

CURRICULUM VITAE

Yogesh Mishra (PhD)

Assistant Professor (Stage III)

Department of Botany

(Center of Advanced Study in Botany)

Institute of Science

Banaras Hindu University

Varanasi-221005

E-mail:  ymishra@bhu.ac.in; yogeshbhu@gmail.com

 : https://www.researchgate.net/profile/Yogesh_Mishra5

 : <https://orcid.org/0000-0002-9955-1448>



1. Personal Information:

(i) Date of Birth: 08-10-1977

(ii) Language Known: Hindi and English

2. Area of Interest:

To unravel the molecular mechanism of abiotic stress tolerance and signaling in cyanobacteria and plants using interdisciplinary approaches

3. Specializations:

Molecular Biology, Physiology, Genomics, Proteomics (Chloroplast-, Nuclear-, & Phospho-proteomics), and Metabolomics of Cyanobacteria and Plants

4. Research vision: Our research group aims to achieve a comprehensive understanding of abiotic stress tolerance and signaling mechanisms in cyanobacteria and higher plants at the molecular level. To address this objective, we employ integrated molecular and systems-level approaches in three distinct model organisms: *Anabaena* sp. PCC 7120, *Dumortiera hirsuta* (a liverwort), and *Arabidopsis thaliana*. Specifically, our investigations focus on the following key questions-

(i) How do cyanobacteria respond and adapt to abiotic stresses, with particular emphasis on transcriptional regulators, photosynthetic acclimation, and post-stress recovery (PSR)?

*(ii) What biochemical, physiological, and molecular mechanisms enable *Dumortiera hirsuta* to survive and adapt under seasonal fluctuations?*

*(iii) What functional roles do S-domain receptor-like kinases (SD-RLKs) and legume lectin-like proteins (LLPs) play in mediating abiotic stress tolerance and signaling in *Arabidopsis thaliana*?*

5. Positions

- **Assistant Professor** at Department of Botany, Banaras Hindu University, Varanasi, India-221005 (Nov 2015 onwards)

- **Assistant Professor** at Department of Botany, Panjab University Chandigarh, India (Dec 2014 – Nov 2015)
- Post-doctoral researcher at **Max Planck Institute for Plant Breeding Research**, Department of Plant Developmental Biology, Cologne, Germany (July 2013 – Nov 2014) **Adviser- Prof. Csaba Koncz**
- Post-doctoral researcher at **Umeå Plant Science Center (A center of excellence)**, Department of Plant Physiology, Umeå University, Sweden, Umeå, Sweden (Nov 2008 – June 2013) **Adviser- Prof. Stefan Jansson and Prof. Wolfgang P Schroder**

6. Honors and Awards

- **Early Career Research Award** by Science and Engineering Board (SERB), India (2016)
- Post-Doctoral fellowship from **Deutsche Forschungsgemeinschaft (DFG)**, Germany (2013 - 2014)
- **SVEN & LILLY LAWSKIS** (Postdoc-Stipendium) Sweden (2010 – 2012)
- Post-doctoral fellowship from **KEMPE FOUNDATION**, Umeå University, Umeå, Sweden (2008 – 2010)
- Junior and Senior Research Fellowship (**JRF and SRF**) from Council of Scientific and Industrial Research (**CSIR**), New Delhi, India, in Dec 2002 and Aug 2005, respectively
- Qualified National Eligibility Test (**NET – JRF**), Dec 2002 conducted by CSIR and UGC, New Delhi, India and qualified Graduate Aptitude Test in Engineering (**GATE**), 2002 conducted by IIT Kanpur, India

7. Education

2003- 2008	PhD (Botany) from Department of Botany, Banaras Hindu University, Varanasi, India PhD title: <i>Biochemical and Molecular Basis of Adaptation of Anabaena doliolum to Heat and UV-B Stress</i> PhD Supervisor – Prof. Lal Chand Rai
2000-2002	Master of Science (M. Sc.) in Botany , Department of Botany, Banaras Hindu University, Varanasi, India 1st division
1996-1998	Bachelor of Science (B. Sc) Botany, Zoology, and Chemistry from Uday Pratap Autonomous College, Varanasi (Affiliated with Purvanchal University, Jaunpur, Uttar Pradesh) 1st division
1992-1994	Intermediate in Bio-group, Uttar Pradesh Board, 1st division
1990-1992	High School in Bio-group, Uttar Pradesh Board, 1st division

8. Professional Memberships

- International Plant Proteomics Organization (INPPO)
- International Society of Photosynthesis Research (ISPR)

9. Special Courses Attended

Chemometrics, Elements of Bioinformatics, Protein Crystallization Course, Statistics for Life Sciences from **Umea University, Sweden**.

