

Title A novel postharvest UV-C treatment to reduce chilling injury (membrane damage, browning and chlorophyll degradation) in banana peel

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Abstract

To investigate the mode of action of UV-C to alleviate CI in banana. Banana [Musa (AAA group), Cavendish subgroup cv. Cavendish] fruits were treated with UV-C at dosages of 0.03 kJ m^{-2} prior to storage at 8 or 25 °C. UV-C treatment reduced both the incidence and severity of banana fruits stored under low temperature. UV-C treatment reduced membrane damage indicated by lower activity of lipoxygenase (LOX) and malondialdehyde (MDA) content. In additions, the *in vitro* polyphenol oxidase (PPO) activity was activated when fruits were stored at CI temperature and UV-C treatment could inhibit the PPO activity. UV-C treatment also delayed yellowing and chlorophyll (Chl) degradation due to the inhibition of chlorophyllase and chl-degrading peroxidase activities. Furthermore, the reduction of ethylene production and respiration rate by UV-C treatment results in extended postharvest shelf life of banana. These finding suggest that the loss of cellular compartments in consequence of membrane degradation, combined with the increase of PPO activity, might contribute to the development of CI in banana peel. UV-C treatment may play an important role in maintained membrane integrity and inhibited PPO activity, reducing the severity of CI symptom and delayed ripening in banana. This novel technique may offer an advance in postharvest handling of bananas and other chilling-sensitive commodities in order to reduce postharvest losses resulting from CI.