

Ecological amplitudes of *Dryas integrifolia* in Northwest Greenland

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Introduction

In a former contribution (LÜNTERBUSCH & DANIELS 2000) was shown, that in Northwest Greenland (Uummanaq district (70°15'N - 72°N)) *Dryas integrifolia* M. Vahl has a fairly broad phytocoenological amplitude since this species occurs in a number of different plant communities. In this paper we show results of investigations into the relationship between *Dryas integrifolia* and a number of vegetational and habitat conditions. The investigations are based on 223 relevés (usually 4 m²). Soil samples stem from the rhizosphere (3-10 cm) and have been analysed according the AG Boden (1996). The results are presented as diagrams showing the amount of relevés in relation to the variation of several vegetational, edaphical and other environmental features.

Results

Species number (vascular plants, bryophytes and lichens) varies, however in most of the relevés species number is between 30 and 80, thus fairly high (Fig. 1). The relevés show a very high species density with average 50,5 species per relevé (usually 4 m²). As can be seen from Fig. 2 *Dryas integrifolia* not only occurs in open „fell field“ vegetation, but preponderantly in stands with high cover values. *Dryas* can dominate in several vegetation types and give the vegetation a special aspect because of its cushion growth form. However very high cover values of *Dryas* (4 and 5) are less frequent. In most relevés the cover values are „middle sized“ (2a, 2b and 3) (Fig. 3). The diameter of the *Dryas* cushions is very variable as is shown in Fig. 4. Even true carpets can be observed at moist sites.

Most of the relevés stem from weakly acidic, neutral or weakly basic soil with pH (measured in aqua dest.) range from 5,5 to far over 7,7 similar to *Dryas integrifolia* stands on Ellesmere Island (HART 1988). On (very) acidic soil *Dryas integrifolia* is rather rare (Fig. 5). This species prefers soils with a percentage of organic material between 4 and 12 (%) (Fig. 6) but also occurs on humus rich soil. Fig. 7 and 8 show that *Dryas integrifolia* grows „preferentially“ on soil with rather low contents of Ca²⁺ and Mg²⁺ (both extracted by a 0,5 molar NH₄Cl suspension). However Fig. 7 and 8 actually show more less the presence of calcareous soils in the Uummanaq district where non calcareous bedrock dominates. The phosphate values are very low (Fig. 9). Only near settlements (recent and left) phosphate content is higher because of eutrophication by bones and (dog) excrements. On weakly acid soil *Dryas integrifolia* preferably grows under dry and intermediate soil moisture conditions (Fig. 10). On calcareous soil it additionally occurs on very wet soil (cf. also LÜNTERBUSCH & DANIELS 2000). The species neither shows a preference for special snow cover (Fig. 11) nor for special wind exposure conditions (Fig. 12).

Vegetational parameters (Fig. 1 - 4):

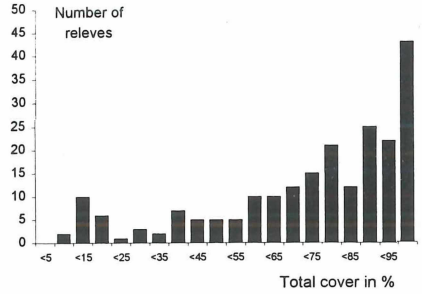
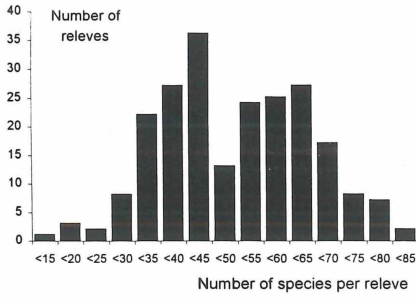


Fig. 1: Number of relevés in relation to species number per relevé

Fig. 2: Number of relevés in relation to total cover % per relevé

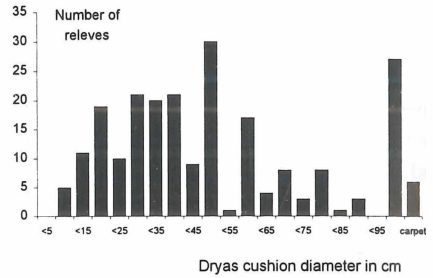
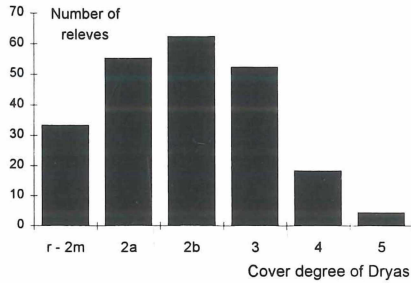


Fig. 3: Number of relevés in relation to cover degree of *Dryas integrifolia* per relevé

Fig. 4: Number of relevés in relation to the mean *Dryas* cushion size per relevé

Edaphical and environmental parameters (Fig. 5 - 12):

