

# Calcium inhibited peel browning by regulating enzymes in membrane metabolism of ‘Nanguo’ pears during post-ripeness after refrigerated storage

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## Abstract

The post-harvest ripening of ‘Nanguo’ pears (*Pyrus ussuriensis* Maxim.) can be effectively postponed by refrigerated storage. However, peel browning (PB) often appears in the pears after refrigerated storage during the shelf life at room temperature. In order to find an effective method to relieve PB of pears, 2%  $\text{CaCl}_2$  was used to treat the fruit after low temperature. In the study,  $\text{CaCl}_2$  treatment on the pears has efficiently restrained the appearance of PB. Higher firmness and polyphenol content were detected in  $\text{CaCl}_2$ -treated fruit during the shelf life. Electrolyte leakage and malondialdehyde (MDA) concentration were lowered in  $\text{CaCl}_2$ -treated fruit. Gene expression levels of phospholipase D (PLD) and polyphenol oxidase (PPO) were inhibited by  $\text{CaCl}_2$  treatment, and the activities of PLD and PPO were lower in  $\text{CaCl}_2$ -treated fruit. The activity and gene expression of superoxide dismutase (SOD) were promoted under  $\text{CaCl}_2$  treatment. Consequently,  $\text{CaCl}_2$  treatment effectively alleviated the PB appearance of ‘Nanguo’ pears after refrigerated storage during the shelf life at room temperature and brown-related genes are regulated by  $\text{CaCl}_2$  to varying degrees, which can help improve the quality of postharvest pears undergoing long term refrigeration and gene modification of brown pears.