Effect of 1-methylcyclopropene and chitosan treatment on the storage quality of jujube fruit and its related enzyme activities

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Abstract

The purpose of this study was to investigate the effects of 1-methylcyclopropene (1-MCP) and chitosan treatment on the storage of Xinjiang jujube fruit at 0 ± 1 °C (relative humidity 90%–95%) for 42 d. Indicators such as rotting rate, firmness, and soluble solids as well as peroxidase (POD), polyphenol oxidase (PPO), lipoxygenase (LOX), superoxide dismutase (SOD), catalase (CAT), and ascorbate peroxidase (APX) activities were measured. The results showed that 1-MCP or chitosan treatment alone inhibits rotting, delays the decline of soluble solids, maintains fruit firmness, and inhibits the accumulation of malondialdehyde. Furthermore, the activities of antioxidant enzymes such as POD, SOD, CAT, and APX are increased, while those of PPO and LOX are inhibited. However, the effect of 1-MCP and chitosan together is superior to that of 1-MCP or chitosan treatment alone. In conclusion, our results indicate that combined 1-MCP and chitosan treatment is an effective strategy for improving the postharvest quality and prolonging the shelf life of Xinjiang jujube fruit.