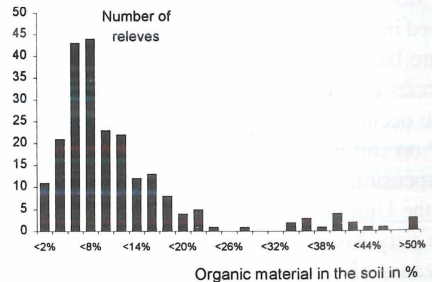
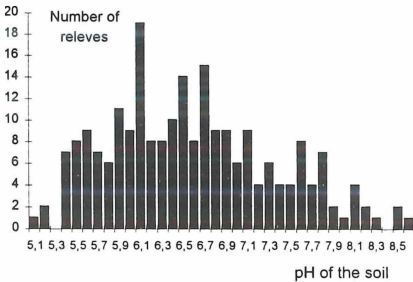


Fig. 5: Amount of relevés in relation to the variation of pH (measured in aqua dest.)

Fig. 6: Amount of relevés in relation to the variation of content of organic material

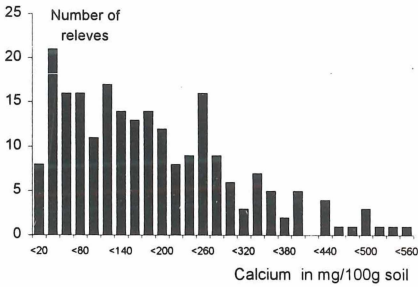


Fig. 7: Amount of relevés in relation to the variation of calcium content (extracted by a 0,5 molare NH_4Cl suspension)

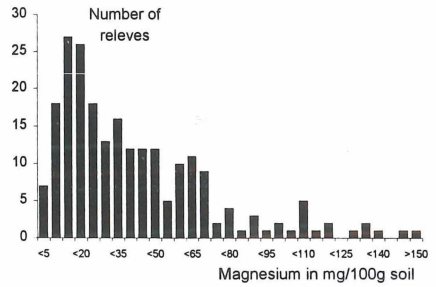


Fig. 8: Amount of relevés in relation to the variation of magnesium content (extracted by a 0,5 molare NH_4Cl suspension)

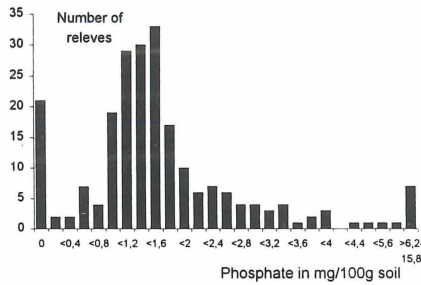


Fig. 9: Amount of relevés in relation to the variation of phosphate content (extracted by the CAL method)

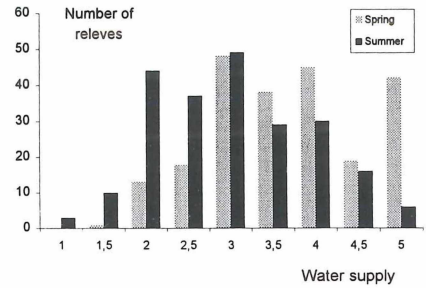


Fig. 10: Amount of relevés in relation to the variation of the estimated water supply: 1 = dry, 3 = mesic, 5 = wet.

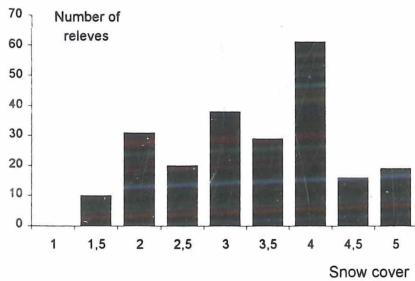


Fig. 11: Amount of relevés in relation to the variation of the estimated snow cover in winter: 1 = no continuous snow cover, 3 = intermediate, 5 = snow accumulation.

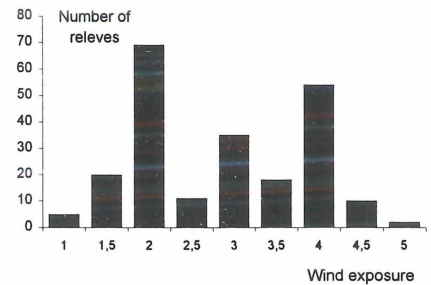


Fig. 12: Amount of relevés in relation to the variation of the estimated wind exposure: 1 = exposed, 3 = intermediate, 5 = sheltered.

Conclusions

Thus in the area of investigation *Dryas integrifolia* seems to be a species with a rather broad ecological amplitude. Thus it can be considered as an active (cf. YURTSEV 1994) species which is able to be component of many plant communities due to its broad ecological amplitude and morphological variation. It can be regarded at most as a preferential faithful species of the class *Carici-Kobresietea* Ohba 1974.

Acknowledgments

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