

**Dr. Syed Adeel Zafar**

Dept. of Botany and Plant Sciences, University of California, Riverside, 92521 USA

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**Academic Qualification**

2015-2019 **Ph.D.** Crop Genetics and Breeding.

Institute of Crop Science, Chinese Academy of Agricultural Sciences, Beijing, China.

**Thesis title:** [Identification and characterization of the \*DPS1\* gene revealed its role in panicle and leaf development in rice](#)

2012-14 **Master's**, Plant Breeding & Genetics.

University of Agriculture, Faisalabad. (CGPA: 3.61/4.0)

**Thesis title:** [Screening of rice germplasm for heat tolerance using some physiological, biochemical and molecular markers](#)

2008-12 **Bachelor**, Agriculture majoring in Plant Breeding & Genetics.

University of Sargodha, Pakistan. (CGPA: 3.79/4.0)

**Professional Experience**

01-2021 to present **Postdoctoral Researcher**, Dept. of Botany and Plant Sciences, University of California, Riverside, 92521 CA, USA (PI: Dr. Paul Nability)

**Project:** [Genome editing and protein interactions to resolve mechanism of plant-insect interactions](#)

06-2020 to 12-2020 **Research Associate**, National Institute for Genomics & Advanced Biotechnology, National Agricultural Research Centre, Islamabad. (PI: Dr. M. Ramzan Khan)

**Project:** [Green super rice in Pakistan, a component of productivity enhancement of rice](#)

It involves field layout preparation, conducting multi-location yield trials, evaluation of rice lines under multiple stresses, data collection and analysis, supervising graduate students and travelling.

**Research Interests**

Understanding complex genetic traits using systems biology and molecular physiology. Crop biofortification. Crop improvement against abiotic & biotic stresses using integrative approaches.

**Academic Awards/Distinctions**

2020 Outstanding Graduate Student Award 2020 from Chinese Academy of Agricultural Sciences.

2019 Outstanding research paper award 2018-19 from Chinese Academy of Agricultural Sciences.

2015 Award of Chinese Govt. Scholarship for Ph. D degree at Chinese Academy of Agricultural Sciences.

2014 Leader of the winning team for model competition organized by Pakistan society of Plant Breeders and Geneticists (PSPBG) at University of Agriculture, Faisalabad.

2014 First position in Quiz Competition organized by Pakistan society of Plant Breeders and Geneticists (PSPBG) at University of Agriculture, Faisalabad.

2012 Punjab education endowment fund (PEEF)-Merit and need based scholarship for the degree of M.Sc. (Hons.) PBG for two years from Govt. of Punjab through University of Agriculture, Faisalabad.

**Skills/Expertise**

- Gene mapping (BSA analysis), map-based cloning, vector construction, agrobacterium-mediated transformation, CRISPR-Cas9, gene expression (qRT-PCR), RNA-seq analysis, basic bio-informatics tools (online and offline software), Prom-GUS assay, Subcellular localization (protoplast and tissue based), protein-protein interaction including yeast-two hybrid assay, pull-down assay, split luciferase, western blotting, etc. Phenotyping by simple, confocal and electron microscopy (Scanning and transmission), sample preparation for microscopy, semi and ultra-thin sectioning of samples like leaves, spikelets and anthers, etc. Cellular and physiological assays like TUNEL, Comet assay, measurement of wax and cutin compounds by GC-MS, ROS, antioxidants (SOD, CAT, POD), MDA, chlorophyll content, cell membrane injury, etc.
- Excellent scientific writing and interpersonal communication skills.

