

KARUNA SHARMA

PhD Scholar| Date of birth: **21 May 1996**

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Google Scholar: <https://scholar.google.com/citations?user=pTCizWgAAAAI>



Education

Degree	Institution	Year	Percentage	Remarks
PhD Botany	Department of Botany, University of Delhi	2021- onwards	Thesis writing underway	-
M.Phil. Botany	Department of Botany, University of Delhi	2020	83.83%	First Position
M.Sc. Botany	Miranda House, University of Delhi	2019	74.95%	-
B.Sc. (Hons.) Botany	Miranda House, University of Delhi	2017	92.6%	University Rank 4

Research Metrics

- **Publications: 10 publications** comprising **8 peer-reviewed journal articles (3 first-author and 5 co-authored)** and **2 first-author book chapters**

2 manuscripts under review (1 first-author and 1 co-authored)

- **Citations:** 334 (Google Scholar)
- **h-index:** 7 (Google Scholar)
- **i10-index:** 6 (Google Scholar)

Professional Profile

PhD Candidate in Botany at the University of Delhi specializing in arbuscular mycorrhizal symbiosis, plant stress physiology (salinity stress), polyamine metabolism, and plant–fungus interactions. Published multiple (10+) research and review articles in internationally recognized journals including Plant Science, World Journal of Microbiology, Frontiers in Plant Science, Journal of Future Foods, among others. Experienced in experimental design, physiological and biochemical analyses, GC–MS metabolomics, scientific writing, peer review, and postgraduate laboratory teaching. Reviewer for leading journals including Journal of Experimental Botany, Plant and Soil, Mycorrhiza, Applied Soil Ecology, Plant Physiology and Biochemistry, 3-Biotech, Frontiers in Plant Science, among others.

Research Interests

- Plant Stress Physiology
- Plant–Fungus Interactions (specialization in Arbuscular Mycorrhizal Symbiosis)
- Polyamine Metabolism
- Plant Biochemistry
- Sustainable Agriculture

Core Technical Expertise

Analytical and Molecular Techniques: DNA and RNA isolation, Agarose Gel Electrophoresis (AGE), Semi-quantitative PCR (sqPCR), qRT-PCR (Gene expression analysis), Gas Chromatography–Mass Spectrometry (GC–MS), High-Performance Liquid Chromatography (HPLC), Flame photometry, Atomic Absorption Spectroscopy (AAS), Attenuated Total Reflectance Fourier-Transform Infrared spectroscopy (ATR-FTIR), CHNS, Spectrophotometry

Data Analysis: SPSS (ANOVA, MANOVA, Hierarchical Cluster Analysis, Student’s t-test, Principal Component Analysis), MetaboAnalyst, Microsoft Excel, Statistical interpretation

Professional Competencies: Data Interpretation, Scientific writing, Critical evaluation of scientific literature, Peer review, Experimental design, Evidence-based reasoning, Technical communication, Scientific editing and proof reading.

Research Experience

PhD Research Scholar | University of Delhi | 2021–Present

Research focuses on Arbuscular Mycorrhizal Fungi-mediated differential salt tolerance in contrasting mungbean genotypes through polyamine metabolism, nitrogen metabolism, central carbon metabolism, antioxidant defense.