10. International Visits

China, UK, France, Germany, Denmark, Finland, Switzerland, Sweden, Norway & other European countries

11. Research Projects Granted

S. N.	Title of the Project	Duration	Source and Amount (₹)
1.	Molecular characterization of a legume lectin-like protein from <i>Arabidopsis thaliana</i> (AT5g03350 or AtLLP1) to uncover its role in abiotic stress mitigation and related signaling	2024-2027	DBT 88 Lakhs
2.	Elucidation of the role of SD1-29 (At1g61380), an S-domain receptor like kinase (SD-RLK) in abiotic stress mitigation and signaling in <i>Arabidopsis thaliana</i>	2023-2026	SERB-CRG 60 Lakhs
3.	Investigation of molecular mechanisms behind seasonal adaptation of selected liverworts in their natural habitats using transcriptomic and proteomic approaches	2020-2023	DBT 60 Lakhs
4.	Proteomic analysis of radiation and cadmium responsive genes regulated by LexA in <i>Anabaena</i> PCC7120	2018-2021	DAE-BRNS 32 Lakhs
5.	Elucidation of the role of S-locus receptor kinases (SRKs) and S-locus glycoproteins (SLGs) in response to reactive oxygen species (ROS) in <i>Arabidopsis thaliana</i>	2016-2019	DST-SERB 50 Lakhs
6.	UGC Start-Up Grant Project: Proteomic characterization of a bryophyte <i>Dumortiera hirsuta</i> (liverwort) under desiccation stress	2015-2017	UGC New Delhi 6.0 lakhs

12. Publication details: (*h*-index -19, Scopus ID – 8967032700, 42 research articles, 4 review articles, and 8 book chapters)

(a) Research papers (Total – 42)

Publications from Independent Work (includes work as corresponding author) (Total – 13)

1. Jha, V. K., Srivastava, A., Yadav, S., Basu, S., Biswas, S., Tripathi, K., Chaurasia, N., Singh, S. K., Srivastava, V., & **Mishra, Y.** (2026). Comparative seasonal proteome profiling of the liverwort *Plagiochasma appendiculatum* reveals molecular strategies of acclimation in its natural habitat. *Plant Molecular Biology Reporter* (Accepted).
2. Yadav, S., Srivastava, A., Jha, V. K., Biswas, S., Basu, S., Chaurasia, N., Singh, S. K., & **Mishra, Y.** (2026). Seasonal proteome profiling of the liverwort *Dumortiera hirsuta* (Sw.)

Nees, from Meghalaya, India, reveals a season-specific acclimation process. *Journal of Bryology*, <https://doi.org/10.1080/03736687.2026.2656827>.

