Water stress-induced oxidative damage and antioxidant responses in micropropagated banana plantlets

ABSTRACT

Oxidative injury and antioxidant responses were investigated in two banana genotypes (Musa AAA 'Berangan' and Musa AA 'Mas') subjected to 40 % PEG-induced water stress. PEG treatment resulted in oxidative injury, as expressed in increased lipid peroxidation and reduced membrane stability index, in both cultivars; however, greater oxidative injury was detected in 'Mas'. Under PEG treatment, catalase activity and glutathione reductase activity were enhanced in both cultivars, but were higher in 'Mas'. Ascorbate peroxidase activity was enhanced in 'Berangan' under water stress, but was unaffected in 'Mas'. Meanwhile, superoxide dismutase activity was inhibited in both cultivars under water stress, but higher activity was detected in 'Berangan'. Higher ascorbate peroxidase and superoxide dismutase activities were associated with greater protection against water stress-induced oxidative injury.

Keyword: Ascorbate peroxidase; Catalase; Glutathione reductase; Lipid peroxidation; Oxidative stress; Superoxide dismutase