

Title Regulation of the expression of lipoxygenase genes in *Prunus persica* fruit ripening
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Citation Acta Physiologiae Plantarum, 33, Number 4, 1345-1352, 2011
Keywords Lipoxygenase; Cloning; Postharvest; Gene expression; Peach

Abstract

Three genes of the lipoxygenase (*LOX*) family in peach (*Prunus persica* var. *compressa* cv. Ruipan 4) were cloned, and their expression patterns during fruit ripening were analyzed using real-time quantitative PCR. All of the three peach *LOX* genes had been expressed during fruit ripening; however, their expression patterns were significantly different. During the normal ripening of peach fruits, the expression levels of *PpLox1*, *PpLox2* and *PpLox3* increased in varying degrees accompanying upsurge of ethylene evolution. After treated by methyl jasmonic acid (MeJA), the peak of ethylene releasing occurred in advance, and the declining rate of fruit hardness was accelerated, the expression level of the three peach *LOX* genes in fruits markedly enhanced at the early stage of storage, but significantly decreased at the late storage stage. So, it could be suggested that all three *LOXs* relate to fruit ripening; however, their functions might be different. *PpLox1* expression increase along with the upsurge of ethylene evolution in both control and MeJA-treated peach fruits suggested that *PpLox1* probably played a major role in the peach fruit ripening. Expression peak of *PpLox2* appeared at the 1 DAH (days after harvest) in both control and MeJA-treated peach fruits, while obvious changes in ethylene evolution and fruit hardness was not observed, which suggested that the rise of *PpLox2* expression can be induced by certain stimulation related to ripening, such as harvesting stress and MeJA treatment. The expression of *PpLox3* kept a lower level in the natural ripening fruits, whereas raced up at the early stage of storage in the fruits treated with MeJA, which indicated that *PpLox3* was expressed inductively and had minor roles during the normal ripening of peach fruits, but when encountered with external stimulation, its expression level would rapidly enhance and accelerate the ripening of peach fruit.

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