Teaching Experience

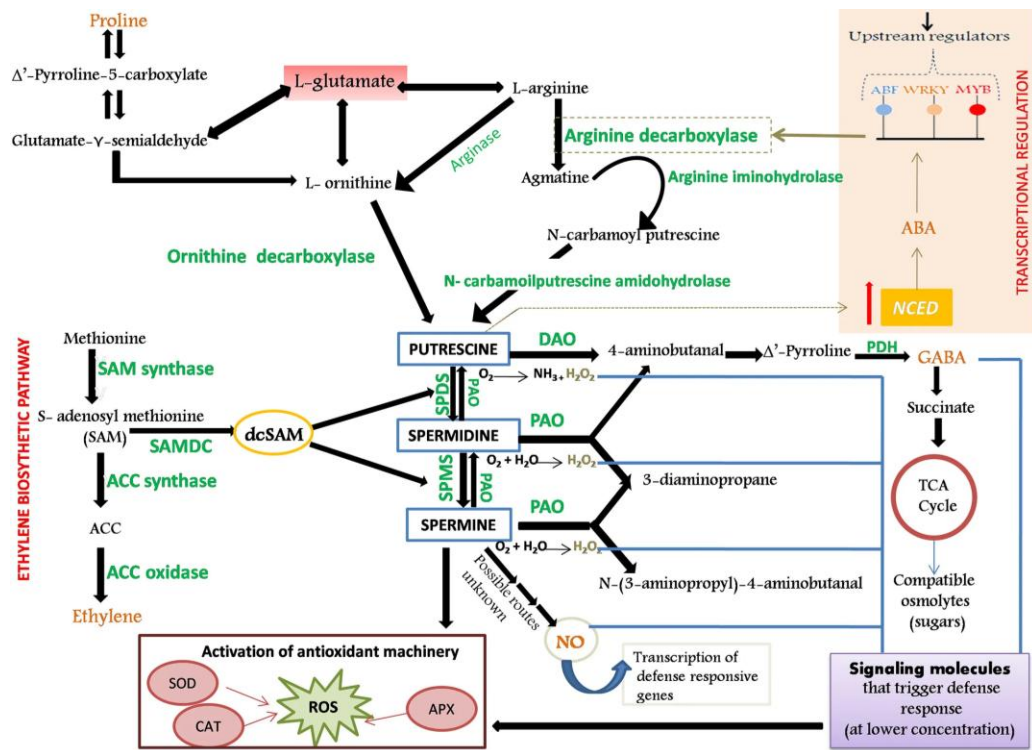
Laboratory Demonstrator and Practical Instructor, Department of Botany, University of Delhi (2021–2026)

- Demonstrated postgraduate practical classes.
- Guided laboratory experiments in Microbiology and Molecular Interactions of Pest and Pathogen of Crop Plants.
- Assisted students in experimental design, data analysis, interpretation, and laboratory safety.

