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The role of polyethylene glycol (PEG) pretreatment in improving sugarcane's salt (NaCl) tolerance

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**Abstract:** An important aspect of salt tolerance studies in different plants is the relationship between salt and water stress. In the present study calluses (60 days old) of 2 sugarcane cultivars (cv. SPF 234 and cv. HSF 240) were treated with 4 different salt concentrations, including a control (0 mM NaCl), after 1% polyethylene glycol (PEG) pretreatment for 5 days. Fresh weight, callus browning, and necrosis data were recorded at day 120. Biochemical parameters (soluble protein contents, and peroxidase, catalase, and superoxide dismutase activity) were also analysed. Regardless of PEG pretreatment, calluses subjected to salt stress had less fresh weight than the control; however, less necrosis was observed in PEG-pretreated callus cultures than in non-pretreated cultures subjected to the same salt concentration. PEG pretreatment enhanced the biosynthesis of soluble protein contents. Likewise, a general increase was observed in antioxidant enzyme activity in the PEG-pretreated callus cultures, as compared to the non-pretreated controls exposed to the same salt concentration. PEG pretreatment also increased the regeneration potential of the callus cultures of both sugarcane cultivars after NaCl treatment. These results suggest that PEG pretreatment could improve salt tolerance in these 2 sugarcane cultivars.

**Key words:** Antioxidant enzymes, in vitro, NaCl stress, polyethylene glycol, sugarcane Abbreviations: Pretreated: P, Non-pretreated: NP

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