Revealing Microbial Allies: Decoding the Composition of Microbial Communities in an Invasive Plant under the Influence of Climate Change

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Background

- The American Southwest is projected to become increasingly arid and hot throughout the end of the century. We are interested in how an invasive plant (*Strigosella africana* – The African mustard*)* and its microbiota will respond to these climatic changes.
- Hypothesis: Plants that withstand the simulated climate change trials are expected to exhibit a bacterial community structure similar to that of other surviving plants, yet distinguishable from the naturally occurring microbiota.

Methods

- Plants were collected in Capitol Reef National Park (southern Utah) & Manning Canyon (North-Central Utah)
- Droughts and heat waves were used to simulate climate stressors in growth chambers.
- 16S amplicon sequencing was used to process root, shoot, and soil samples

Types of analyses performed to characterize the bacterial community

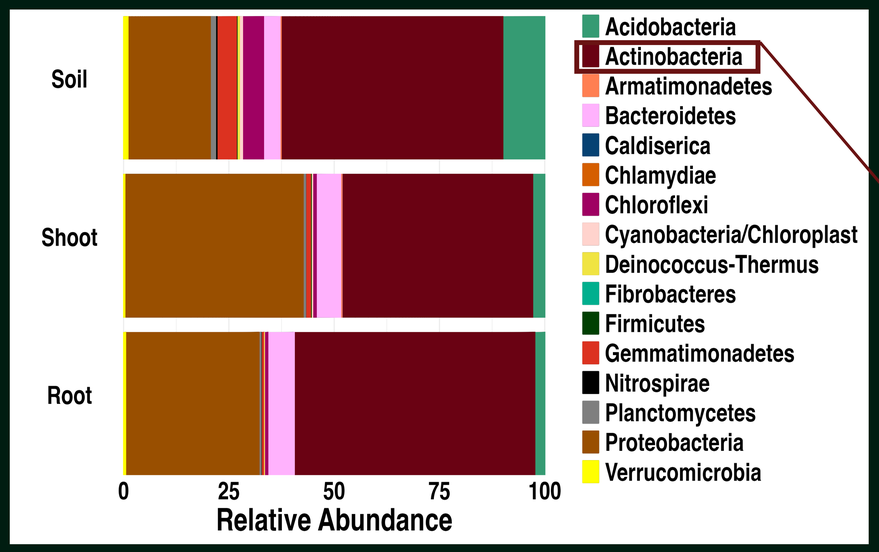

Fig 1. Relative abundance was performed at the phylum level for each sample type.

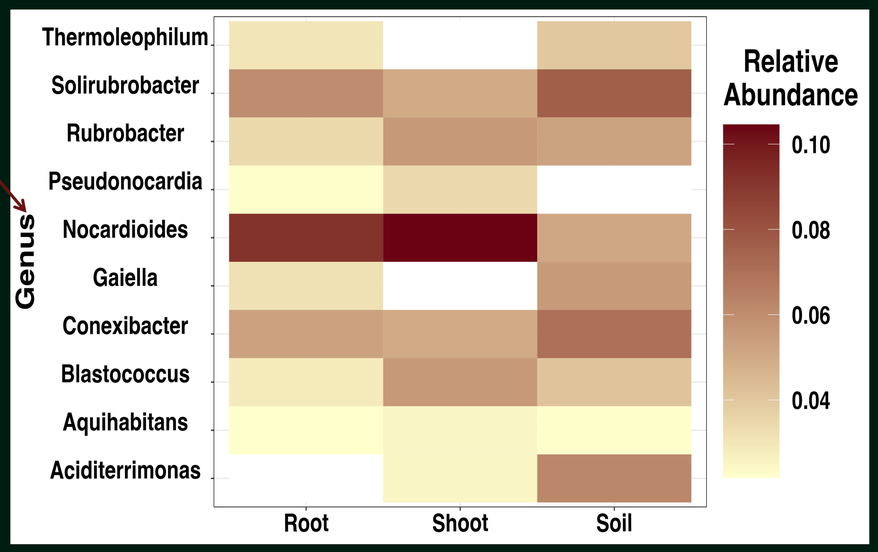

Fig 2. In-depth analyses at the genera level were performed for highly abundant phyla.

