, II | 12 <i>Marchantia alpestris</i> Nees, with<br>gemmae and antheridia | I, II |
| 2 <i>Barbilophozia hatcheri</i> (Evs.)<br>Loeske, with sporophyte | I, II | 13 <i>Marsupella boeckii</i> (Aust.) Lindb.                        | II, x |
| 3 <i>Barbilophozia lycopodioides</i><br>(Wallr.) Loeske           | I     | 14 <i>Marsupella condensata</i> (Ångstr.)<br>Kaalaas               | I     |
| 4 <i>Blepharostoma trichophyllum</i><br>(L.) Dum.                 | II    | 15 <i>Marsupella revoluta</i> (Nees)<br>Lindb.                     | I     |
| 5 <i>Cephalozia bicuspidata</i> (L.) Dum.                         | I     | 16 <i>Orthocaulis kunzeanus</i> (Hübener)<br>Buch                  | II    |
| 6 <i>Cephalozia pleniceps</i> (Aust.)<br>Lindb.                   | II    | 17 <i>Pleuroclada albescens</i> (Hook.)<br>Spr.                    | I     |
| 7 <i>Cephaloziella starkei</i> (Funk.)<br>Schffn.                 | I     | var. <i>islandica</i> (Nees) Spr.                                  | I     |
| 8 <i>Fimbriaria ludwigii</i> (Schwaegr.)<br>Limpr.                | I     | 18 <i>Preissia quadrata</i> (Scop.) Nees,<br>with sporophyte       | II    |
| 9 <i>Gymnomitrium concinnatum</i><br>Corda ap. Sturm              | II    | 19 <i>Ptilidium ciliare</i> (L.) Hampe                             | I, II |
| 10 <i>Gymnomitrium coralloides</i> Nees                           | I, II | 20 <i>Scapania irrigua</i> (Nees) Dum.                             | I     |
| 11 <i>Haplomitrium hookeri</i> (Sm.)<br>Nees, with sporophyte     | II, x | 21 <i>Scapania subalpina</i> (Nees) Dum.                           | I, II |
|   |       | 22 <i>Sphenolobus minutus</i> (Cranz)<br>Steph.                    | I, II |
|   |       | 23 <i>Tritomaria scitula</i> (Taylor) Jørg.                        | II    |

## MUSCI

## ANDREAEAELES

- |   |   |   |   |
|---|---|---|---|
| 24 <i>Andreaea rupestris</i> Hedw.                        | I | var. <i>papillosa</i> (Lindb.) C. Jens. | I |
| var. <i>alpestris</i> (Thed.) C. Jens,<br>with sporophyte | I |   |   |

## SPHAGNALES

- |                                       |       |  |       |
|---------------------------------------|-------|--|-------|
| 25 <i>Sphagnum girgensohnii</i> Russ. | I, II | 28 <i>Sphagnum teres</i> (Schimp.)<br>Ångstr.  | I, II |
| 26 <i>Sphagnum riparium</i> Ångstr.   | I     | fo. <i>squarrosula</i> Lesq.                   | I, II |
| 27 <i>Sphagnum robustum</i> Røll.     | I, II | 29 <i>Sphagnum warnstorffianum</i> Du<br>Rietz | I, II |

## BRYALES

- |  |          |  |          |
|--|----------|--|----------|
| 30 <i>Amblystegium serpens</i> (Hedw.)<br>B.S.G. var. <i>juratzkanum</i><br>(Schimp.) Dix. | I, II, x | 37 <i>Brachythecium starkei</i> (Brid.)<br>B.S.G.                    | I, II, x |
| 31 <i>Aulacomnium palustre</i> (Hedw.)<br>Schwaegr.  | I, II    | 38 <i>Bryum cf. archangelicum</i> B.S.G.                             | I, x     |
| 32 <i>Aulacomnium turgidum</i> (Wg.)<br>Schwaegr.  | I, II    | 39 <i>Bryum arcticum</i> (R. Brown)<br>B.S.G., with sporophyte       | II, x    |
| 33 <i>Bartramia ithyphylla</i> Brid.<br>with sporophyte                                    | I, II    | 40 <i>Bryum argenteum</i> Hedw.                                      | II, x    |
| 34 <i>Blindia acuta</i> (Hedw.) B.S.G.<br>with sporophyte                                  | I, II    | 41 <i>Bryum inclinatum</i> (Sw.) Blandow                             | I, x     |
| 35 <i>Brachythecium reflexum</i> (Starke)<br>B.S.G.  | I, II    | 42 <i>Bryum neodamense</i> Itzigs                                    | I        |
| 36 <i>Brachythecium salebrosum</i> (Web.<br>et Mohr) B.S.G.                                | I, x     | 43 <i>Bryum pallescens</i> Schleich ex<br>Schwaegr., with sporophyte | I, II, x |
|  |          | 44 <i>Bryum pendulum</i> (Hornsch.)<br>Schimp.                       | I, x     |
|  |          | 45 <i>Bryum pseudotriquetrum</i> (Hedw.)<br>Schwaegr.                | I        |

