

6. Abstract

Comparative population dynamics of *Anthericum liliago* (L) and *Anthericum ramosum* (L)

The aim of the study was to estimate the importance of habitat type and ploidy level for population dynamics of plants. In the study I was comparing dynamics and plasticity of two rare closely related species *Anthericum liliago* L. (4n) and *Anthericum ramosum* L. (2n). Specifically, I was comparing dynamics of both species on the same habitat type (open habitat, where the studied species co-occur) and dynamics of *Anthericum ramosum* on two contrasting habitats (forest and open habitat). I attempted to estimate to what extent are the differences in population dynamics between the populations due to genetic differences or plasticity.

Population dynamics of both species was studied using analysis of population transition matrices from years 2006-2007. The mean population growth rates (λ) were much higher for the populations of both species from the open habitat (*A. liliago* $\lambda=1.50$, *A. ramosum* $\lambda=1.42$) than for populations of *A. ramosum* from the forest habitat ($\lambda=0.99$). Populations from the open habitat are thus growing whereas forest populations are stable. These results indicate that the population dynamics for the two different species from the same habitat type is more similar than the dynamics of one species *A. ramosum* from the contrasting habitats.

The analysis of elasticities showed that the critical phase of the life cycle of all studied population types is the survival of small vegetative plants (this transition is important especially for forest populations). Also the production of seedlings by one flowering plant is important for *A. liliago*, whereas for *A. ramosum*-open it was seed production. But the LTRE analysis showed that transition which positively contributes most to real changes in population growth rate for open-habitat populations is seedling germination from seed bank, which is important for *A. ramosum*. For *A. liliago* it is the survival of flowering plants. When comparing open and forest populations of *A. ramosum*, the flowering and the reproduction of *A. ramosum*-open significantly positively contributes to real changes in λ . Only overall contribution of the habitat type was significant (open habitat has higher λ) indicating the importance of habitat conditions for the population dynamics of *A. ramosum*.

Growing dynamics and plasticity of the species from both habitat types were studied for 2 seasons (2007, 2008) in experimental garden by the reciprocal-transplant method. All

the three studied population types showed the same reaction on conditions of the 2 different habitat types: in the second season the biomass of grown plants was significantly much bigger in the forest conditions than in the open. These results indicate that *A. liliago* and *A. ramosum* are plastic and this plasticity is comparable between both species. In the second season only plants of *A. ramosum* were flowering and they flowered more in the open-habitat conditions.

Key words: *Anthericum*, population dynamics, phenotypic plasticity, polyploidy