

Effects of sea level rise on the root chemistry of *Chamaecrista lineata* var. *Keyensis*



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INTRODUCTION

As the temperatures reach historic highs, associated risks are becoming more apparent. Many native plant species are bound to be affected by the increased fluxes in salinity due to frequent coastal flooding and sea level rise. The presence of salt can prevent water absorption and nutrient uptake, affecting their growth, reproduction, and defense. In this study we investigate how different salinity levels could affect plant functioning of the endemic and endangered plant *Chamaecrista lineata* var. *Keyensis* via changes in their root secondary chemistry.



Chamaecrista lineata var. *Keyensis*

METHODS

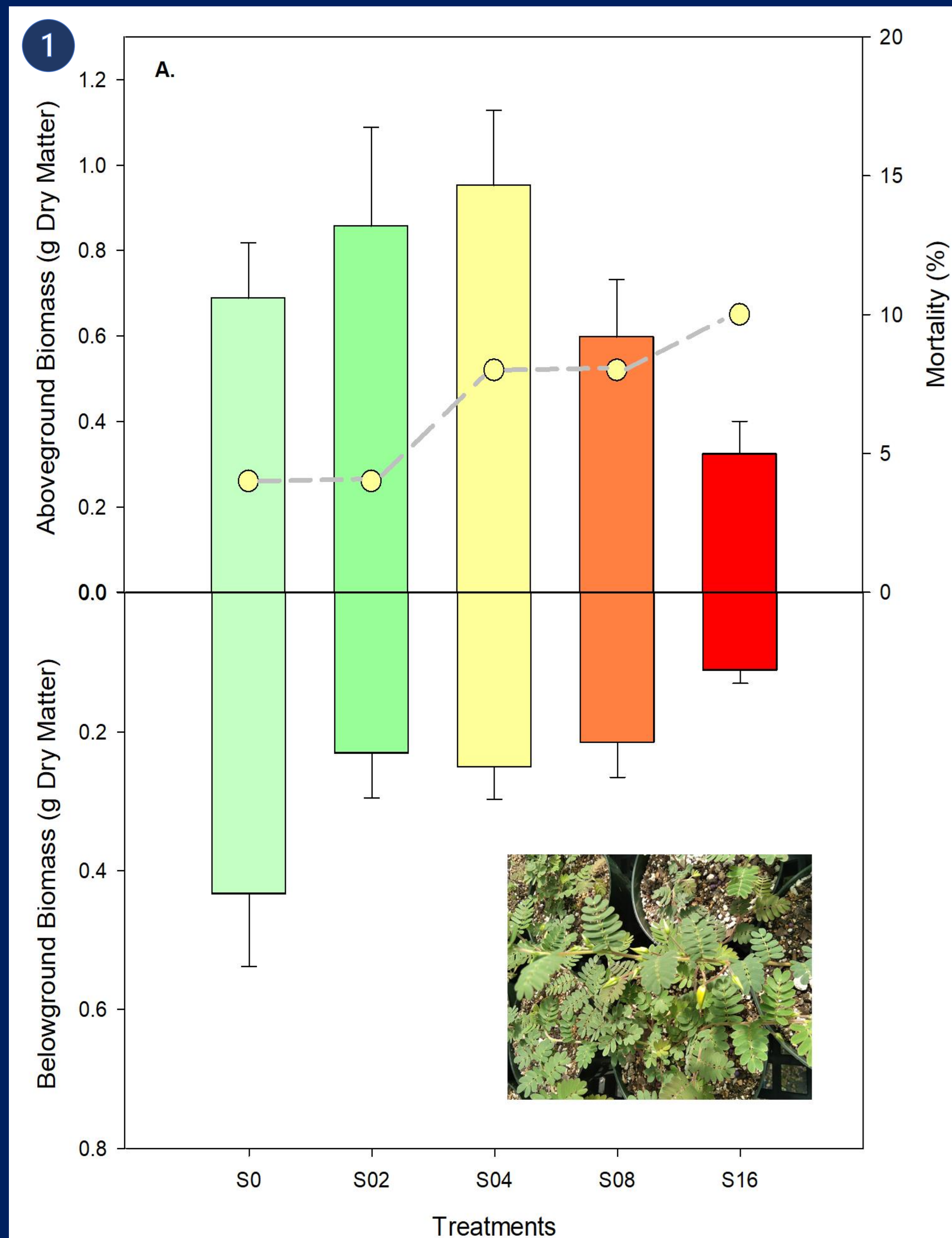
250 germinated seed plants of *Chamaecrista lineata* var. *Keyensis*

