Xiaqing Yu

Areas of Research

Plant Polyploidy, plant genetics and stress physiology.

Contact Information

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Research Interests

1. Plant Polyploidy

Our primary research focus on plant polyploidization – one of the most important driving forces in plant speciation. Polyploidization often results in very diverse phenotypic changes, such as larger organs and enhanced stress tolerance. The molecular mechanism underlying these changes are largely unknown. We are using a new artificial experimental system in *Cucumis* to study both the phenotypic and genomic consequence of polyploidization in the hope of understanding the evolutionary success of polyploids in nature. *C*. ×*hytivus* (*Cucumis* ×*hytivus* Chen and Kirkbride, 2n = 38) is an allotetraploid obtained through interspecific cross and subsequent genome duplication between *C*. *hystrix* (2n = 24) and cucumber (2n = 14). *C*. ×*hytivus* represents a breakthrough in the wide hybridization of *Cucumis* and is a valuable resource for the improvement of cucumber. However, newly synthesized allopolyploid also suffers from the “genomic shock”, which leads to the extensive genetic and epigenetic changes. We have characterized the phenotypes of *C*. ×*hytivus* and assembled its genome using state-of-art sequencing technology. Significant subgenome dominance and instant sequence loss were detected following allopolyploidization in *Cucumis*. Currently we are going to resolve the role of non-coding RNAs in plant polyploidy and explore the single cell level transcriptomic changes after polyploidy.

2. Plant genetics and stress physiology

The growing human population and climate change are putting an ever-great burden on agriculture. Stress-resistant crops are needed to ensure yield stability. Plants are

continuously subjected to a number of different simultaneous abiotic stresses in nature and the combinations of drought and heat stresses have shown a significantly detrimental effect on plant growth compared to the effect of the individual stresses. Therefore, we are aiming to understand the mechanism underlying combined stress tolerance, especially those driven by polyploidy.

Education Background

Bachelor： Nanjing Agricultural University
Doctor： Nanjing Agricultural University

CSC joint-PhD program: Aarhus University

Work experience

Assistant Professor, Nanjing Agricultural University, 2016-

Honors and Awards

Shen Nong China Agricultural Science and Technology Award

Selected Publication

Xiaqing Yu, Zaobing Zhu, Tinglin Zhang, Ji li, Chunyang Cheng, Qunfeng Lou, Carl-Otto, Ottosen, Jinfeng Chen*. High-throughput sequencing reveals change of microRNA expression caused by allopolyploidization in *Cucumis*. *Biologia Plantarum*. 2020, 64, 104-109.

Xiaqing Yu, Xixi Wang, Benita Hyldgaard, Zaobing Zhu, Rong Zhou, Katrine H. Kjær, Theoharis Ouzounis, Qunfeng Lou, Ji Li, Qingsheng Cai, Eva Rosenqvist, Carl-Otto Ottosen and Jinfeng Chen. 2018. Allopolyploidization in *Cucumis* contributes to delayed leaf maturation with repression of redundant homoeologous genes. *The Plant Journal*. 94, 393-404.

Xiaqing Yu, Rong Zhou, Xixi Wang, Katrine H. Kjær, Eva Rosenqvist, Carl-Otto Ottosen and Jinfeng Chen. 2016. Evaluation of genotypic variation during leaf development in four *Cucumis* genotypes and their response to high light condition. *Environmental and Experimental Botany*. 124, 100-109.

Xiaqing Yu, Benita Hyldgaard, Eva Rosenqvist, Carl-Otto Ottosen, Jinfeng Chen. 2015. Interspecific hybridization in *Cucumis* leads to the divergence of phenotypes in response to low light and extended photoperiods. *Frontiers in Plant Science*. 6, 802.