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**ORIGINAL PAPER**

# Effects of mycorrhiza and silicon on the alleviation of salt damage in salt-sensitive and salt-tolerant pepper genotypes*

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**Abstract**

Salinity is a detrimental abiotic stress that occurs in arid and semi-arid environmental conditions. Salinity adversely affects the growth, yield, and quality of plants. Some plants are sensitive to salt stress, while others are more resistant owing to the tolerance mechanisms induced by physiological, biochemical, and molecular responses. The present study was conducted to investigate the effects of mycorrhizal colonization (*Glomus clarum*) and silicon (Si) under different salinity levels on the activity of antioxidant enzymes, such as super oxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX), and glutathione oxidase (GPX) and lipid peroxidation (MDA), of salinity sensitive (cv. Demre) and tolerant (cv. Karaisali) pepper cultivars. Three different salt doses (0 mM NaCl, 75 mM NaCl, 150 mM NaCl), with AM and 2 mM $K_2SiO_3$, were applied into 4-L vermiculite-containing pots with pepper plants. The antioxidant enzyme activities increased following the increasing salt doses. All antioxidant enzymes were observed to display differences in their activity in the two pepper genotypes that differed in salt sensitivity. Catalase, ascorbate peroxidase, and glutathione reductase activities were higher in the salt-sensitive pepper genotype. Si and mycorrhiza treatment improved the defense mechanisms in peppers, and attenuated the oxidative damage in cellular functional molecules caused by the overproduction of reactive oxygen species (ROS) under salt stress. Therefore, mycorrhiza and silicon applications, resulting in increased salt tolerance, can be used in areas with salinity problems.

**Keywords:** *Capsicum annuum,* silicon, mycorrhiza, salinity stress, antioxidative enzymes, abiotic stress

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