

Can systemic resistances contribute to ecologically based IPM control of nematodes in pineapple ?

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Introduction: Pineapple monoculture and the use of pesticides reduced the biodiversity in the agrosystems and increased the imbalance between pathogenic and beneficial organisms. Non specific plant natural defenses may contribute to ecologically based IPM as an alternative to pesticides for nematode control in pineapple.

Material and Methods: *Two pineapple varieties, Smooth Cayenne (SC) and MD-2, received Elicitor treatment as soil applications of 50mL Methyl-jasmonate, 10^{-4} M, or Salicylic acid, 10^{-3} M, or Laminarin (β 1,3 Glucans), 37 g/L, followed by Nematodes inoculation: *R. reniformis* (5000/pot). Nematode populations growth was evaluated and enzymatic activities involved in plant defense: Catalase (CAT), Superoxide dismutase (SOD), Phenylalanine ammonialyase (PAL) and Lipoxigenase (LOX) were measured on non inoculated plants.*

Results: The nematode population growth was slowed down on the nematode tolerant variety MD-2 by Methyl-jasmonate and Salicylic acid, *p values* were 0.003, 0.021. Most of the decreases ranged 30 to 70%. Methyl-jasmonate and Laminarin induced significative enzymatic activities variations; Salicylic acid treatment did not. Most remarkable were the decreases of Catalase and PAL activities. Meanwhile LOX activity increased significantly and a slight increase in SOD was also observed.

Discussion: Pineapple has been able to set up defenses against nematodes after elicitor treatments, but tolerant and sensitive varieties did not react equally. LOX, PAL and some of the oxidative enzymes (CAT) can be used to characterize the physiological changes in the plant. Is the MD-2 response a Systemic Resistance? Similar experiments using a split-root system have confirmed this (*data to be published*).

LOXs control the Methyl-jasmonate pathway, meanwhile PAL controls the Salicylic acid and phenylpropanoids pathways. The LOX activity increase may reflect an enhanced biosynthesis of the signal molecule Methyl-jasmonate, characterizing an Induced Systemic Resistance set up. On the contrary, the decrease of PAL activity is less clear as it means less phenylpropanoids involved in plant defense. But it may also reflect a necessary balance between Salicylic acid and Methyl-jasmonate pathways.