3. Basu, S., Yadav, S., Jha, V. K., Biswas, S., Srivastava, A., Tripathi, K., Mondal, R., Chaurasia, N., Singh, S. K., & **Mishra, Y.** (2025). Two evolutionary diverged liverworts that shared the same habitats developed distinct seasonal adaptive strategies: Insights from a transcriptomic approach. *Plant Molecular Biology Reporter*, 43, 1621-1641.
4. Srivastava, A., Kumar, A., Biswas, S., Srivastava, V., Rajaram, H., & **Mishra, Y.** (2023). Cd-induced cytosolic proteome changes in the cyanobacterium *Anabaena* sp. PCC 7120 are mediated by LexA as one of the regulatory proteins. *Biochimica et Biophysica Acta (BBA) – Proteins and Proteomics*, 1871, 140902.
5. Srivastava, A., Kumar, A., Biswas, S., Kumar, R., Srivastava, V., Rajaram, H., & **Mishra, Y.** (2023). Gamma-radiation stress response of the cyanobacterium *Anabaena* sp. PCC 7120: Regulatory role of LexA and photophysiological changes. *Plant Science*, 326, 111529.
6. Biswas, S., Mondal, R., Srivastava, A., Trivedi, M., Singh, S. K., & **Mishra, Y.** (2022). *In silico* characterization, molecular phylogeny, and expression profiling of genes encoding legume lectin-like proteins under various abiotic stresses in *Arabidopsis thaliana*. *BMC Genomics*, 23, 480.
7. Srivastava, A., Kumar, A., Biswas, S., Srivastava, V., Rajaram, H., & **Mishra, Y.** (2022). Regulatory role of LexA in modulating photosynthetic redox poise and Cd stress tolerance in the cyanobacterium *Anabaena* sp. PCC 7120. *Environmental and Experimental Botany*, 195, 104790.
8. Mondal, R., Biswas, S., Srivastava, A., Basu, S., Trivedi, M., Singh, S. K., & **Mishra, Y.** (2021). *In silico* analysis and expression profiling of S-domain receptor-like kinases under different abiotic stresses in *Arabidopsis thaliana*. *BMC Genomics*, 22, 817.
9. Yadav, S., Srivastava, A., Biswas, S., Basu, S., Singh, S. K., & **Mishra, Y.** (2021). Seasonal changes in the antioxidative defence system of a liverwort *Dumortiera hirsuta*. *Journal of Plant Growth Regulation*, 41, 1265-1275.
10. Srivastava, A., Biswas, S., Yadav, S., Kumar, A., Rajaram, H., Srivastava, V., & **Mishra, Y.** (2021). Physiological and thylakoid proteome analyses of *Anabaena* sp. PCC 7120 for monitoring photosynthetic responses under cadmium stress. *Algal Research*, 54, 102225.
11. Srivastava, A., Biswas, S., Yadav, S., Kumar, S., Srivastava, V., & **Mishra, Y.** (2021). Acute cadmium toxicity and post-stress recovery: Insights into coordinated and integrated response/recovery strategies of *Anabaena* sp. PCC 7120. *Journal of Hazardous Materials*, 211, 124822.
12. Yadav, S., Srivastava, A., Biswas, S., Chaurasia, N., Kumar, S., Singh, S., Srivastava, V., & **Mishra, Y.** (2020). Comparison and optimization of protein extraction and two-dimensional gel electrophoresis protocols for liverworts. *BMC Research Notes*, 13, 60.
13. Kaur, S., Srivastava, A., Kumar, S., Srivastava, V., Ahluwalia, A. S., & **Mishra, Y.** (2019). Biochemical and proteomic analysis reveals oxidative stress tolerance strategies in *Scenedesmus abundans* against allelochemicals released by *Microcystis aeruginosa*. *Algal Research*, 41, 101525.

Publications arising from post-doctoral work (Total – 8)

14. **Mishra, Y.**, Hall, M., Locmelis, R., Nam, K., Söderberg, K. A. G., Storm, P., Chaurasia,

- N., Rai, L. C., Jansson, S., Schröder, P. W., & Sauer, U. H. (2017). Active-site plasticity revealed in the asymmetric dimer of AnPrx6, the 1-Cys peroxiredoxin and molecular chaperone from *Anabaena* sp. PCC 7120. *Scientific Reports*, 7, 17151.
15. Sauer, U. H., **Mishra, Y.**, Hall, M., Nam, K., Jansson, S., & Schröder, W. P. (2016). Dimeric cyanobacterial 1-Cys Prx6 is a moonlighting protein. *Acta Crystallographica Section A*, 72, s247–s248.
 16. Shiryayeva, L., **Mishra, Y.**, Antti, H., Kjellsen, T. D., Strimbeck, G. R., & Schröder, W. P. (2014). Metabolomic analysis of extreme freezing tolerance in Siberian spruce (*Picea obovata*). *New Phytologist*, 204, 545–555.
 17. Jänkänpää, H. J., Frenkel, M., Zulfugarov, I., Reichelt, M., Krieger-Liszka, A., **Mishra, Y.**, Gershenzon, J., Moen, J., Lee, C. H., & Jansson, S. (2013). Non-photochemical quenching capacity in *Arabidopsis thaliana* affects herbivore behaviour. *PLoS ONE*, 8, e53232.
 18. Jänkänpää, H. J., & **Mishra, Y.** (2012). Metabolic profiling reveals metabolic shifts in *Arabidopsis* plants grown under different light conditions. *Plant, Cell & Environment*, 35, 1824–1836. **(Joint first author)**
 19. **Mishra, Y.**, Kiss, Z. A., Jänkänpää, H. J., Funk, C., Schröder, P. W., & Jansson, S. (2012). *Arabidopsis* plants grown in the field and climate chambers significantly differ in leaf morphology and photosystem components. *BMC Plant Biology*, 12, 6.
 20. **Mishra, Y.**, Hall, M., Chaurasia, N., Rai, L. C., Jansson, S., Schröder, P. W., & Sauer, U. H. (2011). Expression, purification, crystallization and preliminary X-ray crystallographic studies of alkyl hydroperoxide reductase (AhpC) from cyanobacterium *Anabaena* sp. PCC 7120. *Acta Crystallographica Section F*, 67, 1203–1206.
 21. Hall, M., **Mishra, Y.**, & Schröder, P. W. (2011). Preparation of stroma, thylakoid membrane and lumen fractions from *Arabidopsis thaliana* chloroplasts for proteomic analysis. *Methods in Molecular Biology*, 775, 207–222.

