

Effects of 1-MCP on fruit quality and core browning in ‘Yali’ pear during cold storage

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Abstract

‘Yali’ pear (*Pyrus bretschneideri* Rehd. cv. Yali) is susceptible to core browning after a long term of cold storage. In this study, the effects of 1-methylcyclopropene (1-MCP) with different concentrations (0, 0.25, 0.5, 1.0 $\mu\text{L L}^{-1}$) on the quality and core browning of ‘Yali’ pear fruit were investigated. The results showed that 1-MCP significantly reduced the ethylene production, kept higher firmness and titratable acidity (TA) content, and lowered core browning. Moreover, the most effective concentration of 1-MCP was found at 1.0 $\mu\text{L L}^{-1}$. Compared with control, 1.0 $\mu\text{L L}^{-1}$ 1-MCP treatment decreased the content of H_2O_2 , while maintained higher levels of ascorbic acid (AsA) and glutathione (GSH) of core, and meanwhile, it reduced phenolics content and polyphenol oxidase (PPO) activity of core. In addition, among the four encoded the enzyme of PPO genes (*PbPPO1*, *PbPPO4*, *PbPPO5* and *PbPPO6*), the expressions of *PbPPO1* and *PbPPO5* were markedly inhibited by 1-MCP. It suggested that 1-MCP could effectively keep fruit quality, and inhibit core browning which was resulted from the inhibition on accumulation of reactive oxygen species, reduction on phenolics content, PPO activity and its associated genes (*PbPPO1* and *PbPPO5*) expression of core in ‘Yali’ pear during cold storage.