

Title Changes in biosynthesis of aroma volatile compounds during on-tree maturation of ‘Pink Lady®’ apples

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Citation Postharvest Biology and Technology, Volume 47, Issue 3, March 2008, Pages 286-295

Keywords Aroma; Alcohol dehydrogenase; Alcohol *o*-acyltransferase; Hydroperoxide lyase; Lipoxygenase; Pyruvate decarboxylase; *Malus × domestica*; Maturation; ‘Pink Lady®’ apple; Quality; Volatile compounds

Abstract

The production of aroma volatile compounds and standard quality attributes, in addition to lipoxygenase (LOX), hydroperoxide lyase (HPL), pyruvate decarboxylase (PDC), alcohol dehydrogenase (ADH) and alcohol *o*-acyltransferase (AAT) activities, were assessed during maturation of ‘Pink Lady®’ apples. Low production of aroma volatiles was observed in early harvested fruit, which gradually increased as ripeness approached. Hexyl acetate, hexyl 2-methylbutanoate, hexyl hexanoate, hexyl butanoate, 2-methylbutyl acetate and butyl acetate were prominent within the blend of volatiles produced by fruit throughout maturation. Multivariate analysis showed these compounds had the highest influence on differentiation of maturity stages, indicating that aroma volatile emission is an important factor for definition of fruit ripeness, which suggests production of these esters might be useful as an index of maturity. No large variations in AAT activity were found throughout the experimental period despite increasing ester emission, suggesting the enhancement of ester production by ‘Pink Lady®’ apples at ripening arises mainly from greater availability of substrates. Increased LOX activity was observed at later stages of fruit development, and the possible role of this enzyme activity on enhanced capacity for aroma volatile biosynthesis in more mature fruit is discussed.