Publications arising from doctoral work (Ph.D.) (Total – 5)

22. **Mishra, Y.**, Bhargava, P., Chaurasia, N., & Rai, L. C. (2009b). Proteomic evaluation of non-survival of *Anabaena doliolum* at elevated temperatures. *European Journal of Phycology*, 44, 551–565.
23. **Mishra, Y.**, Chaurasia, N., & Rai, L. C. (2009a). AhpC (alkyl hydroperoxide reductase) from *Anabaena* sp. PCC 7120 protects *Escherichia coli* from multiple abiotic stresses. *Biochemical and Biophysical Research Communications*, 381, 607–612.
24. **Mishra, Y.**, Chaurasia, N., & Rai, L. C. (2008b). Heat pre-treatment alleviates UV-B toxicity in cyanobacterium *Anabaena doliolum*: A proteomic analysis of cross tolerance. *Photochemistry and Photobiology*, 85, 824–833.
25. **Mishra, Y.**, Bhargava, P., Thapar, R., Srivastava, A. K., & Rai, L. C. (2008a). A comparative study of antioxidative defense system in copper- and temperature-acclimated strains of *Anabaena doliolum*. *World Journal of Microbiology and Biotechnology*, 24, 2997–3004.
26. **Mishra, Y.**, Bhargava, P., & Rai, L. C. (2005). Differential induction of enzymes and antioxidants of antioxidative defense system in *Anabaena doliolum* exposed to heat stress. *Journal of Thermal Biology*, 30, 524–531.

Publications from collaborative work (Total – 16)

