Junior Science Communications
Faculty of Applied Sciences, UiTM Shah Alam
https://journal.uitm.edu.my/ojs/index.php/JSC

E-ISSN 2637-0689
Vol 38 2024

Colloquium on Applied Sciences 2024
Faculty of Applied Sciences, UiTM Shah Alam, Malaysia

Evaluating the Efficacy of Malay Apple (*Syzygium malaccense*) Leaves Extract in Chitosan/Alginate Coating for Preserve Postharvest Quality of Bilimbi (*Averrhoa bilimbi*)

Nurin Qasrina Balqis Mohd Farid, Suzaira Bakar

Structured Abstract

Background: The natural tendency of bilimbi to spoil quickly requires it to be consumed within a period of 4-5 days. Therefore, it is crucial to prioritise quality preservation when handling and storing bilimbi fruits after harvesting. A sustainable and organic coating is now being used as a practical substitute for artificial coatings, resulting in a significant decrease in fruit spoilage after harvesting and improving the duration for which the fruit can be stored. The physicochemical characteristics of bilimbi were assessed after applying a coating of chitosan/alginate along with an extract from Malay Apple leaves (ME). Minimal alterations were observed in the rate of weight loss, colour, firmness, pH, and moisture content when stored for 13 days at a refrigeration temperature of 4ºC, in comparison to the control.

Methods: The ME was obtained by using 70% ethanol. The samples were coated by immersing them in the coating solution using a dipping method. The levels of ascorbic acid and titratable acidity were determined using titration techniques. The total phenolic contents were determined using gallic acid and the quantification of flavonoids was conducted by employing Quercetin as the standard solution, and the analysis was performed using a UV-Vis Spectrophotometer.

Results: The control samples showed mould growth after being stored at 4°C after seven days, while the fruit samples coated with alginate enriched with ME remained mould-free for an extended shelf life of up to 13 days. The levels of ascorbic acid, total phenolics, total flavonoid contents, total soluble solids, and titratable acidity remained relatively constant during storage, with values of 18.86 mg/100g, 27.17 mgGAE/g, 1.21 mgQE/g, 3.68%, and 2.58% respectively, when chitosan was combined with ME.

Conclusion: The application of chitosan enriched with ME on the samples demonstrated the highest efficacy in preserving the overall quality of the fruit. On the other hand, the use of alginate enriched with ME effectively maintained firmness and inhibited the growth of mould. It can be concluded that the ME-enriched coating was effective in preserving the quality of bilimbis during postharvest storage.

Keywords: Bilimbi, Malay Apple Leaves Extract, Chitosan/Alginate, Coating, Quality

*Correspondence: suzaira@uitm.edu.my
Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia