

Humic Acids Enhance Tomato Tolerance to Salt Stress Reducing Lipid Peroxidation and Upholding Photochemical Efficiency

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Cultivated lands are in danger due to the increase of salt concentration and the reduction of organic matter content. Organic compounds (humic acids, HA) act as an environment source of auxins during the plant development. Auxin level is diminished in roots of tomato during salt stress. The aim of this work was to evaluate the potential of HA in enhance plant capacity to cope with salt stress. Tomato plants pretreated or not with HA were exposed to salt stress (300 mM NaCl) for 72h. Chlorophyll a fluorescence, lipid peroxidation and cell membrane integrity were measured using MINI-PAM light-modulated fluorimeter, MDA content and electrolyte leakage rate, respectively. Salt stress inhibited the photochemical quenching (qP) and enhanced the nonphotochemical quenching (NPQ) and the peroxidation in leaves and roots, whereas the pretreatment with HA antagonized all these effects. On the other hand, plants exposed to NaCl also underwent a reduction in the electron transport rate (ETR), but the HA pretreatment was not able to prevent this ETR inhibition. The cell membrane integrity of leaves and roots were reduced by this salt treatment, while the HA was able to recover only the root integrity. Taken together, the data suggest that HA can be used to enhance the salt tolerance of tomato plants, and that this capacity could be related to their intrinsic auxin-like activity.

Key words: Humic Acids, Salt Stress

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