Name: Dr. Rashmi Shakya

Department: Botany

Current Designation: Associate Professor

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Academic Qualifications (reverse chronological order):

2012-2013	***Master of Science in Systems and Synthetic Biology***, College of Science and Engineering, University of Edinburgh, Scotland, U.K.
2001-2003	***Master of Science (Gold medalist),*** Botany (Specialization: Plant pathology), Dr. B. R. Ambedkar University, Agra, Uttar Pradesh, India
1999-2001	***Bachelor of Science (Gold medalist),*** Botany, Chhatrapati Sahu ji Maharaj University, Kanpur, Uttar Pradesh, India

Research Degree(s) (reverse chronological order):

Nov. 2022- May 2023	***Postdoctoral fellow***, Institute for the Conservation and Improvement of Valencian Agrodiversity (COMAV), Universitat Politècnica de Valencia, Valencia, Spain
Dec. 2003-Feb. 2009	***Doctorate of Philosophy***, Department of Botany, University of Delhi, Delhi, India

Field of Specialization under the Subject/Discipline: Reproductive Biology, Plant Physiology and Bioinformatics

Total Teaching Experience: 17+ Years

Teaching at Miranda House: since 1 September 2006

Honors and Awards

1. SERB International Research Experience (SIRE) Award 2022 by the Department of Science and Technology, Government of India for undertaking a 6 months research project at the Universitat Politècnica de València, Valencia, Spain.
2. Bursary Award 2012-2013: School of Biological Sciences, University of Edinburgh, Edinburgh, Scotland, U.K.
3. Delhi University Fellowship for Faculty Training Program (2012-2013) for doing a Masters in Systems and Synthetic Biology at the University of Edinburgh, Edinburgh, Scotland, U.K.

4. CSIR-UGC Senior Research Fellowship Award in December 2005
5. CSIR-UGC Junior Research Fellowship Award in December 2002
6. Awarded CSIR-UGC LECTURESHIP (National Eligibility Test) certificate in LIFE SCIENCES, 2002.
7. National scholarship Award for being among the top 0.1 % candidates in AISSCE 1997.

LIST OF PUBLICATIONS

1. **Shakya R**, Kumari R and Deepali (2024) Morphological and biochemical profiles of pollen allergens from Asteraceae: a pilot study. The Botanical Review (Accepted) IF- 4.0

2. Zuzunaga-Rosas J, Mircea DM, Calone R, **Shakya R,** Ibáñez-Asensio S, Boscaiu M, Fita AM, Ramón HM and Vicente O (2024) Mitigation of salt stress in lettuce by a biostimulant that protects the root absorption zone and improves biochemical responses. Frontiers in Plant Sciences 15: 2024. https://doi.org/10.3389/fpls.2024.1341714 (IF-6.63)

3. **Shakya R**, Capilla E, Pagan NT, Muñoz M, Boscaiu M, Lupuţ I, Vicente O and Verdeguer M (2023) Effect of two biostimulants, based on *Ascophyllum nodosum* extracts, on Strawberry performance under mild drought stress. Agriculture, 13(11): 2108 https://doi.org/10.3390/agriculture13112108 (IF- 3.6)

4. Kumar D, Singh B, Kumar G, **Shakya R**, Vikram K, Rani A and Singh H (2023) Phyto-fabrication and characterization of *Alternanthera sessilis* leaf extracts-mediated silver nanoparticles and evaluation of larvicidal potential. Biomass Conversion and Biorefinery, https://doi.org/10.1007/s13399-023-04948-6 (IF- 4.05)

5. Mircea DM, Calone R, **Shakya R**, Zuzunaga-Rosas J, Sestras RE, Boscaiu M, Sestras AF and Vicente O (2023) Evaluation of drought responses in two *Tropaeolum* species used in landscaping through morphological and biochemical markers. *Life*, 13(4): 960 https://doi.org/10.3390/life13040960 (IF- 3.253)

6. Mircea DM, Calone R, **Shakya R**, Saavedra MF, Sestras RE, Boscaiu M, Sestras AF and Vicente O (2023) Use of multivariate analysis in screening for drought tolerance in ornamental Asteraceae species. *Agronomy*, 13 (3): 687 https://doi.org/10.3390/agronomy13030687 (IF- 3.7)

7. Kumari R, Singhvi N, Sharma P, Choudhury C and **Shakya R** (2023) Gut microbiome bacteriocins as potential inhibitors of Stearoyl-CoA desaturase 1 to regulate adipocyte differentiation and thermogenesis to combat obesity. *Journal of Biomolecular Structure and Dynamics*, http://dx.doi.org/10.1080/07391102.2023.2167121 (IF- 5.235)

8. Kumar P, **Shakya R**, Vikram K, Kumar D, Chauhan RPS and Singh H (2023) Chemical constituents and strong larvicidal activity of *Solanum xanthocarpum* among selected plant extracts against the malaria, filaria, and dengue vectors. *Journal of vector borne diseases*, 60(1):18-31, 10.4103/0972-9062.361177 (IF- 0.735)

