

Abstract

This thesis aimed on comparison of environmental requirements and morphological and biological traits of diploid and triploid cytotypes of wetland plant flowering rush (*Butomus umbellatus*), occurring in Eastern Slovak Lowland in unique mixed populations, and to develop primers for variable microsatellite loci suitable for further genetic studies. In total, 72 populations of *Butomus umbellatus* were found. The analysis of relative genome size by the flow cytometry (FCM) technique revealed 34 exclusively triploid cytotype populations, 8 exclusively diploid populations and 30 mixed populations of *Butomus umbellatus*. In mixed populations, the numbers of diploid and triploid individuals are quite equivalent and the plants create combined compact communities.

Analyses of environmental characteristics of sites with specific cytotypes (PCA, RDA, ANOVA) revealed no difference in site requirements of diploid and triploid *Butomus umbellatus* plants. Morphometric analyses (PCA, CDA) of traits of 36 diploid and 54 triploid plants confirmed differing morphology of both cytotypes occurring in the nature. Subsequent replanting of these plants into pots and cultivation further increased these differences. The ratio of width and length of internal perianthium is the most reliable parameter to distinguish diploid and triploid plants (0.5–0.7 and 0.7–1.1, respectively). Still, there are some individuals in either ploidy group that morphologically match rather the characteristics of the opposite cytotype. On the other hand, no differences in traits related to vegetative reproduction were found: both cytotypes create approximately the same number of rhizome buds and almost never form bulbils in inflorescences. The analysis of ploidy level of seedlings grown up from triploid plant's seeds confirmed high number of aneuploids among the descendants, alongside purely diploid or triploid seedlings. However, full-grown aneuploid individuals were not recorded in the nature.

To facilitate population-genetics analyses, 14 specific primer-pairs for variable nuclear microsatellite loci were developed. The microsatellite primers are published in this thesis.