The effects of 75 mM and 150 mM NaCl (EC 8.50 and 15.35 dS m\(^{-1}\)) were studied on a salt-tolerant and a salt-sensitive pepper (Capsicum annuum L.) genotype. The salt-tolerant genotype showed lower declines in relative water content (RWC), no change in chlorophyll (Chl) content, lower increases in lipid peroxidation, and greater increases in superoxide dismutase (SOD) activity, total protein content, and glutathione content. The salt-sensitive genotype showed greater decreases in RWC, Chl content, SOD activity, and in guaiacol peroxidase (GPOX) activity, and higher increases in lipid peroxidation and the amount of proline, with a negligible increase in glutathione content. These results revealed that increases occurred in some anti-oxidative stress enzymes in the salt-tolerant pepper genotype, as well as increases in glutathione content under salinity stress. These may provide better protection against reactive oxygen species (ROS).