

The alleviation of cold-stimulated flesh reddening in ‘Friar’ plum fruit by the elevated CO₂ with polyvinyl chloride (PVC) packaging

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Abstract

Flesh reddening (FR) is considered as one of the most important chilling injury (CI) symptoms of ‘Friar’ plums. The effect of different modified atmosphere packages on FR of ‘Friar’ plums was investigated and it was found that polyvinyl chloride (PVC) packaging could effectively alleviate FR. Especially, complete suppression of FR by PVC packaging was achieved during storage at 0 °C for 8 weeks and shelf life at 25 °C for 7 days following 4 weeks of storage. PVC packaging altered atmosphere components and completely inhibited cold-induced ethylene production in ‘Friar’ plums. The PVC-packaged plums lowered accumulation of metabolites and decreased activities of enzymes associated with the phenylpropanoids pathway and the anthocyanins biosynthesis. As a result, cyanidin 3-*O*-glucoside and cyanidin 3-*O*-rutinoside, two red pigments, failed to accumulate in the flesh of the PVC-packaged plums. Collectively, PVC packaging improved quality and alleviated CI of ‘Friar’ plums during refrigeration and shelf life.