Title Aroma volatile biosynthesis in apples at harvest or after harvest affected by jasmonates

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Citation ISHS Acta Horticulturae 712: 381-388. 2006.

Keywords apples; ethylene; jasmonates; volatile

Abstract

Effects of jasmonates on production of aroma volatile compounds by 'Tsugaru' apples [*Malus sylvestris* (L.) Mill. var. domestica (Borkh.) Mansf.] at harvest, and by 'Delicious' apples after harvest were examined. Among volatiles classified as alcohols, esters, ketones, aldehydes, acetic acid, and α-farnesene, esters were the most prevalent compounds, followed by alcohols. Jasmonate treatment at pre-climacteric stage increased the production of esters (butyl propanoate, butyl butyrate, and propyl butyrate) and of anthocyanin. In addition, jasmonate treatment stimulated 1-aminocyclopropane-1-carboxylate oxidase 1 (*ACO 1*) mRNA transcript and thylene production at 3 days after treatment. This result suggests that jasmonates may influence ACC oxidase activity. The impact of jasmonate application after harvest on volatile production differed with cultivar. The combination of ethephon with jasmonates reduced volatile production by 'Delicious' compared with ethephon only. The effect of jasmonates on volatile production was related to the effect of jasmonates on internal ethylene concentration. The results show that the effect of jasmonates on aroma volatiles in apples may be mediated by ethylene. Furthermore, the effect of jasmonates on aroma volatiles may depend on the fruit development stage when treated with jasmonates.