SAHIL

Assistant Professor of Botany | Plant Molecular Biology & Genomics Researcher

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Location: Himachal Pradesh / New Delhi, India

PROFESSIONAL SUMMARY

Academician and researcher specializing in Plant Molecular Biology, Crop Genomics, and Abiotic Stress Resilience in rice (*Oryza sativa* L.). Completed B.Sc. (Hons.) in Botany from Hansraj College, University of Delhi, and M.Sc. in Botany from the Department of Botany, University of Delhi / Hansraj College. Expert in high-throughput QTL mapping, Meta-QTL analysis, GWAS, and haplo-pheno mapping with extensive experience using reference panels (3K Rice Genome, 10K India SNP datasets). Demonstrated academic excellence with CSIR NET JRF (AIR 15) and Rank 1 in multiple All-India Ph.D. entrance examinations. Currently serving as Assistant Professor of Botany at NSCBM Govt. College, Hamirpur, dedicated to advanced teaching and impactful research in molecular mechanisms of heavy metal tolerance.

ACADEMIC APPOINTMENTS & PROFESSIONAL EXPERIENCE

Assistant Professor (Botany) **16th July 2026 – Present**

Department of Higher Education, Himachal Pradesh — NSCBM Govt. College, Hamirpur, HP

- Delivering undergraduate and postgraduate courses in Botany, Molecular Genetics, Plant Physiology, and Biotechnology.
- Directing research inquiries in molecular plant physiology, abiotic stress responses, signaling cascades (MAPK and Calcium), and QTL discovery in rice accessions.
- Mentoring students in bioinformatics tools, gene structure analysis, and statistical genetics workflows.

Assistant Professor (Botany) **14th November 2023 – 15th July 2026**

Department of Higher Education, Himachal Pradesh — ABV Government Degree College, Takipur, HP

- Taught core plant sciences curriculum and coordinated department laboratory infrastructure and academic committees.
- Facilitated student research seminars and organized workshops on modern genomic techniques in crop improvement.

HONORS, FELLOWSHIPS & ACADEMIC ACHIEVEMENTS

- **CSIR-UGC NET JRF:** Awarded Junior Research Fellowship in Life Sciences by CSIR, Govt. of India with All India Rank (AIR) 15.
- **Rank 1:** University of Delhi Entrance Examination for Ph.D. in Botany.
- **Rank 1:** University of Delhi Entrance Examination for Ph.D. in Genetics.
- **Rank 1:** University of Delhi Entrance Examination for Ph.D. in Plant Molecular Biology & Biotechnology.
- **Academic Distinction:** Secured 2nd position in M.Sc. Botany at Hansraj College, University of Delhi.

RESEARCH SPECIALIZATION & TECHNICAL SKILLS

Research Specialization

- Plant Heavy Metal Toxicity (Lead, Cadmium, Copper, Zinc)
- Abiotic Stress Resilience & Antioxidant Defense
- MAPK & Calcium Signaling Cascades

Genomics & Bioinformatics

- GWAS, QTL Mapping & Meta-QTL Integration
- Haplo-Pheno & Ortho Analysis
- Haplotype Analysis of Candidate Genes

Bioinformatics Software & Panels

- BioMercator V4, TASSEL, PLINK, R (Genomics packages)
- 3K Rice Genome Panel & 10K India SNP Datasets
- RGAP, Ensembl Plants, Nipponbare Reference Genome

Laboratory & Molecular Techniques

- DNA/RNA/Plasmid Isolation, RT-PCR, Western Blotting
- FISH, Virus-Induced Gene Silencing (VIGS)
- Bacterial Cell Transformation & Phenotypic Screening

RESEARCH & ACADEMIC PROJECTS

- **M.Sc. Dissertation:** Expression Analysis of Diphthamide Genes under Abiotic Stresses in *Arabidopsis thaliana*. Profiled key diphthamide synthesis genes under abiotic stress conditions and performed bioinformatic analysis to map protein interactors and pathways.

- **Bioinformatics Project:** Construction of Multiple Sequence Alignment (MSA) of Actin Gene. Constructed MSAs across model organisms using CLUSTAL Omega to evaluate structural homology and phylogenetic relationships.
- **Haplo-Pheno & GWAS Project:** Multi-environment phenotypic screening across 500+ rice accessions utilizing 3KRG and 10K India SNP datasets for metal-specific heredity variants.

