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.