27. Jagriti Misra, David Wiseman Lamare, Dapboklang Rynjah, Akanksha Srivastava, **Yogesh Mishra,** & Neha Chaurasia (2026) Unravelling the secrets of siderophore production in cyanobacteria from Meghalaya. *Brazilian Journal of Microbiology* 57: 39
28. Baruah, P., Srivastava, A., **Mishra, Y.,** & Chaurasia, N. (2024). Modulation in growth, oxidative stress, photosynthesis, and morphology reveals higher toxicity of alpha-cypermethrin than chlorpyrifos towards a non-target green alga at high doses. *Environmental Toxicology and Pharmacology*, 106, 104376.
29. Jaiswal, A., Pandey, A. K., **Mishra, Y.,** & Dubey, S. K. (2024). Insights into the biodegradation of fipronil through soil microcosm-omics analyses of *Pseudomonas* sp. FIP_A4. *Chemosphere*, 363, 142944.
30. Chanu, N. C., Mandal, M. K., Srivastava, A., **Mishra, Y.,** & Chaurasia, N. (2023). Proteomics reveals damaging effect of alpha-cypermethrin exposure in a non-target freshwater microalga *Chlorella* sp. NC-MKM. *Current Microbiology*, 80, 144.
31. Singh, S., Biswas, S., Srivastava, A., **Mishra, Y.,** & Chaturvedi, T. P. (2021). *In silico* characterization and structural modeling of a homeobox protein MSX1 from *Homo sapiens*. *Informatics in Medicine Unlocked*, 22, 100497.
32. Chaurasia, N., **Mishra, Y.,** Chatterjee, A., Rai, R., Yadav, S., & Rai, L. C. (2017). Overexpression of phytochelatin synthase (*pcs*) enhances abiotic stress tolerance by altering the proteome of transformed *Anabaena* sp. PCC 7120. *Protoplasma*, 254, 1715–1724.
33. Shrivastava, A. K., Pandey, S., Yadav, S., **Mishra, Y.,** Singh, P. K., Rai, R., Singh, S., & Rai, L. C. (2016). Comparative proteomics of wild type, *An+ahpC* and *AnahpC* strains of *Anabaena* sp. PCC 7120 demonstrates AhpC-mediated augmentation of photosynthesis, N₂-fixation and modulation of regulatory network of antioxidative proteins. *Journal of Proteomics*, 140, 81–99.
34. Sen, S., Agrawal, S., **Mishra, Y.,** Rai, S., Chatterjee, A., Yadav, S., Singh, S., & Rai, L. C. (2015). Exploring the membrane proteome of the diazotrophic cyanobacterium *Anabaena* PCC 7120 through gel-based proteomics and *in silico* approaches. *Journal of Proteomics*, 127, 161–168.
35. Mishra, S., Bhargava, P., Rai, R., **Mishra, Y.,** Zotta, T., Parente, E., & Rai, L. C. (2010). Protein fingerprinting may serve as a complementary tool for the phylogenetic classification of heterocystous (*Nostoc*, *Anabaena*, *Cylindrospermum*, *Aulosira*, and *Tolypothrix*) cyanobacteria. *Internet Journal of Microbiology*, 7, 2.
36. Chaurasia, N., **Mishra, Y.,** & Rai, L. C. (2008). Cloning, expression, and analysis of phytochelatin synthase (*pcs*) gene from *Anabaena* sp. PCC 7120 offering multiple stress tolerance in *Escherichia coli*. *Biochemical and Biophysical Research Communications*, 376, 225–230.
37. Bhargava, P., Kumar, A., **Mishra, Y.,** & Rai, L. C. (2008). Copper pre-treatment augments ultraviolet-B toxicity in the cyanobacterium *Anabaena doliolum*: A proteomic analysis of cell death. *Functional Plant Biology*, 35, 360–372.
38. Bhargava, P., **Mishra, Y.,** Srivastava, A. K., Narayan, O. P., & Rai, L. C. (2008). Excess copper induces anoxygenic photosynthesis in *Anabaena doliolum*: A

- proteomic assessment of its survival strategy. *Photosynthesis Research*, 98, 61–74.
39. Thapar, R., Srivastava, A. K., Bhargava, P., **Mishra, Y.**, & Rai, L. C. (2007). Impact of different abiotic stresses on growth, photosynthetic electron transport chain, nutrient uptake, and enzyme activities of Cu-acclimated *Anabaena doliolum*. *Journal of Plant Physiology*, 165, 306–331.
 40. Srivastava, A. K., Ara, A., Bhargava, P., **Mishra, Y.**, Rai, S. P., & Rai, L. C. (2007). A rapid and cost-effective method of genomic DNA isolation from cyanobacterial culture, mat, and soil suitable for genomic fingerprinting and community analysis. *Journal of Applied Phycology*, 19, 373–382.
 41. Bhargava, P., **Mishra, Y.**, Srivastava, A. K., Ara, A., & Rai, L. C. (2006). Preliminary analysis of the cuprome of *Anabaena doliolum* using two-dimensional gel electrophoresis. *Current Science*, 91, 1520–1523.
 42. Srivastava, A. K., Bhargava, P., **Mishra, Y.**, Shukla, B., & Rai, L. C. (2006). Effect of salt, copper, and temperature pretreatment on ultraviolet-B induced antioxidants in diazotrophic cyanobacterium *Anabaena doliolum*. *Journal of Basic Microbiology*, 46, 135–144.

