

Title Cold-induced endogenous nitric oxide generation plays a role in chilling tolerance of loquat fruit during postharvest storage

Author Maojun Xu, Jufang Dong, Ming Zhang, Xiangbin Xu and Lina Sun

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Abstract

The effects of low temperature on endogenous nitric oxide (NO) generation and the role of endogenous NO in chilling tolerance of loquat fruit during cold storage were investigated. Low temperature at 1 °C triggered a marked increase in endogenous NO levels in loquat fruit during postharvest storage. Pretreatment of fruit with the NO scavenger 2-(4-carboxyphenyl)-4,4,5,5-tetramethylimidazoline-1-oxyl-3-oxide (cPTIO) not only abolished endogenous NO accumulation but also aggravated chilling injury symptoms in the fruit stored at 1 °C and 95% RH. Moreover, the cold-stored fruit in which NO accumulation is abolished by cPTIO exhibited significantly higher membrane permeability, lipid peroxidation, superoxide anion ($O_2 \cdot^-$) production rates and hydrogen peroxide (H_2O_2) contents than the control fruit. Furthermore, the results show that abolition of endogenous NO accumulation significantly reduced activities of superoxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX) and peroxidase (POD) in the fruit during cold storage. Together, our results suggest that cold-induced endogenous NO generation in loquat fruit during postharvest storage plays a critical role in alleviating chilling injury symptoms by affecting the antioxidative defense systems in the fruit.