Pre treatment salicylic acid: Effects on growth and cadmium uptake by *Musa* species under *in vitro* conditions

Cadmium (Cd) is an omnipresent non-nutrient heavy metal, with particular concern because of its high solubility, mobility, and high phytotoxicity even at low concentrations as well as its toxicity for human upon its entry into the food chain. Reports have been implied that Cd toxicity has the form of oxidative stress which is the result of the stimulus of free oxygen radical production, and by the modification of the activity of different antioxidant enzymes. In this study, salicylic acid (SA) has been investigated as a pre-treatment on Grand Naine cultivar grown *in vitro*. Grand Naine explants were cultivated on MS medium supplemented with different concentrations of SA (0, 0.5 and 1mM), then these explants transferred twice to MS medium supplemented with varying concentrations of Cd (0, 50, 100, 200, 500, 1000 and 1500μM CdCl₂) to examine the accumulation effect of Cd on banana explants. After two subcultures on Cd medium, we found out that adding SA at 0.5mM had a significant positive effect on vegetative growth such as; mortality, shoot multiplication, plantlet height (cm), fresh and dry weight (g), total chlorophyll, carotenoids, proline content and the change in protein pattern. The application of 0.5mM of SA to the plants treated with 500μM Cd reduced the uptake of Cd by 15%. The results in this paper are expected since SA is knowing as a hormone-like substance which has been reported as an alleviator for abiotic and biotic stresses either *in vitro* or *in vivo* cultures in many different plant species. Moreover, the analysis of protein pattern revealed that SA pre-treatments caused changes in gene expression which resulted in changes in protein synthesis.

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