Abstract

The roles of jasmonates [jasmonic acid (JA) and methyl jasmonate (MeJA)] on anthocyanin accumulation and low temperature stress were investigated. Jasmonates or jasmonates combined with aminoethoxyvinylglycine (AVG) stimulated greater anthocyanin accumulation compared to the untreated control (UC), in apples regardless of fruit growth stages. Therefore, jasmonates may be related to anthocyanin formation in apples [*Malus sylvestris* (L.) Mill. var *domestica* (Borkh.) Mansf.] in the presence and absence of ethylene. Cyanidin 3-galactoside was the primary anthocyanin in apples. The expression of five anthocyanin biosynthetic genes of chalcone synthase (CHS), flavanon 3-hydroxylase (F3H), dihydroflavonol 4-reductase (DFR), anthocyanidin synthase (ANS), and UDP-gucose flavonoid 3-O-glucosyltransferase (UFGluT) was examined in apples. The expression of UFGluT was detected in the development stage only when anthocyanin was detected. The expression of UFGluT anthocyanin biosynthetic gene increased in the skin treated with JA which had higher anthocyanin than the UC. In contrast, jasmonates did not influence anthocyanin accumulation in sweet cherries (*Prunus avium* L.). Effect of low temperatures on jasmonates was examined in mangosteens (*Garcinia mangostana* L.), mango (*Mangifera indica* L.), and banana (*Musa* spp.). In mangosteens, JA in the skin of fruit stored at 7°C increased compared with 13°C. Superoxide dismutase (SOD) activity, total phenolics, and ascorbic acid were each linked to the degree of Chilling injury (CI). Exogenous application of n-propyl dihydrojasmonate, which is a JA derivative, effectively decreased CI. In general, IC_{50} values of O_2^-- and DPPH-radical scavenging activity were associated with the degree of CI. Low temperature-induced JA may play a protective role against CI.