Glycine Betaine Affects Antioxidant Response and Lipid Peroxidation in Wheat Genotypes under Water-Deficit Conditions

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Abstract : Glycine betaine (N, N', N''- trimethyl glycine), (GB) as aqueous solution (100 mM) containing 0.1% TWEEN-20 (Ploythylene glycol sorbitan monolaurate) was sprayed on selected nineteen wheat genotypes at maximum tillering and anthesis stages. Water-deficit conditions resulted in lipid peroxidation. GB applications reduced lipid peroxidation in all wheat genotypes at both the stages. Catalase (CAT) activity was recorded more in control than under stressed conditions in selected wheat genotypes at both the stages; GB had no effect. The ascorbic acid content in leaves of selected genotypes increased under water deficit. A genotypic variability in Ascorbate peroxidase (APx) activity was recorded and GB treatment decreased it. Superoxide dismutase (SOD) activity was increased significantly under water-deficit at both stages in all genotypes. In present study, prolonged water-deficit conditions caused CAT deficiency/suppression which was compensated by APX and SOD; and GB exogenous application mitigated negative effect of water-deficit stress on lipid peroxidation.

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Keywords : glycine-betaine, lipid peroxidation, ROS, water deficit stress

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