Title Crucial contribution of membrane lipids' unsaturation to acquisition of chilling-tolerance in peach fruit stored at 0 °C

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Abstract

Peach fruits (*Prunus persica* L.) were less prone to chilling injury (CI) when stored at 0 °C than at 5 °C for 30 days. In order to make known the mechanism involved, the relationship between CI and membrane lipid unsaturation was investigated in this study. The results demonstrated that peach fruit stored at 0 °C manifested higher membrane lipid fluidity and higher membrane lipid unsaturation than at 5 °C. In addition, a higher omega-3 fatty acid desaturase gene (*FAD*) mRNA level and a higher level of linolenic acid (C18:3) were found when peach fruits were stored at 0 °C. The findings indicated that the higher membrane lipid unsaturation in peach fruit stored at 0 °C was beneficial in maintaining membrane lipid fluidity and enhancing tolerance of peach fruit to low temperature stress, and the C18:3 level could be regulated by omega-3 *FAD*.