9. **Shakya R**, Singh N and Bhatla SC (2021) Iron homeostasis regulates maturation of tomato (climacteric) and capsicum (non-climacteric) fruits. *Journal of Plant Biochemistry and Biotechnology*, 30, 392–395, https://doi.org/10.1007/s13562-020-00611-7 (IF- 1.525)

10. **Shakya R** (2020) Localization of calcium signaling components on pollen and stigma of sunflower. *International Journal of Botany Studies*, 5(5): 267-272

11. **Shakya R** (2020) Stigma receptivity with pollen in sunflower accompanies novel histochemical and biochemical changes in both male and female reproductive structures. *Vegetos*, 33: 376–384, https://doi.org/10.1007/s42535-020-00118-5 (IF- 0.042)

12. **Shakya R** (2016) Synthetic biology: role of open-source approaches. *International Journal of Sciences and Applied Research*, 3(3): 26-31

13. **Shakya R** and Verma D (2016) Protein Kinase A-like Kinase and Cell Division Related Protein Kinase 2 as Drug Target for African Sleeping Sickness. *International Journal of Biotechnology and Biomedical Sciences*, 2(1): 27-31.

14. **Shakya R** and Bhatla S C (2010) A comparative analysis of the distribution and composition of lipidic constituents and associated enzymes in pollen and stigma of sunflower. *Sexual Plant Reproduction* (Now called *Plant reproduction*) 23: 163-172. https://doi.org/10.1007/s00497-009-0125-0. (IF- 4.217)

Book chapters

1. Rathore P and **Shakya R** (2024) Next-Generation Techniques in Ecophysiology: metabolomics, proteomics, SAR/QSAR. In Tripathi S, Bhadouria R, Srivastava P, Singh R and Devi RS (Eds.) Ecophysiology of Tropical Plants: Recent Trends and Future Perspectives. CRC Press Taylor & Francis, pg. 283-297. https://doi.org/10.1201/9781003335054-29

2. **Shakya R** and Deepali (2024) Markers of oxidative stress in plants. In Tripathi S, Bhadouria R, Srivastava P, Singh R and Devi RS (Eds.) Ecophysiology of Tropical Plants: Recent Trends and Future Perspectives. CRC Press Taylor & Francis, pg. 298-313. https://doi.org/10.1201/9781003335054-30

3. Devi LS and **Shakya R** (2023) Role of extreme climate events in amplification of plant invasion. In Tripathi S, Bhadouria R, Srivastava P, Singh R and Batish DR (Eds.) Plant Invasions and Global Climate Change. Springer, Singapore, pg. 77-97. https://doi.org/10.1007/978-981-99-5910-5_4

4. **Shakya R** and Lal MA (2018) Photoassimilate translocation. In: Plant physiology, Development and Metabolism. Springer Singapore, pg. 227-251. https://doi.org/10.1007/978-981-13-2023-1_6

5. **Shakya R** and Bhatla SC (2018) Pollination, fertilization and seed development. In: Plant physiology, Development and Metabolism. Springer Nature Singapore, pg. 821-856. https://doi.org/10.1007/978-981-13-2023-1_26

6. **Shakya R** and Lal MA (2018) Fruit development and ripening. In: Plant physiology, Development and Metabolism. Springer Nature Singapore, pg. 857-883. https://doi.org/10.1007/978-981-13-2023-1_27

7. Lal MA, Kathpalia R, Sisodiya R and **Shakya R** (2018) Biotic stress. In: Plant physiology, Development and Metabolism. Springer Nature Singapore, pg. 1029-1095. https://doi.org/10.1007/978-981-13-2023-1_32

8. Sharma B, **Shakya R** and Bhatla SC (2014). Floral biology of Sunflower- A histological and physiological analysis. In: Arribas JI (Ed.) Sunflowers: growth and development, environmental influences and pests/diseases. Nova Publishers, New York, USA.

E-content

1. Rashmi Shakya (2024) E-content for the course MBC-002: Cell and Molecular Biology, Unit 4 - Cellular Transport for the first semester of the M.Sc. Biochemistry program (MSCBCH), School of Sciences, IGNOU, pg. 81-107, ISBN 9789361060328.

2. Rashmi Shakya (2016) E-lesson titled "Pollen-pistil interaction and fertilization" for the undergraduate botany course for the paper titled 'Plant Reproductive Biology' under virtual learning Environment, ILLL, University of Delhi. ISSN 2349-154X, 978-93-85611-91-9.

3. Rashmi Shakya (2015) E-lesson titled "Carbohydrate metabolism" for the NMEICT MHRD project of virtual learning Environment, ILLL, University of Delhi. ISSN 2349-154X

4. Rashmi Shakya (2015) E-lesson titled "Translocation in the phloem" for the NMEICT MHRD project of virtual learning Environment, ILLL, University of Delhi. ISSN 2349-154X.

