

Faculty Profile

Dr. Nitika Kapoor

Assistant Professor, Department of Botanical and Environmental Sciences, GNDU,
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Orchid ID: 0000-0002-3705-7524

Qualification: M.Sc. (Botany), UGC-CSIR-JRF-NET, Ph.D.

Area of Specialization: Plant stress Physiology and
Biochemistry, Phytoremediation, Biochar

Teaching experience: 16 Years

Research Experience: 20 Years

Publications: 54+ 2 Books

Research papers: 17

Book Chapters: 37; **Books edited:** 2

h index: 16

i10 index: 18

Citations: 1015

<https://scholar.google.com/citations?user=8nWmuC0AAAAJ&hl=en>

Scopus h index: 8

Citations : 453

NEPTEL MOOCs/AgMOOCs qualified: 12

FDP/Refresher courses attended: 12

Workshops/Conferences/ Symposia/Seminars attended:

Training/workshops: 19

Conferences/ Symposia/Seminars: 44



Major Research Project:

Title	Agency	Period	Amount Mobilized (Rs lakh)
Antioxidative potential of Brassinosteroids in salt stressed maize	UGC, New Delhi	3 Years (2011-2014)	Rs. 11.47 Lakh

Membership of Academic bodies:

- ✓ Member Board of Studies (UG) in Department of Botanical and Environmental Sciences, GNDU, Amritsar for the term 1-7-2016 to 30-6-2018
- ✓ Member Board of Studies (PG) in Department of Botanical and Environmental Sciences, GNDU, Amritsar for the term 1-7-2018 to 30-6-2020
- ✓ Member Faculty of Life Sciences, GNDU, Amritsar for the term 1-7-2024 to 30-6-2026
- ✓ Life member of Punjab Academy of Sciences, Patiala
- ✓ Life member of Society for Plant Research, Vegetos, An international Journal of Plant Research and Biotechnology (Springer, Sept, 2024)

- ✓ Life member of **Bioclues Organization**
- ✓ Life member of **ASIA ASSOCIATION OF PLANT SCIENTISTS**

Reviewer of many peer-reviewed research journals of international repute including *Plant Stress* (Elsevier), *Vegetos* (Springer), *International Journal of Environmental Research* (Springer), *Heliyon* (Cell Press), *Frontiers in Plant Science* and *Frontiers in Microbiology*(Frontiers Media).

Assistant Editor: Vegetos (Springer)

Guest Editor: Frontier in Plant Sciences

Research Guidance:

Degree Awarded: 1, Enrolled for Ph.D. degree: 5

- ✓ Guided Ms. Amandeep Rattan for Ph.D. degree (degree awarded from GNDU, Amritsar, 2016), who is appointed as research fellow in UGC sanctioned major research project.
- ✓ Co-Guide of Ms. Ramanpreet Kaur for Ph.D. degree, who is registered in Department of Biotechnology, LPU, Phagwara (Regd. No. 41600110), for her work entitled “*In- vitro* screening of potato varieties against saline and drought stress based on ultra-structural and physiological parameters”

Resource person

1. Invited as **keynote Speaker** and delivered a talk on the topic entitled “**Promoting Millets for Nutrition, Sustainability and Agricultural Resilience: Rediscovering a forgotten super grain**” during **International conference on Emerging Trends and Innovations in Basic Sciences (ETIBS-2024)**, organized by Career Point University, Hamirpur (H.P.) india in collaboration with **The University of the West Indies, St. Augustine, Trinidad and Tobago, West Indies** (22-23 Nov, 2024).
2. Delivered an invited lecture on the topic entitled “” during **National Conference on “Good Agricultural Practices of selected Medicinal Plants” & SPR-Mini Symposium on “Biotechnological & Genomic tools to combat climate change”** organized at Aligarh Muslim University, Aligarh (U.P.), India (November 16-18, 2024).
3. Co-chaired the session during **National Conference on “Good Agricultural Practices of selected Medicinal Plants” & SPR-Mini Symposium on “Biotechnological & Genomic tools to combat climate change”** organized at Aligarh Muslim University, Aligarh (U.P.), India (November 16-18, 2024).
4. Delivered an invited lecture on the topic entitled “**Composting of food waste-turning waste into Black Gold**” in Expert Lecture Session organized by School of Natural Sciences and GU-IIC, GNA University, Punjab (August 23, 2024)
5. Acted as Resource person and delivered a guest lecture on the topic entitled “**Millets: The Sustainable Food Crops**” organized by Eco Club, PCM S.D. College, Jalandhar under “Mission LIFE” sponsored by Punjab State Council of Science and Technology, Chandigarh (April 19, 2024).
6. Delivered an invited lecture on the topic entitled “**Career challenges faced by Young Women Investigators**” in Regional Young Investigators’ Meeting (RYIM-2023)-Srinagar, Organized by **University of Kashmir, in collaboration with Central**

University of Kashmir, J&K, sponsored by India Bioscience, Bangalore (September, 2023)

7. Acted as Resource person and delivered a talk during online workshop on the topic **“Plant Nutrition and Hospitality Industry”** organized by Department of Hotel Management and Catering Technology, CT Institute of Management and Information Technology, North Campus (Maqsudan), Jalandhar (June 1, 2022).
8. Acted as Resource person and delivered a talk during online webinar on **“Biodiversity Building a shared future for all life”** to celebrate International Biodiversity day under the aegis of **Association of Microbiologists of India-Lovely Professional University Unit**, organized by School of Bioengineering and Biosciences, Lovely Professional university, Phagwara, Punjab (May 22, 2022).

Teaching Experience: 16 Years

Position	Institution	Period
Junior Research Fellow (UGC-JRF) Assisted in Graduate and Postgraduate Theory and Practical Classes	Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar.	Oct 2004 – Oct 2006
Senior Research Fellow (UGC-SRF) Assisted in Graduate and Postgraduate Theory and Practical Classes	Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar.	Oct 2006 – Jan 2009
Assistant Professor in Botany (Teaching Graduate and Postgraduate classes)	PG Department of Botany, Hans Raj Mahila Maha Vidyalaya, Jalandhar	Jan 2009 – Jan 2013
Sr. Assistant Professor in Botany (Teaching Graduate and Postgraduate classes)	PG Department of Botany, Hans Raj Mahila Maha Vidyalaya, Jalandhar	Jan 2013 – April 2023
Assistant Professor in Botany (Teaching Graduate and Postgraduate classes)	Department of Botanical and Environmental Sciences, GNDU, Amritsar	April 2023- Continuing

Research Experience: 20 Years

Position	Institution	Period
Junior Research Fellow (UGC-JRF)	Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar.	2004-2006
Senior Research Fellow	Department of Botanical and Environmental Sciences, Guru Nanak Dev University,	2006-2009

(UGC-SRF)	Amritsar.	
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Offices held at Department of Botanical and Environmental Sciences, GNDU, Amritsar:

- Faculty Advisor, Department of Botanical and Environmental Sciences, GNDU, Amritsar (Session 2023-24)
- Member Campus Committee, GNDU, Amritsar (1-04-24 to 31-3-25)
- Coordinator, Celebrations of International Biodiversity day, Funded by Punjab State Council of Science and Technology, Chandigarh (May 22, 2023).
- Coordinator, for Essay Writing completion organized Under “Mission LIFE-Life Style for Environment”, sponsored by Punjab State Council of Science and Technology, Chandigarh, organized by GNDU, Amritsar (May 29-30, 2023).

