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Comparative transcriptome analysis of candidate genes involved in chlorogenic acid biosynthesis during fruit development in three pear varieties of Xinjiang

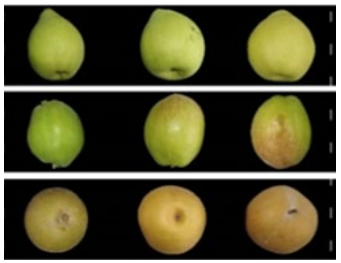
Key words:

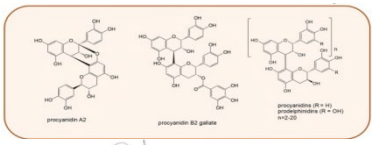
Pear varieties, Chlorogenic acid, Transcriptome analysis, DEGs, WGCNA



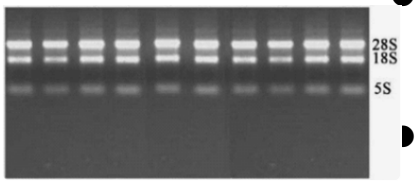
Research Summary

Chlorogenic acid （CGA）is a potential chemo-preventive agent with many biological activities in pear fruit. The key genes of involved in CGA biosynthesis during the development of pear fruits in three pear varieties of Xinjiang were excavate in this research to provide the guidance for future.

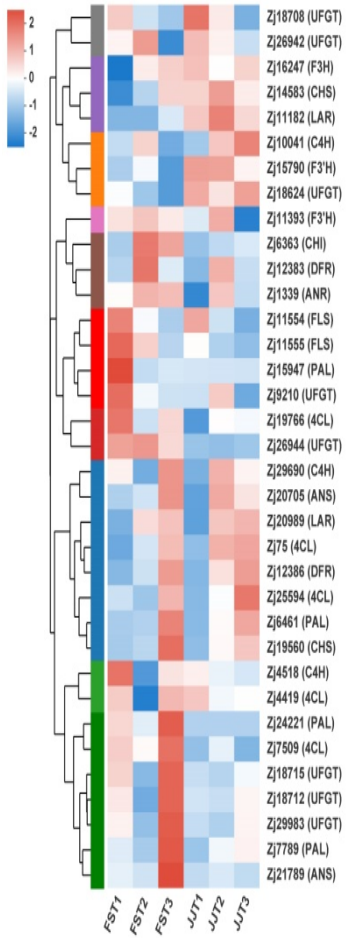








- **Determination of CGA and arbutin content of three pear varieties, *Pyrus bretschneideri* Rehd, *P. sinkiangenensis* Yü , *P. pyrifolia* (Burm. F.) Nakai. cv. Starkrimson at different developmental periods**
- **RNA sequencing, de novo assembly function annotation and classification**
- **Analysis of differential expression genes(DEG)**
- **Analysis of key genes involved CGA biosynthesis**
- **The weighted gene co-expression network analsis** (WGCNA) **of DEGs**



Innovation points

- Systematically measured the contents of arbutin and CGA in fruit during development of three pear cultivrs.

- Obtain 77,130 unigenes from 1,343,719,214 clean reads by sequencing RNA samples of the three pear varieties from the three typical stages, 88, 103 and 163 days after full bloom.

- A total of 47,579 unigenes accounting for 61.69% of all unigenes were annotated.