Article in conference proceedings

1. **Shakya R** (2016) Sunflower pollen allergy: A brief review. Conference proceedings of the international conference Public Health: Issues, Challenges, Opportunities, Prevention, Awareness (PUBLIC HEALTH: 2016) Organized by Daulat Ram College, University of Delhi, New Delhi, India and Krishi Sanskriti, New Delhi, India. Page no. 146-149

Poster Presentations

1. Basudha Sharma, **Rashmi Shakya** and S C Bhatla, Department of Botany, University of Delhi, Ultrastructural and elemental analysis of Stigma and Pollen in sunflower at International Conference of electron microscopy and XXXV Annual Meeting of electron microscope society of India (July 9-11, 2014). ***Best poster Award***

2. **Rashmi Shakya** and Renuka Agrawal, Department of Botany, Miranda House, University of Delhi, Adapting to Climate Change: Natural resource Management at National conference on "Climate Change: Impacts, Adaptation, Mitigation Scenario and Future Challenges in Indian Perspective" organized by Deen Dayal Upadhyay College, University of Delhi on 02-03 March 2015.

3. **Rashmi Shakya** and S C Bhatla. Structural and biochemical analyses of pollen-stigma interaction in sunflower. The 24th International Conference of Sexual Plant Reproduction (Plant Reproduction 2016) organized by the International Association of Sexual Plant Reproduction and Frontiers in Sexual Plant Reproduction IV from 18-23 March 2016 at Tucson, Arizona, USA.

4. Jahnve Gupta, Anubha Gupta, Vanshika Bhardwaj, **Rashmi Shakya**, Poonam Sharma and Rekha Kumari (2021) presented following three posters at the 6th Annual International Conference of Indian Network for Soil Contamination Research (INSCR) in association with A.N.D.C, D.D.U.C., Gargi College, K.M., Ramjas College, SVC (University of Delhi), Maitreyi College (DU), PG Department of Zoology (MU), CMP College (AU) & PhiXgen Pvt. Ltd. From 15-18 November 2021
   i. Human gut bacteriocins in regulating the plasticity of adipocytes and their role in obesity: An *in silico* study.
   ii. *In silico* characterization of gut microbiome proteins involved in the biosynthesis of neurotransmitters implicated in depression.
   iii. Study of anti-inflammatory effects of gut microbe *Faecalibacterium prausnitzii* in inflammatory bowel disease (IBD) using bioinformatics tools.

5. Poster entitled 'Isolation and characterization of a thermophile from Jakrem, Meghalaya, India' presented at the 7th Annual International Conference of Indian Network for Soil Contamination Research (INSCR) held from 9-11 November 2022 (Ankita Shelly, **Rashmi Shakya**, Chirashree Ghosh and Rekha Kumari)

6. Posters presented by interns of DSKC Summer internship program (on 18.07.2023) under my mentorship.
   i. Characterization of floral developmental stages and study of the structure of pollen and pistil (Nidhi Sharma, Jweria Alam and Varia)
   ii. Metagenomic approach to identify xenobiotic degrading bacterial genera from waste dumpsite soil (Bhalswa Sanitary Landfill) (Dhritidipa Roy and Ritesh Kumar).
   iii. Biochemical identification of industrially important enzymes from a thermophile and deducing its phylogenetic relationship (Sonal Roy and Vidhi Dhiman).

7. Posters presented during the 8th Annual International Conference of Indian Network for Soil Contamination Research (INSCR) held from 03.04.2024 to 05.04.2024
   i. Profiling xenobiotic degrading microbial biodiversity from Bhalswa sanitary landfill, Delhi: metagenomic approach (Ritesh Kumar, Ankita Shelly, **Rashmi Shakya** and Rekha Kumari)
   ii. Spatial-temporal variations in microbial and physicochemical characteristics of institutional water environment (Fathima Amal, Rahnuma Firdous, Upasana Bhattacharjee and Ritesh Kumar, **Rashmi Shakya**, Rekha Kumari and Shailendra Kumar)

Oral Presentations

1. Two oral presentations at the International Conference on Public Health: Issues, Challenges, Opportunities, Prevention, Awareness (PUBLIC HEALTH: 2016) Organized by Daulat Ram College, University of Delhi, New Delhi, India and Krishi Sanskriti, New Delhi, India (16 January 2016)
   i. Sunflower pollen allergy: a brief review
   ii. Protein Kinase A-like Kinase and Cell Division Related Protein Kinase 2 as Drug Target for African Sleeping Sickness

2. Oral presentation on the title 'Advanced omics techniques for the identification of xenobiotic-degrading microorganisms: Metagenomics, Metaproteomics and Metabolomics' presented at international conference cum workshop 'Making sense of omics: Proteomics, Transcriptomics and Molecular Drug Design at Zakir Husain College, University of Delhi from 23.042025 to 24.04.2024 (Ritesh Kumar**, Rashmi Shakya** and Rekha Kumari) *Second Position*

Research Projects:

1. Use of PGPR-based seed coatings for mitigation of salinity stress in plants funded by R & D Cell of Miranda House, Project code: R & D- 36/2024 (PI) (July 2024-June 2025)

2. Water pollution and clean water accessibility (SDG 6) in Institutional areas of University of Delhi: Assessment of physicochemical characteristics and mapping of microbial diversity funded by R & D Cell of Miranda House, Project code: R & D- 31/2024 (Co-PI) (January 2024-December 2024)

3. Effect of biostimulants on crops and of natural herbicides on common weeds funded by DST, SERB International Research Experience (SIRE) program (November 2022-May 2023)

4. Structural and Biochemical Analysis of Pollen-Stigma Interaction in Sunflower funded by UGC from 24 February 2007 to March 2009

Travel Grants

International travel grants from the University Grants Commission (UGC) and Indian National Science Academy, New Delhi (INSA) for poster presentation at the 24th International Conference of Sexual Plant Reproduction (Plant Reproduction 2016) organized by the International Association of Sexual Plant Reproduction and Frontiers in Sexual Plant Reproduction IV from 18-23 March 2016 at Tucson, Arizona, USA.