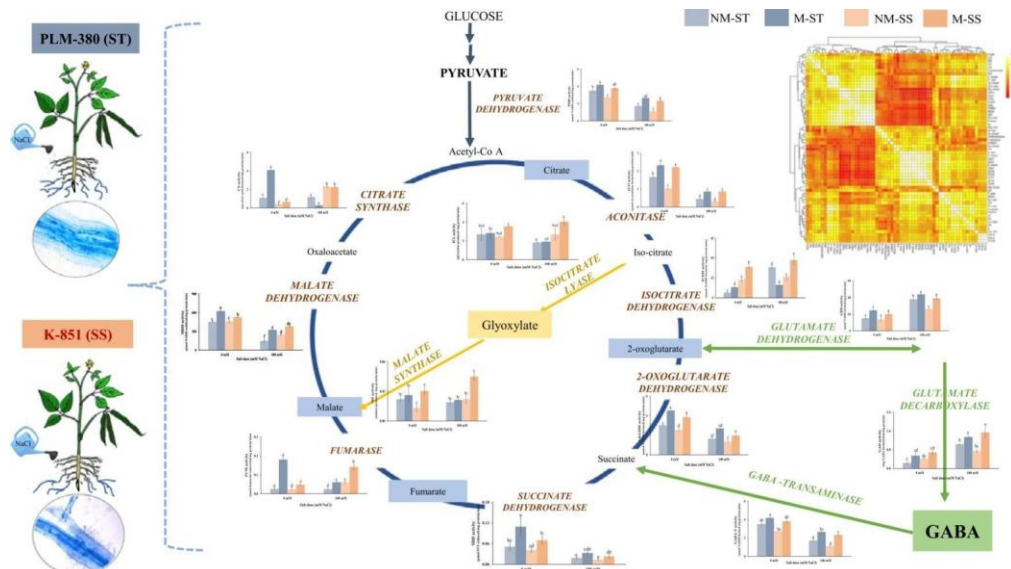
Publications

First-author Articles

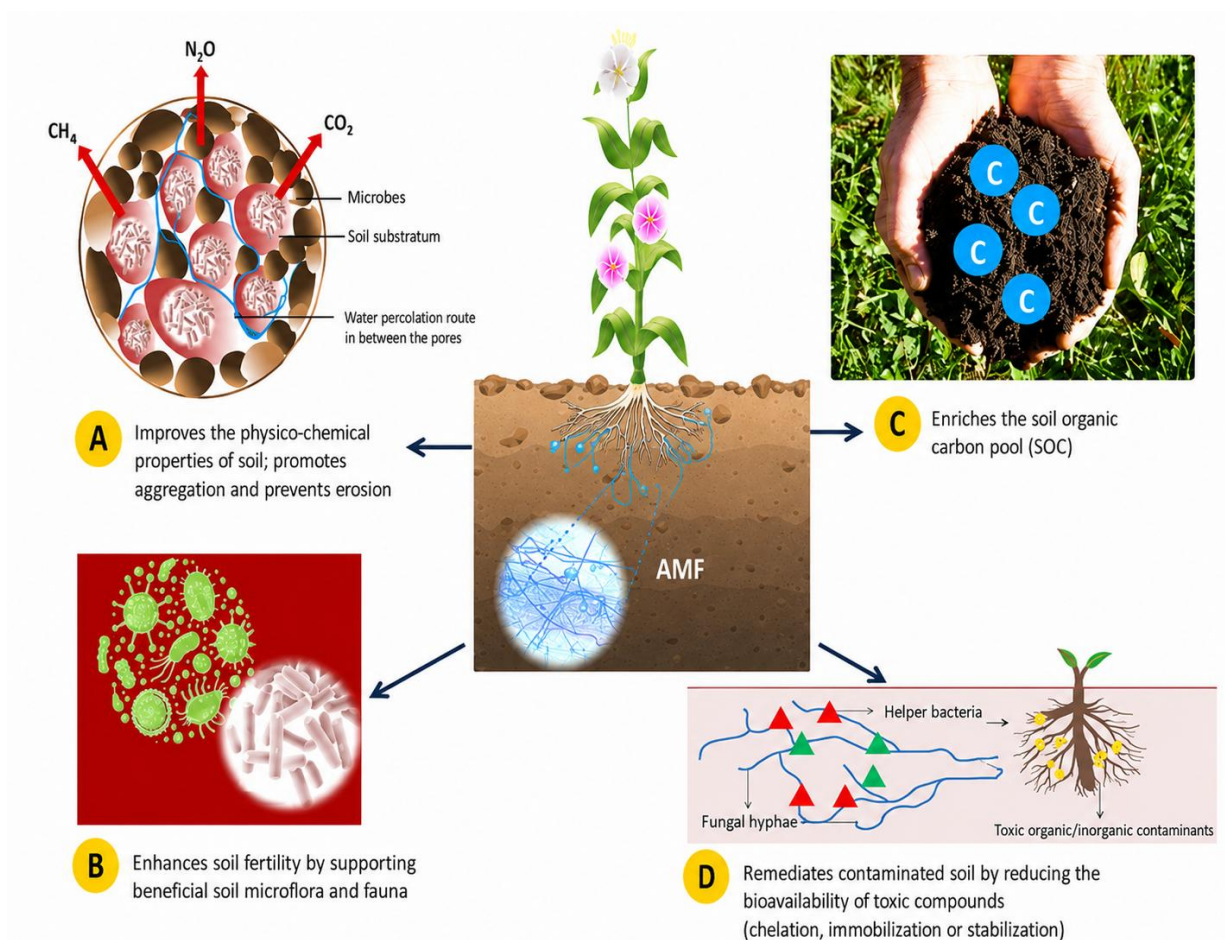
1. **Sharma, K.**, Gupta, S., Thokchom, S. D., Jangir, P., & Kapoor, R. (2021). Arbuscular Mycorrhiza-Mediated Regulation of Polyamines and Aquaporins During Abiotic Stress: Deep Insights on the Recondite Players. *Frontiers in Plant Science*, 12:642101. <https://doi.org/10.3389/fpls.2021.642101>



