

Summary

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Summary

The present investigation deals with cytotaxonomy and ecology of Campanula patula L. s. l. and Campanula Rapunculus L. The studied plants were collected in the Alps as well as in some alpine forelands of Switzerland and Austria.

Campanula patula s. l. proved to be differentiated into three types: 1) a diploid northern race ($2n=20$) which attains its southern limit in central alpine valleys; 2) a diploid southern race ($2n=20$) which goes northwards to the upper Rhine valley and central alpine valleys; 3) a tetraploid race ($2n=40$) the distribution of which partially overlaps with that of the northern diploid race.

Further differences observed between the three types concerned their cytology, morphology and, partially, ecology.

The chromosome sets of both diploids consisted of metacentric or submetacentric chromosomes; however, the proportion of particular chromosome types was different in each of the two races: longer chromosomes prevailed in the karyotype of the southern diploid. The tetraploids had mostly shorter chromosomes in their karyotype; in this respect they resembled the northern diploid race.

The most useful morphological criteria for determination of the particular types were length and form of the sepals. The ratio between the length of the sepals and the length of the free parts of the petals presented a further character of a diagnostic value. The plants belonging to the northern race had short sepals, those of the southern race were much longer, whereas the values of tetraploids were intermediate.

Reciprocal crosses showed that apparently no distinct genetical barrier existed between the two diploid races of Campanula patula: numerous hybrids were obtained. The experimental data agree with the field observations, such hybrids were found by the author in the region where two races come into

contact. On the other hand, the crosses between diploids and tetraploids were only successful when diploids were used as female parents.

As to the ecological conditions, the northern race of Campanula patula grows on moist or dry and only slightly fertilized soils. It appears in some variants of the Arrhenatheretum and Mesobrometum. The southern race grows in dry, not much fertilized stations within the plant communities of the Arrhenatherion and the Mesobromion. The habitat of the tetraploid race is similar to that of the northern race.

The results of the present work point to a putative hybrid origin of the tetraploid race of Campanula patula; it could be assumed that it has arisen from crosses between representatives of the southern and the northern diploid race.

Campanula Rapunculus L. occurs all over western and central Europe. It shows rather a limited morphological variability. Its chromosome set ($2n=20$) consists of rather long chromosomes, compared with Campanula patula s. l. In respect to the ecology it resembles Campanula patula southern race. The crossing experiments show a wellmarked genetical affinity between the whole Campanula patula group and Campanula Rapunculus, however, no hybrids were found in field. Only in a few herbarium specimens some individuals could be seen.