Offices held at Hans Raj Mahila Maha Vidyalaya, Jalandhar, Punjab:

- Co-ordinator of Community College courses (UGC-community college scheme)
- Course Co-ordinator Diploma in Organic farming(UGC-community college scheme)
- Incharge DD pant Botanical Sciences Society
- Editor-HMV News
- Editor- Science Magazine “Gravity”
- Incharge Self defence classes of Science students
- Co-Dean Student Council
- Incharge- Criterion II (Teaching Learning and Evaluation) of NAAC and AQAR**
- Organizing secretary** of E-international conference on Plant Biodiversity and Environment Conservation (ICPBEC-2021) held in collaboration with Punjab Biodiversity Board (20-21, May, 2021).

Appreciation/Awards/honours:

1. Awarded **Junior Research Fellowship** in Life Sciences Under the UGC Fellowship Scheme and qualified for **Lectureship** (2004).
2. Awarded **Senior Research Fellowship** in Life Sciences Under the UGC Fellowship Scheme (2006).
3. First Position in **Prof. I.S. Grover Memorial Quiz** conducted by Department of Botanical & Environmental Sciences, G.N.D.U., Amritsar (2004).
4. **Third prize in Poster Competition-** “24-Epibrassinolide regulated Asada-Halliwell pathway in copper stressed maize (*Zea mays* L.) seedlings” presented in National Seminar on “Environment and Sustainable Development”. Department of Botanical and Environmental Sciences, **Guru Nanak Dev University, Amritsar (Nov 3-4, 2009). Abstract no. MB-23, pp. 28.**
5. Received **appreciation certificate from Guru Nanak Dev University, Amritsar** for being standing first in Bhai Vir Singh Flower and Plants show-cum- seminar (December 18-20, 2018).
6. Received **appreciation certificate from Guru Nanak Dev University, Amritsar** for being standing Second in Bhai Vir Singh Flower and Plants show-cum- seminar (December 8-10, 2019).
7. Received **appreciation certificate from Office of Deputy Commissioner-Cum-District election officer, Jalandhar on National voter day-2021** for being member of organizing committee (25 January, 2021).
8. Qualified 8 week **NEPTEL** online certification course organized by IIT, Kanpur , funded by ministry of HRD, Govt. of India entitled “**Cell culture technologies**”(8 week course, Feb-April, 2019, **equivalent to FDP**) with a consolidated score of 88% marks (**in category of top 2% topper and Elite + silver medal**), Feb-April 2019.

9. Received appreciation certificate from Principal, Hans Raj Mahila Maha Vidyalaya Jalandhar for commendable job in Three day Entrepreneurship Development Awareness camp sponsored by Entrepreneurship Development Institute of India under DST-NIMAT Project, organized by Career Counselling Cell (EDC) and commerce Club, Hans Raj Mahila Maha Vidyalaya, Jalandhar (12-14 March, 2020)
10. Won **second prize in poster presentation competition organized by E-international conference on Plant Biodiversity and Environment Conservation (ICPBEC-2021) in collaboration with Punjab Biodiversity Board**, Hans Raj Mahila Maha Vidyalaya, Jalandhar (20-21, May, 2021)
11. Received **“Best Women Researcher Award”** from PEARL- A Foundation for Educational Excellence in Higher Education, in recognition of outstanding contributions in the field of Botany during National conference on “SMART SUMMIT-2021” at Maduri (19 June, 2021)
12. Conferred with **Young Scientist Award-2024 (ENVIRONMENT)** by **Society for Plant Research (SPS) (Vegetos)** during **National Conference on “Good Agricultural Practices of selected Medicinal Plants” & SPR-Mini Symposium on “Biotechnological & Genomic tools to combat climate change”** organized at Aligarh Muslim University, Aligarh (U.P.), India (November 16-18, 2024). She was also presented with a Springer book voucher for the value of **EUR 300** (Three hundred euros) as a price token by Springer Nature Publisher.

Refresher course/ Faculty Development Programme attended: 12

Name of the Course/Summer School	Organized by	Duration	Sponsoring Agency
Orientation Programme-85	Academic staff College, GNDU, Amritsar	May 4-31, 2011	UGC Sponsored
Refresher Course in Environment Sciences(ID)	Academic staff College, GNDU, Amritsar	9 th June,2015 to 29 th June, 2015	UGC Sponsored
Faculty Development Programme on Advance Techniques in Research	Hans Raj mahila Maha Vidyalaya, Jalandhar	March 25-31, 2016	UGC Sponsored
Faculty Development Programme on Technological Innovation in Science for humanity	Hans Raj mahila Maha Vidyalaya, Jalandhar	April 25-May 01, 2016	DBT Sponsored
One Week Faculty Development Program on "Open Source Tools for Research"	Teaching Learning Centre, Ramanujan College, University of Delhi, under the aegis of Ministry of Human Resource Development, Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching.	June 08 - June 14, 2020	MHRD sponsored
Two-Week Faculty Development	Teaching Learning centre,	July 25 -	MHRD sponsored

Programme on "MANAGING ONLINE CLASSES AND CO-CREATING MOOCS 3.0" and obtained grade A+ .	Ramanujan College, University of Delhi, under the aegis of Ministry of Human Resource Development, Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching.	August 10,2020	
One week online workshop on "Academic Writing and Ethics in Research"	School of Education, Guru Nanak Dev University, Amritsar under the aegis of Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching.	2-8 December, 2020	MHRD, Govt of India Sponsored
One week FDP on "Guru Siddhta: Advances in Teaching and learning Pedagogies"	Hans Raj mahila Maha Vidyalaya, Jalandhar	June 24-30, 2022	DBT, Govt of India Sponsored
One week Short term course on Disaster Management and Environmental Awareness	UGC-MMTTC, GNDU, Amritsar	Jan 4-10, 2024	UGC Sponsored
NEP 2020 Orientation and Sensitization Programme	UGC-MMTTC, GNDU, Amritsar	May 14-22, 2024	UGC Sponsored
Faculty induction Programme-11	UGC-MMTTC, GNDU, Amritsar	May 27- June 22, 2024	UGC Sponsored