Membership of Professional Bodies:

1. Life member of the Indian Network of Soil Contamination Research since 2021
2. Life member of the Indian Science Congress Association since 2016
3. Life member of the Society of Plant Reproductive Biologists since 2016
4. Member of the Confederation of Indian Industries (CII) Primary Education Council 2017-2018
5. Member of the International Association of Sexual Plant Reproduction Research (IASPRR) 2015-2016
6. Life member of the Botanical Society, University of Delhi since 2008

Administrative Responsibilities:

1. Nodal Officer, NIRF 2024

2. Member, Garden Committee, Miranda House 20 May 2023-till date

3. Teacher-in-Charge, Department of Botany-20 May 2020 - 19 May 2022

4. Convenor, Garden Committee, Miranda House- 20 May 2020 - 19 May 2022

5. Treasurer, Miranda House Staff Association- September 2019- October 2022

6. Member, Extended Admission Committee for B.Sc. (Hons,) Botany- 2020-2021, 2021-2022, 2015-2016, 2009-2010, 2008-2009

7. Member, Extended Admission Committee for B.Sc. Life Sciences Program- 2012-2013, 2010-2011 Member, Proctorial Committee- May 2019- October 2022
8. Member, PRO Committee- 2018
9. Co-convenor, IBSD Miranda House Centre for North East Studies (2017-till date)
10. Member, North East Cell- 2017-2021
11. Member, MH Vatavaran (2016-2019)
12. Member, Garden Committee- 2015-2020, 2011-2012, 2010-2011, 2009-2010, 2008-2009
13. Teacher-in-Charge, Department of Botany, May 2015-August 2015
14. Staff Advisor, National Service Scheme- 2017-2018
15. Staff Advisor, Jigyasa, The Quiz Society- 2009-2010, 2008-2009, 2007-2008
16. Staff Advisor, Antheia, The Botanical Society- 2011-2012, 2010-2011, 2009-2010,
17. Convenor, Tricord, the Life Sciences Society- 2011-2012
18. Department Coordinator, Biology Baseline Test, 2010
19. Member, Scrutinizing Committee, Department of Botany for the post of Assistant Professor- 2015
20. Member of the interview panel for the Ad hoc appointments in college as subject expert and observer.

Invited talks/Session chair/Resource person (reverse chronological order):

1. Resource person for the Two-day workshop on 'Computational Biology in Deciphering Microbial Ecology' organized by Miranda House, University of Delhi and Phixgen Pvt. Ltd in collaboration with the Federation of European Microbiological Societies (FEMS) from 15-16.06.2022. Conducted a session on Introduction to Biological Databases on 16.06.2022.

2. Resource person for the short-term online course on Bioinformatics: An introduction for beginners and conducted two online hands-on training sessions on 'Retrieval of data from biological databases' and 'Use of PHYLIP software for molecular phylogeny' on 3 and 10 July 2020.
3. Resource person for the bridge course on Basic Laboratory Techniques organized for B.Sc. Life Sciences I Year students (2016-2017, 2017-2018, 2018-2019, 2019-20220, 2023-2024).
4. Resource person for the bridge course on Basic Laboratory Techniques organized for B.Sc. (H) Botany I Year students (2016-2017, 2017-2018, 2018-2019, 2019-2020, 2023-2024).
5. Resource person for the Biology workshop during the first "Astrobiology Summer School" organized by UK Centre for Astrobiology held at the University of Edinburgh from 8-12 July 2013
6. Resource person for the "Computational Biology- A Workshop for Science Teachers" workshop organized by D S Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi under DBT Star College Project from 9 - 11 January 2012.
7. Resource person for the workshop on the "Application of Culture Techniques in Plant, Animal and Bacterial Systems" at D S Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi during 1-14 July 2009 and conducted two lecture cum practical session on "Introduction to Plant Cell Culture" and "Protoplast Culture" on 6 and 14 July 2009 respectively.

Workshop/Add-On Course/ Training Program Coordinator

1. Co-Convenor of the three day skill development program based on Terrarium, Hydroponics & Aeroponics, Floriculture & Landscaping jointly organized by the MH- Vatika, the Garden Committee and the Department of Botany under the aegis of IQAC Miranda House, in collaboration with Indian Agricultural Research Institute (IARI) Pusa, New Delhi from 18.04.2024 to 20.04.2024

2. Convenor of the workshop entitled "Composting Techniques" organized by the Department of Botany, MH-Vatika, in collaboration with the Agronomy Division, Indian Agricultural Research Institute (IARI), PUSA, New Delhi on 20 September'2022.

