

TITLE: COATINGS FORMED BY CHITOSAN AND *Mentha piperita* L. ESSENTIAL OIL INHIBIT *Colletotrichum* SPECIES AND ANTHRACNOSE DEVELOPMENT IN MANGO CULTIVAR TOMMY ATKINS

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ABSTRACT:

Anthracoze caused by *Colletotrichum* species has been a major problem for maintaining the postharvest quality of mango (*Mangifera indica* L.), limiting domestic and export marketing. In Brazil, the occurrence of anthracnose in mango has been typically attributed to *Colletotrichum gloeosporioides*; however, *C. asianum*, *C. fructicola*, *C. tropicale*, *C. dianesei* and *C. karstii* were recently identified as the *Colletotrichum* species prevalent in anthracnose lesions in mango from orchards of Northeastern Brazil. This study assessed the efficacy of chitosan (CHI) and *Mentha piperita* L. essential oil (MPEO) alone or in combination to control the mycelial growth of five different *Colletotrichum* species, namely *C. asianum*, *C. dianesei*, *C. fructicola*, *C. tropicale* and *C. karstii*, identified as potential anthracnose-causing agents in mango. The efficacy of coatings of CHI and MPEO combinations in controlling the development of anthracnose in (artificially inoculated) mango cultivar Tommy Atkins was evaluated during 15 days of room storage (25 ± 0.5 °C). CHI (2.5, 5, 7.5 or 10 mg/mL) and MPEO (0.3, 0.6, 1.25, 2.5 or 5 µL/mL) alone effectively inhibited the mycelial growth of all tested *Colletotrichum* isolated in laboratory media. Combinations of CHI (5 or 7.5 mg/mL) and MPEO (0.3, 0.6 or 1.25 µL/mL) strongly inhibited mycelial growth and showed additive or synergistic inhibitory effects on the tested *Colletotrichum* isolates, based on the Abbott index. The application of coatings formed by combinations of CHI (5 or 7.5 mg/mL) and MPEO (0.6 or 1.25 µL/mL) that presented synergistic interactions decreased anthracnose lesion severity in mango artificially contaminated with *C. asianum*, *C. dianesei*, *C. fructicola*, *C. tropicale* or *C. karstii* during the measured room storage period. The anthracnose lesion severity in mango coated with the combinations CHI and MPEO was similar or lower than those observed in mango treated with the synthetic fungicides thiophanate-methyl (10 µg a.i./mL) or difenoconazole (0.5 µg a.i./mL). The application of coatings containing low doses of CHI and MPEO may be an effective alternative for controlling the postharvest development of anthracnose in mango cultivar Tommy Atkins.

Keywords: Edible coating; *Mangifera indica* L.; *Colletotrichum* spp.; Anthracnose; Postharvest treatment

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