

Development of an Edible Fruit & Vegetable Coating from Refined Rice Bran Wax

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Edible coatings are promising methods which extend the shelf life of fresh fruits and vegetables. Rice bran wax based coating also acts as an excellent shelf life extension approach. Rice bran wax which is a by-product of rice bran oil refining process can be utilized as an edible coating after purification. In this study, three purification methods named, A, B, C were carried out. Method-A; crude wax was refluxed for defatting with hexane and Isopropyl alcohol (IPA) in two steps, next bleached with 10% sodium borohydride. Method-B; Equivalent to method A but only IPA was used for defatting. Method-C; A single step process where the wax was refluxed with 99% ethanol. Characteristic of the refined waxes along with the purity were as follows, color lightened, melting point increased, moisture, free fatty acids, acid values and peroxide values decreased. Thereafter, edible coatings were formulated using refined waxes, Polysorbate-80 and distilled water at 5%, 10% and 15% concentrations for dipping tomatoes. The effect of the above coating on physiochemical properties (Physiological Weight Loss (PLW), Total soluble solids (TSS), Titratable Acidity (TA) and pH) of tomatoes was measured within 21 days at 28 °C. PLW of uncoated tomatoes indicated the highest weight loss. Then 10% coating of method B, indicated the best results of PLW, which reduced the weight loss. 15% coating, tomatoes spoiled more than others due to the blocking of the respiratory cells. Considering the methods and coatings combination, TSS values of 10% coating in A and B were increased lesser than C method. The TA of the tomatoes declined with maturity but their pH increased. All the physiochemical properties were significantly affected ($p < 0.05$) for coating treatments. Finally, it could be suggested that 10% coating of all methods indicated the effectiveness of the physiochemical properties.

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