2. **Sharma, K.** and Kapoor, R. (2023). Arbuscular Mycorrhiza Differentially Adjusts Central Carbon Metabolism in two Contrasting Genotypes of *Vigna Radiata* (L.) Wilczek in Response to Salt Stress. *Plant Science*, 32:111706. <https://doi.org/10.1016/j.plantsci.2023.111706>



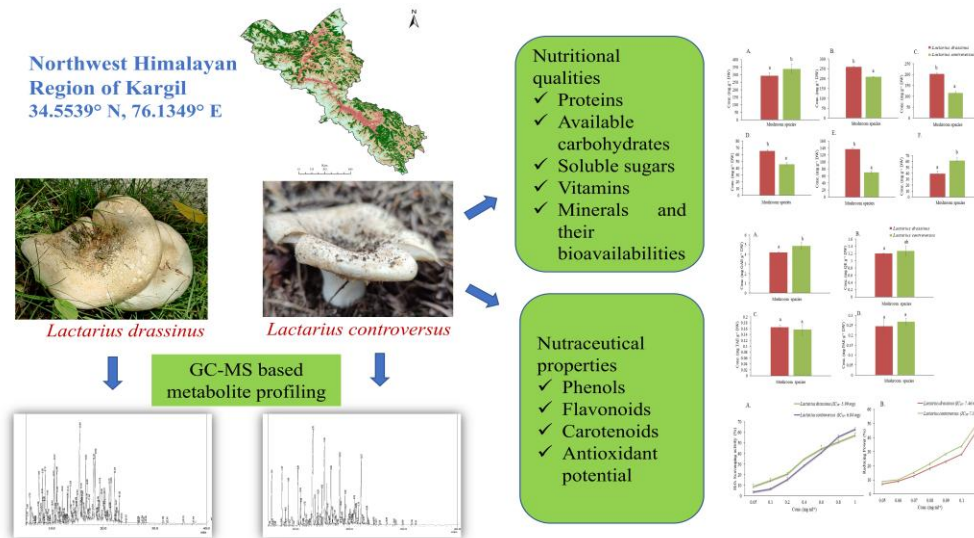
3. **Sharma, K.,** Gupta, S., Thokchom, S.D. and Kapoor, R., (2021). The Potential Roles of arbuscular mycorrhizal fungi in soil health and conservation. *International Journal of Plant and Environment*, 7(01), pp.39-48. doi: <https://doi.org/10.18811/ijpen.v7i01.4>



