

OPTIMIZATION OF NANOPARTICLE INGREDIENTS IN HYDROXYPROPYL METHYLCELLULOSE-BASED COMPOSITE COATINGS FOR BANANA PRESERVATION

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Summary

This study aimed to optimization of three ingredients carnauba nanoparticles, chitosan nano particles and cellulose nanocrystals which were added into hydroxypropyl methylcellulose-based to improve the permeability barrier of coating, therefore increasing preservation capacity of banana. Orthogonal symmetry was used in design of experiments with multiple independent with 3 factors influencing: concentrations of carnauba nanoparticle (5-7%), chitosan nanoparticle (0.5-1.5%) and cellulose nanocrystal (0.3-0.7%) and 4 objective functions: total sugar (%), hardness (kg/cm^2), weight loss (%) and sensory (score). Results showed that the optimized HPMC-based composite supplemented with 6.86% carnauba nanoemulsion, 1.3% chitosan nanoparticle and 0.63% cellulose nanocrystal. Using this optimized coating, storage prolong to 30 days with quality of banana obtained: 7.5 sugar total, 2.3 kg/cm^2 hardness, 3.03% weight loss and 16.9 score of sensory.

Keywords: *Composite, carnauba nanoemulsion, chitosan nanoparticle, cellulose nanocrystal, HPMC, coating, banana.*