

Zhang Huping



Areas of Research

Biology of fruit quality.

Contact Information

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Research Interests

Biology of fruit quality, mainly focus on the mechanism and regulation of sugar metabolism and aroma compounds biosynthesis during pear fruit development and ripening

Some of the problems we are currently working on are described below:

1. Sugar metabolism

Sugar content is one of the critical flavor quality traits perceived by consumers, and the transported sugars are stored or metabolized in cells, where they can affect fruit quality.

- 1) We determine the phloem unloading pathway in pear using transmission electron microscopy coupled with a symplasmic tracer dye, carboxyfluorescein diacetate (CFDA).
- 2) We report expression patterns of PbTMTs and correlations with sugar contents of pears, and demonstrate the important role of PbTMT4 in fruit development and ripening.
- 3) We tried to dissect the molecular mechanism of sugar accumulation in pear fruit using the RNA-seq-based transcriptome analysis and weighted gene coexpression network analysis (WGCNA) mainly by comparing two cultivars (low-sucrose pear and high-sucrose pear) in three fruit-ripening stages.

2. Aroma compounds biosynthesis

Aroma is a key factor determining the flavor characteristics in fruits, especially because it largely influences consumer choice and preference. We focus on the LOX pathway of fatty acid metabolism and explores the changes in volatile compounds, substrates, associated enzyme activity, and gene expression in the Korla fragrant pear during fruit development. In addition, the role of external precursors in the production of volatile

esters was evaluated. Our results provide insight into the potential limiting factors in the biosynthesis of esters and, thus, help in improving the flavor quality of pears.

Education Background

Bachelor: Shanxi Agricultural University

Master: Shihezi University

Doctor: Nanjing Agricultural University

Work experience

Lecturer, Shihezi University, 2004-2009

Assistant Professor, Shihezi University, 2009-2014

Assistant Professor, Nanjing Agricultural University, 2014-

Selected Publication

Zhang H, Zhang S, Qin G, Wang L, Wu T, Qi K and Zhang S. 2013. Molecular cloning and expression analysis of a gene for sucrose transporter from pear (*Pyrus bretschneideri* Rehd.) fruit. *Plant Physiology and Biochemistry*. 73: 63-69.

Zhang H, Wu J, Tao S, Wu T, Qi K, Zhang S, Wang J, Huang W, Wu J and Zhang S*. 2014. Evidence for apoplasmic phloem unloading in pear fruit. *Plant Molecular Biology Reporter*. 32 (4): 931-939.

Chen J, Lu J, He Z, Zhang F, Zhang S and Zhang H. 2020. Investigations into the production of volatile compounds in Korla fragrant pears (*Pyrus sinkiangensis* Yu). *Food Chemistry*. 302: 125337.

Lü J, Tao X, Yao G, Zhang S and Zhang H. 2020. Transcriptome analysis of low- and high-sucrose pear cultivars identifies key regulators of sucrose biosynthesis in fruits, *Plant and Cell Physiology*, 61 (8): 1493 – 1506.

Cheng R, Cheng Y, Lue J, Chen J, Wang Y, Zhang S and Zhang H. 2018. The gene *PbTMT4* from pear (*Pyrus bretschneideri*) mediates vacuolar sugar transport and strongly affects sugar accumulation in fruit. *Physiologia Plantarum*. 164 (3): 307-319.