PUBLICATIONS & MANUSCRIPTS

1. Sharma, T., Sahil, Keshan, R., & Soni, A. (2025). "Molecular Mechanisms to Facilitate Recovery After Flooding Attempts to Increase Flood Stress Tolerance in Crops". In: *Plant Flooding: Sensitivity and Tolerance Mechanisms*.
2. Kumari, A., Sharma, D., Sahil, Kumar, K., Sevanthi, A. M., & Agarwal, M. (2024). "Meta-analysis of mapping studies: Integrating QTLs towards candidate gene discovery".
3. Kumari, A., Sharma, D., Sharma, P., Sahil, Wang, C., Verma, V., Patil, A., Imran, M., Singh, M. P., Kumar, K., Paritosh, K., Caragea, D., Kapoor, S., Chandel, G., Grover, A., Jagadish, S. V. K., Katiyar-Agarwal, S., & Agarwal, M. (2023). "Meta-QTL and haplo-pheno analysis reveal superior haplotype combinations associated with low grain chalkiness under high temperature in rice". *International Journal of Ecology and Environmental Sciences*.
4. Kumari, A., Sharma, P., Rani, M., Laxmi, V., Sahil, Sahi, C., Satturu, V., Katiyar-Agarwal, S., & Agarwal, M. (2022). "Meta-QTL and ortho analysis unravels the genetic architecture and key candidate genes for cold tolerance at seedling stage in rice". *NIH / PubMed Central*.
5. Rani, M., Sahil, S., Singh, K. B. M., Paritosh, K., Laxmi, V., & Agarwal, M. (2022). "A forward genetics approach identifies pathogenicity genes in *Fusarium oxysporum* f. sp. *carthami*, a fungus causing vascular wilt disease of safflower".
6. Sahil, Kirti, Sharma, Shabir, & Rather. (2022). "Microalgae as Biofertilizer for Sustainable Agricultural Productivity". In: *Biofertilizers for Sustainable Agriculture and Environment*, CRC Press / Taylor & Francis. DOI: 10.1201/9781003280682-6
7. Sahil et al. (2021). "Toxicity: Its Assessment and Remediation in Important Medicinal Plants". In: *Medicinal and Aromatic Plants*, Springer. DOI: 10.1007/978-3-030-58975-2_22
8. Sahil et al. (2021). "Expression and Regulation of Stress-Responsive Genes in Plants Under Harsh Environmental Conditions". In: *Harsh Environment and Plant Resilience*, Springer. DOI: 10.1007/978-3-030-65912-7_2
9. Bharti, J., Sahil et al. (2021). "Mitogen-Activated Protein Kinase, Plants, and Heat Stress". In: *Harsh Environment and Plant Resilience*, Springer. DOI: 10.1007/978-3-030-65912-7_13
10. Sahil et al. (2021). "Salicylic acid for healthier plant growth and enhanced yield under adverse environmental conditions", *Springer*.
11. Sahil et al. (2021). "Jasmonic acid for sustainable plant growth and production under resilient environmental conditions", *Springer*.
12. Sahil et al. (2021). "Transcription factors involved in plant responses to stress adaptation", *Elsevier*.
13. **Manuscript:** Meta-Analysis of Projected QTLs and Candidate Gene Identification for Lead (Pb) and Heavy Metal Tolerance in Rice (*Oryza sativa* L.).
14. **Manuscript:** Mitigation Strategies and Signaling Cascades in Response to Heavy Metal-Induced Oxidative Stress in Higher Plants.

CONFERENCES, LEADERSHIP & SERVICE

Conference Presentations & Participation

- **CUHP (Jan 2025):** Oral Presentation on "Elucidating the molecular mechanisms responsible for heat tolerance in plants".
- **IAAT (2017):** Attendee & Volunteer at 27th Conference & Int. Symposium on Plant Systematics.
- **SeaBuckthorn Association (2019):** Attendee & Volunteer at National Conference.

Leadership & Academic Service

- **President** / **General Secretary** / **Joint Secretary:** Delhi University Botanical Society (DUBS).
- **Vice President & Cultural Secretary:** Botanical Society, Hansraj College.
- **Mess Council Member:** Hansraj College Hostel.
- **Volunteer:** 61st Annual Flower Show, University of Delhi.