Invasive Potential of *Echinacea pallida* in Western Minnesota

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the echinacea project — investigating ecology and evolution in fragmented prairie habitat since 1995

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Introduction

- Tallgrass prairie has decreased to less than 1% of its original extent.
- In 2007, restorations were planted with the non-native *Echinacea pallida*, rather than the native *Echinacea angustifolia*.
- Flowering *E. pallida* appear to grow faster & larger than the native *E. angustifolia.*
- *E. angustifolia* are self-incompatible, but are able to hybridize with the non-native species.
- It is unknown if the hybrids could invade nearby native prairie or how they may interact with native species
- The hybrids pose a threat of eliminating the *E. angustifolia* by genetic swamping.

Hypothesis

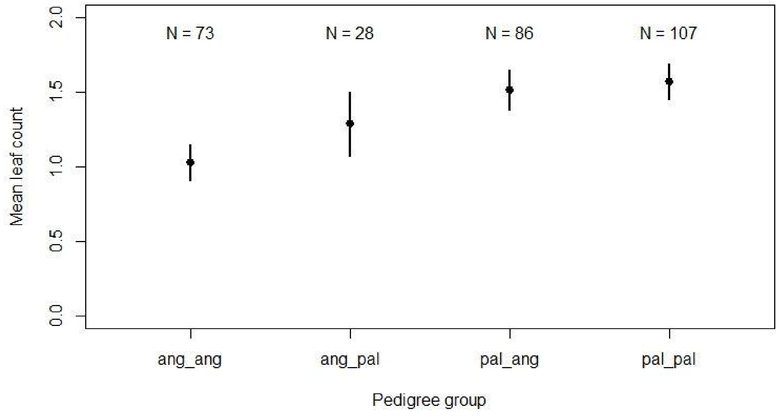
Hybrids & non-hybrids differ in survival, leaf count, & longest leaf measurements.

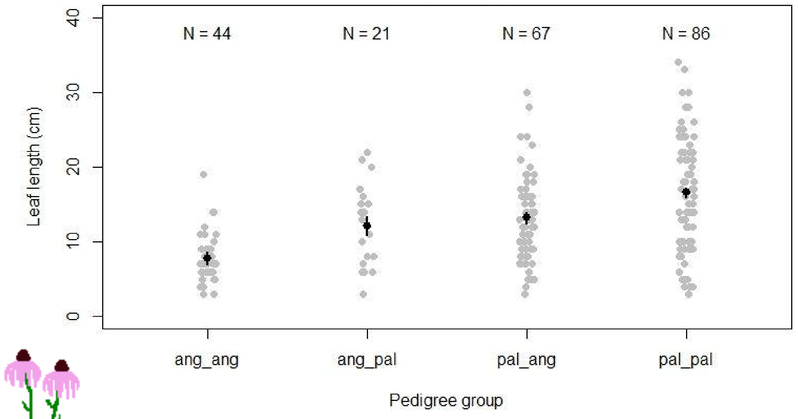


Results

Hybrids Display Intermediate Results in Survival, Leaf Count, and Longest Leaf Length Measurements

Maternal	Paternal	abbrev.	Survival Rate
angustifolia	*angustifolia*	ang_ang	60.3%
angustifolia	*pallida*	ang_pal	75.0%
pallida	*angustifolia*	pal_ang	77.9%
pallida	*pallida*	pal_pal	80.4%





Linear model, N=294, p-value < 0.0001
Generalized linear model, N = 294, p-value = 0.01

Methods

Hybrids & non-hybrids planted in 2013 were randomly assigned positions in a 10x30 meter plot.

1. Locate each plant, marking each location with a pin flag
2. Count the leaves of each surviving plant & measure the length of each leaf (cm)
3. Identify each plant's pedigree

Conclusion

- The survival, leaf count, & longest leaf measurements for both hybrid crosses & the non-native are greater than the native species.
- Plant locations within the plot were randomized, so the differences are due to seed pedigree.
- The hybrids may invade native prairie based off the higher survival rates.
- If the hybrids and the non-native species continue to persist, nearby *E. angustifolia* populations may be at risk of genetic swamping which could lead to local extinction in Western Minnesota.

Acknowledgments

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