

## Hybridization and morphological variation in Icelandic birch species

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Gene flow via introgressive hybridization between two co-existing birch species in Iceland, diploid dwarf birch *B. nana* and tetraploid downy birch *B. pubescens*, has been well documented. As a consequence, taxonomical delineation based on morphology is difficult. On the contrary, the genomes are highly stable, as only three groups of birch exist in Iceland, i.e. diploid, triploid and tetraploid. No aneuploids are found. In this study all plants were identified based on chromosome number, after which variation in species-specific characters, essentially in the leaf morphology, was analysed qualitatively and quantitatively. Samples from 14 natural woodlands in Iceland were collected from all parts of the country. Eight discrete morphological characters were scored and nine leaf variables were measured. The results show that interspecific hybridization is not a rare event, as 9.5% of 427 birch plants examined are triploid. All three genome groups (diploid, triploid and tetraploid) are variable and this variability overlaps in most of their morphological distribution, implying bi-directional introgression. Nevertheless, diploid *B. nana* can be distinguished from tetraploid *B. pubescens* most of the time. The triploid hybrids were difficult to predict - only half of them were assigned correctly, i.e. as morphological intermediates. All variables support the cytotaxonomic classification, with the triploid group bridging the two species. The present study also shows a clear indication of geographical structure when analysing the three genome groups separately, and this can be partly explained by differences in mean July temperature.