Gene Expression Pattern Analysis Related to Maturity in Early-ripening Mutant of ‘Fuji’ Apple

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Apple fruit ripens through chemical changes on developmental stages until reaching the consumer. These changes are result of the interaction of the genes involved in maturity. The expression level of gene related to ripening plays an important role in determining quality of fruit. There are many genes known to be connected with maturation. Among them, we focused on cross-talks between ethylene and auxin and developmental regulators. Therefore, we selected the genes associated with synthesis or signal transduction of ethylene and auxin, developmental regulators. We identified the expression level and pattern of them in ‘Fuji’ apple and early-ripening mutant of ‘Fuji’ apple, ‘Beni shogun’. Consequently, we confirmed MdACO1 (1-aminocyclopropane-1-carboxylate oxidase 1) of ‘Beni shogun’, a gene related to ethylene biosynthesis, increased sharply than ‘Fuji’ apple. In addition, the transcription factor MdEIL1 (ETHYLENE INSENSITIVE 3-like 1 protein), a gene related to ethylene signal transduction, showed different expression pattern. Through this study, we could explore the key genes that accelerate the ripening of apples and suggest the possibility of coexistence between early maturing and maintaining good quality.

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