POLLINATORS' TEMPORAL DECREASE IN FLORAL FIDELITY A POTENTIAL MECHANISM FOR EARLY FLOWER SELECTION

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Background

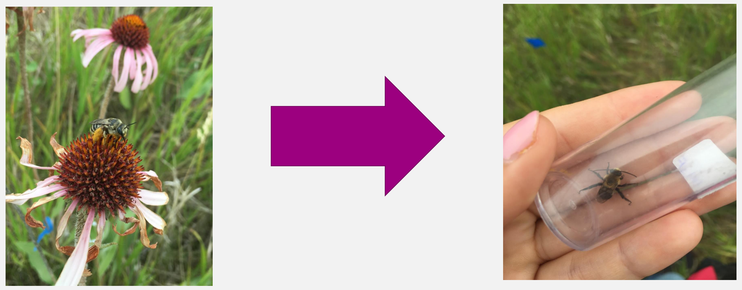
- Prairies are the most endangered ecosystem in North America, *Echinacea angustifolia* is a model study species for predicting prairie survival
- *Echinacea* is pollen limited but not pollinator limited
- Generalist pollinators visit other plant species and may lose or contaminate *Echinacea* pollen along the way

Research Question

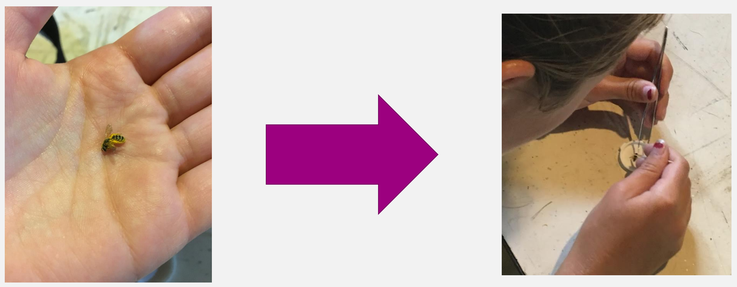
- How does the composition of pollen loads brought to *Echinacea* by generalist pollinators change over time?

Methods

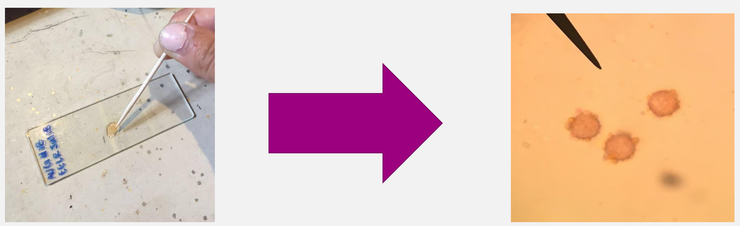
1. Catch pollinators that land on *Echinacea* during early, peak & late flowering at 3 sites, record taxa.



