

## Summary

I conducted a biosystematic study of the polyploid complex of *Vicia cracca* with  $2n = 2x = 14$  and  $2n = 4x = 28$  occurring in the central Europe. Flow cytometry, isozyme analyses, crossing experiments, and geometric morphometrics were employed for the first time to study distribution, reproductive system and morphological variability in this polyploid complex. Using this complex approach, new evidence for the hypothesised autopolyploid origin of tetraploids was obtained. In the area of the former Czechoslovakia, tetraploids and diploids exhibit basically parapatric ranges. Tetraploids are rarely found in Slovakia whereas pure diploid populations were not found in the Czech Republic. A narrow zone of several mixed-ploidy populations along the Czech-Slovak border was recorded. This contact zone is probably of a secondary origin and is maintained by a balance between dispersal rates of the cytotypes and a frequency-dependent selection against inter-ploidy hybrids. A strong triploid block between cytotypes was proved by pollination experiments. Triploids resulting from fusion of reduced and unreduced gametes within diploid populations were very rare (0.1 %) and occurred in a restricted area in northwest Slovakia. Gene flow between cytotypes via the formation of tetraploid seeds by diploid mother plants seems to be possible but also extremely rare. Analyses of isozyme variation suggest that both cytotypes of *V. cracca* exhibit mixed breeding system with prevailing outcrossing. Cytotypes are slightly but significantly different with regard to morphology, especially in flower characters. Besides the quantitative differences, there were also some changes in the shape of floral structures correlated with the ploidy level. Impact of the natural selection on the reinforcement of morphological differences between cytotypes in sympatric populations was tested. Based on my results, recognition of the two diploid races of *V. cracca* delimited previously does not seem to be justified.

**KEYWORDS:** *Vicia cracca* polyploid complex, autotetraploid, flow cytometry, isozymes, geometric morphometrics, triploid block, minority cytotype exclusion.