

**Background:** In tundra ecosystems, the adjustment of phenological events, such as bud burst, to snowmelt timing is crucial to the climatic adaptation of plants. Natural small-scale variations in microclimate potentially enable plant populations to persist in a changing climate.

**Aims:** To assess how plant phenology responds to natural differences in snowmelt timing.

**Methods:** We observed the timing of eight vegetative and reproductive phenophases in seven dwarf-shrub species in relation to differences in snowmelt timing on a small spatial scale in an alpine environment in subarctic Finland.

**Results:** Some species and phenophases showed accelerated development with later snowmelt, thus providing full or partial compensation for the shorter snow-free period. Full compensation resulted in synchronous occurrence of phenophases across the snowmelt gradient. In other species, there was no acceleration of development. The timing of phenophases varied between two consecutive years and two opposing mountain slope aspects.

**Conclusions:** The results have shown three distinct patterns in the timing of phenophases in relation to snowmelt and suggest alternative strategies for adaptation to snowmelt timing. These strategies potentially apply to other species and tundra ecosystems and provide a framework, enabling one to compare and generalise phenological responses to snowmelt timing under different future climate scenarios.