**Peer Reviewed Publications**

- Syed Adeel Zafar**, Uzair M., Khan M.R., Patil S.B., Fang J., Zhao J., Singla-Pareek S.L., Pareek A. and Li X. 2021. *DPS1* regulates cuticle development and leaf senescence in rice. ***Food and Energy Security***. <https://doi.org/10.1002/fes3.273>
- Fang J, Guo T, Xie Z, Chun Y, Zhao J, Peng L, **Syed Adeel Zafar**, Yuan S, Xiao L, and Li X. 2021. The URL1-ROC5-TPL2 transcriptional repressor complex represses the ACL1 gene to modulate leaf rolling in rice. ***Plant Physiology***. <https://academic.oup.com/plphys/advance-article/doi/10.1093/plphys/kiaa121/6094639>
- Ahmed S, Rashid MAR, **Syed Adeel Zafar**, Waqas M, Uzair M, Azhar MT, Rana IA, Azeem F, Chung G, Ali Z, Atif RM. 2020. Genome-wide Investigation and expression analysis of APETALA-2 Transcription Factor Subfamily Reveals its Evolution, Expansion and Regulatory Role in Abiotic Stress Responses in Indica Rice (*Oryza sativa* L. ssp. indica). ***Genomics***.
- Syed Adeel Zafar**, Patil S., Uzair M., Fang J., Zhao J., Yuan S., Uzair M., Luo Q., Shi J., Schreiber L., and Li X. 2020. *DEGENERATED PANICLE AND PARTIAL STERILITY 1 (DPS1)* encodes a cystathionine  $\beta$ -synthase domain containing protein required for anther cuticle and panicle development in rice. ***New Phytologist***, 225:356–375.
- Syed Adeel Zafar**, Hameed A., Khan A.S., Ashraf M., Qamar Z., Li X., and Siddique K.H.M. 2020. Agronomic, physiological and molecular characterization of rice mutants revealed key role of ROS and catalase in high temperature stress tolerance. ***Functional Plant Biology***. 47(5) 440-453.
- Syed Adeel Zafar**, Zaidi SS, Yashika Gaba, Singla-Pareek SL, Dhankher OP, Li X, Mansoor S, Pareek A. 2020. Engineering Abiotic Stress Tolerance via CRISPR-Cas mediated genome editing. ***Journal of Experimental Botany***, 71:470-479.
- Chun Y, Fang J., **Syed Adeel Zafar**, Shang J., Zhao J., Yuan S., and Li X. 2020. *MINI SEED 2 (MIS2)* encodes a receptor-like kinase that controls grain size and shape in rice. ***Rice***, 13:7.
- Patil S., **Syed Adeel Zafar**, Uzair M., Zhao J., Fang J., and Li X. 2019. An Improved Mesocotyl Elongation Assay for the Rapid Identification and Characterization of Strigolactone-Related Rice Mutants. ***Agronomy*** 9(4), 208.
- Wang M., Qin Y., Chun Y., Zhao J., Fang J., **Syed Adeel Zafar**, Guo B. and Li X. 2018. Characterization of a Novel Semi-dwarf GID1 Allele Identifies an Amino Acid Required for Its Interaction with SLR1 in Rice. ***Journal of Plant Growth Regulation*** 37(3): 840-848.
- Syed Adeel Zafar**, Hameed A., Nawaz M.A., Ma W., Noor M.A., Hussain M. and Rahman M. 2018. Mechanisms and molecular approaches for heat tolerance in rice (*Oryza sativa* L.) under climate change scenario. ***Journal of Integrative Agriculture***. 17(4): 726-738.
- Zhao J., Zhao L., Zhang M., **Syed Adeel Zafar**, Fang J., Li M., Zhang W. and Li Xueyong. 2017. Arabidopsis E3 Ubiquitin Ligases PUB22 and PUB23 Negatively Regulate Drought Tolerance by Targeting ABA Receptor PYL9 for Degradation. ***International Journal of Molecular Sciences*** 18: 1841.

**Syed Adeel Zafar**, Hameed A., Khan A.S. and Ashraf M. 2017. Heat shock induced morpho-physiological response in indica rice (*Oryza sativa* L.) at early seedling stage. *Pakistan Journal of Botany*, 49(2): 453-463.

**Syed Adeel Zafar**, Hussain M., Raza M, Ahmed HGM, Khan A, Rana IA, Sadia B, Atif RM. 2016. Genome wide analysis of heat shock transcription factor (HSF) family in chickpea and its comparison with Arabidopsis. *Plant Omics Journal*. 9(2). pp: 136-139.

**Syed Adeel Zafar**, Shokat S, Ahmed HGM, Khan A, Ali MZ, Atif RM. 2015. Assessment of salinity tolerance in rice using seedling based morpho-physiological indices. *Advancements in Life Sciences* 2(4). pp: 142-149.

