Abstract

Genome duplication plays a significant role in plant evolution. Formation of new polyploids is generally considered to be rare. Nevertheless, under natural conditions mixed-ploidy populations occur in relatively large numbers. Only the observations in the cytotype contact zone can identify all the factors affecting the stability or instability of the population. Number of research focusing on study of cytotype coexistence in natural mixed-ploidy populations is still low.

As a model system for the study of mechanisms governing cytotype coexistence was chosen the *Tripleurospermum inodorum*. Research focused on natural mixed-ploidy populations and also on planted mixed-ploidy populations. Permanent plots were located in south, west, northwest and north Bohemia. Field observations were supplemented by cultivation experiments carried out in the greenhouse.

Several phenomena were discovered at the level of whole populations. Cytotype distribution in the plot was random. The spatial structure of natural populations was quickly changing even within a single season. Even between single plot evaluations the cytotype ratios varied. Three percent of all plants were triploid hybrids. Most often detected cytotype in soil seed bank was diploid cytotype.

The study of population dynamics shows, that tetraploids are more successful in surviving in mixed-ploidy populations. Seedlings and overwintering rosettes were identified as the critical phases of the lifecycle.

Tetraploid manifested greater fitness during cultivation experiments. Their germination was faster and also the germination rate was higher. They were more efficient in nutrient utilization, tolerated nutrient poor substrate and higher population density. Diploid plants were more likely than others to bloom under stress conditions.

Keywords: polyploid speciation, minority cytotype exclusion, mixed-ploidy populations, population dynamics