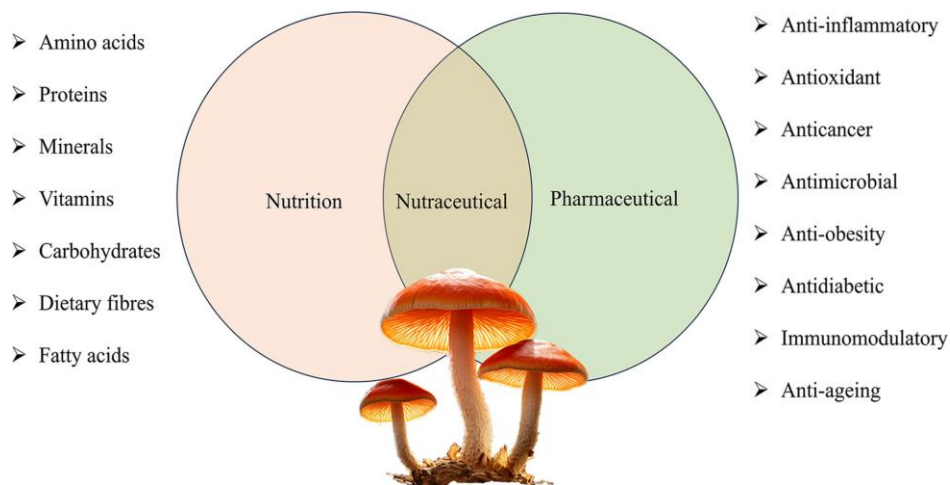
Co-authored Articles

1. Jangir, P., Mehra, N., **Sharma, K.,** Singh, N., Rani, M. and Kapoor, R., (2021). Secreted in xylem genes: drivers of host adaptation in *Fusarium oxysporum*. *Frontiers in Plant Science*, 12, p.628611. <https://doi.org/10.3389/fpls.2021.628611>
2. Saxena, B., **Sharma, K.,** Kapoor, R., Wu, Q.S. and Giri, B., (2022). Insights into the molecular aspects of salt stress tolerance in mycorrhizal plants. *World Journal of Microbiology and Biotechnology*, 38(12), p.253. <https://doi.org/10.1007/s11274-022-03440-z>

3. Mayirnao, H., Thokchom, S. D., Gupta, S., **Sharma, K.**, and Kapoor, R. (2023). Characterization of nutritional properties of two wild edible mushrooms, *Lactarius drassinus* Verma et al. and *L. controversus* (Pers.) Pers., from cold desert of northwest Himalayas for their potential as food supplements. *Journal of Fungi*, 9(7), 763; <https://doi.org/10.3390/jof9070763>



4. Mayirnao, H.S., **Sharma, K.**, Jangir, P., Kaur, S. and Kapoor, R., (2025). Mushroom-derived nutraceuticals in the 21st century: an appraisal and future perspectives. *Journal of Future Foods*, 5(4), pp.342-360. <https://doi.org/10.1016/j.jfutfo.2024.07.013>



5. Mayirnao, H. S., Jangir, P., **Sharma, K.**, Kaur, S., Sharma, Y. P., and Kapoor, R. (2025). Nutrient and antioxidant profile of four species of wild mushrooms from cold-desert with implications for human dietary and supplement use. *Food Chemistry Advances*, 7, 101023. <https://doi.org/10.1016/j.focha.2025.101023>

- Manuscripts Under Review

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- Figure 1: Influence of three biological axes – AMF, Genotype & AMF – on polyamine metabolism.**
- The figure illustrates the influence of three biological axes – AMF, Genotype, and AMF – on polyamine metabolism. The diagram is divided into three main sections: a conceptual diagram on the left, a metabolic pathway diagram in the center, and a heatmap on the right.
- Conceptual Diagram (Left):** Shows the interaction of AMF (Arbuscular Mycorrhizal Fungi), Genotype, and AMF (Arbuscular Mycorrhizal Fungi) on a *Vigna radiata* plant. The plant is shown with roots and leaves, and a watering can is used to represent salinity (Na⁺Cl⁻). The plant is labeled *Vigna radiata* (L.) Wilczek. The AMF is represented by a green circle with a plus sign, and the Genotype is represented by a green circle with a plus sign. The AMF (Arbuscular Mycorrhizal Fungi) is represented by a green circle with a plus sign.
- Metabolic Pathway Diagram (Center):** Shows the polyamine pathway, including the conversion of Methionine to Putrescine, and then to Spermidine and Spermine. The pathway is divided into three compartments: Chloroplast, Cytoplasm, and Apoplast. The pathway involves the following steps:
- Methionine is converted to Putrescine by the enzyme SAMDC.
 - Putrescine is converted to Spermidine by the enzyme SPDS.
 - Spermidine is converted to Spermine by the enzyme SPMS.
 - Arginine is converted to Ornithine by the enzyme ARGINASE.
 - Ornithine is converted to Putrescine by the enzyme ODC.
 - Putrescine is converted to GABA by the enzyme DAO.
 - Putrescine is converted to PAO by the enzyme PAO.
 - PAO is converted to Spermine by the enzyme PAO.
- Heatmap (Right):** Shows the relative expression of various genes across different conditions. The genes listed on the right are: AMF, GENOTYPE, SALINITY, DAO, PRO, PAO, ARG1_ORN_Ratio, ORN, SAMDC, K_{root}, K_{shoot}, PRO_RUT_Ratio, PUT, ARG1, SPM, GLU, SPMS, HETH, ODC, GABA, SPDS, SPD, ARG, ADC, PA_Ratio, NAK_{shoot}, Na_{shoot}, NAK_{root}, and Na_{root}.
- Table (Far Right):** Shows the relative expression of various genes across different conditions. The table has 10 columns and 10 rows. The columns are labeled: AMF, GENOTYPE, SALINITY, DAO, PRO, PAO, ARG1_ORN_Ratio, ORN, SAMDC, K_{root}, K_{shoot}, PRO_RUT_Ratio, PUT, ARG1, SPM, GLU, SPMS, HETH, ODC, GABA, SPDS, SPD, ARG, ADC, PA_Ratio, NAK_{shoot}, Na_{shoot}, NAK_{root}, and Na_{root}.

