MEETINGS OF THE BOTANICAL SOCIETY OF THE NETHERLANDS

MEETING OF THE SECTION FOR VEGETATION RESEARCH ON DECEMBER 29TH, 1967

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Shrub heath communities in south-east Greenland

The shrub heath constitutes a major part of the vegetation of Greenland. Different types occur, the distribution pattern of which is chiefly determined by climatic and edaphic factors.

In 1966 the author paid a four months visit to the Angmagssalik area (65 °N. lat. -67 °20'N. lat.). in South-east Greenland (ca. 60 °N. lat.-ca. 68 °N.lat.) to study among others the shrub heath, which is, as in other low-arctic parts of South-east Greenland, the most common vegetation type there. The bedrock in the mountainous area, which is cut by fjords, consists mainly of gneiss, granite and schist. The investigations were carried out in a coastal locality (with a local oceanic climate) and in an inland locality (with a local continental climate).

Where the middle West Greenland shrub heath is almost completely dominated by *Ledum groenlandicum* and, particularly *Ledum palustre ssp. decumbens* the South-east Greenland shrub heath is completely characterized by *Empetrum hermaphroditum, Vaccinium uliginosum* ssp. *microphyllum* and in a lesser degree *Salix glauca.* Furthermore *Salix herbacea, Carex bigelowii, Polygonum viviparum, Poa alpina,* and *Juncus trifidus* are the most common species of vascular plants in it. Fructicose lichens (particularly *Cladonia* and *Stereocaulon* species) and Bryophytes (especially *Dicranum* and *Aulacomnium* species) generally play an important role under the heath shrubs. The shrub heath favours stable, acid gravelly, often peaty soils with a sufficient water supply and needs a constant snowcover in the winter, which disappears early in the spring.

In the mountainous Angmagssalik area the shrub heath, where developed and covering a great number of square meters, is mosaic-like, due to the great variation in local conditions. There are hardly two patches completely alike in a shrub heath slope.

The shrub heath is developed to its most luxuriant degree on sheltered places on steep South to West exposed slopes with a permanent water supply in the growing season. Up to fourty species of vascular plants were counted there in field plots.

As a result from the investigations a number of shrub heath communities are distinghuised. The dominance of the shrub heath species was used as the main criterion for the distinction of communities, which are subdivided into variants according to overall floristic composition and the development of the moss layer.

Shrub heath communities

I. *Empetrum hermaphroditum* community
   1. Typical variant
   2. Variant of *Diapensia lapponica*
   3. Variant of *Phyllodoce coerulea*

II. *Empetrum-Vaccinium uliginosum* ssp. *microphyllum* community
   1. Typical variant
   2. Variant rich in herbs
   3. Variant of *Diapensia lapponica*
   4. Variant of *Phyllodoce coerulea*
   5. Variant of *Betula nana*
   7. Variant of fructicose lichens

III. *Empetrum-Vaccinium-Salix glauca* community
   1. Typical variant
   2. Variant of *Phyllodoce coerulea*

IV. *Empetrum-Salix glauca* community
   1. Typical variant
   2. Variant of *Juniperus communis*

V. *Vaccinum uliginosum* ssp. *microphyllum* community
   1. Typical variant
   2. Variant of *Cassiope tetragona, Dryas integrifolia* and *Empetrum*
   3. Variant of fructicose lichens

VI. *Betula nana* community
   1. Variant of fructicose lichens
   2. Variant of *Sphagnum* species

Communities I, II and III are the most common. Variant 2 of community V is absolutely restricted to the inland part of the area.

MEETING OF THE SECTION FOR VEGETATION RESEARCH ON OCTOBER 19TH, 1968

J. VAN DER TOORN *(Instituut voor Oecologisch Onderzoek, Kampen)*

Ecological differentiation of Phragmites communis Trin.

Transplantation experiments have shown that in the Netherlands the species *Phragmites communis* includes genetically determined types differing mainly in stem length. Long-stemmed types are found in the freshwater tidal area of the Rhine, the short-stemmed types grow in the low-moor peat areas of the northeastern part of the country. In brackish water tidal areas of the Rhine and Scheldt estuaries, both types occur.

A study was made of the environment in which a number of these types occur, i.e. a low-moor peat region (Kalenberg, in the northwestern part of the province of Overijssel), a freshwater tidal area (the Biesbosch), and in brackish water tidal areas (Zuidland and Ossendrecht). In the low-moor peat area of Kalenberg *Phragmites* grows around and in shallow lakes (about 1 to 2 m deep), which were formed after the removal of peat, where the reed often occurs as floating stands. Ecesis by seed probably took place at one time on the narrow strips of peat-ground ('legakkers') left behind by the peat diggers. There are indications that in the older stands a phosphorus deficiency occurs.

In the tidal areas the reed grows on a nutrient-rich mineral soil flooded twice a day at high tide. In the freshwater tidal areas the reed is able to establish itself from rhizomes on low-lying ground (about 0.75 m under M.H.W.L.).

Temperature measurements indicate that in the low-moor peat region around Kalenberg night frosts in April and May are more frequent and reach lower values than in the Biesbosch. Even greater differences are found between these two areas when the localities of reed establishment are compared. In Kalenberg night frosts are relatively the most frequent on the 'legakkers', but in low-lying places in the Biesbosch during the same period there are no night frosts at all.