BRYOPHYTES OF THE ANGMAGSSALIK AREA, GREENLAND

46 <i>Bryum purpurascens</i> (R. Brown) B.S.G. . . . .	II	76 <i>Leptobryum pyriforme</i> (L.) Wills., II with sporophyte	
47 <i>Calliergon sarmentosum</i> (Wahlenb.) Kindb.	II	77 <i>Meesia uliginosa</i> Hedw., with sporophyte	I, x
48 <i>Calliergon stramineum</i> (Brid.) Kindb.	I, II	78 <i>Mielichhoferia mielichhoferi</i> (Hook) Wijk et Marg.	I, x
49 <i>Campylium stellatum</i> (Hedw.) C. Jens.	II	79 <i>Mniobryum wahlenbergii</i> (Web. et Mohr) Jenn.	II
50 <i>Ceratodon purpureus</i> (L.) Brid.	II	80 <i>Mnium orthorrhynchum</i> Brid.	II, x
51 <i>Cirriphyllum cirrosum</i> (Schwaegr.) Grout	II, x	81 <i>Mnium rugicum</i> Laur.	I, x
52 <i>Climacium dendroides</i> (L.) W.M.	I	82 <i>Oligotrichum hercynicum</i> (Hedw.) Lam. et Cand., with sporophyte	II, x
53 <i>Conostomum tetragonum</i> (Vill.) Sw.	I, II	83 <i>Oncophorus virens</i> (Hedw.) Brid., with sporophyte	II
54 <i>Desmatodon latifolius</i> (Hedw.) Brid., with sporophyte	I, II	84 <i>Oncophorus wahlenbergii</i> Brid.	I
55 <i>Dicranella cerviculata</i> (Hedw.) Schimp., with sporophyte	I, x	85 <i>Orthotrichum</i> cf. <i>speciosum</i> Nees	I, x
56 <i>Dicranoweissia crispula</i> (Hedw.) Lindb.	I	86 <i>Paludella squarrosa</i> (L.) Brid.	I
57 <i>Dicranum elongatum</i> Schleich. ex Schwaegr.	I, II	87 <i>Philonotis caespitosa</i> Wills.	I, II
58 <i>Dicranum fuscescens</i> Turn.	II	88 <i>Philonotis fontana</i> (L.) Brid., with sporophyte	I, II
59 <i>Dicranum majus</i> Turn.	I, x	89 <i>Philonotis tomentella</i> (Mol.) Dism.	I, II
60 <i>Dicranum scoparium</i> (L.) Hedw.	I, II	90 <i>Plagiobryum zierrii</i> (Hedw.) Lindb.	I, II, x
61 <i>Distichium capillaceum</i> (Hedw.) B.S.G., with sporophyte	I	91 <i>Plagiothecium denticulatum</i> (Hedw.) B.S.G.	II
62 <i>Distichium hageni</i> Ryan	II, x	92 <i>Plagiothecium laetum</i> B.S.G.	II, x
63 <i>Drepanocladus aduncus</i> (Hedw.) Warnst.	I, II	93 <i>Pohlia cruda</i> (Hedw.) Lindb.	I, II
var. <i>polycarpus</i> (Voit.) Eoth.	I	94 <i>Pohlia</i> cf. <i>drumondii</i> (C.M.) Andrews	I
64 <i>Drepanocladus badius</i> (Hartm.) Roth	II	95 <i>Pohlia nutans</i> (Hedw.) Lindb., with sporophyte	I
65 <i>Drepanocladus exannulatus</i> (B.S.G.) Warnst.	I, II	96 <i>Pohlia obtusifolia</i> (Brid.) L. Koch	II
66 <i>Drepanocladus revolvens</i> (Sw.) Warnst.	II, x	97 <i>Polytrichum alpinum</i> L. ex Hedw.	II
67 <i>Drepanocladus uncinatus</i> (Hedw.) Warnst.	I, II	98 <i>Polytrichum commune</i> L. ex Hedw.	I
68 <i>Eurhynchium pulchellum</i> (Hedw.) Jenn.	I, x	99 <i>Polytrichum juniperinum</i> Willd. ex Hedw.	I, II
39 <i>Fissidens osmundoides</i> Hedw.	II, x	100 <i>Polytrichum piliferum</i> Schreb. ex Hedw.	I, II
70 <i>Grimmia torquata</i> Hornsch., with gemmae	II, x	101 <i>Racomitrium canescens</i> (Hedw.) Brid.	I, II
71 <i>Helodium blandowii</i> (Web. et Mohr) Warnst.	I, x	102 <i>Racomitrium fasciculare</i> (Hedw.) Brid.	II
72 <i>Hylocomium splendens</i> (Hedw.) B.S.G.	II,	103 <i>Racomitrium heterostichum</i> (Hedw.) Brid.	II, x
73 <i>Isopterygium pulchellum</i> (Hedw.) Jaeg.	II	104 <i>Racomitrium lanuginosum</i> (Hedw.) Brid.	II
74 <i>Kiaeria glacialis</i> (Berggr.) Hag., with sporophyte	I, II	105 <i>Racomitrium</i> cf. <i>microcarpon</i> (Hedw.) Brid.	II, x
75 <i>Kiaeria starkei</i> (Web. et Mohr) Hag.	I, II	106 <i>Schistidium apocarpum</i> (Hedw.) B.S.G., with sporophyte	II, x

