

Mubashir Abbas

Chinese Academy of Agricultural Sciences, Beijing, P.R. China

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Summary

- Passionate about combining computer programming, big data (NGS), and biological knowledge to solve complex biological problems.
 - Skilled in prioritizing projects to meet deadlines and producing high-quality results.
 - Experienced in using open-source programs to develop pipelines and scripts for data analysis.
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Education

Ph.D. in Biochemistry and Molecular Biology

Chinese Academy of Agricultural Sciences, Beijing, China

December 2023

- Dissertation: "GWAS to Understand the Genetic Basis of Root System Architecture in Cotton under Salt and Drought Stress Conditions."

M.Sc. in Agricultural Biotechnology

University of Agriculture, Faisalabad, Pakistan

December 2018

- Thesis: "DNA Barcoding of Shisham (*Dalbergia sissoo*) Population of Lower Punjab, Pakistan."

B.Sc. in Agricultural Biotechnology

University of Agriculture, Faisalabad, Pakistan

August 2016

- Major: Agricultural Biotechnology
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Work Experience

Postdoctoral Research Fellow

Chinese Academy of Agricultural Sciences, Beijing, China

June 2015 – April 2016

- Integrated population genetics, transcriptomics, and transposable elements to study gossypol biosynthesis and transcriptional defense against Verticillium wilt in cotton.
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Skills

- **Programming Languages:** Proficient in Bash/Linux command-line scripting and R; intermediate in PERL, Python, and JavaScript.
 - **Bioinformatics Pipelines:** Streamlining data analysis pipelines, scripts, and tutorials.
 - **Genome Assembly Tools:** Canu, NextDenovo, Flye, SPAdes, Unicycler, Pilon, Bandage, etc.
 - **Organelle Genome Assembly:** GetOrganelle, MITObim, NOVOPlasty.
 - **Variant Annotation:** Annovar, SnpEff, Ensemble VEP.
 - **Proteomics & Metabolomics:** Statistical tests, differential expression, enrichment, and pathway analyses.
 - **NGS-Based Analyses:** Mapping RNA/DNA sequencing reads using BWA, Bowtie2, STAR, HISAT2.
 - **Variant Calling:** GATK, Bcftools.
 - **Genome-Wide Association Studies (GWAS):** EMMAX, EMMA, Plink, Tassel, GAPIT.
 - **Population Genomics:** XPCLR, nucleotide diversity, QTL analysis.
 - **Server Management:** Installation of programs/packages, running web servers like Galaxy.
 - **Molecular Biology:** DNA/RNA/protein isolation, PCR, qPCR, vector construction, and transformation.
 - **High-Throughput Phenotyping:** Hydroponics, Rhizoslides, root system architecture analysis.
 - **Machine Learning:** K-means clustering, PCA, Linear Discriminant Analysis (LDA).
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Peer-Reviewed Articles

1. Abbas M, Abid M.A, Meng Z, Abbas M, Wang P, Lu C, Askari M, Akram U, Wei Y, Wang Y, Guo S, Liang C, Zhang R. Integrating advancements in root phenotyping and genome-wide association studies to open the root genetics gateway. 28, Sep 2022 Physiologia Plantarum
2. Abbas M, Zang Youyi, Chao Lu, Muhammad Aamir Khan, Muhammad Aneeq Ur Rahman, Muhammad Jawad Umer, Chengzhen Liang, Zhigang Meng, Peilin Wang, Muhammad Askari, Yunxiao Wei, Rui Zhang. Insights into genetic diversity and functional significance of the

bHLH genes in cotton fiber development. 23, April 2024 Industrial crops and products

3. Abbas M, Muhammad Jawad Umer, Mengying Yang, Heng Wang, Qiankun Liu, Muhammad Aamir Khan, Xiaoyan Cai, Zhongli Zhou, Zhang R, Fang Liu. A short-chain dehydrogenase/reductase gene mediates *Verticillium dahliae* resistance in cotton and has undergone selection during domestication. (Under consideration The Plant Journal)
4. Qiankun Liu, Pengtao Li, Muhammad Jawad Umer, Abbas M, Mengying Yang, Heng Wang, Qiankun Liu, Muhammad Aamir Khan, Xiaoyan Cai, Zhongli Zhou, Zhang R, Fang Liu Identification of EXPA4 as a key gene in cotton salt stress adaptation through transcriptomic and coexpression network analysis of root tip protoplasts. BMC Plant Biology
5. Peilin Wang †, Yuanchun Pu †, Abbas M †, Muhammad A. Khan, Jiangling Xu, Yejun Yang, Ting Zhou, Kai Zheng, Qanjia Chen, Sun Guoqing. Genome-wide identification and analyses of cotton high-affinity nitrate transporter 2 (NRT2) family genes and their responses to stress. Frontiers in Plant Science
6. Peilin Wang†, Mubashir Abbas†, Lili Zhou, Muhammad Jawad Umer, Hongmei Cheng and Huiming Guo*. Advances in Genome Sequencing and Artificially Induced Mutation Provides New Avenues for Cotton Breeding. Frontiers in Plant Science
7. Aamir Ali Abro, Muhammad Qasim, Abbas M, Noor Muhammad, Ijaz Ali, Shiguftah Khalid, Junaid Ahmed, Muhammad Waqas, Sezai Ercisli, Rashid Iqbal & Fang Liu. Integrating physiological and molecular insights in cotton under cold stress conditions. Genetic Resources and Crop Evolution.
8. Muhammad Aamir Khan, Saeed Ahmad, Mubashir Abbas, Ayaz khan, Yunxiao Wei, Rui Zhang, Impacts of Climate Change on Cotton Production and Advancements in Genomic Approaches for Stress Resilience Enhancement. Journal of Cotton Research
9. Muhammad Ali Abid, Qi Zhou, Abbas M, Zhigang Meng, Yuan Wang, Yunxiao Wei, Sandui Guo, Zhang Rui, Chengzhen Liang. Natural variation in Beauty Mark is associated with UV-based geographical adaptation in *Gossypium* species 2023. BMC Biology
10. Yulu Ye, Peilin Wang, Man Zhang, Abbas M, Jiaxin Zhang, Chengzhen Liang, Yuan Wang, Yunxiao Wei, Zhigang Meng and Rui Zhang. High-throughput UAV-based phenotyping reveals the genetic basis of plant height in upland cotton. Plant journal
11. Aamir Ali Abro, Muhammad Qasim, Muhammad Usama Younas, Ijaz Ali, Abbas M, Noor Muhammad, Shiguftah Khalid, Junaid Ahmed, Umbreen Bibi, Muhammad Waqas, Sezai Ercisli, Fahad Al-Asmari, Temoor Ahmed, Rashid Iqbal & Fang Liu. Impact of elevated temperatures on the

