



EFFECT OF FOLIAR APPLICATION OF GIBBERELLIN IN MITIGATING SALT STRESS IN TOMATO (*Solanum lycopersicum*), “THILINA” VARIETY

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Abstract

Soil salinity is a major abiotic stress that adversely affects crop productivity and quality. One of the key constraints of expanding tomato cultivation in some regions of the dry zone of Sri Lanka is high salt concentrations prevails in soil. Exposure of plants to high salinity triggers a reduction in endogenous bioactive gibberellin (GA₃) which coincided with DELLA protein accumulation. The objective of this study was to test the effect of exogenous foliar application of GA₃ to overcome the salt stress of tomato plants. Tomato variety "Thilina" was used for the study. Tomato plants treated with NaCl were foliar sprayed either with GA₃ solution or with water as a control. Each treatment contained five replicates. After 15 days of transplanting in pots, salt stress was imposed by treating soil with 150 mM NaCl weekly. Foliar application of 20 μM GA₃ solution was carried out at 6-day intervals. The growth was declined in plants subjected to NaCl stress. Foliar application of GA₃ to salt stress-induced plants led to the improvement in vegetative growth. In comparison to water sprayed NaCl-treated control plants, GA₃ sprayed NaCl-treated plants showed 24.0 % increase in number of branches, 19.7 % increase in internode number, 18.8 % increase in internode lengths and increase in fresh/dry weights of shoot and root. Further, compared to NaCl-treated plants, GA₃ applied NaCl-treated plants showed 4.4% increase in leaf relative water content, 19.2% increase in stomatal density and 38.6% increase in total chlorophyll content. In conclusion, the data indicated a positive effect of GA₃ in improving the growth of NaCl-stressed tomato plants. It can be suggested that exogenous application of GA₃ plays an essential protective role in suppressing the growth retarding effect of NaCl treatment.

Keywords: foliar application gibberellin, growth, salt stress, tomato