

Antimicrobial activities of chitosan and calcium chloride on in vitro growth of *Colletotrichum gloeosporioides* from papaya

ABSTRACT

The antimicrobial activities of chitosan and calcium chloride (CaCl₂) on the growth, spore germination, and hyphal morphology of *Colletotrichum gloeosporioides*, isolated from naturally infected papaya fruits, was investigated in in vitro studies. Chitosan was found to inhibit the radial growth and spore germination of the fungus significantly at higher concentrations. Radial growth was inhibited by 52 and 82% with 0.75 and 1% chitosan, respectively. Spore germination was completely inhibited in Potato Dextrose Agar (PDA) medium containing 0.5% and above chitosan concentrations. Light microscope observations showed that chitosan induced morphological changes, including abnormal branching, swelling hyphal tips, vacuolation and distortion. Calcium chloride at 1 to 4% had no pronounced effects on mycelial growth inhibition. However, PDA amended with 3 and 4% CaCl₂ significantly ($P \leq 0.05$) inhibited about 26% of spore germination relative to the control. Findings from these experiments demonstrated that chitosan has suppressive activity against *C. gloeosporioides* of papaya and could be used as part of a disease management program. Nevertheless, to a lesser extent, CaCl₂ can also be included as part of the program.

Keyword: Non chemical control; Natural compounds; Postharvest pathogen; Papaya