The Effect of Salinity Levels on *Arabidopsis thaliana* Growth and Survival

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BACKGROUND INFORMATION

- This experiment is conducted to exemplify how plants; specifically the *Arabidopsis thaliana* are to apt to survive in a human contaminated environment
- High soluble salt levels in the soil can cause plant drought stress.
- These chemicals contaminate the soil producing a high concentrate salt level making it hard for plants to survive.
- The percent survival and shoot height can show the changes and differences between all types of *Arabidopsis thaliana*

PURPOSE AND HYPOTHESIS

- This experiment is testing how different salt concentrations affect the percent survival and shoot height of *Arabidopsis thaliana*.
- Our predictions are that none of the plants will survive high concentrate salt level.
- The *Landsberg erecta* and the *Colombia* will germinate but not last long, but the mutant will not germinate at all.
- Lastly, all three plants will germinate and thrive in the no salt concentrate level.

PROCEDURE

1. Cold treat the seeds to begin germination.
2. Water seeds with normal water to start growth
3. Once the seeds have germinated, begin to water each environment with the correct water (high salt, low salt, control)
4. Observe and record height and survival rates

Salt mixtures
Grams of salt formula
Mass (g) = Concentration (mM) * Volume (mL) * Formula Weight (g/mol)

THANK YOU

Special thanks our scientist, Julie Ann Herman, who helped contribute to our experiment.

RESULTS

Calculated
- Averages of shoot height (per day)
- Percent survival rate (per day)
- ANOVA test

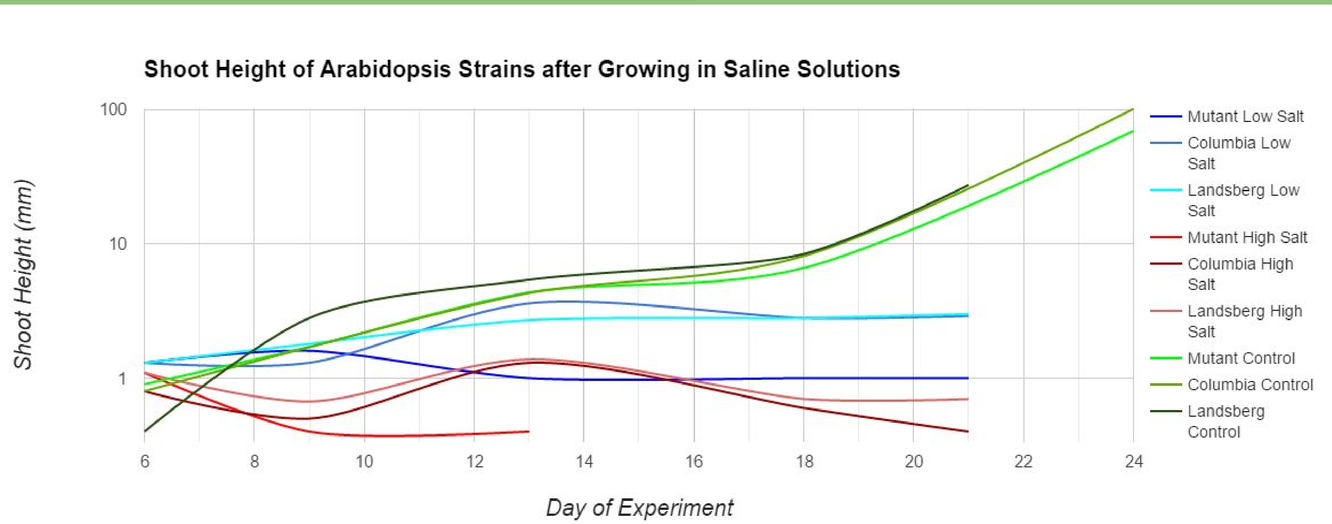
Control (No Salt Added)
- Large average heights
- 100% or more survival rate

Low Salt
- Decrease in average heights
- Decrease in survival rate

High Salt
- Large decrease in average height and survival rates
- Mutant died out

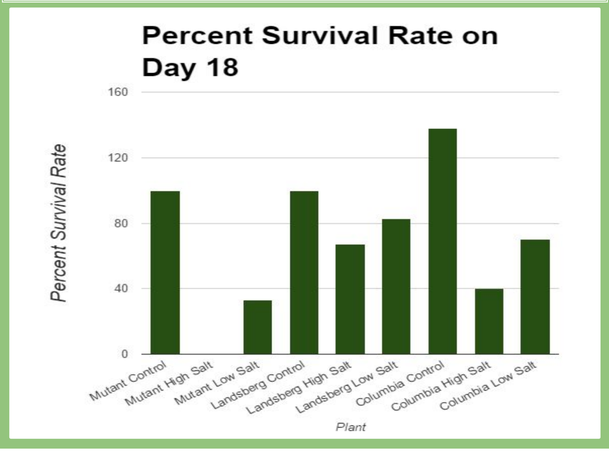
Overall
- Mutant survived the worst and Landsberg survived the best

P-Value Percentage
Columbia: -1.5E-5%
Landsberg: -7.4E-10%
Mutant: -2.3E-3%



CONCLUSIONS

- The data supports our original hypothesis.
  - 300 millimolar: No growth
  - 150 millimolar: Mutant died, Wild Types could not grow
  - Control: All plants grew rapidly
- The salt sensitive gene is the reason for the differences
- There is statistical significant in the data, salt does affect the shoot height and survival rate of the plants
- Potential errors; human error for measuring, planting error, and not measuring the amount of water given



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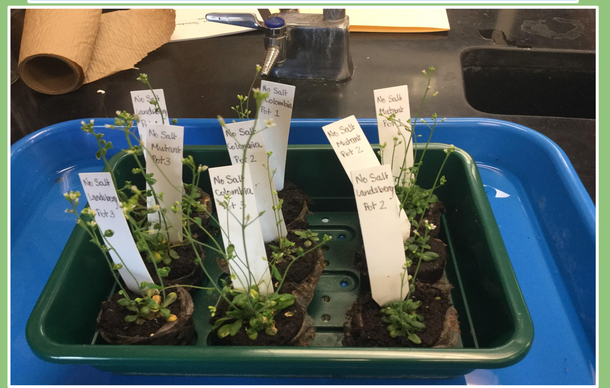
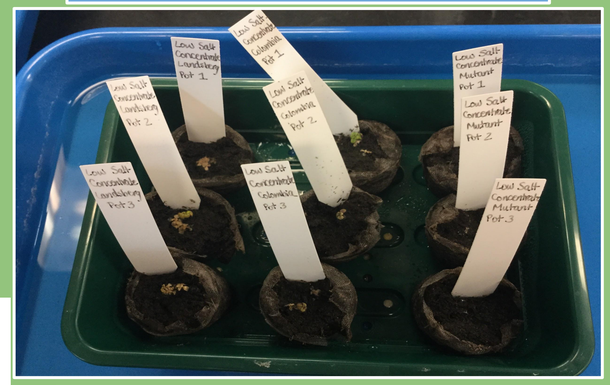
Control Experiment with No Salt Added



Low Salt Concentrate Experiment with 150 millimolar of Salt



High Salt Concentrate Experiment with 300 millimolar of Salt