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The transcriptomic studies on rice (*Oryza sativa*) developing embryo and endosperm

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RNA-seq analysis of rice (*Oryza sativa* L.ssp. *indica* cv. 9311) developing embryo (3, 7 and 14 DAP (Days after Pollination)) generated 27,190 genes. Among these genes, the number of genes expressed stage-specifically were 1,131, 1,443 and 1,223 and a total of 1,011 differentially expressed genes were identified, while 672 genes with significant changes in expression between 3 and 7 DAP, 504 DEGs between 7 and 14 DAP. A large number of genes related to metabolism, transcriptional regulation, nucleic acid replication/processing and signal transduction were expressed predominantly in the early and middle stages of embryogenesis. In addition, we found that many transcription factor families may play important roles at different developmental stages, not only in embryo initiation but also in other developmental processes. The endosperm development has an important role for rice yield and quality. We used RNA-seq to reveal the molecular mechanisms involved in rice endosperm development. Three cDNA libraries were taken from rice endosperm at 3, 6 and 10 days after pollination (DAP), which resulted in the detection of 21,596, 20,910 and 19,459 expressed genes, respectively, and 10,371 genes were differentially expressed. A large number of genes related to ribosomes, the spliceosome and oxidative phosphorylation were found to be expressed in the early and middle stages. Plant hormone, galactose metabolism and carbon fixation related genes showed a significant increase in expression at the middle stage, whereas genes for defense against disease or response to stress as well as genes for starch/sucrose metabolism were strongly expressed during the later stages of endosperm development. The RNA-Seq result confirmed the expression characteristics of rice endosperm development.

Biography

Jianbo Wang has completed his PhD from Wuhan University, China. He is interested in the research on plant reproductive development, and has published more than 40 papers in reputed journals.

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