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#### Summary

The investigation deals with 106 populations of Lotus alpinus occurring on various substrates above timberline in surrounding of Davos (Grisons, Switzerland). In addition to field observations, studies on germination as well as some transplantation experiments were carried out.

Lotus alpinus within the alpine zone is differentiated into diploids ( $2n=12$ ) and tetraploids ( $2n=24$ ). A rather definite pattern of distribution of either race results from their respective ecological requirements. The diploid occur exclusively on silicate and most frequently are confined to altitudes higher than 2300-2400 m.a.s.l. The tetraploids inhabit silicate, dolomite and serpentine substrates; on silicate, however, only lower alpine stations are accessible to the 24 chromosomic plants and the contact zone between the two chromosomic races is remarkably narrow, whereas on dolomite and serpentine the tetraploids are found as well at higher altitudes. Phytosociological affinities of diploids and tetraploids within the contact zone are not distinct. As indicated by experiments, the absence of the diploids on substrates other than silicate is apparently due to competition. The distribution pattern observed on silicate seems to be influenced by the snowmelt time within the alpine zone.

A positive distinction between diploids and tetraploids was not possible, morphological variation being too pronounced, particularly in tetraploid plants. No hybridization between the two races was found.

The 24 chromosomic plants originating from various substrates manifested some differences in habitus and behaviour and might accordingly be considered as local edaphic races.

A continuous transition between the tetraploid Lotus alpinus and Lotus corniculatus seems to occur; however, the problem of gene exchange between these taxa requires further study.

Cyanogenesis was studied in 490 plants of both chromosomic races of Lotus alpinus. Some trends that confirm the previous results of URBANSKA-WORYTKIEWICZ and WILDI (1975) are discussed.

In conclusion, comments on a further evolution of Lotus alpinus are given.