

Abstract

Clonal Architecture in the Endangered Populations of the Shrub Birch *Betula humilis* Schrk [†]

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Abstract: In many plant species sexual and asexual reproduction occur simultaneously. Clone size and clonal architecture, i.e. the spatial distribution of ramets, can significantly affect pollination and mating. In guerrilla strategy vegetative ramets belonging to one genet are dispersed and intermixed with other clones, which facilitate cross-fertilization. In turn, the mixing of ramets of different clones is significantly limited in phalanx strategy, increasing the probability of self-fertilization by geitonogamy. The shrub birch, *Betula humilis*, is a wind-pollinated species, which also reproduces vegetatively. The aim of the study was to define the strategy of clonal growth and investigate clonal diversity in the endangered *B. humilis* populations from the southwestern margin of the species range to assess their potential influence on pollination and selfing. We conducted genotyping at seven nuclear SSR (simple sequence repeats) loci of 522 ramets within 24 sampling plots in six populations differentiated in size and level of competition from other plant species. The analysis revealed 86 genets in total. Clonal and genetic diversities were substantial in all populations. Spatial distribution of ramets and number of genets differed between studied populations, but in general, the phalanx strategy dominated, as from 59% to 95% of ramets shared the same genotype with their closest neighbour. Nevertheless, clones were relatively small, most of individuals were unrelated, and plots with intermixed genets were found in all studied localities. This observation indicates that self-pollination does not seem to be a considerable threat, even in small and overgrown *B. humilis* stands. The plasticity of clonal growth strategies may facilitate survival of the shrub birch and allows it to persist under different environmental conditions

Keywords: clonal propagation; endangered species; genetic relatedness; microsatellites