Online Courses (MOOCs/FDP/ Refresher courses) attended: 12

1. Qualified 8 week **NEPTEL** online certification course organized by IIT, Kanpur , funded by ministry of HRD, Govt. of India entitled "**Cell culture technologies**"(8 week course, Feb-April, 2019, **equivalent to FDP**) with a consolidated score of 88% marks (**in category of top 2% topper and Elite + silver medal**), Feb-April 2019.
2. Qualified 8 week **NEPTEL** online certification course organized by IIT, Madras , funded by ministry of HRD, Govt. of India entitled "**Organic Farming for sustainable Agricultural Production**" (8 week course, Jul-Sept, 2019, **equivalent to FDP**) with a consolidated score of 81% marks (**in Elite category + silver medal**), Jul-Sept, 2019.
3. Qualified 4 week **NEPTEL** online certification course organized by IIT, Kanpur , funded by ministry of HRD, Govt. of India entitled "**Bioenergetics of Life Processes**" (4 week course, Feb-March, 2020, **equivalent to 1/2 FDP**) with a consolidated score of 81 % marks (**in Elite category**), Feb-March, 2020.
4. Qualified 8 week **NEPTEL** online certification course organized by Indian Institute of Science, Bangalore, funded by ministry of HRD, Govt. of India entitled "**Cell Biology: Cellular organization, Divisions and Processes**" (8 week course, Feb-April, 2021,

- equivalent to 1/2 FDP)** with a consolidated score of 66 % marks **(in Elite category)**, Feb-April, 2021.
5. Qualified 6-week **AgMOOCs** online certification course organized by IIT, Kanpur in collaboration with Common wealth of learning, Canada entitled **“Employment Generation among Rural Youth through Agripreneurship”** with **distinction and with Honor code and Competency certificate**, Feb-April 2019.
 6. Qualified 6-week **AgMOOCs** online certification course organized by IIT, Kanpur in collaboration with Common wealth of learning, Canada entitled **“Detection, Diagnosis and management of Plant diseases”** with **distinction and with Honor code and Competency certificate**, Nov-Dec, 2019.
 7. Qualified 6-week **AgMOOCs** online certification course organized by IIT, Kanpur in collaboration with Common wealth of learning, Canada entitled **“Diagnosis of crop and stored grain pests and their management”** with **Honor code and Competency certificate**, Feb-March, 2020.
 8. Qualified 8-week **AgMOOCs** online certification course organized by IIT, Kanpur and BHU Varanasi in collaboration with Common wealth of learning, Canada under Madan Mohan Malaviya National Mission on Teachers and Teaching entitled **“Fundamentals of Agriculture Extension”** with **Honor code**, 30 June 2020.
 9. Qualified 8-week **AgMOOCs** online certification course organized by IIT, Kanpur and Department of Entomology, UAS-Raichur, Karnataka in collaboration with Common wealth of learning, Canada under Madan Mohan Malaviya National Mission on Teachers and Teaching entitled **“Integrated Pest Management”** with **Honor code**, 30 June 2020.
 10. Successfully completed **One Week Faculty Development Program on "Open Source Tools for Research"** organized by **Teaching Learning Centre, Ramanujan College, University of Delhi**, under the aegis of Ministry of Human Resource Development, Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (June 08 - June 14, 2020).
 11. Successfully completed a **2-Week Faculty Development Programme on "MANAGING ONLINE CLASSES AND CO-CREATING MOOCS 3.0"** and **obtained grade A+ organized by Teaching Learning centre, Ramanujan College, University of Delhi**, under the aegis of Ministry of Human Resource Development, Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (July 25 - August 10, 2020).
 12. Participated in the Online Refresher Course on “Science Academics” conducted by PG & Research Department of Chemistry & Physics, A.P.A.College of Arts & Culture, Palani, Tamilnadu and obtained A+ grade held from 24.06.2020 to 07.07.2020.

List of Publication:

Research Papers:

1. Bhardwaj, R., **Arora, N.**, Sharma, P. and Arora, H.K. (2007). Effects of 28-homobrassinolide on seedling growth, lipid peroxidation and antioxidative system in *Zea mays* L. seedlings under nickel stress. *Asian Journal of Plant Sciences*. 6(5): 765-772. ISSN: 1682-3974, Scopus indexed, Impact factor: 0.87
2. Sharma, P., Bhardwaj, R., **Arora, N.** and Arora, H.K. (2007). Effect of 28- homobrassinolide on growth, Zn metal uptake and antioxidative enzyme activities in *Brassica juncea* L. seedlings. *Brazilian Journal of Plant Physiology*.19 (3): 203-210. ISSN: 16770420, Scopus indexed, Impact factor: 2.656
3. Bhardwaj, R., Sharma, P., Arora, H.K. and **Arora, N.** (2008). 28-Homobrassinolide regulated Mn-uptake and growth of *Brassica juncea* L. *Canadian Journal of Pure and Applied Sciences*. 2 (1): 149-154. ISSN: 1715-9997
4. **Arora, N.**, Bhardwaj, R., Sharma, P. and Arora, H.K. (2008). Effects of 28-homobrassinolide on growth, lipid peroxidation and antioxidative enzyme activities in seedlings of *Zea mays* L. under salinity stress. *Acta Physiologia Plantarum*. 30: 833-839. ISSN: 1861-1664, Scopus indexed and UGC listed, Impact factor-2.983
5. **Arora, N.**, Bhardwaj, R., Sharma, P. and Arora, H.K. (2008).28-Homobrassinolide alleviates oxidative stress in salt treated maize (*Zea mays* L.) plants. *Brazilian Journal of Plant Physiology*. 20 (2): 153-157. ISSN: 16770420; Scopus indexed, Impact factor: 2.656
6. **Arora, N.**, Bhardwaj, R., Sharma, P, Arora, H.K. and Arora, P. (2008). Amelioration of Zn toxicity by 28-homobrassinolide in *Zea mays* L. *Canadian Journal of Pure and Applied Sciences*. 2 (3): 503-509. ISSN: 1715-9997
7. Sharma, P., Bhardwaj, R., **Arora, N.**, Arora, H. K. and Kumar A. (2008). Effects of 28-homobrassinolide on nickel uptake, protein content and antioxidative defence system in *Brassica juncea*. *Biologia Plantarum*. 52 (4): 767-770. ISSN: 0006-3134; Scopus indexed, Impact factor: 1.122
8. **Arora, N.**, Bhardwaj, R., Sharma, P and Arora, H.K. (2008). Mitigation of Cu- stress by the application of 28-Homobrassinolide in maize seedlings. *Plant Stress*. 2(2): 127-130; ISSN: 1749-0359
9. Bhardwaj, R., Sharma, P., **Arora, N.** and Arora, H.K. (2011). Amelioration of Mn toxicity by brassinosteroids in *Brassica juncea* L. *International Journal of Environment and Waste management*. 8(1/2): 114-122. ISSN: 1478-9868; Scopus indexed, Impact factor-0.54
10. Kapoor, N., Bhardwaj, R. and Rattan. A. (2012). Stress Protective properties of Brassinosteroids. *Indian J. of Biotechnology and Bioengineering*. 1: 41-50.
11. Rattan A, **Kapoor, N** and Bhardwaj, R (2014). Role of Brassinosteroids in Osmolytes Accumulation under Salinity Stress in *Zea mays* Plants. *International Journal of Science and Research*.3 (9): 1822-1827; ISSN: 2319-7064
12. Rattan A, Kapoor, D, **Kapoor, N** and Bhardwaj, R (2014). Application of Brassionsteroids Reverses the Inhibitory Effect of Salt Stress on Growth and Photosynthetic Activity of *Zea mays* Plants. *International Journal of Theoretical & Applied Sciences* 6(2): 13-22., ISSN: 0975-1718, UGC listed, Impact factor-3
13. Kapoor, D., Rattan, A., Gautam,V. **Kapoor, N.** and Bhardwaj, R. (2014). 24-Epibrassinolide Mediated Changes in Photosynthetic pigments and Antioxidative Defence System of Radish Seedlings under Cadmium and Mercury Stress. *Journal of Stress Physiology & Biochemistry*, 10 (3): 110-121 , ISSN: 1997-0838, UGC listed,

