

Bidisha Bhowal | Research Professional
Specialisation: Plant Biochemistry and Molecular Biology | Biotechnology | Bioinformatics |

Plant Biochemist and Biotechnologist with over five years of experience in molecular biology, biochemistry, and bioinformatics. Skilled in designing, executing, and troubleshooting complex experiments related to biochemical assay development and plant-microbe interactions, apart from protein isolation, purification, and enzyme kinetic assays. Deep expertise in the genus *Oryza* (rice), focusing on genome-wide identification, molecular evolution, and metabolic pathways related to stress tolerance. Trained expertise in bioinformatics and genome mining to identify and characterise plant proteins and enzymes, essential for mapping India's plant-based research landscape. Currently, awaiting PhD defense

Education

PhD in Biotechnology (2021-2026)

Delhi Technological University.....

Master of Technology in Industrial Biotechnology (2015-2017)

Delhi Technological University.....CGPA 9.05

Bachelor of Technology in Biotechnology (2011-2015)

Bengal College of Engineering and Technology, West Bengal University of Technology.....CGPA 9.26

Professional Experience

Project Associate I (JRF) | ICGEB, New Delhi (Dec 2017-Feb 2021)

1. Managed laboratory operations and spearheaded a DBT-sponsored project under the mentorship of Prof. S.K. Sopory.
2. Contributed to building a research foundation for plant-microbe interactions and stress mitigation.
3. Integrated biochemical and microbiological datasets to write comprehensive scientific reports
4. Authored 2 research articles, 2 review articles, and 1 book chapter during tenure.

Core Competencies and Technical Skills

1. **Biochemistry & Enzymology:** Standardization and optimization of protein isolation, over-expression, purification, and characterization (western blotting). Biochemical characterization using enzyme activity assays and abiotic stress assays.
2. **Antioxidant Assays:** Hands-on assessment of stress treatments and biochemical analyses, including SOD, CAT, and APx.
3. **Molecular Biology:** DNA/RNA extraction, plasmid isolation, PCR, and expression analysis utilizing qRT-PCR techniques. Transcriptome data analysis and primer designing.
4. **Plant-Microbe Interactions:** Bacterial isolation of PGPRs, bioformulation, and identification using 16S rRNA sequencing. Chemotaxis assays and plant-microbe interaction studies.
5. **Data Analysis & Statistics:** Bioinformatics, genome mining, in silico analysis, molecular docking, and dynamic simulation (GROMACS, Schrödinger). Proficiency in R and Python 3.0 for analytical data interpretation.
6. **Experimental Design:** Strong background in problem-solving, troubleshooting, and scientific report writing.

Awards and Recognition

1. Qualified GATE(BT) 2015 with AIR 393 and GATE percentile 95.6%
2. Qualified CSIR-Direct SRF 2021

Publications

1. Bhowal, B., Hasija, Y. & Singla-Pareek, S.L. Mapping the molecular evolution and role of wild rice GLYIII protein-encoding genes in abiotic stress response. **Biochem. Genet.** (2026) <https://doi.org/10.1007/s10528-026-11357-7>
2. Bhowal, B., Hasija, Y., & Singla-Pareek, S. L. (2024). Tracing the intraspecies expansion of glyoxalase genes and their expanding roles across the genus *Oryza*. **Functional & integrative genomics**, 24(6), 220. <https://doi.org/10.1007/s10142-024-01492-y>
3. Garai, S., Bhowal, B*., Gupta, M., Sopory, S. K., Singla-Pareek, S. L., Pareek, A., & Kaur, C. (2024). Role of methylglyoxal and redox homeostasis in microbe-mediated stress mitigation in plants. **Plant science**, 338, 111922. <https://doi.org/10.1016/j.plantsci.2023.111922>

For other articles: <https://orcid.org/0009-0004-7493-6378>

Additional Experience

1. Freelance Assessor: Evaluated state-of-the-art LLMs for educational capabilities with Turing and Telus Digital.
2. Peer Reviewer: Reviewed 3 research articles for PeerJ, Plant Gene, and the Journal of Applied Genetics.

Contact Information

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- Portfolio: <https://bidisha63-ai.github.io/>