

Title Effect of intermittent warming combined with methyl jasmonate treatment on chilling injury and quality of peach fruit

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Citation Abstracts of 7th International Postharvest Symposium 2012 (IPS2012). 25-29 June, 2012. Putra World Trade Centre (PWTC), Kuala Lumpur, Malaysia. 238 pages.

Keywords peach; chilling injury

Abstract

The effect of intermittent warming (IW), methyl jasmonate (MJ) treatment and a combination of IW and MJ (IW+MJ) treatment on chilling injury and fruit quality was investigated. Severity of internal browning (IB), fruit color (L^* , a^* , b^* value), firmness, extractable juice, total soluble solids (TSS), total acid, vitamin C and ion leakage were measured after 3 and 5 weeks of storage at 0 °C plus 3 d at 20°C for shelf-life determination. The activities of superoxide dismutase (SOD, EC 1.15.1.1), catalase (CAT, EC 1.11.1.6), ascorbate peroxidase (APX, EC 1.11.1.11), polyphenol oxidase (PPO, EC 1.10.3.1) and peroxidase (POD, EC 1.11.1.7) were analyzed after 3 and 5 weeks of storage at 0 °C. The results showed that treatment with IW or MJ alone significantly prevented IB in peach fruit compared with the control. IW+MJ treatment had better effect than IW or MJ treatment alone. The IB index was 37.3%, 29.7% and 52.2%, respectively lower in IW, MJ and IW+MJ treatment than that in control fruit after storage for 5 weeks. Extractable juice, TSS, total acid and vitamin C contents were also maintained at higher levels in the combined treatment. However, no significant difference was found on firmness and quality parameters among treatments. Moreover, the combined treatments resulted in higher activities in SOD, CAT and APX, and lower activities in PPO and POD than the control. These results suggest that a combination of IW and MJ treatment may be a useful technique to alleviate chilling injury of peach fruit during cold storage. The effect of IW combined with MJ treatment on alleviating chilling injury of peaches may be attributed to its ability to enhance antioxidant system and maintain membrane integrity.