

Effect of ATP treatment on enzymes involved in energy and lipid metabolisms accompany peel browning of ‘Nanguo’ pears during shelf life after low temperature storage

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Abstract

The postharvest ripening and senescence of ‘Nanguo’ pears (*Pyrus ussuriensis* Maxim.) can be effectively delayed by low temperature storage. However, peel browning (PB) often occurs in pear fruit during shelf life at room temperature. In this study, ATP treatment on ‘Nanguo’ pears has efficiently inhibited the occurrence of PB. Higher flesh firmness, ATP concentration and energy charge (EC) were detected in ATP-treated fruit during shelf life. Malondialdehyde (MDA) concentration and electrolyte leakage were lowered in ATP-treated fruit. Gene expression levels of ATP synthase (*ATPase*), NADH dehydrogenase (*NDA*) and vacuolar proton-inorganic pyrophosphatase (*VPP*) were promoted by ATP treatment, and the activities of *ATPase*, *NDA* and *VPP* were higher in ATP-treated fruit. The elevated activity and gene expression of phospholipase D (*PLD*) were restrained under ATP treatment. ATP treatment effectively alleviated the PB of ‘Nanguo’ pears and the possible mechanisms were discussed.