Inbreeding and outbreeding depression in *Stylidium hispidum*: implications for mixing seed sources for ecological restoration

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Biography:
Siegy Krauss is a Senior Research Scientist at Kings Park in Perth, Western Australia, where he leads the conservation genetics program. Here, genetics tools and thinking are underpinning practical outcomes in plant conservation and ecological restoration.

The benefits of composite rather than local seed provenances for ecological restoration have recently been argued, largely on the basis of maximising evolutionary potential. However, these arguments have downplayed the potentially negative consequences of outbreeding depression once mixed provenances interbreed. In this study, we compared intraspecific F1 hybrid performance for four populations of Stylidium hispidum, a species endemic to south Western Australia. To test for outbreeding depression, we conducted controlled pollinations and assessed germination and survival to 6 months for three cross categories (within population crosses, short- and long-distance F1 hybrids) for paired sites (3-10km apart) distributed within two genetically and climatically differentiated regions (120km apart). Fully reciprocal transplant trials with F1 progeny were established in 2011 within initial source populations to further assess outbreeding depression through survival, growth, flowering and ultimately life-time reproductive success through fruit and seed production for all plants for each of 5 years. For germination and survival, we found strong evidence for outbreeding depression in long-distance crosses, and inbreeding depression for within population crosses, relative to short distance crosses. For in situ survival and growth, we found evidence for a long-distance cross advantage over both short-distance and within-population crosses. Final fruit and seed production results will be presented. Cumulative results that identify an intermediate outcrossing distance (here, equivalent to 10km) in this species are considered in light of the evolutionary consequences of mixing seed sources for biodiversity restoration.

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