

Genetic Variability of Isolated Eastern Alpine Populations of *Linnaea borealis* L., Characteristic Species of Boreal Forests, Indicates ‘in situ’ Glacial Survival

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Abstract

In a rapidly changing environment, because of habitat loss and fragmentation, many plant species have become rare. We investigate genetic variability between two small isolated populations of twinflower from the Eastern Alps and three population from the core Boreal distributional range. The results revealed three main clusters, exemplars from the Boreal range are present in all three clusters. Very low genetic variation within the two isolated Alpine populations and very high genetic variation between the two Alpine populations was found, despite their being only 73 km apart. Moreover, a low proportion of distinct genotypes were found in the Alpine populations in comparison to the Northern one. We conclude that the two isolated Alpine populations are both glacial relict populations, based on the high genetic variability between them, probably due to consecutive bottlenecks and long-term isolation under specific environmental conditions. However, glacial relicts, usually associated with vulnerable habitats deserve urgent attention involving conservation countermeasures especially from the perspective of climate change.

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