

JOINT EVENT

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Trehalose mediated oxidative stress tolerance in maize seedlings under salinity and low P stress**Md. Motiar Rohman, Md. Robyul Islam, Mahmuda B Monsur and Mohammed Amiruzzaman**
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Statement of the Problem: Over production of reactive oxygen species (ROS) under salinity and low P stress limits crop growth and production. Therefore, they must be removed for cellular survival. Trehalose (Tre), a disaccharide, is reported to have environmental stress tolerance role. Therefore, exogenous Tre might have an important role in the regulation of antioxidants (enzymatic and non-enzymatic) responsible for lessening oxidative damage. The objective of the study was to investigate the regulatory role of Tre on enzymatic antioxidants in maize seedlings under salinity and low P stress.

Methodology & Theoretical Orientation: Seven days old seedlings of two maize genotypes, BARI Hybrid Maize-7 (BHM-7) and BARI Hybrid Maize-9 (BHM-9), were imposed to 12 dSm⁻¹ salinity and low P (10 ppm) in the presence and absence of Tre (10 mM) for seven days. Growth parameters as well as reactive oxygen species (ROS), lipid peroxidation (as malondialdehyde, MDA), lipooxygenase (LOX) and enzymatic antioxidant activities were investigated in fully expanded leaves.

Findings: Tre increased the length and volume of roots as well as delayed the loss of chlorophyll. Both salinity and low P increased ROS, MDA and LOX activity enormously, and Tre lessened all of the contents. Although Tre failed to increase the activity of superoxide dismutase (SOD) under salinity stress, it maintained higher activity under low P and salinity +low P stress. Increased activities of catalase (CAT) and ascorbate peroxidase (APX) under both stresses indicated their importance in scavenging H₂O₂. In case of double stress, Tre restored the stress inhibited activities in both genotypes. Increased glutathione reductase (GR) and dehydroascorbate reductase (DHAR) activities by Tre under salinity and P stress signified their role in maintaining glutathione (GSH) and ascorbate (ASA) in maize.

Conclusion & Significance: Exogenous Tre maintained growth parameters and reduced oxidative damage. It is recommendation that Tre be applied to reduce oxidative stress in maize.

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