- Mayirnao H.S., **Sharma K.**, Jangir, P., Kaur, S., Kapoor, R. (2026). Functional ecology of macrofungi in cold deserts with emphasis on adaptation and ecosystem processes. (Under review in *Fungal Biology Reviews*)

Conferences/Symposia/Workshops:

- Participated in NASI Award Lectures on “Plant Genome for Forward and Reverse Genetics” (by Prof. A.K. Tyagi) and “Gene Therapy of Jaundice using Animal Virus” (by Prof. Debi P Sarkar) organized by National Academy of Sciences, India (NASI) and Miranda House, University of Delhi (2014)
- Mentored a workshop on “Green Nanotechnology for Beginners” under the Innovation Project Sugarcane to Nanoparticles: Green Nanotechnology the Future (project code: 310) under the aegis of University of Delhi, Delhi (2016).
- Participated in BIOTIKOS, 2016 “National Symposia on Nanobiotechnology” organized by TERI University Biotechnology Centre at TERI University, New Delhi (2016)
- Participated in the workshop “RuBisCo – From sequence to protein expression” organized by Department of Botany and D.S. Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi (2017).
- Attended the 27th Conference of the Indian Association for Angiosperm Taxonomy and International Symposium on “Plant Systematics: Priorities and Challenges” organized by Department of Botany, University of Delhi, Delhi (2017).
- Participated in the National Conference of Sea buckthorn Association of India on “Sea buckthorn: Translating Research into Sustainable Utilization and Conservation” organized by Delhi University Botanical Society, University of Delhi, Delhi and Sea buckthorn Association of India (2019).
- Participated in the informative workshop on “Mycorrhizal Wonders in Nature” organized by TERI University, India Habitat Centre, New Delhi (2020).
- Participated in two-day National online workshop on “Fungal Systematics and Technological Advances” organized by Department of Botany, Sri Shivaji Science College, Amravati in association with Mycological Society of India (MSI-Mumbai Unit), Maharashtra (2020).
- Participated in the National Workshop on “Urban Heat Island and Spreading Awareness on Emerging Challenges of Air Pollution and Climate Change on Human Health in Urban Ecosystem” organized by Environmental Pollution Laboratory, Department of Environmental Studies, University of Delhi, India (2024).

Conference Presentations

- Poster Presentation in the National Conference on “*Recent Advances in Fungal Diversity, Plant-Microbes Interaction and Disease Management*”, organized by Centre of Advanced Studies in Banaras Hindu University, Varanasi (2020).
- Oral Presentation in International Conference on “*Biodiversity, Biotechnology and Bio-prospects of Fungi for Agricultural, Industrial and Environmental Sustainability (BBBFAIES-2024)*”, Golden Jubilee Celebration of Mycological Society of India, Chennai (2024).
- Oral Presentation in the National Conference on “*Fungal Frontiers: Biodiversity, Biomolecules and Bioengineering Applications for Sustainable Perspectives*” and 51st Annual Meeting of Mycological Society of India (Prof. C.V. Subramanian Birth Centenary Celebration), Jodhpur (2024).