(b) Scientific reviews (Total – 4)

1. Yadav, S., Basu, S., Srivastava, A., Biswas, S., Chaurasia, N., Singh, S. K., & **Mishra, Y.** (2023). Bryophytes as modern model plants: An overview of their development, contributions, and future prospects. *Journal of Plant Growth Regulation*, 11, 6933–6950. **(Corresponding author)**
2. Srivastava, A., Mondal, R., Yadav, S., Biswas, S., & **Mishra, Y.** (2019). How the transcriptional regulation machineries in cyanobacteria differ from other eubacteria? *Journal of Scientific Research*, 63. **(Corresponding author)**
3. Srivastava, A., Tiwari, A., Mondal, R., Yadav, S., Biswas, S., & **Mishra, Y.** (2018). Orange carotenoid protein (OCP): A key player in non-photochemical quenching of cyanobacteria under fluctuating light condition. *International Journal of Plant and Environment*, 4, 1–6. **(Corresponding author)**
4. Deswal, R., Gupta, R., Dogra, V., Singh, R., Abat, J. K., Sarkar, A., **Mishra, Y.**, Rai, V., Sreenivasulu, Y., Amalraj, R. S., Raorane, M., Chaudhary, R. P., Kohli, A., Giri, A. P., Chakraborty, N., Zargar, S. M., Agrawal, V. P., Agrawal, G. K., Job, D., Renaut, J., & Rakwal, R. (2013). Plant proteomics in India and Nepal: Current status and challenges ahead. *Physiology and Molecular Biology of Plants*, 19, 461–477.

(c) Chapters contributed to books (Total – 8)

1. Tripathi, K., & **Mishra, Y.** (2026). Genetic modifications in cyanobacteria: Current status and future prospects. In H. Tombuloğlu & G. Tombuloğlu (Eds.), *Genetic modification technologies and applications* (pp. xx–xx). IntechOpen. <https://doi.org/10.5772/intechopen.1014041> **((Corresponding author))**
2. Biswas, S., Yadav, S., Srivastava, A., & **Mishra, Y.** (2021). Genetically modified plants vs. scared world. In P. Singh, A. Borthakur, A. A. Singh, A. Kumar, & K. Singh (Eds.), *Policy Issues in Genetically Modified Crops: Global Perspectives*. (pp. 317–334). Academic Press. **(Corresponding author)**
3. Kaur, S., Srivastava, A., Ahluwalia, A. S., & **Mishra, Y.** (2021). Cyanobacterial blooms and cyanotoxins: Occurrence and detection. In S. K. Mandotra, A. K.

Upadhyay, & A. S. Ahluwalia (Eds.), *Algae*. (pp. 339-352). Springer, Singapore.
(*Corresponding author*)

4. Yadav, S., Biswas, S., Srivastava, A., & **Mishra, Y.** (2019). Development of bryophytes as a new model system to understand the phenomenon of terrestrialization with environmental changes. In S. Singh, S. Upadhyay, A. Pandey, & S. Kumar (Eds.), *Molecular Approaches in Plant Biology and Environmental Challenges. Energy, Environment, and Sustainability Series*. (pp. 475-486). Springer, Singapore.
(*Corresponding author*)
5. Chaurasia, N., & **Mishra, Y.** (2017). Novel technologies for plant functional genomics. In S. K. Dubey, A. Pandey, & R. S. Sangwan (Eds.), *Current Developments in Biotechnology and Bioengineering*, (pp. 241–257). Elsevier. (*Corresponding author*)
6. **Mishra, Y.**, Bhargava, P., Chaurasia, N., Narayan, O. P., Kumari, N., & Rai, L. C. (2008). Cyanobacterial proteomics II: Alternatives to gel electrophoresis and method of protein identification (Chapter 6). In D. Mohanty, P. Kleiner, & S. N. Bagchi (Eds.), *Protocols on Algal and Cyanobacterial Research* (pp. 129–137). Narosa Publishing House, New Delhi.
7. **Mishra, Y.**, Bhargava, P., Chaurasia, N., Narayan, O. P., Kumari, N., & Rai, L. C. (2008). Protocol for cyanobacterial proteomics I (Chapter 5). In D. Mohanty, P. Kleiner, & S. N. Bagchi (Eds.), *Protocols on Algal and Cyanobacterial Research* (pp. 112–128). Narosa Publishing House, New Delhi.
8. Bhargava, P., Srivastava, A. K., **Mishra, Y.**, & Rai, L. C. (2004). Cyanobacteria and stress management: A molecular approach (Chapter 6). In K. Singh (Ed.), *Biotechnological Applications of Cyanobacteria* (pp. 75–96). Academic World, India.

13: Editorial activity

- Editorial member in BMC Plant Biology

14: Participation in National and International seminars/conferences

- Delivered several talks in national and International seminars in India and Abroad