

## ABSTRACT

The present study was carried out to determine the effects of exogenous application of salicylic acid on growth and other physiological attributes of *Helianthus annuus* L. cultivar S-278 plants under salt stress. The salicylic acid was applied to sunflower plants as seed priming and foliar spray. 0ppm, 100ppm and 200ppm concentrations of salicylic acid were used both under salt stress and non stress conditions. Tween-20 (0.1%) was used as surfactant. Various salinity levels i.e control, 4dSm<sup>-1</sup>, 8dSm<sup>-1</sup> and 12dSm<sup>-1</sup> showed different effect of salicylic acid. Increasing salinity levels caused a delay in germination and decreased the weight and length of seedlings. Salt stress adversely affected all the parameters viz. height of plants, number of leaves, plants fresh-dry weight, total chlorophyll contents, photosynthetic rate and transpiration rate. Application of salicylic acid both as seed priming and foliar spray was proved to be effective in alleviation of the adverse impacts of salt stress on sunflower plants. Plants treated with salicylic acid showed much better growth and productivity in comparison to non treated plants under saline and non-saline conditions. By increasing the concentrations of salicylic acid under saline conditions, growth and physiological parameters of plants were improved. Of all the levels of salicylic acid, 200ppm concentration of salicylic acid was found to be more effective than the others in mitigation of the bad impacts of salinity on sunflower plants and increased the productivity of plants. Significant increase in height of plant (56.5%), leaf number (53.8%), root length (28.8%), shoot length (24.5%), fresh weight of root (79.9%) and shoot (83.9%), dry weight of root (176%) and shoot (89.7%), photosynthetic pigments (chlorophyll a 35.8%), photosynthetic rate (48%), transpiration rate (32.6%), number of seeds per plant (34%), weight of seeds (51%) was recorded when exogenous application of 200ppm concentration of salicylic acid was given to control plants. The total antioxidant activity, DPPH radical scavenging activity and total phenolic contents obtained from sunflower shoot and seeds extract was also studied. Under non-saline conditions, the antioxidant activity was minimum. With increasing salinity levels, the antioxidant activity was increased. Maximum DPPH radical scavenging activity (6.5%), total phenolic contents (35.7%) and total antioxidant activity (51%) was observed in salt stressed (at 12dSm<sup>-1</sup>) sunflower plants treated with 200ppm concentration of salicylic acid.