

Background: Salinity is a major abiotic stress factors in current worlds agriculture. It is quite chaotic situation in the fields, that dissolved salts in the irrigation waters are not controllable.

Aim: To investigate the salt tolerance in three widely used Arabidopsis accessions by comparing their photosynthetic performance

Hypothesis: A distinct response in relation to salt stress will be reflected in the photosynthetic performance of Plants

Accessions & conditions:
Arabidopsis thaliana
 cv Columbia-0 (USA),
 cv Landsberg erecta-0 (Germany),
 cv Wassileskija (Russia).

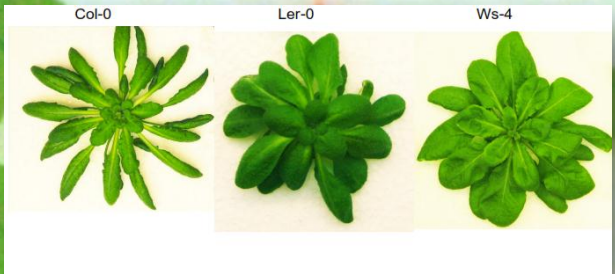


Fig 1 Three accessions under focus Sodium chloride (NaCl) used as stress agent for one week and plants are changed to Recovery system (no NaCl). NaCl Conc: 0 mM, 50 mM, 75 mM, 100 mM, 150 mM



Fig 2 Four weeks old plants



Fig 3 Plants on day 5 of stress at 150mM salt conc.

Results: The Arabidopsis accessions showed slow growth during stress condition. Healthy four weeks old plants subjected to stress (Fig 2) showed decreasing chlorophyll content under stress (Fig 4). Plants did not show tolerance at 150 mM NaCl (Fig 3). The photosynthetic efficiency of plants(0-100mM) did not decrease during one week of stress and recovery. Non photochemical quenching changed during recovery phase (Fig 5) implicating change in pH.

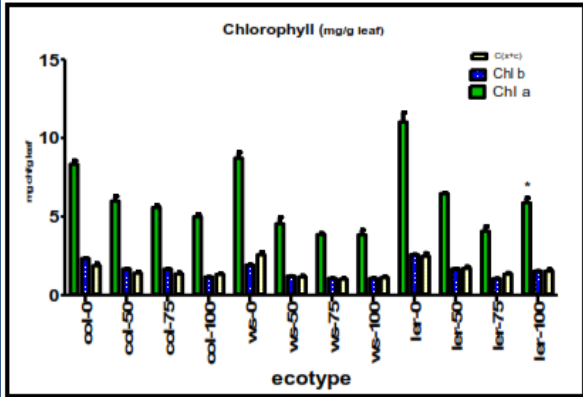


Fig 4 Chlorophyll content in 7-day salt treated plants.

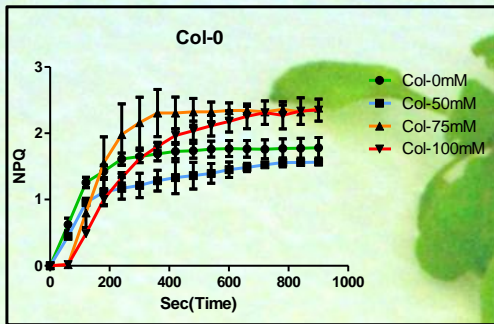


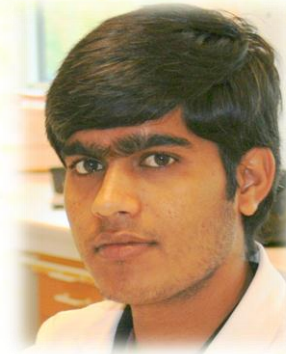
Fig 5 NPQ on day 7 of recovery phase in col-0

Conclusion:

- Current results suggest the salinity decreases both plant growth and photoprotective ability of photosynthetic apparatus in Arabidopsis.
- Col-0 ecotype tend to show higher salt tolerance comparative to Ws-4 and Ler-0.
- Hydroponic system used for the study supported the experiment to find out the salinity tolerance of the ecotypes(100mM).

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Impact of salinity on photosynthetic performance in Arabidopsis Ecotypes.

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