3. Member of the organizing committee for the webinar on Discover your calling under the career Counselling Way Forward lecture series organized by Antheia, The Botanical Society of Miranda House under the aegis of the Internal Quality Assurance Cell, Miranda House on 19 July 2021.

4. Coordinated a 4-week short-term online course on Bioinformatics: An Introduction for Beginners from 29 June to 24 July 2020 for undergraduate students jointly organized by the Department of Botany and Zoology, Miranda House, University of Delhi.

5. Member of the organizing committee for the National Webinar on "Tinkering with plant genomes" organized by the Department of Botany, Miranda House, University of Delhi on 6 July 2020.

6. Member of the organizing committee for an Outreach program on women's safety organized by North East Cell of Miranda House in collaboration with the National Commission for Women on 28 August 2019.

7. Coordinator for the Bonsai Workshop organized on 22 March 2018 by the Department of Botany, Miranda House, University of Delhi under DBT Star College Scheme in collaboration with Indian Bonsai Association, New Delhi**.**

8. Coordinator for a one-day seminar on" Folktales of North East India" on 23 September 2017 organized by IBSD Miranda House Centre for North East Studies and The North East Society, Miranda House, University of Delhi.

9. Coordinator for "Labour and Employment Issues in North East India 18 April 2017, organized by IBSD Miranda House Centre for North East Studies, Miranda House, University of Delhi.

10. Add-on Course on "Bioinformatics and *in silico* medicine" at D. S. Kothari Centre for Research and Innovation in Science Education, Miranda House, from January 2014-April 2014. January 2016-April 2016.

11. Workshop on "PCR and Blotting Techniques" for students of B.Sc. (Hons.) Botany III Year at Department of Botany and DSKC Life Sciences Laboratory, Miranda House, University of Delhi under the aegis of DBT Star College Scheme from 27-29 February 2012.

Undergraduate Summer Research Projects/internships

Undertaken under the aegis of DS Kothari Centre for Research and Innovation in Science Education, Miranda House

Research-based internships-

1. Application of vernier Sensors in Biological Experiments: Factors affecting enzyme activity, the buffering capacity of juices, the absorption spectrum of chloroplast pigments, testing water quality

(May-June 2009).
2. Application of the natural dyes on different textile materials: an eco-friendly approach (May-July 2010).
3. Soil analysis from pesticide-contaminated fields in NCR (May-July 2016)
4. Assessment of different developmental stages of *Catharanthus roseus* flower and *in vitro* pollen germination studies (May 2019-July 2019)
5. Characterization of floral developmental stages and study of the structure of pollen and pistil of *Catharanthus roseus* (6 June 2023 to 18 July 2023)
6. Biochemical identification of industrially important enzymes from a thermophile and deducing its phylogenetic relationship (6 June 2023 to 18 July 2023)
7. Metagenomic approach to identify xenobiotic degrading bacterial genera from waste dumpsite soil (Bhalswa Sanitary Landfill) (6 June 2023 to 18 July 2023)
8. Seed coating as an effective strategy to mitigate abiotic stress in plants (13.06.2024 to 26.07.2024)

Review-based online internships (15 June 2021 to 31 July 2021)
1. Iron Homeostasis and its regulation by nitric oxide, melatonin and hydrogen sulfide during Fruit Ripening.
2. Role of nitric oxide in plant reproduction
3. Pollen stigma interaction- the role of enzymes
4. Role of Calcium in Pollen-stigma interaction
5. Role of Reactive oxygen species in plant reproduction
6. *Ostreococcus tauri*- an emerging model organism for experimental studies in plants
7. A survey of pollen allergens in Asteraceae
8. Pollen-stigma interaction in grasses- a review

Refresher Course/ Orientation Program

1. Participated in the UGC-sponsored Refresher Course in "Biotechnology and its Application" organized by the Centre for Professional Development in Higher Education, Institute of Lifelong Learning, University of Delhi from July 21 to August 10, 2009.
2. Participated in the UGC-sponsored Orientation Programme OR-66 organized by the Centre for Professional Development in Higher Education, Institute of Lifelong Learning, University of Delhi from 3 to 30 March 2011
3. Participated in the UGC-sponsored Interdisciplinary Refresher Course entitled "Folklore Culture and tradition" organized by the Centre for Professional Development in Higher Education, Institute of Lifelong Learning, University of Delhi from 18 February 2016 to 9 March 2016.

Training Programs

1. Participated in the face-to-face Five Days Training Program on Understanding the Vulnerability And Risk Associated With Urban Areas from 23-27 November 2021 jointly organized by the National Institute of Disaster Management, (Ministry of Home Affairs, Government of India), Center for Environmental Studies and Disaster Management, Miranda House, University of Delhi and Department of Environmental Studies, University of Delhi.
2. Participated in a one-week DST-sponsored training program on "Integrated nutrient management and nutrient budgeting using advanced models to increase crop productivity" held from 3-7 February

2020 at ICAR, Indian Institute of Soil and Water Conservation, Research Centre, Udhagamandalam, Tamil Nadu.

