Effects of pollinators and seed predators on female and hermaphrodite sex morphs and demography of the gynodioecious plant, *Polemonium foliosissimum*

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In gynodioecious plant species, in which there are female and hermaphrodite sex morphs, females require a fitness advantage over hermaphrodites to be maintained since they do not sire seeds. In the past decade, the importance of ecological context, and species interactions, especially of mutualism and antagonism, in providing the requisite advantage to maintain females has come into the limelight. Despite this, few studies have assessed the lifetime fitness consequences of interactions with mutualists and antagonists using demographic modeling. I am conducting experimental field manipulations to assess the effects of bee pollinators, fly seed predators on the Rocky Mountain plant, *Polemonium foliosissimum*, and using demographic modeling to project the long-term consequences for sex morph fitness.

In *Polemonium*, females set significantly more seed (mean for females = 851, hermaphrodites = 672; $t = 2.399$, $df = 385$, $p = 0.017$) and experience lower fruit predation rates ($t = -4.096$, $df = 368$, $p < 0.001$). In 2011, I conducted an experiment to test the importance of pollen limitation and fly predation to sex morph seed set. I conducted a fully factorial application of hand pollination (open pollination vs. pollen addition) and seed predator egg removal (ambient numbers of eggs vs. eggs removed) treatment. Although hand pollination and egg removal both increased seed set, only egg removal had a statistical interaction with gender. Sex morphs respond differently to egg removal, and removing eggs reduced the female advantage in seed set.

By marking and tracking the size of plants over four years, I have found that females advance more quickly to a large reproductive size than hermaphrodites ($\alpha^2 = 19.49$, $df = 2$, $p < .001$). Demographic models show that lifetime fitness of this long-lived species is relatively insensitive to the seed set differences, and much more sensitive to the growth rate differences, between the sex morphs.