ABSTRACT

Mixed-ploidy populations, consisting of multiple cytotypes, are an optimal system for studying genome doubling consequences in plants. The role of frequency dependent selection, known as minority cytotype exclusion principle, is very important in them, but there are many factors limiting this selection.

In my thesis, I evaluate the changes in cytotype frequencies and pattern in permanent plots in natural mixed-ploidy populations of three plant species – *Butomus umbellatus*, *Knautia serpentinicola* and *Tripleurospermum inodorum* and I also experimentally analyze partial aspects of frequency dependent selection towards minority cytotype in artificially established mixed-ploidy arrays of two plant species – *Arabidopsis arenosa* and *Tripleurospermum inodorum*.

Varied changes in frequencies of minority cytotype ware revealed in permanent plots. Usually there was decrease, but in two plots there was increase in minority cytotype frequency and in one case it became dominant. Observed changes depend on initial frequencies of minority cytotype in populations, biological properties of species and particular environment of permanent plot. Relative indexes describing the frequency and the strength of disturbances and also the amount of soil nutrients was used to compare the environment of permanent plots across species.

Essential impact of different cytotype phenology on their coexistence was revealed in *Arabidopsis arenosa* studying development in flowering and reproductive success of each individual, but only tetraploids had the advantage from this difference. There were significant changes in cytotype frequencies or pattern within experimental arrays in next generation. Difference in phenology was revealed also between cytotypes of *Tripleurospermum inodorum*, were the peaks of flowering were not overlapping and and both cytotypes had the benefit from this shift.

key words: polyploidy, ploidy coexistence, minority cytotype exclusion, assortative mating