

Transcriptome analyses provide new possible mechanisms of aroma ester weakening of ‘Nanguo’ pear after cold storage

Fei Shi, Xin Zhou, Qian Zhou, Zhuo Tan, Miao-miao Yao, Bao-dong Wei and Shu-juan Ji

Scientia Horticulturae 237: 247-256. (2018)

Abstract

‘Nanguo’ pear are popular for their unique aroma ester. However, we found that the fragrance faded undergoing long term low temperature (LT) storage, and the aroma-weakening mechanism has not been well understood. To this end, the transcriptome of the fruit on 0 d and optimum tasting period (OTP) during shelf life at room temperature (RT) and after cold storage were analyzed, respectively. On the OTP, the kind of volatile esters decreased to 18 and the total content of aroma ester decreased significantly after cold storage. A total of 2441 and 7513 genes were differentially expressed between 0 d and the OTP during shelf life and after cold storage, respectively. These genes were categorized into various functional groups and pathways according to the bio-information analysis. Notably, genes demonstrated significant differential expression only in the fruit after LT storage included several from the plant hormone signal transduction category such as *DELLA* and *JAR*, as well as some related to fatty acid metabolism such as *fadD*, *fabG*, *SCD*, *FAD*, *LOX2S* and *HPL* and transcription factors (TFs) MYBP, NFYA, and ERF1. These results revealed that the signal transduction of abscisic acid, salicylic acid, fatty acid metabolism, as well as TFs plays important roles in the aroma weakening after cold storage.