Improving salt tolerance in tomato plants through the use of biofertilizers: a biochemical approach

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Salinity figures among the most harmful abiotic stresses affecting tomato development and metabolism. As an environmentally friendly practice, the aim of this study was to evaluate the potential effects of biostimulants, in particular arbuscular mycorrhizal fungi (AMF) and compost, in improving tomato tolerance to salt stress. A greenhouse experiment was carried out using a Cambell33 tomato variety. Tomato seeds were treated with a native AMF consortium and compost under nonsaline (0mM) and highsaline (150mM) conditions. The research included an indepth examination of key biochemical parameters such as chlorophyll and protein, sugar,and malondialdehyde (MDA) content as well as catalase (CAT), peroxidase (POX), and polyphenol oxidase activities (PPO). The results showed that compost had a positive effect on protein content and PPO activity. In addition, AMF reduced MDA content, indicating a potential for mitigating oxidative stress under salinity. The combined application of compost and AMF showed a positive effect on chlorophyll content and CAT activity suggesting an improvement in antioxidant capacity and photosynthetic processes under salt stress. This research provides valuable information on sustainable agricultural practices that promote advances in the application of compost and AMF to improve tomato performance under adverse environmental conditions of salt stress.