Bet-hedging and seed vigour in Vaccaria hispanica is affected by maternal environment

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Abstract
Offspring performance is affected by mother plants via genes and maternal environment. Seed characteristics such and dormancy and vigour are affected by the environmental resources during plant development. Intra and inter-variation in seed dormancy and longevity are considered as a bet-hedging strategy to reduce the recruitment failure across years under environmental uncertainty. In this study, the effects of drought and herbivory, two common environmental stresses, were investigated on biomass and seed quality in *Vaccaria hispanica* (Mill.) Rauschert, an annual forb. Plants were subjected to different levels of water and simulated herbivory stress. Maternal water stress suppressed seed mass, but it stimulated dormancy in seeds. Progenies from the maternal stress environment were more persistent than those from the maternal control environment after being exposed to ٤٥°C and ١٠٠٪ relative humidity for ٨ days. The findings highlighted the importance of the water maternal effect versus herbivory on seed dormancy and longevity in this species. The results may help us understanding the life cycle and population dynamics of *V. hispanica* in successive years.

Key words: *Vaccaria hispanica*, vigour, dormancy, maternal effect, water stress, simulated herbivory