

Title The roles of jasmonates in fruit color development and chilling injury
Author S. Kondo
Citation ISHS Acta Horticulturae 727:45-56. 2006.
Keywords anthocyanin; apples; low temperature; mangosteens; sweet cherries

Abstract

The roles of jasmonates, [jasmonic acid (JA) and methyl jasmonate (MeJA)], on fruit color development and chilling injury were investigated. The effects of jasmonates on fruit color development differed between climacteric and nonclimacteric fruits. Jasmonates were concentrated in the early growth stages of apple (climacteric) fruit pulp [*Malus sylvestris* (L.) Mill. var. *domestica* (Borkh.) Mansf.] development, decreased with days after full bloom (DAFB), and then increased again during maturation. However, in sweet cherry (nonclimacteric) fruit pulp (*Prunus avium* L.), their concentrations were high during early growth stages then decreased toward harvest. Jasmonates, and jasmonates combined with aminoethoxyvinylglycine (AVG) stimulated greater anthocyanin accumulation compared to untreated controls (UC), in apples, regardless of fruit growth stages. Therefore, jasmonates may be related to anthocyanin formation in apples in the presence and absence of ethylene. The expression of UDP-glucose Flavonoid 3-O-glucosyltransferase (*UGluT*) anthocyanin biosynthetic gene increased in the skin treated by JA which had higher anthocyanin than the UC. In contrast, jasmonates did not influence anthocyanin accumulation in sweet cherries. The effect of low temperatures on jasmonates was examined in mangosteen (*Garcinia mangostana* L.). JA in the skin of fruit stored at 7°C increased compared with fruits stored at 13°C. Exogenous application of *n*-propyl dihydrojasmonate, which is a JA derivative, effectively decreased chilling injury (CI). Low temperature-induced JA may play a protective role against CI.