

## *Betula nana* L. in the district of Święciany (Northeastern Poland).

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The places in which *Betula nana* grows in the Middle of Europe have lately given rise to greater scientific interest, for this arctic-boreal element has been found in the fossil rather than in the living state. This species is a characteristic element of the so called „Dryas-Flora“ which, as arctic tundra, used to cover considerable areas of Middle Europe right after the retreat of the last glacial age. The proofs of this may be found in different parts of Poland not only in the fossil leaves and seeds of *Betula nana*, but also in the latest results of pollen analyses, which confirm the existence of *Betula nana*-pollen in the deepest deposits of peat-bogs (2, 4, 5).

Recently there have been known to botanists in Poland two fixed places of growth of *Betula nana*, the first in „Linje“, district of Chełmno (Pomerania), discovered by Nowicki in 1837, rediscovered by H. Conwentz in 1901 (1); the second on the peat-bog „Jelnia“, near the town of Dżisna, near the river Dźwina (Wilno-country), described by E. Ralski in 1928 (3).

The next places of growth of this species discovered in 1931, are situated in the district of Święciany (Wilno-country), about which a short preliminary sketch has been given in „Ochrona Przyrody“, Annual 11 (6).

Fig. 66 shows the geographical location of two different habitats of *Betula nana*.

The first habitat is situated on the moss „Ole“, 4 km from the railroad station Rozłogi (main track of Święciany-Łyntupy-Królewszczyzna) in the forest district Mile, state forestry Łyntupy; the other one is situated on the moss „Pustelnia“, com-

munity Komaje (private property of Mr. E. Czechowicz), at a distance of 15 km from the railroad station Łyntupy.

The moss Ole, in the third subdivision of the forest district Mile, has an elongated shape, and a surface area of 300 ha; it runs from the Northwest to the Southeast. To the North and West it is bordered by a hilly formation of diluvial loam containing a large amount of erratic stones (boulders). These fertile hills are at present under prospective farm cultivation; the South and Southeast areas are covered up by marshy meadows with trees scattered round on them as, birch (*Betula pubescens*), alder (*Alnus glutinosa*) and com-

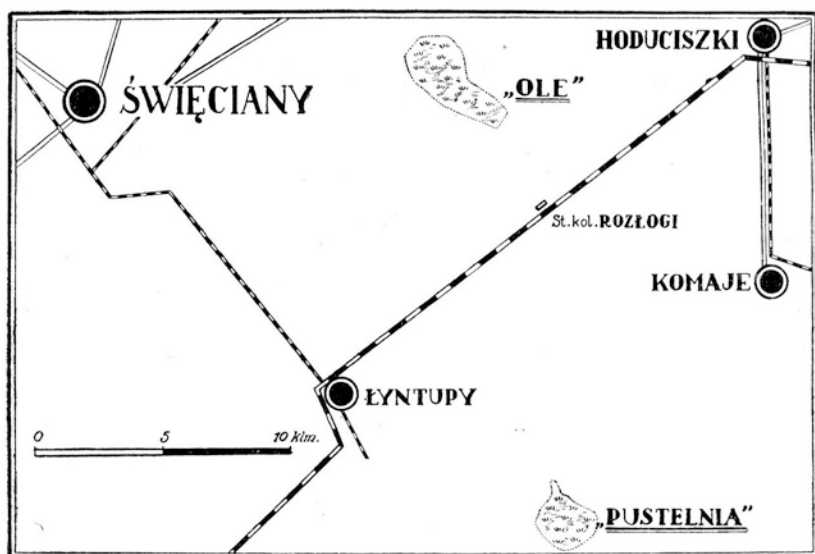


Fig. 67. Plan showing growing spots of *Betula nana*, district of Święciany.

mon pine (*Pinus silvestris*). In the close neighbourhood of this moss, in certain places only, there is a forest composed of fir, pine, and, in a still smaller number of aspen, birch and some other kind of trees of secondary importance. Along the borderline of the third and eleventh subdivisions of this forest district a stream „Komajka“ has its beginning, and runs in the Southeast direction to the lake Mieguny, a distance of 8 km.

The moss Ole belongs to the so called „upland mosses“ (oligotrophic acid peats or, highmoors), composed mostly of different bog mosses (*Sphagnum*). The spreading cover of mosses is interwoven with lichens (*Cladonia*) and with a few other typical moss plants, e. g.

*Eriophorum vaginatum*, *Empetrum nigrum* and *Ericaceae* as, *Calluna vulgaris*, *Vaccinium oxycoccus*, *Vacc. uliginosum*, *Andromeda polifolia*, *Andr. calyculata*, *Ledum palustre*. On the moss are dispersed trees in certain places only e. g., some dwarfish shaped pines (*Pinus silvestris* f. *turfosa*) not more than  $2\frac{1}{2}$  m high and some birches (*Betula pubescens*) below the natural height. On the boundary limits of this moss may be found also *Betula verrucosa*, *Alnus glutinosa*, *Salix caprea*, *S. cinerea*, *Viburnum Opulus*, *Rhamnus cathartica*. On the West side of this moss, between the third and eleventh subdivisions of the state forest district, there is a hill, a private property owned by farmers of the village Zwirki. East from this hill, a distance of 80 m, by the road, used only during winter when the moss is frozen, is the before named habitat of *Betula nana* on a surface not larger than 0.5 ha. Its favoured habitats are the slight elevations under the dwarfish shaped pines.