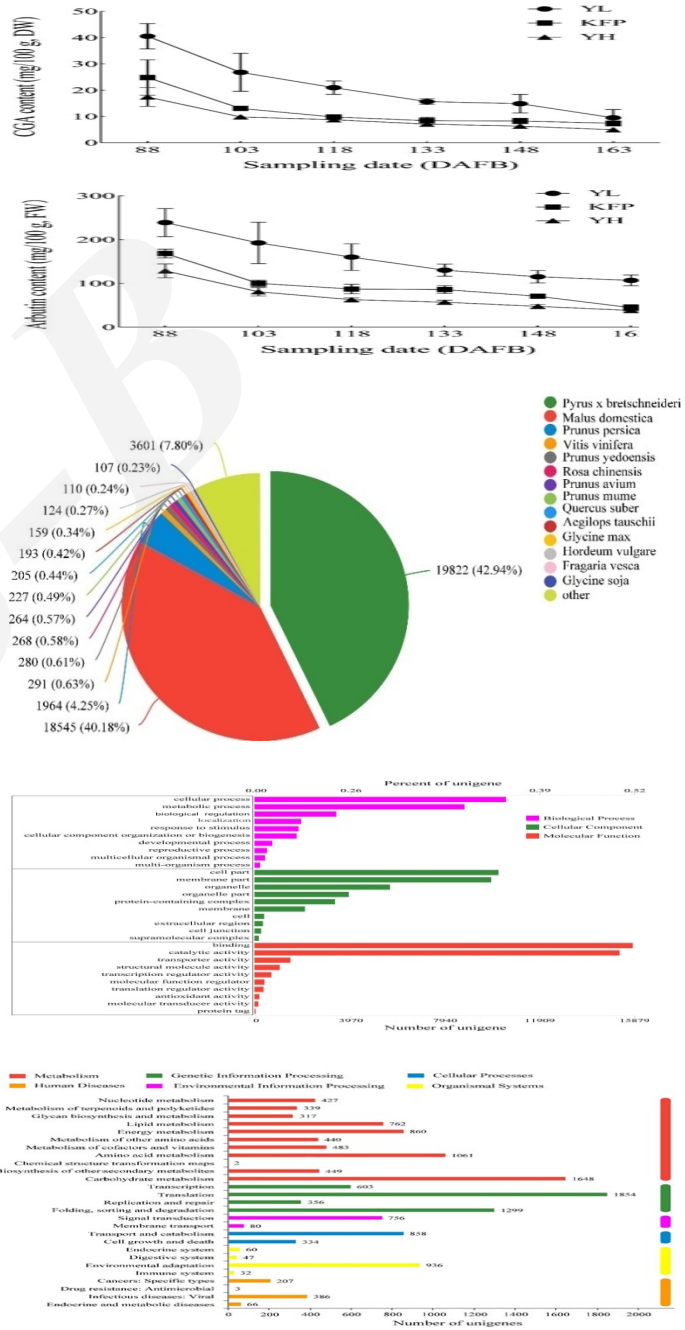
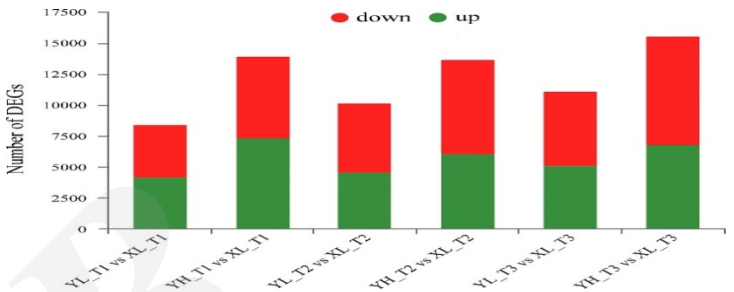


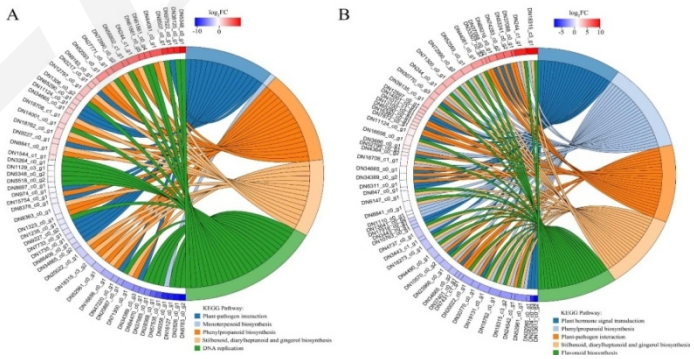
Figure 4

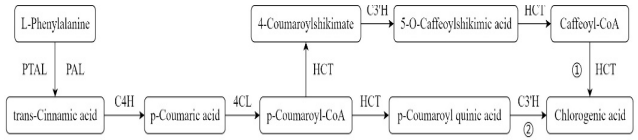
Innovation points

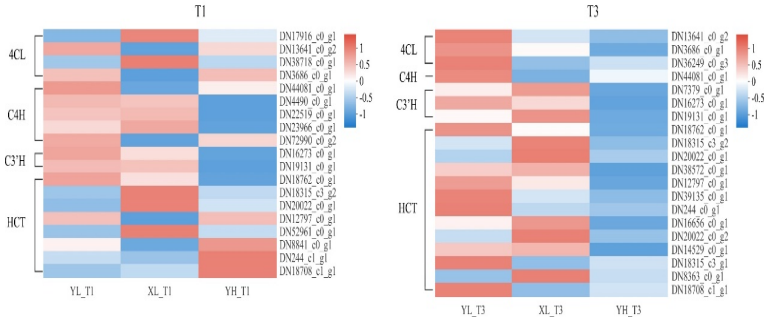
- **Ten typical differentially DEGs including two 4CLs, one C4H, two C3'Hs and five HCTs were identified as the key regulatory genes in CGA biosynthesis**

- **C3'H and HCT in the downstream pathway of CGA biosynthesis were identified as the key rate limiting enzymes via WGCNA of DEGs at different development stages.**









Prospection





Advocating a well-balance diet or promoting healthy eating, especially increasing fruit intake, is becoming the most one important approach to prevent or reduce diet-related non-communicable diseases. Pears are one of the more commonly consumed fruits in the world. The varieties or cultivars of pear containing rich polyphenols, especially CGA and arbutin with important bioactivities have been paid more attention.

Our study will provide important data for nutritional evaluation and guidance in the future breeding of pear fruits in China.