TITLE: COMBINATION OF CHITOSAN AND Mentha ESSENTIAL OILS TO CONTROL ANTHRACNOSE CAUSED BY Colletotrichum gloesporioides AND C. brevisporum IN PAPAYA fruit


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ABSTRACT:
Anthracnose is the most important disease attacking papaya, causing important postharvest losses. Colletotrichum gloesporioides has been commonly reported as the main causal agent of papaya anthracnose. However, other Colletotrichum species have been also associated with papaya antrachnose in different countries. The excessive and continuous use of chemical fungicides has been associated with the development of antifungal resistance in Colletotrichum species. This study investigated the efficacy of chitosan (Chi), Mentha piperita L. (MPEO) and Mentha x villosa Huds (MVEO) essential oil alone or in combinations to inhibit the growth of Colletotrichum gloeosporioides and C. brevisporum isolates associated with anthracnose in papaya cv papaya (Carica papaya L.) fruit. The efficacy of combined concentrations of Chi and MPEO or MVEO to control the development of antrachnose lesions in papaya fruit (papaya) caused by tested Colletotrichum isolates was also evaluated during 10 days of storage (25 ± 0.5 °C). Chi (2.5, 5, 7.5 and 10 mg/ mL), MPEO and MVEO (0.15, 0.3, 0.6 and 1.25 μL/mL) alone effectively inhibited the mycelial growth of three testes isolates of C. gloeosporioides and C. brevisporum in laboratory media. Combinations of Chi (5 or 7.5 mg/mL) and MPEO or MVEO (0.15, 0.3, 0.6 or 1.25 mL/mL) inhibited the growth of tested Colletotrichum isolates and presented in most cases additive or synergistic interactions, as assessed by Abbott index. Development of anthracnose lesions induced by C. gloeosporioides and C. brevisporum isolates was reduced by coatings formed by Chi (5 mg/mL) and MPEO or MVEO (0.3, 0.6 or 1.25 μL/mL) combinations during storage. Decreases in anthracnose lesion development in papaya coated with 5 mg/mL Chi and 0.6 or 1.25 μL/mL MPEO or MVEO were similar or higher than those caused by a commercial fungicides formulation. The application of coatings formed by combinations of selected Chi and MPEO or MVEO concentrations could be considered an alternative strategy to control papaya anthracnose caused by C. gloeosporioides and C. brevisporum.

Keywords: Papaya, mold decay, Colletotrichum spp., edible coating