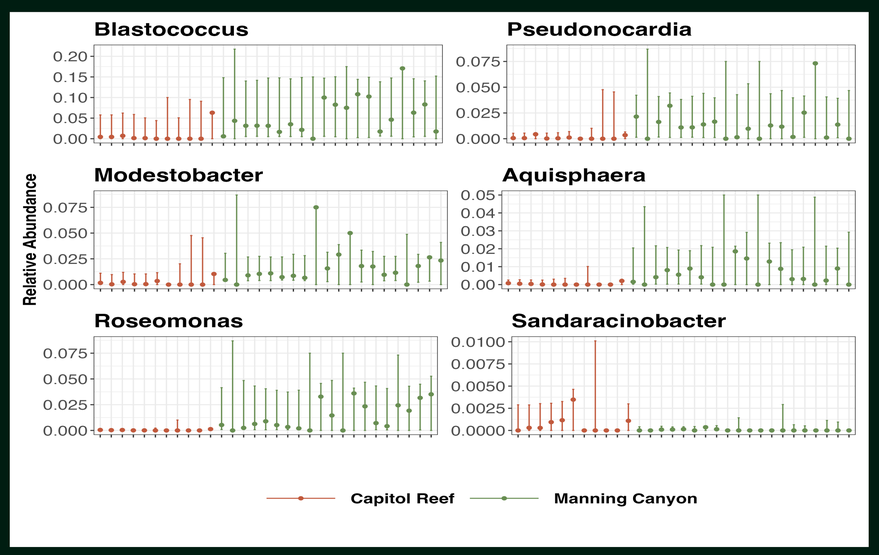

Fig 3. Six genera with significantly differential abundance between the two sampling sites.

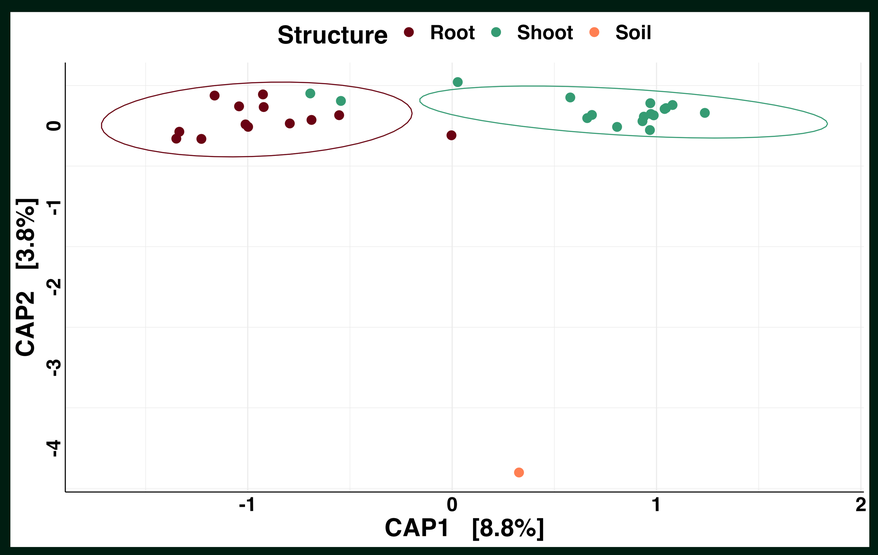

Fig 4. Partial Constrained Analysis of Principal Coordinates (CAP) using Bray-Curtis distance.

Fig 5. Photo of *Strigosella africana*

Fig 6. Plants in the growth chamber trials

Results

- Actinobacteria and proteobacteria were the two most abundant phyla comprising 37% and 27% of all the samples, respectively.
- Comparisons are planned to be completed by the end of the next academic year.