

**Title** The effect of combination of hot water and some postharvest treatment on quality and storage life of Satsuma mandarin

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#### **Abstract**

This study was carried out between 2001 and 2003 to determine the effects of chlorine and heat applications on postharvest losses and storability of 'Satsuma' mandarins (*Citrus unshiu* Mar., cv. Owari). In the first year of the experiment, fruit were dipped in chlorine solutions at different free chlorine [ $\text{Ca}(\text{OCI})_2$ ] concentrations, 0, 50, 100, 150 and 200  $\mu\text{g mL}^{-1}$ , for 2 minutes. In the second year of the experiment, the best resulting chlorine concentration (100  $\mu\text{g mL}^{-1}$ ) was tested with hot water (53°C for 3 min) and hot air treatments (38°C for 48 h) applied either alone or together. In both years, 'Satsuma' fruits were stored for 60 days at  $5\pm 0.5^\circ\text{C}$  and 90-95% relative humidity. First year's results showed that 100  $\mu\text{g mL}^{-1}$  chlorine application provided the best results and higher concentrations increased loss due to diseases, significantly. Hot water+chlorine application decreased the epiphytic microbial populations on fruit surface at a significant level. Scanning electron microscope imaging showed that the surfaces of fruits treated with hot water were more homogeneous and the stomas and cracks were closed in contrast to control and other tested applications. At the end of the storage period, total ratio of diseased fruits reached to 15% in control fruits, and then followed by the chlorine application. Heat applications either alone or in combinations resulted in the lowest decay ratios or no decay was observed. The 53°C hot water application for 3 min was found to be the best treatment since it did not have any negative effects like the hot air applications; it provided effective protection in disease control and affected many quality parameters positively.