

## ABSTRACT

The current study was planned to determine the effect of exogenously applied strains in amelioration of harmful effects of salinity on Growth, yield, Ion contents and Physiological parameters of *Zea mays* L. cv. KS-85 in Botanic Garden, GCU Lahore. Bacterial isolates were obtained from salt affected soil of Kalar Kahar Pakistan. Bacterial isolates were screened at 100 to 100,000ppm and the effect of salt and salt/bacteria mixed treatment on *Zea mays* L was investigated. The effect of bacteria was observed at different levels of salinity (control, 4dSm<sup>-1</sup>, 8dSm<sup>-1</sup>, 12dSm<sup>-1</sup> and 16dSm<sup>-1</sup>). It was found that increasing salinity reduced the plant height, number of leaves, root and shoot length and fresh and dry weight of root and shoot. Application of bacteria increased all the parameters including height (44%), number of leaves (50%), root length (46.6%), shoot length (50%), fresh weight of root (97.89%) and fresh weight of shoot (59.25%) at 16dSm<sup>-1</sup>, whereas, plant's root dry weight and shoot dry weight were also increased (53.5%) and (80.9%) at 16dSm<sup>-1</sup> by application of bacteria. Plants with applied bacteria showed much better growth and productivity in comparison to those plants which were not treated with bacteria. PGPR plays significant role in the regulation of plant growth, chlorophyll contents and nutrient uptake by plants. The effect of salinity was reduced because these bacteria produced indole acetic acid, gibberellins and other growth regulators which are beneficial and undergo the development of root length, root surface area and number of root tips which results in greater uptake of nutrients as well as vegetative growth and biomass thereby improves plant health under stress conditions. Inoculation of bacteria also increased the length of cobs (39.3%), number of grains per plant (89.7%), weight of grains per plant (95%), weight of 1000 grains (2.5%), rate of photosynthesis (30.3%), rate of transpiration (35.2%) and stomatal conductance (89.1%) at 16 dSm<sup>-1</sup>. Application of bacteria also improved the shoot and root nutrient level of potassium (32.2%), (93%), nitrogen (75%), (87.4%), magnesium (76.92%), (49.9%), calcium (89.9%), (85.7%), and phosphorous (89.9%), (77.7%) respectively by decreasing the sodium level of shoot and root up to (77.85%) and (90.96%). It can be suggested that the exogenous application of bacteria can produce excellent results at all salinity levels and significantly improve the growth, yield, ion contents and physiological parameters of *Zea mays* L. cv. KS-85.