5 large flooding trays with 5 different salinity levels

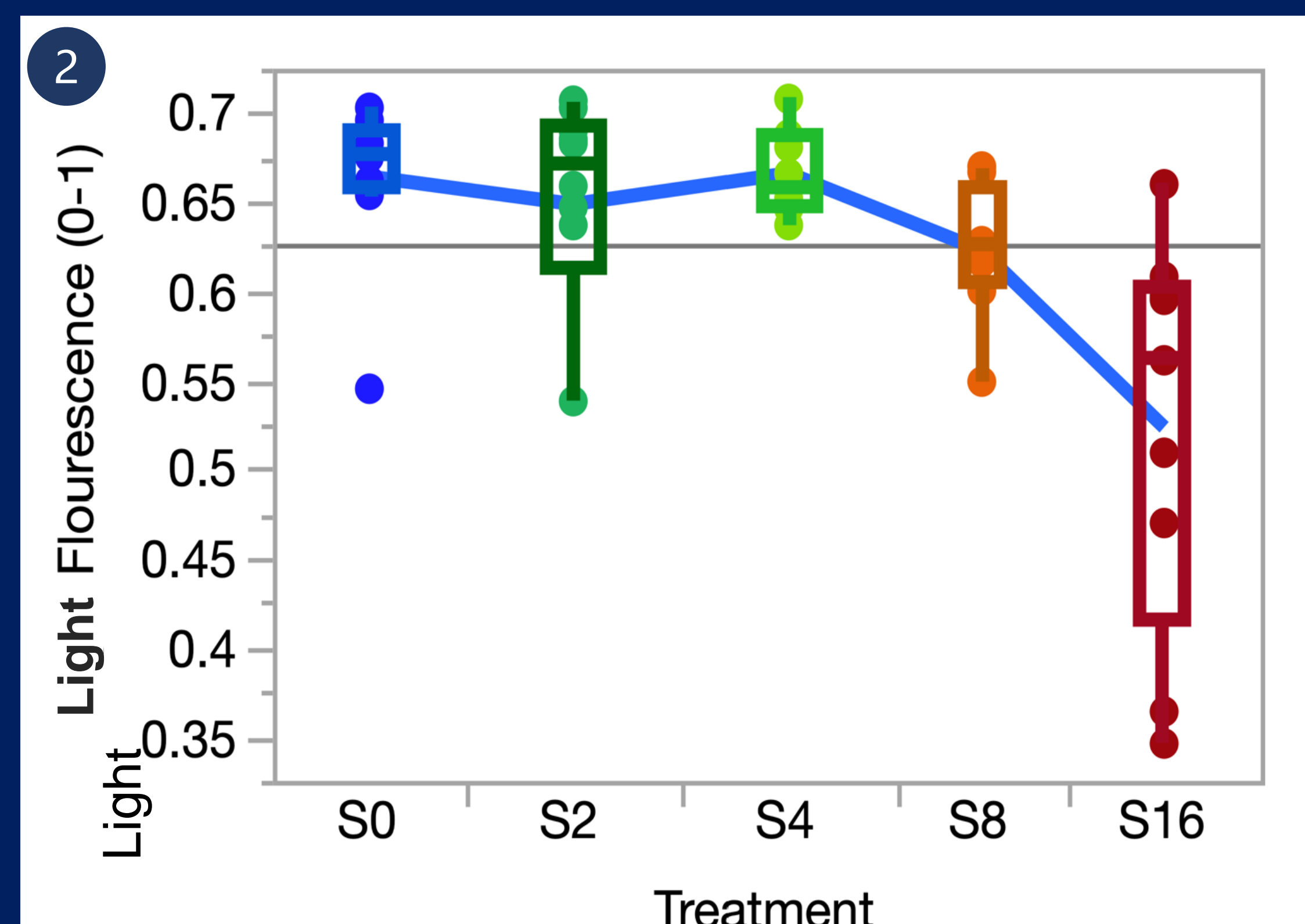
- 0, 2, 4, 8, and 16 parts per thousand of salt

Random samples taken every week in all treatments to analyze:

