Statistical analysis of allelopathy bioassay using python

Final Project Idea

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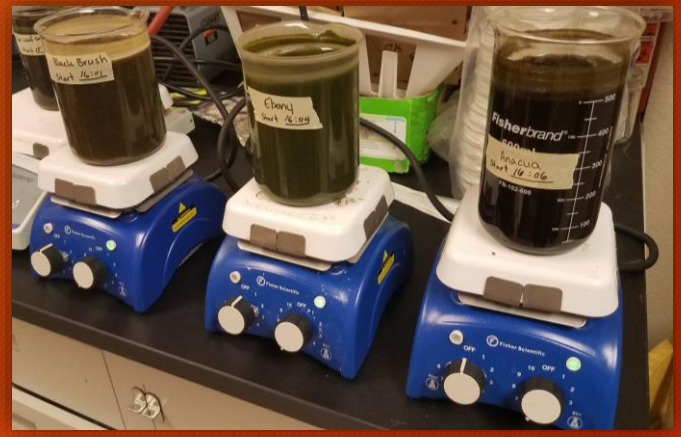
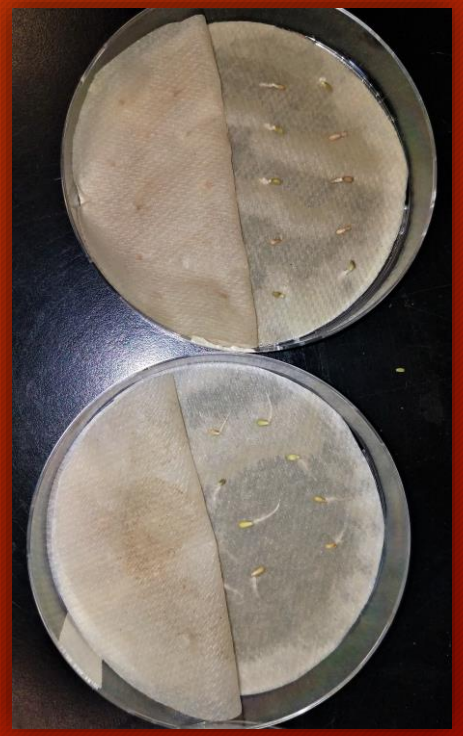
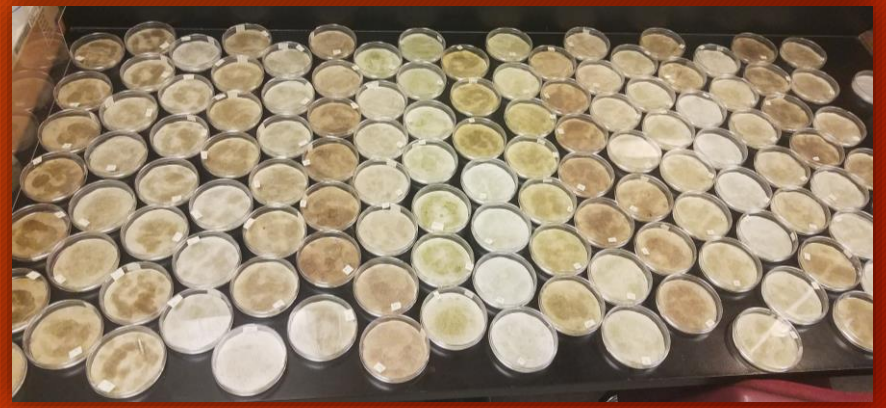
Background

Allelopathy is the chemical inhibition of one plant by another

- Less than 5% of the thorn forest biome is still intact
- Restoration efforts are hindered by the presence of invasive grasses
- Native plant allelopathy may be a useful tool against invasive grasses
- My hypothesis is that some native species are allelopathic







What I want to know

- Which plants inhibit germination and early growth
- Do germination metrics such as: Seed Germination Index, Germinability, Synchronization Index, and Seedling Elongation differ significantly from one treatment to another.
- To analyze this I need to find the appropriate statistical test for each metric

Statistical tests

ANOVA

Assumptions

- Independent observations
- Normality
- Homogeneity of variance between groups

PERMANOVA

Assumptions

- Nonparometric
- Equal multivariate spread

ANCOVA

Assumptions

- Same as ANOVA
- Homogeneity of regression slopes
- Relationship between dependent variable and covariate is linear
- Covariate is independent of the treatment effects

Figures to make

Test for normality

- Histogram of reisduals
- Q-Q plot
- Shapiro-Wilk test