Salicylic acid alleviates oxidative damage in sorghum plants grown under salinity and drought conditions

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It has been proposed that salicylic acid (SA) acts as an endogenous signal molecule responsible for inducing abiotic stress tolerance in plants. Salinity and drought have the ability to cause oxidative damage and further degradation of cell components. In this work, SA was used to alleviate the oxidative stress caused by salinity and drought stress conditions in two cultivars of sorghum plants (Sorghum bicolor L., cv Giza 15 and Sorghum bicolor L., cv Dorado). The effect of presoaked seeds for 5 hr by 1mM SA before grown for 4 weeks on growth parameters, mineral uptake, membrane permeability, lipid peroxidation, H2O2 concentration, proline content, activity of antioxidant enzymes total soluble proteins, and protein pattern of salinity (100mM NaCl), drought (60%) and salinity-drought interaction stressed sorghum was investigated. Comparing with SA untreated plants, Pretreatment with SA increased plant growth parameters. SA also strongly inhibited Na+ accumulation, but stimulated Ca++ accumulation while K+ concentration was unaffected. Lipid peroxidation (MDA) content, membrane permeability and H2O2 were decreased by SA. Additionally, SA significantly increased proline contents. Moreover, there was significant decrease in the antioxidant enzyme activity and caused expression of some protein bands.

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