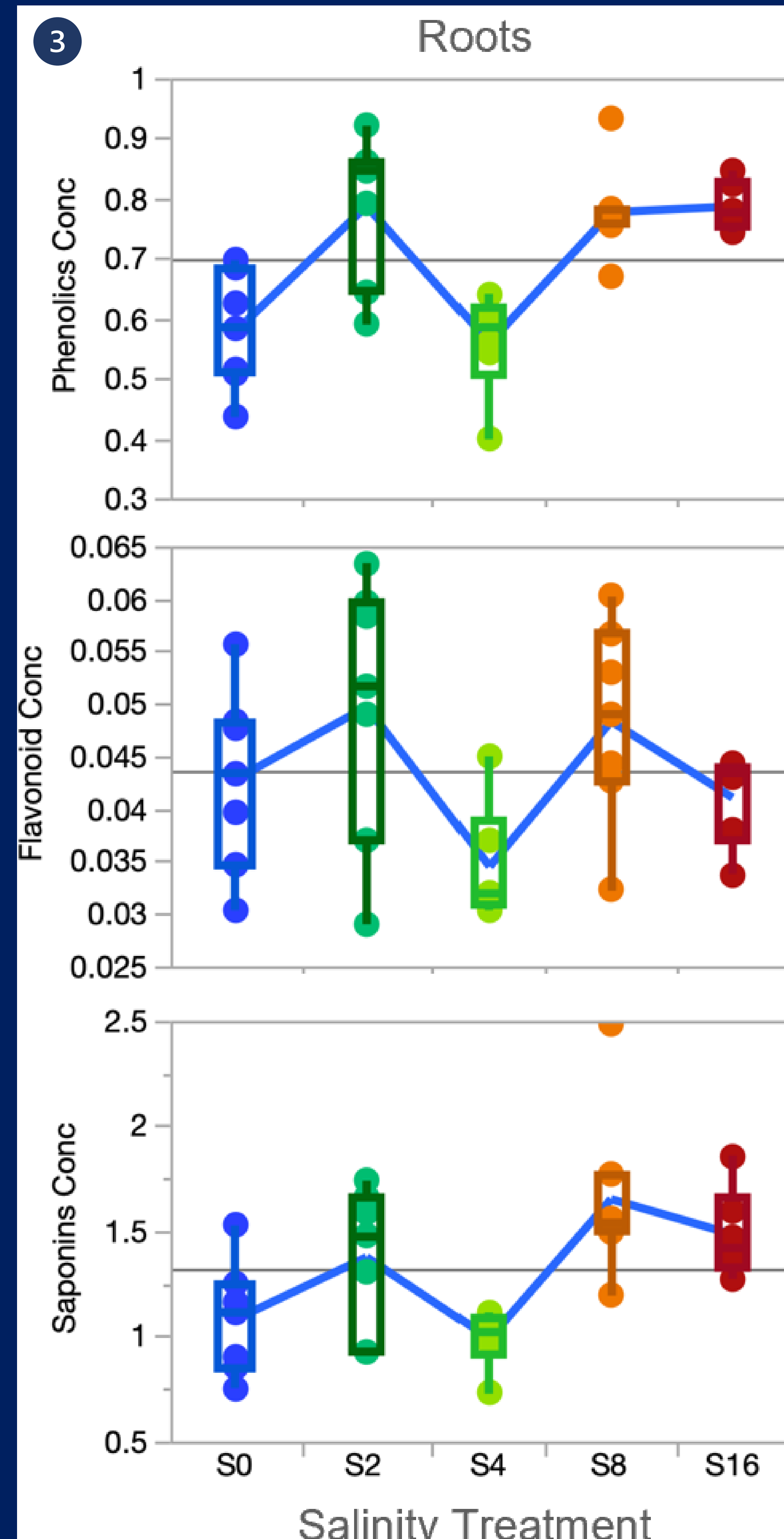
- above and below ground biomass
- Light fluorescence
- Root chemistry
 - phenolics
 - flavonoids
 - saponins



Effect of salinity on biomass



Effect of salinity on light fluorescence



Effect of salinity on presence of secondary compounds in roots

RESULTS

- ❖ 1. Plants in the 0 and 2 ppt treatment outperform all other treatments.
- ❖ 2. Plants in the 16 ppt treatment showed the highest effect on the plants' photosynthetic system.
- ❖ 3. Root secondary metabolites showed an unexpected pattern of variation. As expected, the highest concentration of defense chemical was found in low salinity treatments. Surprisingly, S4 treatment showed the lowest levels of defense chemistry. Secondary metabolite concentration rise again in the higher salinity treatments.

CONCLUSION

Long-term success and persistence is likely to be affected by increasing sea-level rise and hurricane surge.

Salinity-induced mortality is not the primary threat that this species faces.

The negative impact of climatic change on this plant species is likely linked to reproductive depression at the population level.

Sea-level rise is likely to negatively affect local pollinator networks and other associated species.



Chamaecrista lineata var. *Keyensis*

Contributors

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