No evidence of pollen limitation in the long-lived perennial *Echinacea angustifolia*

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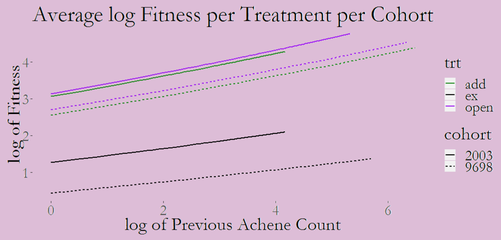
What is Pollen Limitation?

- If a plant is limited in the number of seeds it can make by the amount of pollen it receives, it is pollen limited
- Pollen limitation leads to lower fitness in annual plants, but what about perennials? Does year-to-year variation mitigate the effects of pollen limitation on fitness?

Methods

1. We assigned three groups of *E. angustifolia* (purple coneflower) to either receive no pollen, receive supplemental pollen, or remain untouched for 7 years (2012 – 2018, N = 95)
2. We then used X-rays to determine how many seeds were produced per head.
3. We quantified fitness by using the Aster function in the Aster package in R

Results



The difference between the plants that recived pollen and the control group were negligible, though it did matter how old the plants were (ASTER analysis, N = 95, p = <0.01)

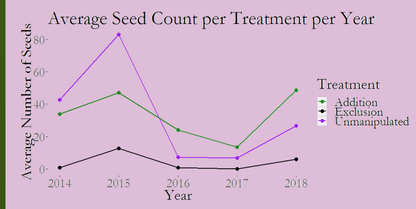
Discussion

- In this population of *E. angustifolia* of about 4200 plants, pollen does not limit fitness.
- These plants could either be limited in resources, or have evolutionary controls against over-producing seeds

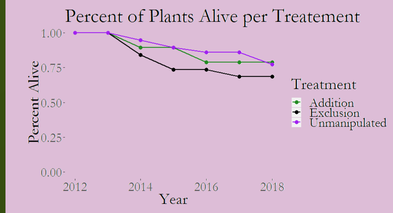
If you give **purple coneflower** supplemental pollen, **it won't make more seeds.**

Over the course of 7 years, repeatedly hand-pollinated plants produce no more seeds than unmanipulated plants

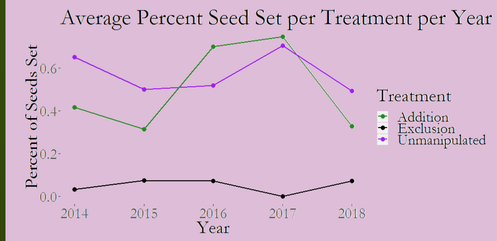
Learn more on the about this project on the Echinacea Project webpage

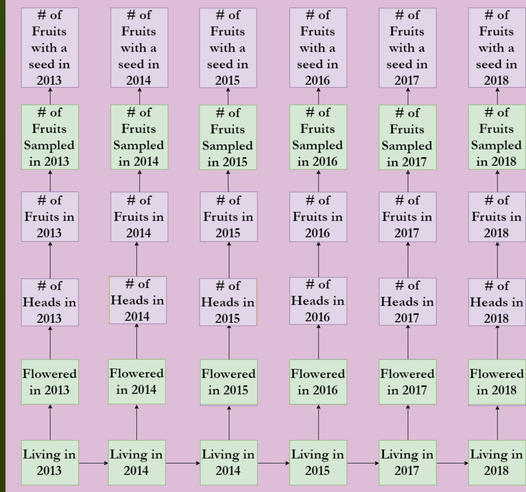


The estimated number of seeds created per plant in each treatment. Again, it tells an unclear story between the addition and unmanipulated groups



The mortality per treatments of plants in the experiment.





The structure of the Aster analysis conducted for this experiment. Green boxes denote binomial distribution. Purple boxes denote Poisson distributions.

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