INHIBITORY EFFECT OF ESSENTIAL OILS AGAINST *COLLETOTRICHUM GLOEOSPORIOIDES* AND *RHIZOPUS STOLONIFER* IN STORED PAPAYA FRUIT AND THEIR POSSIBLE APPLICATION IN COATINGS.

ABSTRACT

The aim of this study was to evaluate the fungicidal effect of the thyme and Mexican lime essential oils studies against *Colletotrichum gloeosporioides* and *Rhizopus stolonifer*, and to determine the possibility of incorporating them in edible coatings to control postharvest diseases of papaya fruits.

For *in vitro* studies, both essential oils were tested to evaluate their effect on mycelial growth of *C. gloeosporioides* and *R. stolonifer* during given incubation times. For *in vivo* tests, fruit were dipped in the thyme and Mexican lime essential oils before and after inoculation. Non-inoculated fruits were similarly treated. A further experiment was carried out by dipping papayas in a coating formulated with both essential oils. Results indicated that the fungicidal effect was more evident with essential thyme than with Mexican lime oil. For the essential thyme oil, concentrations up to 0.060% stopped mycelial growth for both *C. gloeosporioides* and *R. stolonifer*. Papaya fruit dipped in both the essential oils experienced reduced decay caused by *C. gloeosporioides* and *R. stolonifer* by up to 50% and 40%, respectively, compared with the 100% infection observed in non-treated papayas. It was also observed that concentration was not a key factor in reducing the development of these two fungi as it occurred in *in vitro* studies. In papayas immersed in mesquite gum emulsion and formulated with both the essential oils, it was possible to reduce the disease incidence caused by *C. gloeosporioides* by 100% with the thyme and Mexican lime essential oils at 0.1% and 0.5%, respectively.

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