107 <i>Timmia austriaca</i> Hedw.	II, x	109 <i>Tortula norvegica</i> Wahl.	I, x
108 <i>Tomenthypnum nitens</i> (Hedw.) Loeske	II	110 <i>Tortula ruralis</i> (L.) Ehrb.	I

## REFERENCES

- ARNELL, S. (1956): *Ill. Moss flora of Fennoscandia I, Hepaticae*. Bot. Soc. Lund.
- BÖCHER, T. W., K. HOLMEN & K. JAKOBSEN (1957): A synoptical study of the Greenland flora. *Medd. om Grøn.* 163, 1.
- HARMSEN, L. (1933): The Scoresby Sound Committee's 2nd East Greenland Expedition in 1932 to King Christian IX's Land; Mosses. *Medd. om Grøn.* 104, 7.
- HESSELBO, A. (1907): List of Andreaeales and Bryales found in East Greenland between 74° 15' and 65° 35' lat. N. in the years 1898–1902. coll. C. Kruuse, N. Hartz. *Medd. om Grøn.* 30, 9:313–332.
- JENSEN, C. (1897): Mosser fra Øst-Grønland. *Medd. om Grøn.* 15, 7:365–443.
- (1906): List of the Hepaticae and Sphagnales found in East Greenland between 75° and 65° 35' lat. N. in the years 1898–1902. *Medd. om Grøn.* 30, 8:295–312.
- KRUUSE, C. (1912): Rejser og botaniske undersøgelser i Øst-Grønland mellem 65° 30' og 67° 20' i aarene 1898–1902, samt Angmagssalik egnens vegetation. *Medd. om Grøn.* 49.
- LANGE, B. (1952): The genus *Sphagnum* in Greenland. *Bryologist* 55, 2:117–126.
- LANGE, J. & C. KRUUSE (1887): Oversigt over Grønlands Mosser. Cryptogamae cellulares: Muscineae. *Medd. om Grøn.* 3, 3:309–443.
- MUELLER, K. (1954–1957): *Die Lebermoose Europas I, II*. Rabenhorst's Kryptogamen-Flora VI. Leipzig.
- NYHOLM, E (1954–1965): *Ill. Moss Flora of Fennoscandia II, Musci*. Fasc. 1–5. Bot. Soc. Lund.
- PERSSON, H. (1950): Musci. Appendix in J. Lagerkranz: The flora of West and East Greenland. *Nova Acta Reg. Soc. Uppsala* IV, 14, 6:129–134.
- WIJK, R. VAN DER, W. D. MARGADANT & P. A. FLORSCHÜTZ (1959–1967): Index Muscorum 1–4. *Regnum Vegetabile* 17, 26, 33, 48. Utrecht.