

## Abstract

This study was conducted to determine the interactive effect of different concentrations of NaCl salinity and Ascorbic acid (AsA) on growth and yield of *Zea mays* L. cultivar 'Opener'. This attempt was made to verify the role of AsA in alleviating harmful effects of salt stress on plants. Exogenous application of AsA was given in two ways; seed priming and/or foliar spray in concentrations of 100 or 200 ppm. Effect of AsA was observed at four different salinity levels i.e. control, 4dSm<sup>-1</sup>, 8dSm<sup>-1</sup> and 12dSm<sup>-1</sup>. Oxidative stress is one of the consequences of salt stress and to overcome this oxidative damage, different types of enzymatic and non enzymatic antioxidant compounds are produced in plant cell. AsA is one of the non enzymatic antioxidant synthesized in plants. Delayed germination and reduction in seedling weight was observed with increased salinity level in *Zea mays* L. In field experiment, all studied parameters were negatively affected by salinity. There was reduction in plant height, number of leaves, fresh and dry mass of plant, chlorophyll contents, and yield. Rate of photosynthesis and rate of transpiration were also reduced. At 12dSm<sup>-1</sup>, plants were unable to complete their life cycle and became dried after three weeks. Exogenous application of AsA was found effective in alleviating the harmful effects of salinity to some extent. Improved germination and seedling weight were observed in case of AsA seed priming. Under salt stress, seed priming with 200 ppm AsA gave better results than 100 ppm AsA. In field experiment, plants with AsA treatment showed better growth performance and yield as compared to untreated plants. Under non saline condition, 100 ppm priming was found better than 200 ppm, but foliar spray with 200 ppm was proved better than 100 ppm. Under saline condition, 200 ppm AsA application was more effective in alleviating adverse effects of salt stress as compared to 100 ppm AsA either it was applied as seed priming or as foliar spray. At 4dSm<sup>-1</sup>, single application of same concentration of AsA as priming agent proved better than foliar spray but at 8dSm<sup>-1</sup>, foliar spray appeared more effective than seed priming. At 12dSm<sup>-1</sup>, seed priming with AsA helped plants in completion of life cycle. Weight of grains per plant was improved up to 32% and 75% at 4dSm<sup>-1</sup> and 8dSm<sup>-1</sup> respectively. In all treatments of salinity, two applications of 200 ppm AsA gave better results and improved growth, yield, and physiological parameters of *Zea mays* L. cv. 'Opener'.