#### Research Projects/Grants as team member

1. Breeding for high yielding long grain rice with adaptation to high temperatures. IAEA-CRP, Grant No. 16589. Completed, *Research assistant*.
2. National Natural Science Foundation of China (NSFC), Grant No. 31600154, Positional cloning and functional analysis of the stemless and dwarf1 (STD1) gene in rice, 2017/01-2019/12, 200,000 Yuan, Completed. *Participating researcher*.
3. National Natural Science Foundation of China (NSFC), Grant No. 31870271, Studies on the molecular mechanism of URL1 in regulation of leaf rolling in rice, 2019/01-2022/12, 600,000 Yuan, in progress, *participating researcher*.

#### Membership of professional societies

1. American society of plant biologists (ASPB)
2. National academy of young scientists (NAYS), Pakistan® (life time member)

#### International Conferences and Presentations

1. **Poster presentation** on topic “Genome wide investigation and expression analysis of AP2 transcription factor sub-family reveals its evolution, expansion and regulatory role in developmental processes in Indica rice” In: “The Plant and Animal Genome Conference (**PAGXXVI**)” January 13-17, 2018, **San Diego, CA, USA**. <https://pag.confex.com/pag/xxvi/meetingapp.cgi/Paper/28319>
2. Participated in 5<sup>th</sup> International symposium on “Plant Reproductive Development” from 3-7 July 2017, **Shanghai Jiaotong University, Shanghai, China**.
3. Participated in 7<sup>th</sup> International Crop Science Congress, 14-19 August, 2016, **Beijing, China**.
4. **Oral presentation** on topic “Screening for heat tolerance in rice (*Oryza sativa* L.) Through morpho-physiological profiling”. In: International conference on stress biology and biotechnology: challenges and management. May, 21-23, 2014. IAGS, University of Punjab, **Lahore, Pakistan**.

#### Invited speaker at National/International forums

1. Oral talk as invited speaker for a special seminar jointly organized by Biotechnology Research Institute, CAAS and BIOMAN Ltd. China, for “winners of outstanding paper award GSCAAS 2019” on November 05, 2019.
2. Invited speaker at “The 9th national conference on sustainable wheat production” commenced at the University of Sargodha, Pakistan from February 12-14, 2019. <https://oric.su.edu.pk/home/conference/31>
3. Invited speaker for a special seminar at “National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan on February 6, 2019.

**Computer skills**

Adobe photoshop, Adobe Illustrator, Endnote, Statistics 8.1, XLStat, Online and offline bioinformatics softwares, etc.

**Language skills**

English reading, writing, speaking and listening (excellent). Urdu, Punjabi (Native).  
Chinese speaking and listening (moderate). Chinese reading and writing (None).

**Hobbies/Fun activities**

During my free time, I love travelling, hiking and playing badminton and cricket.

**Research Internships and Training workshops**

- Fifteen months (April 2013 to June 2014) research experience as Research assistant in an IAEA funded project (Grant no. 16589) entitled "Breeding for high yielding long grain rice with adaptation to high temperature" at Marker Assisted Breeding Group, Plant Breeding & Genetics division, Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad.
- Four months internship experience (May 01, 2014 to August 31, 2014) under Punjab youth internship program at Pulses Research Institute, AARI, Faisalabad.
- One week "Hands on training on Application of Genomics in Plant Breeding" from March 31-April 04, 2014 at University of Agriculture, Faisalabad.
- One week training course on "Biochemical and Molecular Techniques in Plant Breeding" from 21-25 October 2013 at NIAB Faisalabad.
- 5th One day workshop on "Young Researchers Skill Development" held on 15 December 2012 at University of Agriculture Faisalabad.
- Four days training course on "Transgene Expression and Analysis in Plants" from 02-10-2012 to 05-10-2012 held at National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad.
- Ten weeks internship experience on "Application of Biochemical and Molecular Markers in Plant Breeding" (19-03-2012 to 27-05-2012) in Marker Assisted Breeding group, Plant Breeding & Genetics Division, Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad.
- One month practical experience of "Wheat Productivity Enhancement Campaign" (15-11-2011 to 15-12-2011) with Deputy District Officer Agriculture (Ext.) Bhakkar.