14. Rattan A, **Kapoor, N**, Kapoor, D and Bhardwaj, R (2017). Salinity induced damage overwhelmed by the treatment of brassinosteroids in *Zea mays* seedlings. *Advances in Bioresearch*. 8(4): 87-102, ISSN: 0976-4585, UGC listed, Impact factor-0.97
15. Rattan A, Kapoor, D, **Kapoor, N**, Bhardwaj, R and Sharma, A (2020). Brassinosteroids Regulate Functional Components of Antioxidative Defense System in Salt Stressed Maize Seedlings. *Journal of Plant Growth Regulation*. 39: 1465-1475 <https://doi.org/10.1007/s00344-020-10097-1> **Electronic ISSN: 1435-8107; Print ISSN: 0721-7595 Impact factor: 4.8**
16. Singh, A.D., Khanna, K., Kour, J., Dhiman, S., Bhardwaj, T., Devi, K., Sharma, N., Kumar, P., **Kapoor, N**. Sharma, P., Arora, P., Sharma, A. and Bhardwaj, R. (2023). Critical review on biogeochemical dynamics of mercury (Hg) and its abatement strategies. *Chemosphere*, 319: 137917, 24 Jan, 2023, Elsevier, **ISSN 0045-6535, Impact factor: 8.943**
17. Dhiman, S., Khanna, K., Kumar, P., Bhardwaj, T., Devi, K., Sharma, N., Sharma, P., Arora, P., Kapoor, N., Sharma, A. and Bhardwaj, R. (2023). Divulging Molecular Perspectives of Plant Defense Machinery Under Heavy Metal Toxicity. *Journal of Plant Growth Regulation*, 1-37. **Electronic ISSN: 1435-8107; Print ISSN: 0721-7595; Springer, Impact factor: 4.8**

Book Chapters:

1. Bhardwaj, R., Sharma, I., **Arora N.**, Uppal, P., Kanwar, M.K., Sharma, N and Hundal, G.S. (2009). Regulation of oxidative stress by Brassinosteroids in plants. **In: Oxidative stress: Role of antioxidants in plants (editor: Parvez Ahmad)**. pp.215-231, Studium Press Pvt. Ltd, New Delhi.
2. Bhardwaj, R., **Arora N.**, Uppal, P., Sharma, I., Kanwar, M.K. (2011). Prospects of brassinosteroids in medicinal applications. **In: Brassinosteroids: A Class of Plant Hormone. (editor: Sanshul Hayat)**. pp. 439-458, **Springer, The Netherlands**.
3. Bhardwaj, R., **Arora, N.**, Sharma, P., Arora, H.K. and Thukral, A.K. (2013). Stress protective properties of Brassinosteroids in Plants. **In: Eco restoration and Biodiversity Conservation**. Prof S.B. Saksena Commemoration Volume (Eds. G.P. Mishra and A. Gupta). pp. 55-71, Aviskhar Publishers Distributors, Jaipur, India.
4. Sharma R, Bhardwaj R, Kapoor D, Sonia, Rattan A, Kumar V, Sharma A, Thukral AK, Kaur S and **Kapoor N** (2015). Oxidative stress management through sugar signaling and antioxidant network in plants. In: *Photosynthesis: functions, genomics, physiological process and environmental issues*. (Ed. Nafees A. Khan). pp. 185-210, Nova publication, New York, USA.
5. Handa, N., Bhardwaj, R., Kapoor, D., Poonam., Kaur, S., Kaur, H., Rattan, A., Thukral, A.K., Arora, S. and **Kapoor, N**. (2016). Selenium: An Antioxidative Protectant in Plants under Stress. In book: *Plant Metal Interaction: Emerging Remediation Techniques*, Edition: First, Publisher: **Elsevier**, Editors: Pervaiz Ahmed, pp.179-208
6. Kapoor, N. and Kaur, R. (2017). Heavy metals and Human health. In: *Conference Proceedings of "Recent advances for quality enhancement in Science and Tehnology-2017"* (Jan 16-17, 2017) Eds: E. Khosla, S. Sharma, A. Bhatia, N. Kapoor, Bussiness Press India, Delhi NCR, India, pp.136-165. ISBN: 978-93-828-7640-3
7. Kapoor, N. (2017). Antioxidative responses of plant to Salinity stress. In *Conference Proceedings of "Recent advances for quality enhancement in Science and Tehnology-2017"* (Jan 16-17, 2017) Eds: E. Khosla, S. Sharma, A. Bhatia, N. Kapoor, pp.63-89. ISBN: 978-93-828-7640-3