- genetic and morpho-physiological traits of cotton genotypes cultivation. *Genetic Resources and Crop Evolution*
12. Manzar Abbas, Yan K, Li J, Zafar S, Hasnain Z, Aslam N, Iqbal N, Hussain SS, Usman M, Abbas M, Tahir M, Abbas S, Abbas SK, Qiulan H, Zhao X, El-Sappah AH. Agri-Nanotechnology and Tree Nanobionics: Augmentation in Crop Yield, Biosafety, and Biomass Accumulation. *Front in Bioengineering and Biotechnology*. 2022 Apr 26; 10:853045.
 13. Manzar Abbas, Li Y, Elbaiomy RG, Yan K, Ragauskas AJ, Yadav V, Soaud SA, Islam MM, Saleem N, Noor Z, Zafar S, Hussain SS, Abbas M, Abbas S, Li J, El-Sappah AH. Genome- Wide Analysis and Expression Profiling of SIHsp70 Gene Family in *Solanum lycopersicum* Revealed Higher Expression of SIHsp70-11 in Roots under Cd²⁺ Stress. *Frontiers in Biosciences (Landmark Ed)*. 2022 Jun 9;27(6):186.
 14. Akram U, Song Y, Liang C, Abid MA, Askari M, Myat AA, Abbas M, Malik W, Ali Z, Guo S, Zhang R, Meng Z. Genome-Wide Characterization and Expression Analysis of NHX Gene Family under Salinity Stress in *Gossypium barbadense* and Its Comparison with *Gossypium hirsutum*. *Genes (Basel)*. 2020 Jul 16;11(7):803.
 15. Myat AA, Zhou Y, Gao Y, Zhao X, Liang C, Abid MA, Wang P, Akram U, Abbas M, Askari M, Guo S, Zhang R, Meng Z. Overexpression of GhKTI12 Enhances Seed Yield and Biomass Production in *Nicotiana Tabacum*. *Genes (Basel)*. 2022 Feb 25;13(3):426.
 16. Lu C, Wei Y, Meng Z, Liu Y, Ali AM, Liu Q, Abbas M, Wang Y, Liang C, Wang Y, Zhang R. Overexpression of LT, an Oncoprotein Derived from the Polyomavirus SV40, Promotes Somatic Embryogenesis in Cotton. *Genes (Basel)*. 2022 May 11;13(5):853.
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Ph.D. Research

- Natural variation in the promoter region of GA20ox2 is associated with primary root length in cotton. (Under consideration for submission in *Plant Communications*).
 - GWAS reveals GhMYB44 as a putative target under positive selection for drought-induced root length variation in cotton. (Under preparation).
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Honors and Awards

- GCAAS Scholarship, Chinese Academy of Agricultural Sciences, Beijing (2019–2023).
- Graduate Student Assistantship, Biotechnology Research GSCAAS, Beijing (2019–2023).

- Marfie Foundation Kuwait Scholarship for Higher Education (2017).
 - University Merit Scholarship, University of Agriculture Faisalabad, Pakistan (2017).
 - Beijing Government Scholarship for Excellent International Students (2021–2022).
 - National Youth Internship Scheme, Agriculture Department Gilgit-Baltistan, Pakistan (2017–2018).
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Conferences and Workshops

- Workshop on Bioinformatics, University of Agriculture, Faisalabad (November 2018).
 - China-Pakistan International Conference on Cotton Biotechnology, CAAS (September 2019).
 - International Workshop on GWAS, AG2PI, USA (June 2021).
 - 6th National Congress of China Agricultural Biotechnology Society, Chengdu (October 2021).
 - International Workshop on Machine Learning, AG2PI, USA (February 2022).
 - Genomic Solutions for Agriculture and Food Security Lecture, CAAS (March 2023).
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References

Dr. Zhang Rui

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Dr. Liang Chengzhen

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Dr. Liu Fang

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