3. Participated in the STEM Teacher Training Workshop on Research-Based Pedagogy Tools held from 10-13 December 2017 at the Indian Institute of Technology, Gandhinagar, jointly sponsored by the Department of Biotechnology (DBT), Govt. of India; Newton Bhabha Fund of the British Council; Centre of Excellence in Science and Mathematics Education, IISER Pune (supported by Ministry of Human Resource Development, Govt. of India) and Indian Institute of Technology, Gandhinagar, Gujrat.
4. Participated in DST-sponsored training on, 'Science Administration and Research Management' at the administrative staff college of India, College Park Campus, Banjara Hills, Hyderabad, Telangana State from 6-17 February 2017.
5. Participated in Digital Literacy for Innovation in Tomorrow's Education (DLITE) organized by Campus of Open Learning, University of Delhi in collaboration with Edinburgh College, Scotland, U.K. under UK-India Education and Research Initiative (UKIERI) program from 18-21 November 2013.

Faculty Development Program

1. Completed three days Online Faculty Development Programme on "Understanding the Nuances of Sponsored Research Projects" being organized by Mahatma Hansraj Faculty Development Centre (MHRFDC), Hansraj College from 5th December to 7 December 2022.
2. Convener of one week (online) Interdisciplinary Faculty Development Programme on "Environment Sustainability & Climate Change" (4–8 April 2022) organized by Miranda House, University of Delhi in collaboration with Mahatma Hansraj Faculty Development Centre Hansraj College, University of Delhi.
3. Online International Conference Genetics and Genomics Technologies for Crop Improvement organized jointly by the Department of Botany, Hansraj College, University of Delhi & International Maize and Wheat Improvement Center (CIMMYT), Mexico in collaboration with Mahatma Hansraj Faculty Development Centre (MHRFDC), Hansraj College, University of Delhi, 1-3 August 2021.
4. Completed two weeks online Faculty Development Program on "Advanced Concepts for Developing MOOCS" from 2-17 July 2020 sponsored by the Ministry of Human Resource Development Pandit Madan Malviya National Mission on teachers and teaching organized by Teaching Learning Centre, Ramanujan College, University of Delhi
5. Completed two weeks online Faculty Development Program on "Managing online classes and co-creating MOOCS:2.0" from 18 May- 3 June 2020 sponsored by Ministry of Human Resource Development Pandit Madan Malviya National Mission on teachers and teaching organized by Teaching Learning Centre, Ramanujan College, University of Delhi
6. Attended and gave an e-poster presentation at the National Symposium cum Faculty Development Program on "Genome Editing: Tools and Applications" from 15-22 January 2018 organized by D.S. Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi

Short-term courses

1. Participated in the short-term course on the Academic leadership program for academicians entitled, 'Implementation of National Education Policy (NEP) 2020 from 7-9 March 2022 organized by the Centre for Professional Development in Higher Education (CPDHE), Human Resource Development Centre, University of Delhi.

Seminars/Workshops/Conferences attended:

Participation in National Symposia/Seminars/Conferences

1. National conference on Technological Empowerment of Women- commemorating International Women's Day at Vigyan Bhavan, New Delhi on March 8-9, 2018 organized by the National Academy of Sciences, India (NASI)
2. National seminar on "identifying and avoiding publishing in predatory journals: a lesson for researchers" organized by the Department of Botany, University of Delhi on 18 March 2017.
3. UGC-sponsored National conference titled, "Relevance of Medicinal Plants in 21st Century" organized by Ramjas College, University of Delhi on 10-11 February 2015.
4. RGCON-2010 conference organized by Rajiv Gandhi Cancer Institute & Research Centre, Delhi from 26 -28 March 2010 at India Habitat Centre
5. National Symposium on 'New Frontiers in Cell Biology' from 29-30th November 2007 organized by Department of Biochemistry, Deshbandhu College, University of Delhi, Delhi.
6. National seminar on "Current Trends in Plant Sciences" organized by Delhi University Botanical Society, Department of Botany, the University of Delhi from 15-16 February 2007.

Participation in International Conference

1. Presented poster at the 24th International Conference of Sexual Plant Reproduction (Plant Reproduction 2016) organized by the International Association of Sexual Plant Reproduction and Frontiers in Sexual Plant Reproduction IV from 18-23 March 2016 at Tucson, Arizona, USA.

Participation in Workshops

1. Workshop on 'Implementation of NEP 2020: Implications for undergraduates colleges organized by Miranda House, University of Delhi on 29 September 2023.

2. Workshop on "Catalyzing a Cultural Shift in Youth Entrepreneurship" organized by D. S. Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi and Biotechnology Industry Research Assistance Council (BIRAC) on 9 November 2017 (National Entrepreneurship Day).

3. Workshop on "Active learning as a transformational tool for the university classroom" organized by D. S. Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi 15 May 2017.

4. DBT and AOGIN-India sponsored a workshop on "Women Health and Cancer Awareness" organized by the Department of Zoology, Mirada House, University of Delhi on 7 April 2017.
5. National Workshop on Ethnobotany held at Hansraj College, University of Delhi September 16-17, 2016.