The results of the transplantation of long-stemmed reed (Ameide type, freshwater tidal region) and short-stemmed reed (Kalenberg type) to the low-moor peat region of Kalenberg showed that the latter type of reed grew better than the former. In this experiment, both types met no competition from the surrounding vegetation. Severe night frosts damaged both types similarly, but the short-stemmed type made a relatively better recovery than the long-stemmed type. A similar experiment was performed in the Biesbosch at 70 and 40 cm below M.H.W.L. At the 70 cm level both types showed good development. At the lower level growth was less satisfactory, but under these conditions the long-stemmed type showed better development than the short-stemmed type.

In the brackish tidal area around Ossendrecht, transplantation was done in a vegetation of *Scirpus maritimus* at about M.H.W.L. In this experiment the long-stemmed Ameide type and the short-stemmed Ossendrecht type showed better vegetative extension than the short-stemmed Kalenberg type.

An attempt was made to determine whether there is a difference between the Kalenberg and Biesbosch types in relation to the amount of phosphorus and nitrogen in the substrate. No difference in this respect could be demonstrated in water cultures. These types also failed to show differences when grown on peat and clay soils. It is therefore unlikely that any selection between these types of reed is determined by soil differences.

The following hypothesis concerning the selection of reed types by the various milieus is put forward: In low-moor peat regions there is a selection favouring short-stemmed types of reed, mainly due to the occurrence of night frosts in the spring. In freshwater tidal regions selection favours the long-stemmed type because of its superior adjustment to the conditions of tidal movements, especially during the period of establishment. In brackish tidal regions, where *Phragmites* becomes established at higher-lying localities, this kind of selection is absent and both the long-stemmed and the short-stemmed types can become established and persist. There are indications, however, that in this milieu, as a result of the intense competition, certain short-stemmed types are at a disadvantage.

The results of this study will be published in more extended form as a thesis.

MEETING OF THE SECTION FOR VEGETATION RESEARCH ON DECEMBER 20TH, 1968

J. H. WILLEMS *(Botanisch Museum en Herbarium, Utrecht)*

Heath communities with Sarothamnus scoparius and Erica cinerea in the eastern part of the Belgian Kempen and the Dutch province of Limburg

In 1965 and 1966 the author studied the heath communities with *Sarothamnus scoparius* and *Erica cinerea* on the left bank of the river Maas in the eastern part of the region known as the Belgian Kempen. Because of their floristical similarity the remnants of heath in the Dutch province of Limburg on the right bank of the river were also taken into account.

The soil in the Belgian Kempen consists of deposits of sand and gravel overlying tertiary sand and clay formations. Into these the Maas has cut a terrace-like valley, dividing the area into a higher western part (90 m above sea level) and a lower eastern part (50 m above sea level), the latter bordering on the holocene fluvial deposits. The North-South directed edge separating the higher from the lower part is dissected by East-West oriented valleys, some with rivulets, others dry.

The climate has pronouncedly continental features, such as the great differences between summer and winter temperatures. Precipitation is low (700–800 mm per year) as compared with other parts of Belgium; a considerable part consists of snow.

The whole area contains remnants of formerly extensive heathland. The largest remaining part is the "Mechelse Heide" part of which consists of well-developed heath with *Sarothamnus scoparius*. In this we can distinguish several types:

I. *Molinia-Sarothamnus* community (characterized by the absence of *Calluna vulgaris*)
II. *Calluna-Sarothamnus* community
   a. variant poor in species.
   b. variant with *Rumex acetosella* and some *Liliaceae*
   c. variant with *Pteridium aquilinum* and *Vaccinium myrtillus*
   d. variant with *Genista anglica* and *Genista pilosa*

In some places specimens of *Genista anglica* and *Genista pilosa* attain a height of 1.50 m and 1.80 m respectively, *e.g.* on the slopes of the Kikbeek valley near Opgrimbie. These tall plants proved not to be polyploid.

Well-developed *Sarothamnus* heath is also still found near the villages of Gruitrode and Bessemer, North and South of the "Mechelse Heide", respectively.

In the southern part of the Dutch province of Limburg remnants of heath with *Sarothamnus* occur only on the tops of the hills not covered with löss. In the centre of the province, near Roermond (nat. res. "Meinweg") there is an extensive *Sarothamnus* heath of the same type as those in the Belgian Kempen.

Round the "Mechelse Heide", as it were in an arc, there are vegetations with *Erica cinerea*:

I. *Calluna – Erica tetralix – E. cinerea* community. This vegetation occurs only in a single locality near As; it is very rich in species, especially grasses and other herbs, and characterized by *Juniperus communis*.

II. *Calluna – Erica cinerea* community. Under planted *Pinus sylvestris* woods and characterized by i.a. *Vaccinium myrtillus*.

III. *Calluna – Erica cinerea* community. In clearings. *Epilobium angustifolium* is a typical species.

Erica cinerea is absent from the lower, eastern part of the Belgian Kempen.

In the Dutch province of Limburg *Erica cinerea* is found between Reuver and Swalmen and near Venlo, in both localities in types of heath communities very closely related to those of the Belgian Kempen.

The heath communities of the Belgian Kempen are strongly endangered by land reclamation, re-allotment, sand exploitation, reconstruction of houses, etc. A small part of the "Mechelse Heide" was very recently proclaimed a nature reservation.