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Ökologie ausgewählter Schneebodenarten am alpin-nivalen Ökoton der Zentralalpen

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Global warming induced changes will be most pronounced in high-latitude and high-altitude areas in the northern hemisphere. In these regions macroclimatic factors like temperature or snowpack are the main determinants for the distribution of plant species. Long lasting snow cover constrains the growing period for plants in snowbeds. Consequently, the highly adapted timing of development is crucial for reproductive success. In this doctoral thesis the impact of temperature, time of snow melt and photoperiod on flowering phenology of ten common snowbed species in the Central Alps of Austria was estimated.

Various analyses revealed very congruent results. No impact of photoperiod was found. Temperature emerged as the most important single factor controlling phenology. Influence of the time of snow melt was shown only for early phenophases of a subset of species. Hence, the reproductive development was not directly linked with the date of snowmelt, but rather with the cumulative energy input. Integrated cumulative temperature sums calculated using thresholds of 0 °C or 1 °C were the most appropriate indices for predicting generative development, indicating that snowbed plant species are physiologically active even slightly above the freezing point. We found only minor differences in the impact of day and night temperatures. Among the study species *Agrostis rupestris* and *Saxifraga bryoides* will probably benefit most from a moderate temperature induced prolongation of the growing period, whereas *Gnaphalium supinum* will suffer from selective disadvantages.

These results uncover the very high sensitivity of snowbed plant species to temperature related aspects of climate change.