

Membrane lipid metabolism in relation to core browning during ambient storage of ‘Nanguo’ pears

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Abstract

‘Nanguo’ pears are prone to core browning at ambient temperatures. To reveal the role of membrane lipid metabolism in the process of core browning, fruit were treated with n-butanol, a phospholipase D (PLD) inhibitor. Changes in phospholipids and fatty acids, as well as the activities and gene expression of key enzymes were analyzed. Membrane phenotype and ultrastructure were also documented. Phospholipid and fatty acid levels, the activities of PLD and lipoxygenase (LOX), and gene expression changed during fruit ripening. PLD activity and gene expression in n-butanol-treated fruit were lower than those in control fruit, and the symptoms of core browning appeared later and were less severe. Furthermore, the membrane ultrastructure of fruit treated with n-butanol was intact compared with that in control fruit. These results suggested that membrane lipid metabolism plays an important role in the core browning of harvested ‘Nanguo’ pears, and that n-butanol treatment can alleviate disorder development by regulating membrane lipid metabolism.