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## PHARMACEUTICAL BIOTECHNOLOGY

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**Potassium and zinc increase tolerance to salt stress in wheat (*Triticum aestivum* L.)**Amin Ullah Jan<sup>1</sup> and Fazal Hadi<sup>2</sup><sup>1</sup>Shaheed Benazir Bhutto University, Pakistan<sup>2</sup>University of Malakand, Pakistan

Potassium and zinc are essential elements in plant growth and metabolism and plays a vital role in salt stress tolerance. To investigate the physiological mechanism of salt stress tolerance, a pot experiment was conducted. Potassium and zinc significantly minimize the oxidative stress and increase root, shoot and spike length in wheat varieties. Fresh and dry biomass was significantly increased by potassium followed by zinc as compared to control C. The photosynthetic pigment and osmolyte regulator (proline, total phenolic, and total carbohydrate) were significantly enhanced by potassium and zinc. Salt stress increase MDA content in wheat varieties while potassium and zinc counteract the adverse effect of salinity and significantly increased membrane stability index. Salt stress decrease the activities of antioxidant enzymes (superoxide dismutase, catalase and ascorbate peroxidase) while the exogenous application of potassium and zinc significantly enhanced the activities of this enzyme. Significant positive correlation was found of spike length with proline ( $R^2=0.966^{***}$ ), phenolic ( $R^2=0.741^*$ ) and chlorophyll ( $R^2=0.853^{**}$ ). The MDA content showed significant negative correlation ( $R^2=0.983^{***}$ ) with MSI. It is concluded that potassium and zinc reduced toxic effect of salinity while its combine application showed synergetic effect and significantly enhanced salt tolerance.

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