8. Kapoor, D and **Kapoor, N** (2020). Interaction Between Root Endophytes and Plants: Their Bioactive Products and Significant Functions" In : Symbiotic Soil Microorganisms, Soil Biology, Vol. 60. (Eds: Neeraj Shrivastava et al.). Publisher: Springer Nature Switzerland https://doi.org/10.1007/978-3-030-51916-2_3 ISBN: 978-3-030-51915-5, ISBN (e Book): 978-3-030-51916-2
9. Kour J., Khanna, K., Bakshi, P. Sharma, I., Ohri, P. Mir, B.A., **Kapoor, N.** and Bhardwaj, R. (2020) Role of Beneficial Microbes in the Molecular Phytotoxicity of Heavy Metals. In: Faisal M., Saquib Q., Alatar A.A., Al-Khedhairy A.A. (eds) Cellular and Molecular Phytotoxicity of Heavy Metals. Nanotechnology in the Life Sciences. Springer, Cham. https://doi.org/10.1007/978-3-030-45975-8_13 Print ISBN 978-3-030-45974-1 Online ISBN 978-3-030-45975-8, pp. 227-262
10. Dhiman,S., Bakshi, P. Singh, A.D., Bhardwaj, T. Sharma, N., **Kapoor, N.**, Kapoor, D., Kaur, R., Arora, U., Sharma, A., Mir, B.A. and Bhardwaj, R. (2021). Role of Hydrogen sulfide and Ca signaling in abiotic stress tolerance in plants In: Hydrogen Sulfide in Plant Biology- Past and Present (1st Edition), S. Singh, V.Singh, D. Tripathi, S. Prasad and D. Chauhan (Eds) Academic Press, **Elsevier**, Paperback ISBN: 9780323858625. Chapter 16
11. **Kapoor, N.** (2021). Mechanisms of Heavy metal detoxification and tolerance in higher plants. In: Agriculture and Forestry: Current trends, perspectives, issues-III, S. Rout (Ed), Immortal Publications, ISBN: 978-93-5437-260-5
12. Thakur, M, Rattan A, **Kapoor N**, Sharma, K. and Gautam, V. (2021). Advance in Agronomic management and cultivation Practices of *Brassica juncea*. In: Brassica juncea: Production, Cultivation and Uses (Eds. D Kapoor, V. Gautam). pp. 235-262, Nova publication, New York, USA. ISBN- 978-1-53619-241-4
13. Dhiman,S., Ibrahim, M., Devi, K., Sharma, N., **Kapoor, N.**, Kaur, R., Sharma, N., Tikoria, R., Ohri, P. and Bhardwaj, R. (2021). Biochar Assisted Remediation of Toxic Metals and Metalloids. In: Handbook of Assisted and Amendment-Enhanced Sustainable Remediation Technology, (1st Edition), M. N. V. Prasad (Ed). **John Wiley & Sons Ltd.** New York Pp. 131-162 ISBN: 1119670381 (ISBN13: 9781119670384). Chapter 7
14. Singh, A.D., Kour, J., Dhiman, S., Khanna, K., Kumar,P., Kaur, R., Kapoor, N. and Bhardwaj, R. (2021)Prospects of PGPR-Mediated Antioxidants and S and P Metabolism in Plants Under Drought Stress. In: Antioxidants in Plant-Microbe Interaction (1st edition), H.B. Singh, A. Vaishnav, R.Z. Sayyed (Eds.) Ch 24, **Springer Nature** Singapore Chapter DOI https://doi.org/10.1007/978-981-16-1350-0_24 , eBook ISBN 978-981-16-1350-0, Hardcover ISBN 978-981-16-1349-4
15. Dhiman, S., Bakshi, P., **Kapoor, N.**, Sharma, P., Kholi, S.K., Mir, B.A., and Bhardwaj, R. (2021) Nanoparticle-induced oxidative stress in plants. In: Plant responses to nanomaterials: Recent Interventions, and Physiological and Biochemical Responses (1st edition), V. Singh, S. Singh, D.K. Tripathi, S.M. Prasad and D.K. Chauhan (Eds) Academic Press, **Springer Nature**, Switzerland ISBN: 978-3-030-36740-4. Chapter 12
16. Handa, N., Arora, U., **Arora, N.**, Kaur P., Kapoor, D. and Bhardwaj, R. (2021) Role of metabolites in abiotic stress tolerance in legumes. In: Abiotic stress and Legumes (1st edition), V.P. Singh, S. Singh, D.K. Tripathi, S.M. Prasad and R. Bhardwaj (Eds) Academic Press, **Elsevier**, ISBN-13: 9780128153550 Chapter 11, pp. 245-276
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19. Kapoor, N., Sharma, P. and Verma, S. (2022) Microbial remediation of hexavalent chromium from the contaminated soils. In: *Microbes and Microbial Biotechnology for Green Remediation*, J. A. Malik (ed.). **Academic Press, Elsevier Inc.**, eBook ISBN: **9780323904537**, Paperback ISBN:**9780323904520** Chapter 27, pp. 527-546
20. Verma, S., Kumar, M. and Kapoor, N. (2022) Biochar as an Emerging Amendment for Remediation of Heavy Metals-Contaminated Soil. In: *Microbial and Biotechnological Interventions in Bioremediation and Phytoremediation*, J. A. Malik (ed.), **Springer Nature Switzerland**, ISBN: 9783031088292 Chapter 19, pp. 445-486; https://doi.org/10.1007/978-3-031-08830-8_19
21. Kour, J., Singh, A.D., Kumar,P., Devi, K. Sharma. K., Sharma,R., Kaur, R.,Kaur, P., Kapoor, N. and Bhardwaj, R. (2022) Physiological mechanism associated with hyperaccumulation in plants in protection against metal stress. In: *Metals and Metalloids in soil-plant-water systems- Phytophysiology and Remediation Techniques*, T. Aftab and K.R. Hakeem(Eds) Academic Press, **Elsevier. London, USA**, ISBN: 978-0-323-91675-2, Chapter 7, pp. 159-184,DOI: <https://doi.org/10.1016/B978-0-323-91675-2.00005-6>
22. Kapoor, N. (2022) Emerging Role of Nanotechnology in the Food Industry for Food Processing and Packaging. In: *Environmental Sustainability in the Food Industry*, B. Kapoor, R. Singh, D. Kapoor, and V. Gautam (Eds) First edition, CRC Press, **Taylor and Francis**, eISBN: 9781003258568, Chapter 9, pp. 121-144, DOI: [10.1201/9781003258568-9](https://doi.org/10.1201/9781003258568-9) (7 Dec, 2022)
23. Shrama, N., Kapoor, N., Kholi, S.K., Sharma, P., Kour, J., Devi, K., Sharma, A., Kaur, R., Singh, A.P. and Bhardwaj, R. (2022) Kitchen and Agri Waste as Renewable, Clean and Alternative Bioenergy Resource In: *Agricultural and Kitchen Waste: Energy and Environmental Aspects*, D.B. Pal and A.K. Tiwari (Eds), First edition, CRC Press, **Taylor and Francis**, eISBN: 9781003245773, Chapter 11, pp. 243-269, DOI: [10.1201/9781003245773-11](https://doi.org/10.1201/9781003245773-11) (30 Dec, 2022)
24. Singh, A.D., Kour, J., Kumar, P., Sharma. N., Sharma, P., Madaan, I., Sharma, I., Kapoor, N., Singh, A.P. and Bhardwaj, R. (2023) Role of jasmonates in regulating physiological and molecular aspects of plants under abiotic stress. In: *The role of Growth regulators and phytohormones in overcoming Environmental stress*, A. Sharma, S. Pandey, R. Bhardwaj, B. Zheng, D.K. Tripathi (Eds) Academic Press, **Elsevier. London, USA**, ISBN: 9780323983327, Chapter 7, pp. 137-173,DOI:
25. Sharma, P., Dhiman, S., Kapoor, N., Kour, J., Singh, A.D., Sharma, A. and Bhardwaj, R. (2023) Role of sugars in regulating physiological and molecular aspects of plants under

abiotic stress. In: The role of Growth regulators and phytohormones in overcoming Environmental stress, A. Sharma, S. Pandey, R. Bhardwaj, B. Zheng, D.K. Tripathi (Eds) Academic Press, **Elsevier. London, USA**, ISBN: 9780323983327, Chapter 16, pp. 355-374, DOI: June 2023

