Effect of hot water treatment on chilling injury incidence and antioxidative responses of mature green mume (*Prunus mume*) fruit during low temperature storage

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Abstract

Mume (*Prunus mume* Sieb. et Zucc.) fruit are harvested and consumed at the mature green stage and have a short storage life at ambient temperature. The current handling and storage temperatures, below 6 °C, extend the storage life to a week, but chilling injury (CI) occurs after a longer storage. A pre-storage hot water treatment, dipping 'Nankou' fruit in 45 °C water for 5 min, substantially reduced susceptibility of fruit to CI at 6 °C storage, and extended storage life for three-fold. This research was conducted to reveal the antioxidantive responses of fruit to pre-heat treatment and chilling storage. Hot water treatment inhibited the increases in malondialdehyde and hydrogen peroxide levels, and delayed the decreases in ascorbate contents and total antioxidant capacity levels compared with the control fruit during storage. The activities of antioxidant-related enzymes including ascorbate peroxidase and monodehydroascorbate reductase were higher in hot water treated fruit than in the control fruit during cold storage. These results indicate that the alleviation of CI in mature green fruit by hot water treatment might be due to the protection and enhancement of the antioxidant system by increased activity of related enzymes.