



ABSTRACT

The present study was aimed at the determination of the effects of exogenously applied glutathione on growth and other physiological parameters of salt stressed *Triticum aestivum* L. cultivar Faisalabad-08 plants and its role in the alleviation of the adverse effects of salinity in these plants. The application of glutathione was done as foliar spray and as priming agent. The glutathione was first applied to seeds as priming agent. The seed priming was made with various concentrations of glutathione i.e., 0ppm, 100ppm and 200ppm. The seeds of wheat were soaked for 12 hours. The next application of glutathione was carried out 50 days after sowing at the vegetative stage of wheat plants in the form of foliar spray and Tween-20 (0.1%) was used as surfactant. The effect of glutathione was observed at four different levels of salinity viz. control, 4dSm^{-1} , 8dSm^{-1} and 12dSm^{-1} . With the increase in the salinity level, there was a delay in germination and reduction in seedlings weight and lengths. It was observed that all the parameters studied were affected harmfully by salinity. There was notable reduction in plant height, leaf number, number of tillers, plant fresh-dry weights, total chlorophyll contents and productivity. A considerable decrease in the photosynthetic rate and transpiration rate was also observed. Application of glutathione as foliar spray and priming agent was effective in the amelioration of detrimental effects of salt stress on wheat plants. Plants with applied glutathione showed much better growth and productivity in comparison to those plants which were not treated with glutathione. The improvement in the parameters of growth induced by seed priming and foliar application of glutathione was better in plants under saline conditions as compared to the plants of non-saline conditions. Under non-saline conditions, the application of 200ppm glutathione as priming agent and as foliar spray was the most effective. In saline conditions, the improvement increased with the increase in the glutathione concentration and 200ppm glutathione as priming agent and as foliar spray gave best results and proved to be the most effective concentration in mitigating the harmful effects of salts on wheat plants. The seed germination, height, number of leaves, root length, number of ears per plant, number of spikelets per plant, number of grains per plant, weight of 1000 grains and total chlorophyll was reduced to 38.10%, 29.94%, 73.10%, 64.10%, 64.24%, 67.27%, 78.45%, 25.24% and 38.55% respectively at 8dSm^{-1} in comparison to control. 200ppm glutathione as priming agent



and foliar spray increased height, number of leaves, number of grains per spikelet, number of tillers and photosynthesis rate up to 14.91%, 72.25%, 24.14%, 198.51% and 156.06% respectively at 8dSm^{-1} in comparison to control. It can be inferred that the exogenous application of 200ppm glutathione as priming agent and as foliar spray gave best results at all the levels of salinity and considerably improved growth, yield and physiological parameters of *Triticum aestivum* L. cultivar Faisalabad-08 and glutathione can be implicated to alleviate adverse effects of salinity on wheat plants.