- Oral Presentation in the National Conference on “*Fungi for Bharat: Fungi for Better Health, Agriculture, Remediation, and Technology*”, in confluence with the 52nd Annual Meeting of Mycological Society of India, Delhi (2025).

Journal Peer Review Assignments

Reviewer for: Journal of Experimental Botany; Plant and Soil; Mycorrhiza; Applied Soil Ecology; Plant Physiology and Biochemistry; Frontiers in Plant Science; Acta Physiologiae Plantarum; Journal of Plant Growth Regulation; Journal of Soil Science and Plant Nutrition; 3 Biotech.

Academic Awards/Fellowships

- **CSIR-UGC NET-Junior Research Fellow (AIR 62)**
- **University Rank 4**, B.Sc. (Hons.) Botany
- **First Position**, M.Phil. Botany
- **Dr. (Mrs.) Sushma Aneja Memorial Award** for the **BEST ORAL PRESENTATION** in the National Conference on FUNGI for BHARAT: FUNGI for BETTER HEALTH, AGRICULTURE, REMEDIATION, AND TECHNOLOGY
- **Mr. Satish Batra Memorial Book Grant** and the **Dr. S.L. Hora and Smt. V. Hora Endowment Book Grant** for the merit in B.Sc. (Hons.) Botany.

Academic Leadership/Administrative Activities/Membership

- **President, Delhi University Botanical Society (2023–24)**
- **Vice President, DUBS (2020–21)**
- **Secretary, DUBS (2018–19)**
- **Joint Secretary, DUBS (2017–18)**
- **Organizing Committee Member** in the **65th – 68th Annual Flower Show** of University of Delhi (2023-2026)
- **Organizing Sub-Committee Member**, of the **National Conference “FUNGI for BHARAT”** organized under the aegis of Delhi University Botanical Society, Department of Botany, University of Delhi and Mycological Society of India (MSI) (2025)
- **Organizing Member**, 6-day National Workshop-cum-Faculty Development Programme on “**Microbes for Sustainable and Resilient Future**” organized by the Department of Botany, University of Delhi (2021)
- Member, *MH-Vatavaran* (2015-16), the Miranda House Environmental Society, Miranda House, University of Delhi
- Life Member, Delhi University Botanical Society (DUBS)

Academic Service

- Volunteered for Koshika-2016, Annual Botanical Festival at Miranda House, University of Delhi (2016)
- Volunteered at the 27th Conference of the Indian Association for Angiosperm Taxonomy and International Symposium on “Plant Systematics: Priorities and Challenges” organized by Department of Botany, University of Delhi, Delhi (2017).
- Volunteered in the 97th Annual Convocation of University of Delhi, Delhi (2021)
- Volunteered as a member of the organizing team, School of Ultimate Leadership (SOUL) for the Leader’s Talk, University of Delhi, Delhi (2026)

Academic Communication & Creative Contributions

- Served as **Master of Ceremonies** for National conferences, scientific conclaves, University celebrations, and academic events.
- **Designed and developed professional branding, publicity, and visual communication materials** for national scientific conferences, workshops, University of Delhi programs, DUBS initiatives, and institutional outreach events, including scientific posters, standees, invitations, certificates, brochures, banners, and digital promotional content.

ACADEMIC PERFORMANCE INDICATOR

CANDIDATE NAME: Karuna Sharma

ACADEMIC RECORD	Academic Performance Indicator Score
1) Graduation	21
2) Post graduation	23
3) M. Phil.	07
4) Ph.D.	Submission underway
5) NET +JRF	10
6) NET	N.A.
7) Research Publications	06
8) Teaching/Post-Doc Experience	N.A.
9) Awards (i) International/National Level (ii) State-Level	03
TOTAL	70