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Effect of Sodium Alginate Edible Coating with Natural Essential Oils and Modified Atmosphere Packaging on Quality of Fresh-Cut Pineapple

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Abstract : The effect of sodium alginate (1%) based edible coating incorporated natural essential oils, thymol, carvone, and carvacrol as antimicrobial agents at different concentrations (0.1, 0.5, and 1.0%) on the quality changes of fresh-cut pineapple was investigated. Pineapple dipped in distilled water was served as control. After coating, the fruit was sealed in a modified atmosphere package (MAP) using high permeable film and stored at 5°C. Gas composition in package headspace, color values (L*, a*, b*, C*), TSS, pH, ethanol, browning, and microbial decay were monitored during storage. Oxygen concentration continuously decreased while carbon dioxide concentration inside all packages continuously increased over time. Color parameters (L*, b*, c*) decreased, and a* values increased during storage. All essential oils significantly ($p \leq 0.05$) prevented microbial growth than control. A significantly higher ($p \leq 0.05$) ethanol content was found in the control than in all other treatments. Visible microbial growth, high ethanol, and low color values limited the shelf life to 6 days in control as compared to 9 days in all other treatments. Among all essential oils, thymol at all concentrations maintained the overall quality of the pineapple and could potentially be used commercially in fresh fruit industries for longer storage.

Keywords : essential oils, antibrowning agents, antimicrobial agents, modified atmosphere packaging, microbial decay, pineapple
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