Solving Plant Survival Challenges: A Study on Enhancing Plant Growth During Tough Conditions

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Introduction

- Plants face tough conditions such as drought and high salt levels.
- Due to climate change these conditions are becoming more common. Hence, contributing to a decline in agricultural productivity.
- A mustard plant is commonly used in science used to learn and understand how a plant can deal with these conditions with the help of a hormone called abscisic Acid (ABA).
- The aim of this study is to learn how the ABA treatment allows plants to continue growing when it is facing challenges.
- Our goal is to help farmers grow crops that can survive difficult environment conditions.

(ABRC, 2023)

Methods

In this study, we will grow regular mustard plants and those with an added gene called "DREB2A" to measure their stress response. Plants will be grown on a jelly-like substance called 'agar' and are exposed to conditions that mimic drought and high salt as they grow. Plants are then treated with a hormone called ABA before, during, and after these stressful situations to observe how it affects them. Physical characteristics such as germination rate and leaf counting are examined to measure plant growth and response to stress

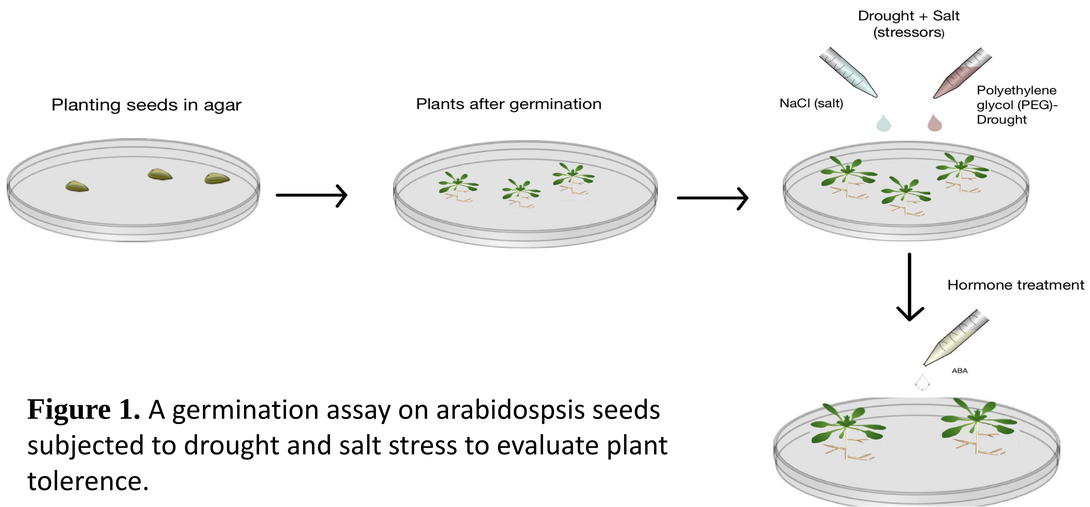
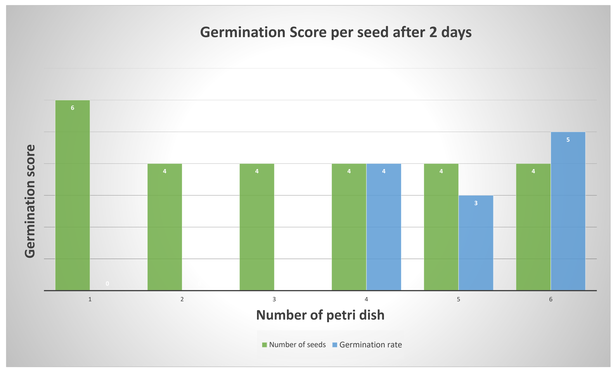


Figure 1. A germination assay on arabidospsis seeds subjected to drought and salt stress to evaluate plant tolerence.

Results



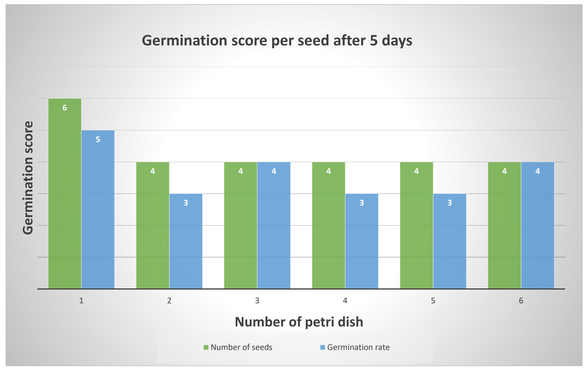


Figure 2. (A) A bar graph of the number of seeds that germinated after two days of being planted in MS agar and Sucrose. **(B)** A bar graph showing the progress of plant growth, five days after being planted in MS agar and Sucrose.

Figure 3. The different stages of plant growth on the seeds planted in MS agar and Sucrose.

Discussion

- Plants with an early ABA treatment are expected to handle stress better and grow more than those treated later.
- These results should aid in determining the ideal ABA timing and dosage to make Arabidopsis plants more resilient to stress, yet this may vary depending on the particular stress(Drought/salt) and whether the plants are regular or modified.
- This study offers valuable insights into the effects of ABA the molecular processes underlying stress responses in Arabidopsis plants, which may have significant implications for further investigations into plant biology and agriculture.

About Me

Khelia Gihozo, originally from Rwanda is a graduate student at Lynn University. Growing up in a community with strong ties to agriculture she is passionate about adressing climate change challenges in agriculture. Currently, conducting research to help plants grow better in a changing environment due to climate change. Her goal is to meet global food demand and fight climate change. Khelia aims to use her knowledge to improve Rwanda's agricultural system and promote women in science.

References

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