Background: Seed germination strategies depend on a number of factors such as climatic variables, habitat, life cycle, phylogenetic affiliation and morphological seed traits.

Aims: We present a novel evaluation of the ecological correlates of germination strategies focussing on plant populations drawn from a single genus and considering a number of relevant explanatory variables.

Methods: Temperature and light-controlled germination experiments were carried out on 21 seed accessions belonging to 13 closely related species of the genus *Silene* L. Accessions were selected to tightly control the phylogenetic effect and give broad ecological and geographic coverage of the genus in Europe, with three North American and Macaronesian outgroups from climatically extreme environments. We used principal component analysis and correlation analyses to identify the correlation structure of germination traits and include multiple explanatory variables.

Results: Three germination strategies were shown to be related to climatic control. (1) Seeds from arid regions with hot, dry summers germinated optimally at cool temperatures associated with the rainfall period under field conditions, whereas (2) the benefit of cold stratification was more marked in provenances characterised by cold, dry winters, and (3) seeds from mild climates preferred warm temperatures for germination. Moreover, (4) biennial populations of disturbed habitats showed synchronised and rapid seed germination over a wide thermal window. In agreement with previous findings, (5) habitat-related syndromes were observed only for wetland populations. Correlations with seed mass were significant when related to summer precipitation, but weak or absent in relation to germination traits, indicating that, though influenced by the local climate, seed mass is a poor predictor of germination strategies.

Conclusions: These results suggest that whilst habitat and life cycle might shape germination patterns to a certain extent, long-term climatic differences play a substantial role in selecting specific germination traits and strategies.

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