UNIVERSITI TEKNOLOGI MARA

COMPARATIVE STUDY ON PHYSICOCHEMICAL PROPERTIES OF ZnO-STARCH NANOCOMPOSITE ON WATERLILY MANGO (*MANGIFERA INDICA*) TO INHIBIT ANTHRACNOSE DISEASE

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MSc

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Anthracnose disease appears on skin mango can affects mango quality during post-harvest can be reduced by coating treatment with zinc oxide. This coating project aim to increase shelf life of mango which is reduce appearance anthracnose disease, maintain moisture content and their marketable quality. Mango has been coated with ZnO-starch with different set parameter studied, different size of zinc oxide specifically 10-30 nm and 60-100 nm , different concentration (control, 0.5 M, 1.0 M, 1.5 M, and 2.0 M) of ZnO-starch and different storage temperature (5ºC, 27ºC, and 32ºC) were varied. This can be achieved by reducing anthracnose disease, maintaining the quality, and increasing shelf life of mango. Starch as a thickening agent and acts as a permeable barrier for the gas exchange was mixed with ZnO NP homogeneously and serve as coating treatment on mango during storage time for 7 days. The physicochemical properties of mango after coating treatment were studied for their weight loss, moisture content, total soluble solids (TSS), pH, and titratable acidity (TA) analysis and texture profile analysis (TPA). Morphological and confirmation of zinc oxide nanoparticle have been identified using FESEM and EDX respectively, homogeneity dispersion of zinc oxide nanoparticle in mango coating was characterized by FTIR and crystallinity properties by XRD. The longest shelf life of mango was found in coating size between 10-30 nm ZnO NP and 1.5 M ZnO-starch solution. Furthermore, the physicochemical analyses have confirmed the coating ability of ZnO in prolonging the shelf life of Water Lily mango at a temperature below 5 ℃.

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