

Lou Qunfeng



Areas of Research

Plant genetic and breeding, plant molecular and cytogenetics.

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Research Interests

Cucubits crop genetic and breeding; plant molecular and cytogenetics; interspecific introgression; plant chromosome evolution

The Lou lab integrates modern genomic and biotechnology methods to study the genetic and molecular mechanisms of important traits in cucubits crops, especially cucumber. And we also are interested on interspecific hybridization in cucumis species and its roles in cultivar improvement, and some researches on the plant species evolution based on the chromosome rearrangement analysis. Some of the problems we are currently working on are described below:

Cucubits crop genetic and breeding

Our primary research interest concerns how the breeding traits form in cucumber. Much of the work focuses on the traits related with plant types and fruit traits. We collect germplasms and also create new germplasms, like through interspecific hybridization, and mutation etc. The problems about the molecular mechanisms of desirable traits, including ideal plant types, fruits traits have attracted our attention recently.

Interspecific hybridization and introgression

We create some unique germplasms thought interspecific hybridization, including allopolyploids, alien addition lines, and introgression lines. We are interested on the chromosomal recombination and genomic interaction from different species in these special germplasms, also the mechanisms of gene introgression.

Plant chromosome evolution

How the plant species arise from the common ancestor is the one of the most fundamental questions in biology. We are interested on the rearrangement of chromosome structure and its roles in plant species formation. We developed some chromosome painting analysis techniques with a high resolution (Plant J, 2020, 102(1):178-186; Plant J, 2014, 78(1):169-79), and employed these techniques to study the differentiation of chromosome structure in Cucumis speices, and analyze the contribution of chromosomal rearrangements to Cucumis speciation.

Education Background

Bachelor: Nanjing Agricultural University

Master: Nanjing Agricultural University

Doctor: Nanjing Agricultural University

Work experience

Assistant Professor, Jiangsu Academy of Agricultural Sciences, 1998-2004

Assistant Professor, Nanjing Agricultural University, 2004-2007

Visiting Scholar, University of Wisconsin-Madison, USA, 2008-2010

Associate Professor, Nanjing Agricultural University, 2008-2014

Professor, Nanjing Agricultural University, 2015-

Selected Publication

- Bi, Y., Zhao, Q., Yan, W., Li, M., Liu, Y., Cheng, C., Zhang, L., Yu, X., Li, J., Qian, C., Wu, Y., Chen, J. and Lou, Q* (2020) Flexible chromosome painting based on multiplex PCR of oligonucleotides and its application for comparative chromosome analyses in Cucumis. *The Plant journal*. 102(1):178-186
- Song, M., Zhang, M., Cheng, F., Wei, Q., Wang, J., Davoudi, M., Chen, J. and Lou, Q* (2020) An irregularly striped rind mutant reveals new insight into the function of PG1beta in cucumber (*Cucumis sativus* L.). *Theor Appl Genet*, **133**, 371-382
- Li, M., Zhao, Q., Liu, Y., Qin, X., Hu, W., Davoudi, M., Chen, J. and Lou, Q* (2020) Development of alien addition lines from *Cucumis hystris* in *Cucumis sativus*: cytological and molecular marker analyses. *Genome* 1-13
- Song, M., Cheng, F., Wang, J., Wei, Q., Fu, W., Yu, X., Li, J., Chen, J. and Lou, Q* (2019) A leaf shape mutant provides insight into PINOID Serine/Threonine Kinase function in cucumber (*Cucumis sativus* L.). *Journal of integrative plant biology*. 61(9):1000-1014
- Song, M., Wei, Q., Wang, J., Fu, W., Qin, X., Lu, X., Cheng, F., Yang, K., Zhang, L., Yu, X., Li, J., Chen, J. and Lou, Q*(2018) Fine Mapping of CsVYL, Conferring Virescent Leaf

Through the Regulation of Chloroplast Development in Cucumber. *Frontiers in plant science*, **9**, 432

- Li, Z., Bi, Y., Wang, X., Wang, Y., Yang, S., Zhang, Z., Chen, J. and Lou, Q*** (2018) Chromosome identification in *Cucumis anguria* revealed by cross-species single-copy gene FISH. *Genome* **61**, 397-404
- Wang, Y., Zhang, Z., Jia, L., Li, Z., Li, J., Lou, Q* and Chen, J.** (2017) Molecular and cytogenetic analyses provide evidence of the introgression of chromosomal segments from the wild *Cucumis hystrix* into the cultivated cucumber through the bridge of a synthetic allotetraploid. *Molecular Breeding*, **37(7):89**
- Zhang, Z.T., Yang, S.Q., Li, Z.A., Zhang, Y.X., Wang, Y.Z., Cheng, C.Y., Li, J., Chen, J.F. and Lou, Q.F*** (2016) Comparative chromosomal localization of 45S and 5S rDNAs and implications for genome evolution in *Cucumis*. *Genome* **59**, 449-457
- Wei, Q.Z., Fu, W.Y., Wang, Y.Z., Qin, X.D., Wang, J., Li, J., Lou, Q.F* and Chen, J.F.** (2016) Rapid identification of fruit length loci in cucumber (*Cucumis sativus* L.) using next-generation sequencing (NGS)-based QTL analysis. *Scientific reports*, **6**, 27496
- Zhang, Y., Cheng, C., Li, J., Yang, S., Wang, Y., Li, Z., Chen, J. and Lou, Q*** (2015) Chromosomal structures and repetitive sequences divergence in *Cucumis* species revealed by comparative cytogenetic mapping. *BMC genomics*, **16**, 730
- Lou, Q., Zhang, Y., He, Y., Li, J., Jia, L., Cheng, C., Guan, W., Yang, S. and Chen, J.** (2014) Single-copy gene-based chromosome painting in cucumber and its application for chromosome rearrangement analysis in *Cucumis*. *The Plant journal*, **78**, 169-179
- Wei, Q., Wang, Y., Qin, X., Zhang, Y., Zhang, Z., Wang, J., Li, J., Lou, Q* and Chen, J.** (2014) An SNP-based saturated genetic map and QTL analysis of fruit-related traits in cucumber using specific-length amplified fragment (SLAF) sequencing. *BMC genomics*, **15**, 1158
- Lou, Q., He, Y., Cheng, C., Zhang, Z., Li, J., Huang, S. and Chen, J.** (2013) Integration of high-resolution physical and genetic map reveals differential recombination frequency between chromosomes and the genome assembling quality in cucumber. *PloS one*, **8**, e62676
- Lou, Q., Iovene, M., Spooner, D.M., Buell, C.R. and Jiang, J.** (2010) Evolution of chromosome 6 of *Solanum* species revealed by comparative fluorescence in situ hybridization mapping. *Chromosoma*, **119**, 435-442
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