26. Sharma, N., Dhiman, S., Kour, J., Bhardwaj, T., Devi, K., Kapoor, N., Bhatti, A., Kapoor, D., Singh, A. and Bhardwaj, R. (2023). Biochar for Sustainable Crop Production. In: Sustainable Valorization of Agriculture & Food Waste Biomass- Application in Bioenergy & Useful Chemicals, D. B. Pal, A. K. Tiwari (Eds) Springer, Singapore, Chapter 10, pp.227-256, Online ISBN978-981-99-0526-3, Print ISBN978-981-99-0525-6, DOI: 10.1007/978-981-99-0526-3_10. 1 Aug 2023
27. Kour, J., Khanna, K., Singh, A. D., Dhiman, S., Devi, K., Sharma, N., Madaan, I., Kapoor, N., Sirhindi, G., and Bhardwaj, R. (2023). Nitric oxide as a modulator of oxidative stress and antioxidative metabolism in plants. In: Nitric Oxide in Developing Plant Stress Resilience, V.P. Singh, D.K. Tripathi, V. Fotopoulos. Academic Press, Elsevier. London, USA, Paperback ISBN: 978-0-323-91209-9, eBook ISBN: 9780323916264, Chapter 5, pp. 91-124, <https://doi.org/10.1016/B978-0-323-91209-9.00011-7>
28. **Kapoor, N**, Verma, S., Sondhi, N. Bhardwaj, R. and Sharma, P. (2023). PGPR (Plant Growth Promoting Rhizobacteria) Mediated Heavy Metal Tolerance in Plants. In: PGPR (Plant Growth Promoting Rhizobacteria) for Plant Stress Management (Eds. I. Sharma, A. Sharma, R. Bhardwaj and G. Sirhindi). Ch. 2, **Nova publication, New York, USA**. ISBN: 979-8-89113-160-6, pp. 19-39, 27 Nov, 2023, DOI: <https://doi.org/10.52305/MJDR1541>
29. Dhiman, S., Singh, A. D., Madaan, I., Tikoria, R., Kapoor, D., Sharma, P., Kapoor, N., Sirhindi, G., Ohri, P. & Bhardwaj, R. (2024). Lead Induced Toxicity, Detoxification and Bioremediation. In *Bioremediation for Sustainable Environmental Cleanup* (Eds. A. Malik, V. K. Garg) (pp. 187-206), Ch 11, CRC Press. (6 Feb, 2024) e ISBN: 9781003277941, DOI: <https://doi.org/10.1201/9781003277941>
30. Devi, K., Singh, A. D., Dhiman, S., Kumar, D., Sharma, R., Parkirti, Vikram, Mir, N.R., Kapoor, N., Ohri, P. and Bhardwaj, R. (2024). Food security under changing environmental conditions. In: Food Security in a Developing World (P. Singh et al. Eds). Springer Nature (I June, 2024), Switzerland, pp. 299-326 **eBook ISBN** 978-3-031-57283-8, **Hardcover ISBN** 978-3-031-57282-1, DOI: [10.1007/978-3-031-57283-8_17](https://doi.org/10.1007/978-3-031-57283-8_17),
31. Verma, S., Vij, S., Mir, N. R., Kumar, S., & Kapoor, N. (2024). Ecosystem Monitoring, Modeling and Assessment. Encyclopedia of Bioinformatics and Computational Biology, 2nd Edition; Elsevier Inc. doi:10.1016/B978-0-323-95502-7.00150-0
32. Ali, M., Kumar, D., Sharma, R., Parkirti, Sharma, A., Manhas, R. K., Kapoor, N., Bhardwaj, R. and Ohri, P. (2024). Morphological, Physiological and Cellular Responses of Plants to Cadmium Toxicity. In: *Plant Responses to Cadmium Toxicity: Insights into Physiology and Defense Mechanisms* (Ed. T. Aftab) . Cham: Springer Nature Switzerland (pp. 89-108), Hard book ISBN 978-3-031-73265-2, **eBook ISBN** 978-3-031-73266-9 <https://doi.org/10.1007/978-3-031-73266-9> (20 Dec, 2024)
33. Devi, K., Sharma, N., Bakshi, P., Ibrahim, M., Bhardwaj, T., Khanna, K., **Kapoor, N.**, Mir, B.A., Singh, A.P., Ohri, P., Sharma, A. and Bhardwaj, R. (2025). Zinc, nematodes, and plant disease: role and regulation. In: *Zinc in Plants* (Eds. D. K. Tripathi, V. P. Singh, S. Pandey, S.

Sharma, D.K. Chauhan) Academic Press, (pp. 225-247), ISBN 9780323913140, <https://doi.org/10.1016/B978-0-323-91314-0.00002-8>

34. Bhardwaj, T., Kumar, D., Parkirti, Vikram, Singh, A., Kapoor, N., Ohri, P. and Bhardwaj, R. (2025). Plant-Microbe Interactions, Signalling Events, and Cellular Networks against Harmful Pathogens. In: *Plant Microbiome and Biological Control: Emerging trends and applications*, Sustainability in Plant and Crop Protection, vol 20 (Eds. P. Mathur, S. Roy), Springer Cham., (pp.37-57); Print ISBN978-3-031-75844-7; Online ISBN978-3-031-75845-4; https://doi.org/10.1007/978-3-031-75845-4_3 (8 Jan, 2025) .
35. Sharma, M., Sharma, R., Mir, N. R., Singh, A., Kaur, H., Verma, S., Ahlawat, Y. K., Yadav, K., Ohri, P., Bhardwaj, R. and **Kapoor, N.** (2025). Role of Silicon in Green Agriculture. In: Sirhindi, G., Bhardwaj, R., Kapoor, N. and Seth, C. S. (Eds.) *Metalloids in Biology from Function to Toxicity* (pp.). Taylor and Francis Group, CRC Press. ISBN: 9781032673561
36. Mir, N. R., Sharma, R., Singh, A., Sharma, M., Mir, B. A., **Kapoor, N.**, Ohri, P., Bhardwaj, R. and Ahlawat, Y. K. (2025). Omics Approaches Towards Metalloid Stress. In: Sirhindi, G., Bhardwaj, R., Kapoor, N. and Seth, C. S. (Eds.) *Metalloids in Biology from Function to Toxicity* (pp.). Taylor and Francis Group, CRC Press. ISBN: 9781032673561
37. Sharma, R., Kumar, D., Parkirti, Mir, N. R., Sharma, M., Singh, A., Mir, B.A., Ohri, P., Bhardwaj, R. and **Kapoor, N.** (2025). Siderophores and their Action against Metalloid Toxicity. In: Sirhindi, G., Bhardwaj, R., Kapoor, N. and Seth, C. S. (Eds.) *Metalloids in Biology from Function to Toxicity* (pp.). Taylor and Francis Group, CRC Press. ISBN: 9781032673561

