



Effect of Passive Modified Atmosphere Packaging (MAP) on Shelf-life Extension of Jackfruit (*Artocarpusheterophyllus L.*) Bùlbs

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Abstract

This study was undertaken to investigate the effectiveness of different passive MAP techniques with minimal processing treatments for extending the shelf-life of fresh-cut jackfruit (*Artocarpus heterophyllus L.*) bulbs kept under low temperature conditions. After treating in a post-harvest solution consisting of CaCl₂ (1%w/v) and ascorbic acid (0.02%w/v) for 30 min, 50g pre-cut jackfruit bulbs were placed and sealed with ambient air in T₁;75µm polyethylene (PE) bags, T₂;125µm PE bags, T₃;187.5µm PE bags and T₄;100µm Polyethylene terephthalate (PET) pouches laminated with low density polyethylene (LDPE) to create different passive MAP techniques. They were stored at 9±5⁰C for 24 days. Randomized Complete Block (RCBD) design was used with 3 replicates for each treatment of the study. Firmness, total soluble solid (TSS), titrable acidity (TA), microbial count and sensory properties were collected at 2-day intervals. Firmness of jackfruit bulbs in different MAP decreased during the storage of period. Food samples in PET pouches (T₄) showed significantly (P<0.05) higher firmness than other MAP samples after 20 days (0.4734 N) and 24 days (0.4080 N) where 75µm thickness PE bags recorded the maximum softening in the fruit after 20 days (0.2478 N) and 24 days (0.2428 N). The initial TSS in all treatments significantly increased (p<0.01) from 5.5% to 13.3%, 14.4%, 12.8% and 14% in T₁,T₂,T₃ and T₄ samples after 24 days, respectively. Initial TA was observed as 0.48% and gradually decreased up to 0.23%, 0.12%, 0.13% and 0.16% in T₁,T₂,T₃ and T₄ samples up to 6 days, respectively. Jackfruit bulbs in PET pouches showed significantly (P<0.05) higher TA than other MAP techniques after 4 days (0.47%) and 8days (0.39%) of storage period. Initial microbial count of jackfruit samples were 3.09x10¹CFU/g and it has increased upto 2.08x10⁶, 7.76x10⁵, 4.57x10⁵ and 1.62x10⁵ CFU/g in T₁,T₂,T₃ and T₄ samples respectively after 24 days. Shelf life was derived keeping a threshold overall sensory score of 3.0 and they were 14, 18, 20 and 24 days in T₁,T₂,T₃ and T₄ respectively. According to the results of firmness, acidity and shelf life, PET pouches could be more suitable to pack jackfruit bulbs in domestic refrigerator compared to PE bags for extending the shelf-life.

Keywords: Jack fruit, modified atmosphere packaging, shelf-life