

SALT STRESS TOLERANCE IN ARABIDOPSIS THALIANA: A COMPARATIVE ANALYSIS OF WILD TYPE AND SALT- RESISTANT GENOTYPES

dohui.kim@concordiahanoi.org | Daisy Kim | Independent Science Research Class 2025/26

EXPERIMENT 1: DETERMINATION OF THE OPTIMAL SALT STRESS CONCENTRATION FOR EVALUATING SALT TOLERANCE

PURPOSE:

This experiment tests how increasing NaCl concentrations affect *Arabidopsis thaliana* seed germination, root growth and seedling biomass, using plate assays with 4 treatment levels + control.

EXPERIMENTAL DESIGN:

Treatments (NaCl in media):
0mM (control), 50mM, 100mM, 150mM, 200mM

RESULTS:



0mM (control)

50mM

100mM

150mM

200mM

The 50 mM concentration exhibited minimal to no observable impact on seed germination, indicating that it was insufficient to induce meaningful salt stress. In contrast, the 100 mM concentration produced a more pronounced yet non-lethal effect, making it the most appropriate and effective condition for use in the subsequent salt tolerance experiment. Additionally, the higher concentrations of 150 mM and 200 mM proved to be excessively severe, resulting in little to no seed germination and thus rendering them unsuitable for further analysis.

EXPERIMENT 2: COMPARISON OF SALT TOLERANCE AMONG SALT-TOLERANT SEED VARIETIES

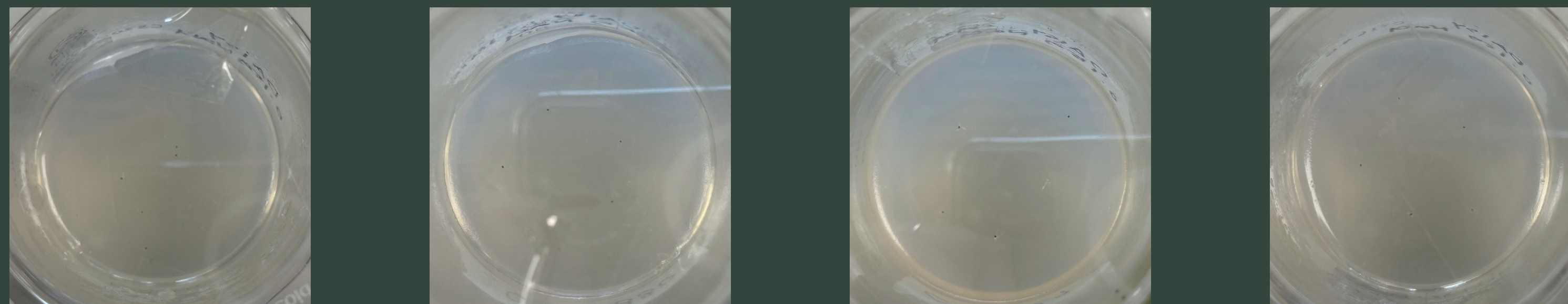
PURPOSE:

This experiment investigates the degree of salt tolerance among three salt-tolerant *Arabidopsis thaliana* genotypes—CS78880, CS929, and CS1640—by comparing their germination and growth responses under salt stress conditions relative to the wild-type control (CS20).

EXPERIMENTAL DESIGN:

- Four *Arabidopsis thaliana* genotypes: CS78880 (salt tolerant), CS929 (salt tolerant), CS1640 (salt tolerant), CS20 (control).
- 100mM salt treatment applied

RESULTS:



CS20

CS78880

CS929

CS1640

Although the camera did not capture the results clearly, CS1640 and CS929 showed moderate root growth under salt stress, indicating a degree of tolerance. In contrast, CS78880 exhibited little to no root sprouting, similar to CS20 wild-type control, suggesting limited tolerance to NaCl. Future research could investigate whether CS78880 is tolerant to other types of salts and determine the specific range of NaCl concentrations it can withstand. Further studies could also explore the physiological or molecular basis of its limited salt tolerance.