Influence of edible coatings chitosan/PVP blending with salicylic acid on biochemical fruit skin browning incidence and shelf life of guava fruits cv. 'Banati'

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Abstract

The effect of chitosan/poly-vinyl-pyrrolidine (CS/PVP) combined with a salicylic acid (SA) at different concentrations (0, 1, and 2 mM) of 'Banati' guava fruits were harvested at three color maturity development stages (M1; green, M2; green-yellow, and M3; yellow). the experiment was carried out during seasons 2016–2017 in a commercial orchard near Damietta Gov., Egypt. Fruits were coated by consolidated biopolymer CS/PVP-SA to minimize browning spots during shelf life at room temperature (27 ± 1 °C and air relative humidity 48 ± 2%) for fifteen days. The measurements were estimated each three-day interims to assess physical and chemical quality attributes. The physical estimations, for example, water loss rate, fruit peel color hue angle (h°), fruit skin browning index, and fruit firmness. The chemical properties, total soluble solids (SSC%), fruit acidity (TA%), and SSC/TA-ratio. The browning parameters were studied such as total phenolic compounds (TP), polyphenol oxidase (PPO; EC:1.14.18.1), and phenylalanine ammonia-lyase (PAL; EC:4.3.1.24). Furthermore, cell wall degradation enzyme activities were determined such as cellulase (CEL; EC: 3.2.1.4), lipoxygenase (LOX; EC: 1.13.11), and pectinase (PT; EC: 3.2.1.15). Furthermore, cell wall degradation enzyme activities were determined such as cellulase (CEL; EC: 3.2.1.4), lipoxygenase (LOX; EC: 1.13.11), and pectinase (PT; EC: 3.2.1.15). The changes in browning and cell wall degradation enzymes activities during shelf life are related to the presence of SA in biopolymer (CS/PVP) to fruits were delayed. The CS/PVP-SA treatment could be improved the antioxidant activities. It is, therefore, possible to point out that the treatment of guava fruits with CS/PVP-SA $_{2\ Mm}$ treatment after harvesting can be considered as a tool to reduce browning in fruit skin.