Layer-by-layer coating of hydrocolloids and mixed plant extract reduces fruit decay and improves postharvest life of nectarine fruits during cold storage

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Abstract

Due to its attractive appearance, pleasing flavor, and presence of secondary metabolites, nectarine is becoming a popular fruit day-by-day in India. However, postharvest life of nectarine fruits is only 3–4 days at ambient and 15–18 days at low-temperature storage conditions. Hence, we studied the effect of hydrocolloid-based coatings such as carboxy methylcellulose (CMC, 1.5%) and chitosan (CH, 1%) alone and/or in combination with mixed plant extract (MPE) of moringa, marigold and eucalyptus on fruit decay, postharvest life, and quality of 'Snow Queen' nectarine fruits during cold storage conditions (1 ± 1 °C, 85–90% relative humidity). The results showed that all the coatings have reduced fruit decay, weight loss (WL), maintained higher fruit firmness and functional quality attributes such as total phenolics, ascorbic acid content, and total antioxidant activity over non-coated (control) fruits. However, layer-by-layer coating of CMC–CH–MPE was the best coating as it reduced fruit decay by ~ 81% and WL by ~ 59% in the nectarine fruits. This coating also maintained the higher levels of total phenolics (~ 15.1%), ascorbic acid (13%), total antioxidant activity (~ 20%), and higher overall acceptability score on 25th day of cold storage. Thus, it can be concluded that 'Snow Queen' nectarine fruits could be stored up to 25 days at low temperature by layer-by-layer coating of CMC–CH–MPE, whereas control fruits could be stored up to 15 days only.