

Preharvest spraying calcium ameliorated aroma weakening and kept higher aroma-related genes expression level in postharvest ‘Nanguo’ pears after long-term refrigerated storage

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Abstract

Refrigerated storage postponed the post-ripening of ‘Nanguo’ pears (*Pyrus ussuriensis* Maxim.), but the aromatic esters of the pears were apt to weaken when the fruit was transferred to room temperature. CaCl_2 treatment, in which the pears were sprayed with 4% CaCl_2 during the days before harvest, inhibited the appearance of aromatic weakening of the postharvest pears after long-term refrigerated storage in the study. CaCl_2 -treated pears presented higher respiration rate, ethylene production and aliphatic acids during ripening in shelf life at room temperature. Higher genes expression of lipoxygenase (*LOX*), and hydroperoxide lyase (*HPL*), which were associated with *LOX* pathway, were found in the CaCl_2 -treated fruit during the ripening in shelf life. The expression levels of genes *ACS*, *ACC*, *PuEIN4* and *PuEIN2* were up-regulated, which were related to ethylene-related pathway. These results demonstrated that the aroma weakening of ‘Nanguo’ pears can be effectively inhibited by CaCl_2 treatment and the potential inherent mechanisms are discussed.