

Development and application of rice starch based edible coating to improve the postharvest storage potential and quality of plum fruit (*Prunus salicina*)

R. Thakur, P. Pristijono, J. B. Golding, C. E. Stathopoulos, C.J . Scarlett, M. Bowyer, S. P. Singh and Q. V. Vuong

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Abstract

The study investigated the possibility of enhancing the shelf life of plum fruit coated with rice starch-**L**-carrageenan (RS-**L**-car) composite coating blended with sucrose fatty acid esters (FAEs). Film solution (starch 3%, carrageenan 1.5% and FAEs 2%) was prepared by mixing the ingredients and properties of stand-alone films (physical, mechanical, barrier and surface morphology) were studied before applying the coating on fruit surface. Fruit were stored at 20 °C for 3 weeks and analyzed for weight loss, ethylene production, respiration rate, color change, firmness, and titratable acidity (TA) and soluble solid content (SSC). Surface morphology of stand-alone film and fruit surface (after applying on the plum fruit) was studied using scanning electron microscopy (SEM). Phytochemical analysis was performed during the storage period and total phenolic content (TPC), total antioxidant capacity (TAC), flavonoid content (FC) and free radical scavenging activity were determined. The rice starch composite coating was shown to be effective in reducing both weight loss (WL) and respiration rate and inhibiting the endogenous ethylene production when compared to the uncoated control fruit stored at room temperature ($p < 0.05$). TPC, TAC, FC and free radical scavenging activity was unaffected in the coated fruit throughout the storage period ($p < 0.05$). The findings reported in this study indicate that the RS-**L**-car-FAEs coating prolongs the shelf life and maintains the overall quality of plum fruit during storage and could potentially be commercialized as a new edible coating for the plum fruit industry.