Books edited:

Sirhindi, G., Bhardwaj, R., **Kapoor N.** and Seth, C.S. (2025). *Metalloids in Biology from Function to Toxicity*, CRC press, ISBN: 9781032673561

Bhatia, A. and **Kapoor, N.**(2021). *Plant Biodiversity and Environment conservation*, Unimax Publication, India, ISBN: 978-93-83790-41-4

Conferences attended: 44

1. Third international conference on plants and environmental pollution, NBRI, Lucknow (Nov 28-Dec 2, 2005).
2. National Symposium on Germplasm Evaluation: Present Trends, Department of Botany, Punjabi University, Patiala (Jan 23-25, 2006).
3. National Symposium on New Challenges in Chemistry, Department of Chemistry, Guru Nanak Dev University, Amritsar (March 20-21, 2006).
4. National Symposium on Researches in Fungal Biology: Emerging Trends, Department of Botany, Punjabi University, Patiala (Jan 30-31, 2007).
5. National symposium on Plant cytogenetics: Recent Trends, Department of Botany, Punjabi University, Patiala (Feb 15-16, 2008).
6. National Seminar and Exhibition on Applications of Radioisotopes and Radiation Technology (ARRT-2008), Organized by Department of Physics, Guru Nanak Dev University, Amritsar in collaboration with National Association for Applications of

- Radioisotopes and Radiation Industry (NAARRI), Mumbai and Board of Radiation and Isotope Technology (BRIT), Mumbai (Feb 7-8, 2008).
7. National Seminar on Depleted Uranium: Environmental Hazards. Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar (April 5, 2008).
 8. Bhagat Puran Singh Memorial Seminar “Ecological Challenges and Social Responsibilities” organized by All India Pingalwara Charitable Society, Amritsar and Guru Nanak Dev University, Amritsar (Aug 6, 2008).
 9. Golden Jubilee Conference on “Challenges and Emerging Strategies for Improving Plant Productivity”. Indian Agricultural Research Institute, New Delhi, India (Nov 12-14, 2008).
 10. DBT sponsored “Popular Biotechnology Lecture Series” organized by Department of Biotechnology, DAV College, Amritsar (Feb 13, 2009).
 11. National Seminar on “Environment and Sustainable Development”. Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar (Nov 3-4, 2009).
 12. National Seminar on “Scaling New Zeniths in Biosciences”. Department of Botany, Biotechnology and Bioinformatics, Hans Raj Mahila Maha Vidyalaya, Jalandhar (Nov 26, 2009).
 13. National conference on “Changing Landscape of Higher Education”. Hans Raj Mahila Maha Vidyalaya, Jalandhar (March 28, 2010).
 14. National conference on “Nanoscience and Nanotechnology-A Revolutionary Discipline”. Department of Physics, Hans Raj Mahila Maha Vidyalaya, Jalandhar (Aug 9-10, 2010).
 15. Science in the 21st Century” 15th Punjab Science congress. Guru Nanak Dev University, Amritsar, under the aegis of Punjab Academy of Sciences, Patiala (Feb 7-9, 2012).
 16. 3rd Bhartiya Vigyan Sammelan and Expo 2012” Science for Global Development” organised by Lovely Professional University, Phagwara, Jalandhar; Punjab Technical University, Jalandhar; Vijnana Bharti, Punjab State Council for Science and Technology (Oct 11- 14, 2012).
 17. UGC DBT Sponsored National Conference on “Medical Biotechnology” organized by Department of Biotechnology, DAV College, Jalandhar (Feb 2, 2013).
 18. Science and Technology for sustainable growth, 17th edition of the Punjab Science Congress organized by Punjab Technical University, Kapurthala (February 14-16, 2014).
 19. Multi-Disciplinary CSIR,DST,DBT sponsored National Conference, Science Colloquium "Emerging Trends in Basic & Applied Sciences" organized by DAV College, Jalandhar (March 6-7, 2014).
 20. DBT Sponsored National Conference on “Advances in Agricultural Sciences and Biotechnology” organized by DAV College, Jalandhar (Feb 28, 2015).
 21. **UGC sponsored National conference on “Stress Tolerance and Plant Biotechnology”** organized by PG Department of Biotechnology, Lyallpur Khalsa College, Jalandhar (Feb 11-12, 2016)
 22. International conference on “Environmental Mutagenesis, Carcinogenesis and Health” and 40th Annual meeting of Environmental Mutagen Society of India (EMSI), organized by Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar (Feb 17-19, 2016)

23. National seminar on “Journalism: gaps between theoretical and practical approaches” organised under Community college scheme of UGC by Department of Mass communication and Video production, Hans Raj Mahila Maha Vidyalaya, Jalandhar (June 27, 2016).
24. International symposium on Genomic medicine: Personalized care for You and Me, Organized by Department of Biotechnology, Doaba College, Jalandhar (Oct 18, 2016).
25. **UGC sponsored National conference on “Recent Advances of *In Silico* Analysis: Role in Plant Stress Biology”** organized by PG Department of Biotechnology, Lyallpur Khalsa College, Jalandhar (Oct 27-28, 2016).
26. **International conference on “Recent Advances for Quality Enhancement in Science and Technology (RAQUEST-2017)”** organized by Hans Raj Mahila Maha Vidyalaya, Jalandhar in association with International Association of Research Scholars, Australia (Jan 16-17, 2017). pp.114
27. **UGC sponsored National conference on “Recent Advances in Microbial Biotechnology: Application in Industry and Society”** organized by PG Department of Biotechnology, Lyallpur Khalsa College, Jalandhar (Feb 23-24, 2017).
28. 3rd International multi track conference on “Sciences, Engineering and Technical innovations” organized by CT institute of Engineering, management and technology, Jalandhar (Nov 26, 2017)
29. 4th International multi track conference on “Sciences, Engineering and Technical innovations” organized by CT institute of Engineering, management and technology, Jalandhar (Oct 5-6, 2018).
30. Golden Jubilee National Symposium on “Current Interventions to plants and microbes for environmental and agricultural sustainability (CIPME-2019)” organized by Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar (March 6-8, 2019).
31. Two day International conference- “Inbix’19 Indian conference on Bioinformatics” organized by Hans Raj Mahila Maha Vidyalaya, Jalandhar in association with Bioclues Organization (Feb 22-23, 2019).
32. National seminar on “Increasing Participation of women in science and technology” organized by Equal opportunity cell, Hans Raj Mahila Maha Vidyalaya, Jalandhar in association with National Commission for Women, Govt. of India (March 16, 2019).
33. Celebrations of “International Day of Biodiversity” organized by Hans Raj Mahila Maha Vidyalaya, Jalandhar in collaboration with Punjab Biodiversity Board, Govt. of India (May 29, 2019).
34. International symposium on bioinformatics organized by Hans Raj Mahila Maha Vidyalaya, Jalandhar (Dec 23, 2019).
35. Multi-Disciplinary SERB-DST and DBT sponsored National Conference, “Science and Technology for Sustainable Future” organized by DAV College, Jalandhar (March 6-7, 2020).
36. International webinar on “Biodiversity & Human Health: New Hits to Fight Diseases” organized by Department of Botanical and Environmental Sciences GURU NANAK DEV UNIVERSITY, AMRITSAR in collaboration with SPINCO BIOTECH PVT LTD & Faculty Development Centre-FDC, GNDU, Amritsar (June 14, 2020).
37. Attended on line Panel discussion on “Would COVID-19 affect Agricultural Research” Organized by Bioclues.org (May 8, 2020)

