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# Variation in competitive ability with mating system, ploidy and range expansion in four *Capsella* species

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## Abstract

Self-fertilization is often associated with ecological traits corresponding to the ruderal strategy in Grime's Competitive-Stress-tolerant-Ruderal (CSR) classification of ecological strategies. Consequently, selfers are expected to be less competitive than outcrossers, either because of a colonization/competition trade-off or because of the deleterious genetic effects of selfing. Range expansion could reduce further competitive ability while polyploidy could mitigate the effects of selfing. Although suggested by meta-analyses, these predictions have not been directly tested yet. We compared the competitive ability of four *Capsella* species differing by their mating system and ploidy level. For vegetative traits we found no difference in competitive ability neither among species nor among populations. For flower production, we found that the two diploid selfing species (*C. rubella* and *C. orientalis*) were more sensitive to competition than the diploid outcrosser (*C. grandiflora*), and that the tetraploid selfer (*C. bursa-pastoris*) was intermediate. Within *C. bursa-pastoris*, we also found that sensitivity to competition increased in parallel to range expansion. A complementary analysis in the tetraploid *C. bursa-pastoris* suggests that reduced fitness along the expansion front could be due to the accumulation of deleterious mutations and/or to a trade-off with flowering time allowing to avoid competition. These results highlight the possible roles of ecological context and ploidy in the evolutionary trajectories of selfing species.

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