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## Effect of heavy metals on antioxidant activities on the growth and yield of potato irrigated with tannery effluent

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A wide range of environmental factors including heavy metals stress stimulates oxidative stress. So, antioxidant resistance mechanisms may provide a strategy to enhance metal tolerance by minimizing the toxic effects of reactive oxygen species (ROS). In the present investigation, the effects of heavy metals producing antioxidative defense systems i.e. Superoxide dismutase, Peroxidase and Catalase were studied in the potato plants grown in soil polluted with heavy metals (Cr, Cd, Pb). The results showed that the tannery effluent was highly toxic with high values of all pollution parameters (pH, TDS, NaCl %, E<sub>Ce</sub>, bicarbonates, chlorides). Amount of heavy metals was also high in the effluent and increased with increasing the concentration of effluent. Amount of chromium was the maximum as compared to other heavy metals. Four concentrations of tannery effluent (0, 2, 4, 6 and 8%) were prepared with normal garden soil along with the two treatments of ascorbic acid i.e., 0 and 0.5mM. The maximum biomass was observed in the control and it was decreased with the increasing effluent concentration. The exposure of plants to the highest concentration (8%) reduces the height of shoot. Among the treatments, 0.5mM was observed to show the best tolerance and growth properties with respect to metals. The antioxidant enzyme activities were increased by metals stress. The present investigation revealed that the ascorbic acid treatment by foliar spray on the growing plants of potato could enhance the efficiency of antioxidants that significantly reduce the toxic effect of metals from tannery effluent amended soil. The antioxidative activity seems to be of primary importance for adaptive response of potato plants against ROS produced under environmental stress

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