38. Participated in Online Seminar sponsored by DST FIST on topic "Neural circuits for escape and exploratory behavior" organised by Post Graduate Department of Zoology, DAV College, Jalandhar with certificate id: CH8E9I-CE000134 (July 15, 2020).
39. Attended the online webinar entitled "Enhancing Stress Tolerance in Plants Using Plant Growth Promoting Bacteria" organized by the Faculty of Life Sciences, DAV University, Jalandhar on 7th August, 2020.
40. E-international conference on Plant Biodiversity and Environment Conservation (ICPBEC-2021) in collaboration with Punjab Biodiversity Board organized by Hans Raj Mahila Maha Vidyalaya, Jalandhar (20-21, May, 2021).
41. National Conference on "Smart Summit-2021" (Science, medicine, agriculture, research and technology) organized by PEARL- A Foundation for Educational Excellence in Higher Education, Maduri (19 June, 2021)
42. Participated in E-Seminar on Sustainable Uses of Biodiversity: Entrepreneurship opportunities under the aegis of Punjab Biodiversity Board organized by Hans Raj Mahila Maha Vidyalaya, Jalandhar (June 17, 2022).
43. Participated in UGC-SAP sponsored two day National seminar on "Plants and Fungi Polyphasic Characterization and Bioprospection" organized by Department of Botany, University of Jammu, Jammu (march 25-26, 2022).
44. Participated in IP Awareness/training program under National Intellectual Property Awareness Mission, organized by Intellectual Property Mission, Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade, office of Controller General of Patents, Designs and Trade Marks, Government of India, (July 29, 2022).

Training / workshop attended: 19

1. Attended training on "Estimation of endogenous polyamines and ABA" at IHBT, Palampur (Dec 20, 2004 - Jan 5, 2005).
2. Sixth(Fulbright)-SAARC IAELP International Workshop on "Water Saving Technologies", Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar (February 22-24, 2006).
3. 26th Workshop on Electron Microscopy, Sophisticated Analytical Instrumentation Facility (SAIF), Punjab University, Chandigarh (April 26-May 3, 2006).
4. Zonal Level Workshop on Disaster Preparedness, Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar (September 23-25, 2006).
5. User Awareness Programme on E-resources, organized by INFLIBENT (UGC), Ahmedabad in Collaboration with Bhai Gurdas Library held at Guru Nanak Dev University, Amritsar (October 29, 2007).
6. DBT Sponsored Workshop on Basic Techniques in rDNA technology, Department of Biotechnology, Lyallpur Khalsa College, Jalandhar (24th December 2007 - 6th January 2008).
7. DBT Sponsored Workshop on "**Bioinformatics Tools in Biological Research**" held at Distributed Informatics Sub Centre (DISC), Department of Biotechnology, Guru Nanak Dev University, Amritsar (March 19-20, 2010).
8. Workshop on Animal tissue culture techniques, organized by Institute of advanced Bio Medical Sciences at Department of Biotechnology, Hans Raj Mahila Maha Vidyalaya, Jalandhar (Nov 5, 2014)

9. Workshop on “Advanced techniques of Botanical Sciences” organized by PG Department of Botany, Hans Raj Mahila Maha Vidyalaya, Jalandhar (Nov 10, 2014)
10. DBT Sponsored Workshop on “Neutraceuticals” organized by PG Department of Botany, Hans Raj Mahila Maha Vidyalaya, Jalandhar (March 18, 2016)
11. DBT Sponsored Workshop on “Herb-bration -Herbal formulations for healthy skin” organized by PG Department of Botany, Hans Raj Mahila Maha Vidyalaya, Jalandhar (March 22, 2016)
12. “Nature Carnival” organized by PG Department of Botany, Hans Raj Mahila Maha Vidyalaya, Jalandhar (August 31, 2016).
13. DBT Sponsored one day Workshop on “**Drug Designing and applications of Bioinformatics**” Organized by Department of Zoology and Bioinformatics, Hans Raj Mahila Maha Vidyalaya, Jalandhar (Oct 21, 2016).
14. Pre-conference workshop on “Big data and Agricultural Bioinformatics” organized by Hans Raj Mahila Maha Vidyalaya, Jalandhar in association with Bioclues Organization (Feb 21, 2019).
15. Workshop on “Introduction to RNASeq and Variant Analysis Workflows using GALAXY” organized by Hans Raj Mahila Maha Vidyalaya, Jalandhar in association with Bioclues Organization (Dec 22, 2019).
16. Workshop cum training on “Natural medicine and its scope in Biomedical sector” conducted by Hans Raj Mahila Maha Vidyalaya, Jalandhar in association with Wetlab Championship and Shaastra (IIT Madras Event) (4-5 Oct, 2019). As organizing secretary.
17. One day online workshop on “Book and Article Publishing and Springer link Platform Demonstration” organized by School of Education, Guru Nanak Dev University, Amritsar under the aegis of Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching, Ministry of Human Resource Development, Govt of India in collaboration with **Springer Nature** (April 29, 2020).
18. One week online workshop on “Academic Writing and Ethics in Research” organized by School of Education, Guru Nanak Dev University, Amritsar under the aegis of Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching, Ministry of Human Resource Development, Govt of India (2-8 December, 2020).
19. One Day workshop on “Multi Omics Data Integration and Visualization using Cytoscape” organized by Department of Bioinformatics and Biotechnology, under DBT Star College Scheme, Hans Raj Mahila Maha Vidyalaya, Jalandhar (11 march, 2023).