6. Indo-Portuguese workshop on 'Emerging trends of nanotechnology in chemistry and biology (INCB-2016)' organized by the Department of Chemistry, Hansraj College & Deshbandhu College, University of Delhi, India in association with CQM, University of Madeira, Portugal held on 12-13 February 2016.
7. Workshop on 'Training the Trainers: IPR workshop", held on 15 January 2016 at Miranda House, Delhi University in collaboration with MHRD IPR chair (Technical).
8. Workshop on "Computational Methods in Drug Discovery" organized by the Department of Chemistry in collaboration with Schrödinger Inc. and D. S. Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi under DBT Star College Project from 16-17 April 2015.
9. Workshop on "Applications of Flow Cytometry" organized by the Department of Zoology and D. S. Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi under DBT Star College Project on 20 March 2015.
10. Workshop on "Environmental Issues in India" organized by Institute of Lifelong Learning, Department of History and Indraprastha College for Women, University of Delhi from March 16-17, 2012.
11. 2nd Training Workshop in Drosophila Genetics, "Teaching Genetics with Drosophila", organized by Drosophila Stock Centre, Department of Zoology from 28 – 29 January 2012 at Department of Zoology, University of Delhi.
12. "Leadership 2.0" a workshop by the Gandhi fellowship program at Miranda House on 21-22 December 2011.
13. National Fluorescence Workshop: spectroscopy and Microscopy in Biology and Chemistry (FCS-2011) held in ICGEB, JNU and IITD, New Delhi during November 14-18, 2011.
14. Workshop on, "Fundamentals of Bioinformatics", organized by the Department of Botany, Ramjas College at the Institute of Lifelong Learning, University of Delhi, Delhi from 26 -30 September 2011.
15. Workshop for Life Sciences Faculty, "Phylogenetics: Principles and Practices". Held under the aegis of ILLL, Department of Botany, University of Delhi and DBT Star College Scheme, Sri Guru Tegh Bahadur Khalsa College, held at ILLL, Academic Research Centre, University of Delhi on August 27-28, 2011.
16. National workshop, "Evolutionary perspectives in modern biological teaching and research", jointly organized by ILLL, Centre for Science Education and Communication and Acharya Narendra Dev College, University of Delhi from May 9-10, 2011 at Academic Research Centre, University of Delhi.
17. Tier-II, ILLL-Microsoft Corporation Workshop on Developing Champion of ICT Capacity Building in DU, Institute of Life Long Learning, from 19-24 April 2010.
18. Workshop "The Fascinating World of e-Resources for Teaching Biology to undergraduate students" held on 8 March 2010, at Daulat Ram College, University of Delhi
19. Workshop "Art and Science of Paper Recycling" organized by MH Vatavaran at Miranda House from January 22-23, 2010.
20. Workshop for Miranda House Science teachers on "Interfacing Real-time Experiments with Computers" at the D S Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi during 16, 17, 20 and 21 April 2009.

21. Workshop entitled "Development of online quizzes in Life Sciences" at the Institute of Lifelong Learning, University of Delhi on 13 April 2009.

22. Workshop for Biology Laboratory Course (Course code: LS 306) of B.Sc. Program III year from October 21-24, 2008 organized at Acharya Narendra Dev College by Institute of Lifelong Learning and Centre for Promotion of Undergraduate Research and Training, Acharya Narendra Dev College, University of Delhi, Delhi.

23. Workshop for Biology Laboratory Course (Course code: LS 206) of B.Sc. Program II year from 24-26 September 2008 at Miranda House organized by Institute of Lifelong Learning and D.S. Kothari Centre for Research and Innovation in Science Education, Miranda House at Miranda House, University of Delhi, Delhi.

Online Conferences/ Workshops/ Training Programs

National Workshops

1. National Virtual Workshop on Create Your Own Garden organized by Garden Committee, Gargi College, University of Delhi, 05-07 November 2020.
2. Participated in an online workshop 'R for Biologists' organized by Institute for Microbial Technology, Chandigarh on 18 July 2020.

International Workshops

1. Participated in the PRE- CONFERENCE WORKSHOP on "PYTHON FOR BIOLOGY" by PhiXgen Pvt. Ltd. during the 6th Annual International Conference of INSCR on MICROBES IN SUSTAINABLE DEVELOPMENT organized in association with the Department of Zoology (DU), Acharya Narendra Dev, College (DU), Deen Dayal Upadhyaya College (DU), Gargi College (DU), Kirori Mal College (DU), PG Department of Zoology (MU), Maitreyi College (DU), Ramjas College (DU), Sri Venkateswara College (DU), C.M.P. College (AU), SGTB Khalsa College (DU), COCAS (PU) & PhiXgen Pvt. Ltd., Gurugram from November 14-15, 2021.

2. Participated in "First Indo-UK SPARC workshop on Transcriptional Dynamics in Developmental Biology" organized by Jawaharlal Nehru University, India and University of Manchester as part of Indo-UK bilateral cooperation under the Scheme for Promotion of Academic and Research Collaboration (SPARC) of HRD Ministry, Government of India from 10-11 August 2020.

3. Participated in a three-day hands-on workshop on "Health and Research in Current Scenario: with Special Emphasis on COVID-19 Virus Genomics and Pathogenicity" from 14-16 July 2020 sponsored by International Society for Microbial Ecology and organized by Sri Venkateswara College in association with PhiXgen Pvt. Ltd.

