

Abstract

Complex *Campanula rotundifolia* agg. is rich in endemic species, especially in the high-elevated mountain ranges. Extreme climatic conditions in the subalpine habitats can lead to a convergence in plant's morphology between plants isolated in different mountain ranges. Because of the lack of morphological differentiation, it is very difficult to reconstruct the evolutionary history of bellflowers *C. scheuchzeri* from the Alps, *C. bohemica* from the Krkonoše Mountains and *C. tatrae* from the Western Carpathians. A similarity in morphology and the same ploidy level can suggest vicariance from a large area of an ancestor species. However, regarding the continuous morphological variation, the high-altitudinal endemics could have originated by local adaptation from originally low-land species.

DNA-ploidy level and genome size were detected by flow cytometry. Taxonomically important characters were found using multivariate morphometric analysis. The phenotypic plasticity of the taxon *C. tatrae* was tested by a cultivation experiment. Genetic structure of the studied species was revealed using molecular marker - microsatellites (7 variable primers).

Studied taxa were tetraploids, but some possessed different genome size. The morphological differentiation was mainly due to characters like calyx lobes length and width, number of leaves on a stem and their length. Taxa of the *C. rotundifolia* agg. were genetically weakly differentiated. There is a strong gene flow along an elevation gradient but there is no allelic migration between the mountain ranges. The taxa with the same wide range of genome size and low morphological differentiation - Eastern European taxa (*C. tatrae* from the Carpathians) genetically differed from the taxa with smaller genome size - Western European taxa (*C. bohemica* and *C. scheuchzeri* from the Krkonoše Mts. and the Alps, respectively). A high portion of admixture shared within clusters suggests a hybridization between the taxa in the past.

The high-altitudinal environment of central Europe was likely colonised by two genetically different groups that underwent a parallel evolution of a very similar morphotype. In addition, the main morphological characters are very varying depending on the environmental changes.

Key-words: *Campanulaceae*, *Campanula rotundifolia* agg., flow cytometry, morphological variation, multivariate morphometrics, microsatellites, mountain ecotypes