

ENHANCEMENT OF CHEMICAL DEFENSE AGAINST TWO POSTHARVEST FUNGAL PATHOGENS IN 'EMBUL' BANANA BY SOLUBLE SILICA TREATMENT

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Postharvest treatment with soluble silica is known to inhibit fungal growth and induce disease resistance in many fruits. Dipping in 1,500 $\mu\text{g mL}^{-1}$ silica solution for 20 min extended the shelf life of 'Embul' banana (*Musa* sp. Mysore group AAB) significantly. The aim of this study was to investigate the possible role of antifungal compounds in silica-enhanced resistance to anthracnose and crown rot (CR) disease in banana. 'Embul' banana 'fingers' (15 replicates) and 'hands' (08 replicates) were exposed to silica treatment (Si+), as above, and those treated with distilled water for 20 min served as controls (Si-). Twenty-four hours after treatment, banana fingers and hands were inoculated with 1×10^8 conidia mL^{-1} suspension of *Colletotrichum* sp. (anthracnose pathogen) and mycelial segments of *Lasiodiplodia* sp. (a CR pathogen), respectively, and incubated at 27 ± 3 °C and 95-100% relative humidity. Anthracnose lesion diameters were taken daily while CR development was assessed and expressed as CR Index (CRI) 14 days after inoculation. *Cladosporium* bioassay coupled with Thin Layer Chromatography was performed to assess antifungal activity in ethyl acetate extracts of Si+ and Si- peel tissues. Methanol extracts of Si+ and Si- peels were subjected to Folin Ciocalteu (FC) assay for Total Phenolic (TP) content. Significant delay (by 04 days) in rot initiation, lower anthracnose lesion diameter (0.5 cm) and CRI (3) were observed in Si+ fruits versus controls (1.4 cm and 5, respectively). In bioassay plates, three antifungal zones ($R_f = 0.14, 0.48, 0.79$) were visible in both Si+ and Si- extracts, indicating them to be pre-formed antifungal compounds (phytoanticipins). Significantly larger antifungal areas and TP levels were detected with Si+ extracts. Si-enhanced resistance to fungal rots in 'Embul' banana may at least be partly attributed to enhanced phytoanticipin levels, including phenolic compounds.

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