Training programs

1. Completed an online teacher training program on Holocaust studies organized by the Overseas Education and Training Department, International School for Holocaust Studies, Yad Vashem in collaboration with Miranda House, University of Delhi on 3 February 2022.
2. Completed a two-day online training course for teaching faculty of Universities and Colleges on Conservation Issues in India organized by Central Academy for State Forest Service (CASFOS),

Dehradun, Uttarakhand, 27-28 January 2021.

International conferences

1. Participated in the 6th Annual International Conference of Indian Network for Soil Contamination Research (INSCR) in association with A.N.D.C, D.D.U.C., Gargi College, K.M., Ramjas College, SVC (University of Delhi), Maitreyi College (DU), PG Department of Zoology (MU), CMP College (AU) & PhiXgen Pvt. Ltd. From 15-18 November 2021 and supervised three students for a poster presentation.
2. Online International Conference Genetics and Genomics Technologies for Crop improvement organized jointly by the Department of Botany, Hansraj College, University of Delhi & International Maize and Wheat Improvement Center (CIMMYT), Mexico in collaboration with Mahatma Hansraj Faculty Development Centre (MHRFDC), Hansraj College, University of Delhi, 1-3 August 2021.
3. Attended Online International Conference on 'Effective strategies for biodiversity conservation' organized by the Department of Botany, Daulat Ram College, University of Delhi on 23-24 March 2021
4. Online International Conference on Omics of Plant-Pathogen Interaction with their Implication organized by National Institute of Technology, Rourkela, Odisha from 16 to 18 November 2020
5. Attended international conference on "Covid genomics" on 17 July 2020 sponsored by the International Society for Microbial Ecology and organized by Sri Venkateswara College in association with PhiXgen Pvt. Ltd.

National webinars

1. Participated in a National webinar on 'Biodiversity and Man' organized by the Department of Botany, Dyal Singh College, University of Delhi, in collaboration with Society for Ecological Research and Natural Resources Management (SERNRM) on 5 June 2020.
2. Participated in the webinar on "Evolution of science seen from historical perspective" organized by the Department of Botany, Deshbandhu College under the aegis of IQAC on 12-13 May 2020.
3. Member of the organizing committee for the webinar 'Tinkering with plant genome' organized by the Department of Botany, Miranda House, University of Delhi on 6 July 2020.
4. Participated in a webinar on 'Utilization of agricultural/forest residues in renewable energy for sustainable development' organized by G B Pant University of Agriculture and Technology, Pantnagar and Society of Biological Chemist, (India) Pant Nagar Chapter at the Department of Biochemistry, CBSH Pantanagar on 30 July 2020.
5. Participated in the webinar on 'Floriculture and Terrace gardening' organized by Mahatma Gandhi Institute for Combating Climate Change Bakoli, Delhi on 7 August 2020.
6. Participated in a webinar on 'Colors in Nature' on 22 August 2020 organized by the Department of Botany, Kirori Mal College under the DBT Star college scheme 2019-2020.
7. Participated in Webinar on "KITCHEN GARDENING AND HOUSEHOLD WASTE MANAGEMENT", held on 25th AUGUST, 2020 organized by Mahatma Gandhi Institute for Combating Climate Change (Govt. of NCT of Delhi) Bakoli, Delhi
8. Participated in the webinar "Clean Yamuna: A Gateway towards cancer prevention: organized by the Department of Biochemistry, Shaheed Rajguru College of Applied Sciences for Women, University

of Delhi in collaboration with Unnat Bharat Abhiyan and Dharamshila Cancer Foundation and Research Centre on 14 September 2020.

9. Participated in a webinar on 'Splendour of orchids' organized by the Department of Botany, Maitreyi College, University of Delhi held on 25 September 2020.

10. Participated in a National webinar on 'Learning from Corona pandemic' organized by the Department of Chemistry, Miranda House on 24-25 September 2020.

11. Attended webinar on "National Education Policy-2020" a collaborative event by the National Service Scheme Unit and Unnat Bharat Abhiyan Society of Shaheed Rajguru College of Applied Sciences for Women held on 29 September 2020 organized by Shaheed Rajguru College of Applied Sciences, University of Delhi.

12. National Webinar on Cybercrimes: Prevention and Mitigation in the Digital Era organized under by Short Term Courses Committee, Maitreyi College, University of Delhi, 22 October 2020.

International webinars

1. Participated in an International webinar on 'Recent trends in Systematic Biology' organized by Government Post Graduate College, Nagnath-Pokhari (Chamoli) and Department of higher education, Uttarakhand on 28 July 2020.
2. Participated in an International webinar on 'Environment, Gender and Climate Change', organized by the Department of Botany, Shivaji College, University of Delhi under the aegis of the DBT Star College Scheme on 28 July 2020.

Synergy (work with other organizations outside the college):

1. Reviewer of e-content for undergraduate level in Botany at Consortium for Educational Consortium (CEC), IUAC, New Delhi.
2. Panelist for recruitment of candidates for the Gandhi fellowship offered by Kaivalya Education Foundation and Piramal Foundation for Education Leadership (2011-2012)