

Publication

Environmental filtering, not local adaptation of established plants, determines the occurrence of seed- and bulbil-producing *Poa alpina* in a local flora

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Genetic variability among subspecies, ecotypes and populations is an important component of biodiversity, particularly when habitats are characterized by steep environmental gradients across short distances as in the landscape of the European Alps. In *Poa alpina* population differentiation is high due to polyploidy, facultative apomixis and the occurrence of seed- and bulbil-producing plants. We analyzed microsatellite diversity of seed- and bulbil-producing populations from two nearby alpine grassland sites in the Swiss Alps and transplanted them reciprocally to test the hypothesis that established plants are locally adapted. The seed- and bulbil-producing populations differed molecularly strongly from each other despite their proximity. The seed-producing plants from the rich, calcareous grassland site performed well at both the home and the away site. Conversely, the bulbil-producing plants from the species-poor grassland had a comparatively low productivity at both sites, but performed better at the high-quality away site compared to its home site. Thus, local adaptation of established plants could not be confirmed by reciprocal transplantation. Results suggest that the distribution of seed- and bulbil-producing *P. alpina* is a result of habitat quality, differences in plant performance, and the requirements for successful offspring recruitment. The prevailing occurrence of bulbil-producing plants at low productivity sites is probably due to different regeneration niches for seeds vs. bulbils, i.e. an advantage of bulbils at cold sites with poor soil and short growing seasons at this elevation.

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