

Title Enhancing the efficacy of chitosan coating by a novel nanoemulsion formulation
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Citation Abstracts of 7th International Postharvest Symposium 2012 (IPS2012). 25-29 June, 2012. Putra World Trade Centre (PWTC), Kuala Lumpur, Malaysia. 238 pages.
Keywords Chitosan; nanoemulsion; tomato; edible coatings; shelf-life

Abstract

The efficacy of chitosan as an edible coating has been well demonstrated, but it could be further enhanced by nanoemulsion formulation which produces novel functional properties. Hence in this study, a chitosan nanoemulsion was prepared and applied as an edible coating to perishable fruits and vegetables. The chitosan solution was homogenised in an ultrasonic bath for varying periods to generate nanoemulsions of 400, 600 and 800 nm droplet sizes. The nanoemulsion was subsequently centrifuged to remove any excess emulsifier, before it was applied as an edible coating. The chitosan nanoemulsion coating was then applied on tomato fruits along with a control with water coating. Indicators of ripening were monitored during the storage period of 20 days ($15\text{ }^{\circ}\text{C} \pm 2$ and 70 - 80 % relative humidity). Results revealed that the ripening of the coated fruits was significantly ($P < 0.05$) delayed in comparison to the control by 5 days. However, the 400, 600 and 800 nm treatments were at par ($P > 0.05$). Thus, the results of the present investigation suggest that chitosan in the form of nanoemulsions has the potential to be used as an alternative to conventional chitosan application for enhancing the shelf-life of tomato fruits.