2. Cool and wipe pollen from body and scopa



3. Mount pollen on slide and count pollen grains



Results

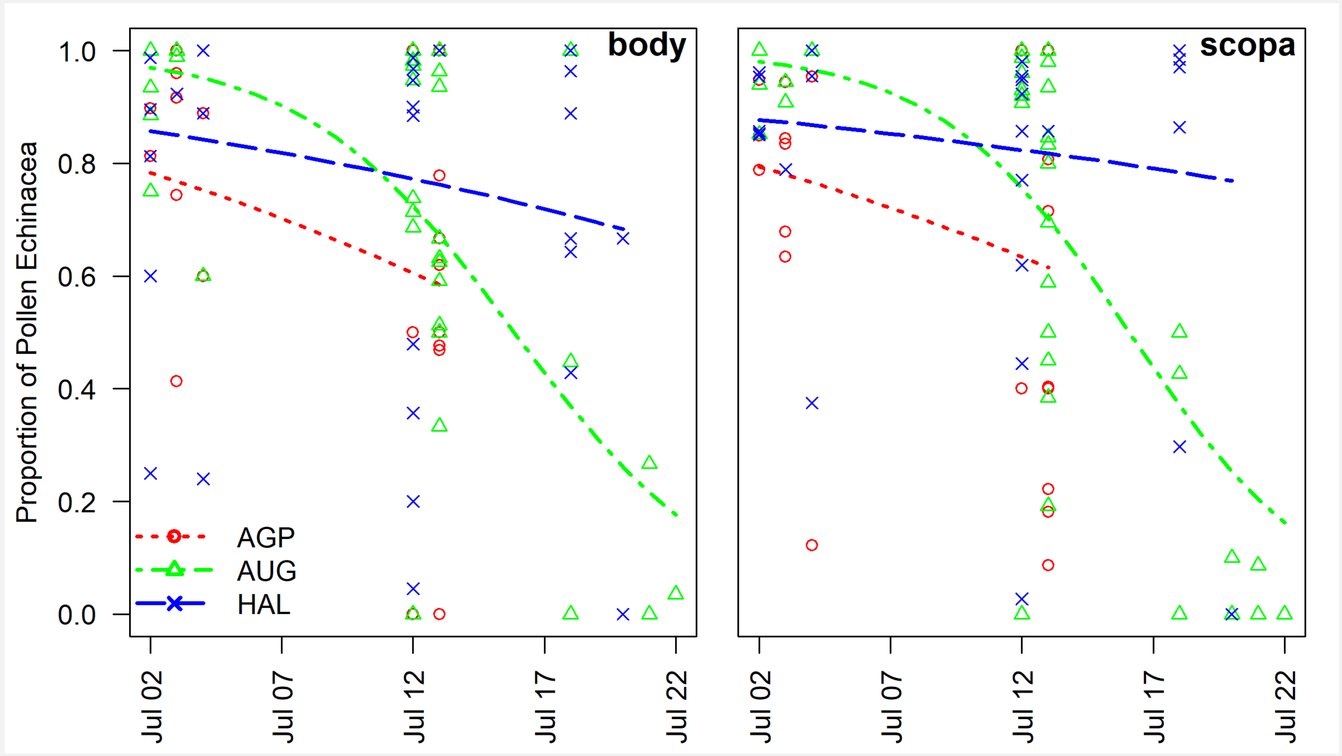


Figure 1. Proportion of *Echinacea* pollen grains carried on the body and scopa of three major taxa, within all sites, over time. (AGP n= 21, AUG n=39, HAL n=27). Points represent individual pollen loads. Taxa*Time was a significant predictor of proportion *Echinacea* pollen. All taxa carried proportionally less Echinacea pollen over time, the extent of this decrease was pollinator taxa specific.

Discussion

- Over 280 studies have shown that early flowering time is strongly and consistently correlated with increased seed set (Reviewed by Munguía-Rosas et al. 2011).
- My study provides a potential mechanism by which early flowering plants have increased seed set
- Bees may experience negative feedback as the season progresses and plants finish flowering
- Temporal decline in floral constancy can potentially explain why late flowering plants have a lower seed set than earlier flowering plants.

Sources & Citation

Echinaceaproject.org

Munguía-Rosas MA, Ollerton J, Parra-Tabla V, De-Nova JA. 2011. Meta-analysis of phenotypic selection on flowering phenology suggests that early flowering plants are favoured: Phenotypic selection on flowering phenology. Ecol. Lett. 14(5):511–21

Ison, Jennifer L., and Stuart Wagenius. "Both Flowering Time and Distance to Conspecific Plants Affect Reproduction in Echinacea Angustifolia, a Common Prairie Perennial." *Journal of Ecology* 102.4 (2014): 920–929. *Wiley Online Library*. Web..

Wagenius, Stuart, and Stephanie Pimm Lyon. "Reproduction of Echinacea Angustifolia in Fragmented Prairie Is Pollen-Limited But Not Pollinator-Limited." *Ecology* 91.3 (2010): 733–742. Print.

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