

Residual sexuality as a factor influencing genetic structure within the agamic complex of *Hieracium* subgenus *Pilosella*

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Hieracium subgenus *Pilosella* belongs to the most taxonomically complicated groups of flowering plants. Apomixis, hybridization and polyploidisation considerably influence the taxonomic structure of this group.

In apomictic members of the subgenus, seeds are produced without meiosis and fertilisation. Offspring are genetic clones of the mother plant. Apomixis results in a stabilisation and long-termed fixation of the existing composition of the genome. Apomixis is not obligatory and some level of residual sexuality usually also occurs. Sexual reproduction disrupts stability fixed by apomixis and changes the composition of the genome in a fundamental way. The residual sexuality could thus play an important role during formation of genetic structure within the agamic complex of the subgenus *Pilosella*.

The questions to be answered include: In what way is residual sexuality manifested in natural populations? How often do haploid parthenogenesis and fusion of unreduced gametes occur, and what is their significance? How do the sexually derived progeny influence the evolution of genetic structure of the population? How do they contribute genetically to next generation of progeny? How often do they produce new genotypes?

To improve our understanding of these problems, the manifestation of residual sexuality in a model system comprising tetraploid sexual accessions of *H. pilosella* and hexaploid apomictic accessions of *H. bauhini* is being studied.

Reciprocal hybridization experiments are being carried out between model accessions to quantify the proportion of progeny derived by sexual processes in the model system. Because the main part of experiments are planned to be carried out this and next year, only preliminary results from 2003 are presented here. In experiments employing *H. bauhini* as the mother plant, only

polyhaploids (3x) and BII hybrids (5x) were detected, and no progeny originated by fusion of unreduced gametes were obtained.

The products of natural hybridization are also being characterised. Thirty-six plants from model population from Valov u Podbořan (*H. pilosella* – 14 individuals, *H. bauhini* – 6 individuals, and hybrids and hybridogenous plants – 16 individuals) are being analysed with respect to ploidy level, DNA content, mode of reproduction, pollen fertility, and isoenzyme and morphological variation. The aim is to bring to light on family relationships between plants in the population and to compare progeny derived from experiments with natural hybrids.

The mode of reproduction (fertility/sterility, apomixis/sexuality) of sexually derived progeny will be evaluated to assess the significance of its contribution in evolution of genetic structure of population.

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