

Zhang Fei



Areas of Research

Germplasm resources and genetic breeding of ornamental plants

Contact Information

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Research Interests

1. Quantitative genetics of important traits in chrysanthemum

My primary research interest is to dissect the genetic basis of important traits of ornamental and economic importance, i.e., inflorescence-, plant architecture-, flowering time- and some other tolerance-related traits mainly in chrysanthemum. Much of this work focuses on elucidating additive and epistatic effects involved in the genetics of the traits by genomic tools and quantitative genetic methods like linkage mapping and genome-wide association analysis, and then identify elite alleles or candidate genes to develop trait-linked markers for efficient breeding purpose.

2. Germplasm innovation and genetic breeding in chrysanthemum

Because of the relatively narrow genetic basis of and the lack of most resistance gene resources in cultivated chrysanthemum, application of chrysanthemum related genera / species in breeding activities is of significance for the improvement of resistance traits in cultivated chrysanthemum. In research of the genetics of the traits described above in chrysanthemum, we produce numerous hybrid populations by artificial hybridization between different chrysanthemum related genera / species or cultivars, from which excellent hybrid lines of interest are chosen by molecular marker-assisted selection and field trials for the development of new cultivars with both improved ornamental traits and strong resistance / tolerance traits.

Education Background

- ◆ **Bachelor:** Horticulture Education, Anhui Science and Technology University, China
- ◆ **Doctor:** Ornamental Horticulture, Nanjing Agricultural University, China

Work experience

- ◆ Assistant Researcher, Flower Research and Development Centre, Zhejiang Academy of Agricultural Sciences, China, 2020.7-2013.1
- ◆ Associate Professor, College of Horticulture, Nanjing Agricultural University, China, 2013.2-2019.12
- ◆ Visiting Associate Professor, Loren Rieseberg's Lab, The University of British Columbia, Canada, 2016.10-2017.9
- ◆ Full Professor, Nanjing Agricultural University, China, 2019.12-

Honors and Awards

- ◆ New Talent of Zhongshan Scholars, Nanjing Agricultural University, 2013
- ◆ Outstanding Teacher Award, Chen Junyu Landscape Education Foundation, 2017
- ◆ Outstanding Innovation Team of Shen Nong China Agricultural Science and Technology Award (7/11), Ministry of Agriculture and Rural Areas, 2019
- ◆ Huanai Horticultural Science and Technology Award (7/11), Chinese Society for Horticultural Science, 2014

Selected Grant (past 5 years)

- ◆ National Natural Science Foundation of China, Mapping of QTL and candidate genes and development of functional markers for drought tolerance in an interspecific *Chrysanthemum dichrum* × *C. nankingense* population (Grant No. 31572152), 2019.1-2022.12, PI.
- ◆ National Natural Science Foundation of China, Genetic variability and dynamic QTL analysis for cold tolerance of chrysanthemum at different developmental stages (Grant No. 31572152), 2016.1-2019.12, PI.
- ◆ National Natural Science Foundation of China, Genetic dissection and molecular markers for anemone-related traits of chrysanthemum (Grant No. 31370699), 2014.1-2017.12, PI.
- ◆ The Program for Key Research and Development, Jiangsu, China: Breeding and application of small-flowered pompom cut chrysanthemum cultivar 'Nannong Zizhu' (Grant No. BE2018426), 2018.4-2020.12, PI.
- ◆ Shanghai Agriculture Applied Technology Development Program, China: Collection, estimation and innovation of cut chrysanthemum with little axillary buds (Grant No. Z20160114), 2016.4-2018.12, co-PIs.

- ◆ The New Agricultural Varieties, New Technology and New Model Update Project of Jiangsu Province: Study on slow-growth conservation in vitro of cut chrysanthemum (Grant No. SXGC[2016]318), 2016.4-2017.11, PI.
- ◆ Jiangsu Provincial Natural Science Foundation, China: Dynamic expression mechanism of cold tolerance QTL in chrysanthemum (Grant No. BK20151429), 2015.7-2018.6, PI.

Selected Publication (past 5 years)

- ◆ Yang Xiaodong, Ao Ni, Qu Yixin, Wu Yangyang, Su Jiangshuo, Ding Lian, Chen Sumei, Jiang Jiafu, Guan Zhiyong, Chen Fadi, Fang Weimin*, **Zhang Fei***. Genetic characterization of anemone-type chrysanthemum (*Chrysanthemum morifolium*) using floral morphology and SRAP markers. *Plant Breeding*, 2020, 139:419-427.
- ◆ Yang Xiaodong, Fang Xinqi, Su Jiangshuo, Ding Lian, Guan Zhiyong, Jiang Jiafu, Chen Sumei, Chen Fadi, Fang Weimin*, **Zhang Fei***. Genetic dissection of floral traits in anemone-type chrysanthemum by QTL mapping. *Mol Breeding*, 2019, 39:136.
- ◆ Chong Xinran, Su Jiangshuo, Wang Fan, Wang Haibin, Song Aiping, Guan Zhiyong, Fang Weimin, Jiang Jiafu, Chen Sumei, Chen Fadi, **Zhang Fei***. Identification of favorable SNP alleles and candidate genes responsible for inflorescence-related traits via GWAS in chrysanthemum. *Plant Mol Biol*, 2019, 99(4-5): 407-420.
- ◆ Yang Xiaodong, Wu Yangyang, Su Jiangshuo, Ao Ni, Guan Zhiyong, Jiang Jiafu, Chen Sumei, Fang Weimin, Chen Fadi, **Zhang Fei***. Genetic variation and development of a SCAR marker of anemone-type flower in chrysanthemum. *Mol Breeding*, 2019, 39(3): 48.
- ◆ Ao Ni #, Ma Jie #, Xu Tingting, Su Jiangshuo, Yang Xincheng, Guan Zhiyong, Fang Weimin, Chen Fadi, **Zhang Fei***. Genetic variation and QTL mapping for cold tolerance in a chrysanthemum F₁ population at different growth stages. *Euphytica*, 2019, 215(5): 88.
- ◆ Sun Wei #, Yang Xincheng #, Su Jiangshuo, Guan Zhiyong, Jiang Jiafu, Chen Fadi, Fang Weimin*, **Zhang Fei***. Genetics of planting density-dependent branching in chrysanthemum. *Scientia Horticulturae*, 2019, 256: 108598.
- ◆ Liu Yanan, Chen Hong, Ping Qi, Zhang Zixin, Guan Zhiyong, Fang Weimin, Chen Sumei, Chen Fadi, Jiang Jiafu*, **Zhang Fei***. The heterologous expression of *CmBBX22* delays leaf senescence and improves drought tolerance in *Arabidopsis*. *Plant Cell Rep*, 2019, 38(1):15-24.
- ◆ Li Pirui, Su Jiangshuo, Guan Zhiyong, Fang Weimin, Chen Fadi, **Zhang Fei***. Association analysis of drought tolerance in cut chrysanthemum (*Chrysanthemum*

morifolium Ramat.) at seedling stage. 3 Biotech, 2018, 8:226

- ◆ Chong Xinran #, **Zhang Fei** #, Wu Yangyang, Yang Xiaodong, Zhao Nan, Wang Haibin, Guan Zhiyong, Fang Weimin, Chen Fadi*. A SNP-enabled assessment of genetic diversity, evolutionary relationships and the identification of candidate genes in chrysanthemum. Genome Biol Evol, 2016, 8(12): 3661-3671.
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