Summary

Microevolution refers to evolutionary changes at or below the species level. These changes are the result of mutation, natural selection, gene flow and genetic drift. When microevolutionary processes in agamic complexes, like *Taraxacum*, are studied, gene flow deserves special attention. *Taraxacum* is very large and widespread genus with a very complicated taxonomy. It forms a polyploid series with basic chromosome number x=8, diploids (obligate sexuals) and triploids (apomicts) prevail.

The presented work studies reproductive behaviour and pathways of the gene flow in *Taraxacum* sect. *Ruderalia* and compares it with *Taraxacum* sect. *Erythrosperma*. Diploid, triploid and tetraploid individuals were sampled from mixed diploid – polyploid natural populations of *Taraxacum* sect. *Ruderalia*, diploids and triploids from *Taraxacum* sect. *Erythrosperma*. Seeds resulting both from the crosses between particular ploidy levels, from isolated anthodia and from open pollinated anthodia (from cultivated and wild plants) were subjected to the flow-cytometric seed screening (FCSS) to determine ploidy levels in the progeny and to infer breeding behaviour of maternal plants. Three possible pathways of the gene flow were studied: (A) fertilization of sexuals by pollen of apomicts, (B) B_{III} (2n+n) hybrid formation, (C) facultative apomixis.

In *Taraxacum* sect. *Ruderalia*, diploid maternal plants when experimentally crossed with triploid pollen donors produced diploid and polyploid progeny. Majority of diploid progeny is supposed to be a selfed one. Polyploid progeny was euploid, fertilization capacity of aneuploid pollen of triploids is low, or aneuploid zygotes die early. On the other hand, aneuploid pollen of hyperdiploid (2n=17) is fertile and produces aneuploid embrya. When diploid sexuals were pollinated with a mixture of the pollen of diploids and triploids or insect pollinated, no polyploids were discovered. It seems that in the mixture with the pollen of diploids, the pollen of triploids is ineffective. This mixture of pollen seems not to provoke self pollination of diploids, threrefore selfed plants are supposed to be rare in nature. Tetraploids in *Taraxacum* sect. *Ruderalia* produce triploid hybrids

much easier with diploid mothers (average seed set 68%, triploids form 89% of this progeny) than triploids do (average seed set 19%, out of them only 18% are triploids). This triploid progenies from diploid mother x tetraploid pollen donor crosses were one of three following types: (i) apomicts, tetraploids thus represent a tetraploid bridge to new apomictic triploid genotypes; (ii) sexuals with probably negligibe microevolutionary impact; (iii) diplosporous nonparthenogenetic plants producing progeny of B_{III} hybrid type. Facultative apomixis in the sense of production of a part of progeny by apomixis and the other part of progeny as the result of fertilization of reduced ovules, was not recorded. B_{III} hybrids were present in the progeny of both triploids and tetraploids, in tetraploids in quite high percentages (up to 50% of the progeny in some crosses), both in experiments and natural localities. Plants producing B_{III} hybrids are the diplosporous plants partially not parthenogenetic.

In *Taraxacum* sect. *Erythrosperma* diploids with irregular pollen and reduced fertility were found to occur quite often (about 25% of individuals) in the area studied. In comparison with *Taraxacum* sect. *Ruderalia* triploids exhibited male sterility quite often and diploids had much stronger tendency to autogamy. Gene flow in *Taraxacum* sect. *Erythrosperma* seems to be limited in comparison with sect. *Ruderalia*, polyploid hybrids are rare even in experimental crosses of diploid sexual x polyploid pollen donor. No facultative apomixis was registered there. B_{III} hybrids occurred approximately in the same frequency as in *Taraxacum* sect. *Ruderalia*. In both sections, B_{III} hybrids represent the most important way of origin of tetraploids, which seem to play important role in 2x – (4x) – 3x cycle.