

Effect of Pectin Incorporated with Jackfruit Seed Extract as Coating on Physicochemical Characteristics and Mold Growth of Longan (*Dimocarpus longan* Lour.)

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Structured Abstract

Background: The agricultural sector faces substantial challenges in maintaining the post-harvest quality of perishable fruits such as longan (*Dimocarpus longan* Lour.). Traditional preservation techniques frequently fail to prolong the shelf life of these fruits while keeping their physicochemical qualities. Edible coatings, especially those made from natural polysaccharides such as pectin, are a promising solution considering their biocompatibility, biodegradability, and capability to build effective environmental barriers. This research aimed to evaluate the effectiveness of pectin coatings incorporated with jackfruit seed extract (PJSE) in enhancing the post-harvest quality and shelf life of longan.

Methods: Longan fruits were treated with PJSE at 5%, 10%, and 15% concentrations where the pectin concentration was 2%, with uncoated and control (treated with 2% pectin) samples used for comparison. The fruits were immersed in the coating solutions for 5 minutes before air-drying at room temperature for 30 minutes. Stored at 25°C for 12 days, samples were analysed every 3 days for weight loss, hardness, colour parameters (L^* , a^* , b^*), total soluble solids (TSS), pH, and mold growth.

Results: The findings revealed that PJSE coatings considerably hindered weight loss while maintaining firmness in longan fruits, with higher concentrations (PJSE 10% and 15%) being most beneficial. Colour analysis demonstrated that the PJSE treatments kept the lightness (L^*), redness (a^*), and yellowness (b^*) values better, indicating that the visual aspects of the fruit were conserved. Furthermore, PJSE coatings efficiently preserved greater TSS levels, indicating a slower metabolic use of sugars during storage. The pH values increased less in PJSE-coated fruits than in uncoated and control samples, indicating better acidity and overall fruit quality retention. Mold growth was greatly reduced in PJSE-coated fruits, particularly at higher concentrations, due to the antibacterial characteristics of jackfruit seed extract.

Conclusion: PJSE coatings improved the post-harvest quality and shelf life of longan fruits, with the 15% PJSE treatment being the most effective, offering a natural and sustainable solution for decreasing post-harvest losses and preserving fruit quality during storage. This study demonstrates the potential of PJSE coatings as a natural and sustainable post-harvest treatment, benefiting both producers and consumers by reducing post-harvest losses and maintaining fruit quality.

Keywords: Edible Composite Coatings, Pectin, Jackfruit Seed Extract, Longan Fruit, Shelf-Life

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