Its association on that specific ground area has been determined and is in accordance with the following list:

<i>Sphagnum medium</i>	<i>Eriophorum vaginatum</i>
<i>Sph. acutifolium</i>	<i>Empetrum nigrum</i>
<i>Sph. fuscum</i> var. <i>fuscescens</i>	<i>Vaccinium oxycoccus</i>
<i>Sph. Warnstorffii</i> var. <i>virescens</i>	<i>Vacc. microcarpum</i>
<i>Sph. recurvum</i>	<i>Vacc. uliginosum</i>
<i>Sph. fallax</i>	<i>Andromeda polifolia</i>
<i>Sph. rubellum</i>	<i>Andr. calyculata</i>
<i>Polytrichum strictum</i>	<i>Ledum palustre</i>
<i>Hylocomium Schreberi</i>	<i>Pinus silvestris</i> f. <i>turfosa</i>
<i>Dicranum Bonjeani</i>	<i>Salix myrtilloides</i>
<i>Cladonia</i> sp.	<i>Betula pubescens</i>

The plant societies existing on this moss and the pollen analyses of the peat deposits will be treated in a special study which is in preparation.

Moreover attention should be paid to the fauna of this moss, especially to a few boreal species existing in that part of Poland only. On this moss the mountain hare is more frequently found than the common hare. Also willow grouse lives here (*Lagopus lagopus*) in a number amounting from 40 to 50 brace.

Undoubtedly the prevailing primitive conditions of this moss together with its peculiar natural beauty, unusual vegetation and rare animals, fully entitle it to be kept as a preservation, the more so as, its soil is of no great value for farming purposes.

Now we are coming to the second place of growth of *Betula nana*, located 20 km South from the place described previously, in the forest area of „Pustelnia“, near the village Komaje. This moss has a surface area of 100 ha; it has a free and loose distribution of pines (*Pinus silvestris*) with a few birch trees (*Betula pubescens*) in between. Here the pine trees have the average height of 7 m and sometimes they reach the height of 15 m. Round this moss the diluvial sandy hills are chiefly covered with pine and fir trees in a more or less diminutive number, and also, with alder trees, here and there.

As to the vegetation of this moss, there is not much difference to that described previously. The moss is also an acid peat (highmoor) but not so extremely oligotrophic; here we find also marshy willows as, *Salix pentandra*, *S. aurita*, *S. cinerea*.

Here *Betula nana* has quite a few distinct growing areas, the surface of which do not exceed 1 ha. In comparison with the other *Betula nana* described previously on the moss Ole this one has the decided tendency to grow smaller in height, its leaf-blades are slightly smaller, and, characteristic for the latter is, that they keep their leaves until the frosty weather makes them fall down.

The plants growing here with *Betula nana* are specified in the following list:

<i>Sphagnum recurvum</i>	<i>Ledum palustre</i>
<i>Polytrichum strictum</i>	<i>Comarum palustre</i>
<i>Hylocomium Schreberi</i>	<i>Salix aurita</i>
<i>Vaccinium oxycoccos</i>	<i>S. pentandra</i>
<i>Vacc. uliginosum</i>	<i>Betula pubescens</i>
<i>Andromeda polifolia</i>	<i>Pinus silvestris turfosa</i>

The fauna of this moss though not large in number is of the greatest interest, both to the naturalist and the hunter. Here occasionally we can see the elk; here all the year round in a small number the common lynx is living in the undergrowth; here comes the wolf living alone in summer but in flocks in winter. Other rare species of mammals found here are: the common otter (*Lutra vulgaris*), the mountain hare (*Lepus variabilis*), the *Mustela lutreola*; among the birds are: the capercaillie (*Tetrao urogallus*), the willow grouse (*Lagopus lagopus*), the black grouse (*Tetrao tetrix*), the common crane (*Grus cinerea*), the black stork (*Ciconia nigra*), the raven (*Corvus corax*), and many others.

The above mentioned habitats of *Betula nana* have great similarity with the already known to botanists in Linje (Pomerania)

and in Jelnia (on the Dźwina-river). In every case known to us *Betula nana* is found on „upland mosses“ (highmoors) with similar associations, however never without the glacial willow (*Salix myrtilloides*).

We declare that *Betula nana* on these specified outposts is a relic of the diluvial Arctic period, however we must say that the thorough paleontological and pollen-analytical proofs were undertaken at Linje only.

We assume in our argumentation that the peat deposits rest on the lake deposits, therefore primarily our *Betula nana* chose its growing place on the elevated banks of the lakes. In time these banks have been covered up by woods and the lakes were changed into mosses, *Betula nana*, from the mineral salts on the banks, have shifted its position to the cold and damp grounds of the peats.

Disregarding the coming climatic changes our *Betula nana* survived on these grounds all obstacles and remained there to our days as a living relic of the glacial period.

We express herewith our thanks to Dr J. Mondelska (Leszno) for the determination of the mosses and to Mr. J. A. Nowak (Poznań) for his help with the translation of this paper.

Poznań, December 1931.

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