

**RAJESH KUMAR TEWARI,**  
**M.Sc., M. Phil., NET, Ph. D.**



Department of Botany, University of Lucknow, Lucknow-226007 (U.P.), INDIA

E-mail [rktewari\\_bot@yahoo.com](mailto:rktewari_bot@yahoo.com),

Mob. +917264871815

ORCID: <http://orcid.org/0000-0002-4849-9248>

RESEARCHGATE: [https://www.researchgate.net/profile/Rajesh\\_Tewari](https://www.researchgate.net/profile/Rajesh_Tewari)

Google Scholar:

[https://scholar.google.co.in/citations?hl=en&user=2zn1xqoAAAAJ&view\\_op=list\\_works](https://scholar.google.co.in/citations?hl=en&user=2zn1xqoAAAAJ&view_op=list_works)

### CAREER GOALS

- To study process of plant adaptation and survival under stressed conditions and translate that understanding in the development of crop plants with efficient nutrient utilization potential.
- To teach students in their skill development in plant sciences.

### TEACHING EXPERIENCE

**Associate Professor**, Aug 11, 2016- Till date, Teaching to B.Sc. and M.Sc. students, at the University of Lucknow, Lucknow-226007 (U.P.)

Courses: Palynology, Angiosperms: Plant Development and Reproduction, Plant Morphogenesis, Electrophoresis, Blotting and sequencing techniques, Macromolecules, Enzymes and Genetic Engineering.

**Assistant Professor** (Part-time), July 2014-Feb 2015, Taught to the students of B.Sc. Classes.

At the Rajat Degree College (University of Lucknow), Lucknow, U.P.

Courses taught: Plant Physiology, Lichens, Bryophytes, Pteridophytes and Gymnosperms

**Lecturer/ Demonstrator** (Part-time/Guest faculty), Session 2005 - 2006. Taught to the students of undergraduate classes

At the University of Lucknow, Botany Department, Lucknow, U.P. and PMS Girls Degree College, Vikas Nagar, Lucknow, U.P.

Courses taught: Plant Physiology, Genetics, Microbiology, Mycology, Gymnosperms

### CORPORATE EXPERIENCE

1. **Consultant Plant Nutritionist**, May 1, 2015 – Aug 11, 2016 at the Jain R & D Lab, Jain Irrigation System Ltd. (JISL), Jalgaon-425001, Maharashtra

### POST-DOCTORAL RESEARCH EXPERIENCE

1. **Lise Meitner Fellow**: December 1, 2013-July 4, 2014. at the Department of Microbiology and Ecosystem Science, Faculty of Life Sciences, University of Vienna, Althanstrasse 14, A-1090 Vienna, Austria.

**Project**: Contribution of iron to programmed cell death in plants.

2. **Belspo Fellow**: December 1, 2012-November 30, 2013, at the Biosphere Impact Studies (BIS), Belgian Nuclear Research Center (SCK•CEN), Boeretang 200, Mol 2400, Belgium

**Project:** Unravelling mode of action of ionising radiation induced adverse effects in *Arabidopsis thaliana* through transcriptomic profiling.

3. **Lise Meitner Fellow:** July 5, 2011- November 30, 2012, at the Department of Microbiology and Ecosystem Science, Faculty of Life Sciences, University of Vienna, Althanstrasse 14, A-1090 Vienna, Austria.

**Project:** Contribution of iron to programmed cell death in plants.

4. **JSPS Post-Doctoral Fellow:** November 5, 2008 – November 4, 2010, at the Laboratory of Plant Nutrition, Faculty of Horticulture, Chiba University, Matsudo, Japan

**Project:** Identification of redox regulated nuclease and their genes involved in apoptotic like death of protoplasts.

5. **Post-Doctoral Fellow:** January 28, 2008 – September 3, 2008, in the Division of Life Sciences, Biotechnology Fusion Research Team, Korea Basic Science Institute (KBSI), Daejeon, Korea

**Project:** Proteomics of CHO cells

6. **Post-Doctoral Fellow:** March 23, 2006 – December 31, 2007, at the Research Center for the Development of Advanced Horticultural Technology (Hort-Tech), Chungbuk National University, Cheongju, Korea

**Project:** Role of nitric oxide in root development.

#### **PRE-DOCTORAL RESEARCH EXPERIENCE**

7. **Senior Research Fellow:** September 2002- September 2005 (CSIR) at the University of Lucknow

Project: Correlating micronutrient disorder with oxidative stress.

8. **Research Assistant:** January 1999 to January 2002 (CST UP) at the University of Lucknow.

Project: Macronutrient requirements of mulberry.

#### **RESEARCH HIGHLIGHTS**

I studied certain aspects of the physiology of plants, including involvement NO and reactive oxygen in root development, saponin synthesis and antioxidant responses of plants under nutritional stress (both deficiency and toxicity). Some of our significant findings are given here. (1) The supply of NO producers (SNP, sodium nitroprusside; SNAP, S-Nitroso-N-acetylpenicillamine; and sodium nitrite with ascorbic acid), NO scavenger (2-phenyl-4,4,5,5-tetramethylimidazoline-1-oxyl 3-oxide, PTIO) and NOS inhibitor (N $\omega$ -nitro-L-arginine methyl ester hydrochloride, L-NAME), revealed that NO is involved in the differentiation and induction of rootlets downstream to auxin action but it does not synthesized by nitric oxide synthase (NOS) in the adventitious roots of mountain ginseng (Plant Cell Rep 27: 563-573). (2) The fundamental role of NO in the activation NADPH oxidase and O $_2^{\cdot-}$  anion generation and their role in root development were elucidated for the first time. NO activates NADPH oxidase activity, resulting into higher O $_2^{\cdot-}$  generation that subsequently induced adventitious roots in root explants of mountain ginseng (Plant Cell Rep 27: 563-573 and Plant Biotechnol. Rep. 1: 227-235). (2) NO provides protection against copper toxicity by enhancing antioxidant defence (Plant Cell Rep 27: 171-181). (3) Exogenous application of nitric oxide (NO) retards H $_2$ O $_2$ -induced senescence of *Phalaenopsis* flower by down regulating activity of xanthine oxidase (Plant Cell Rep 28: 267-279). (4) SA accumulates ginsenosides in ginseng roots by elevating NO, O $_2^{\cdot-}$ , and H $_2$ O $_2$  (J. Plant Growth Reg 30: 396–404). (5) Protoplast chloroplasts also exhibited endogenous accumulation of NO and ONOO $^-$  (Plant Cell Rep 32: 31-44). (6) Recently, we discovered the involvement of NADPH oxidase-like activity in H $_2$ O $_2$  generation in the chloroplasts of *Brassica napus* leaf protoplasts (Planta 235: 99–110). This NADPH oxidase-like activity was subsequently identified as stromal ferredoxin NADP $^+$  oxidoreductase (sFNR). The discovery of sFNR exhibiting NADPH oxidase-like

function in chloroplast is a fundamental finding and it has great significance in redox homeostasis in the chloroplasts (Plant Mol. Biol. 86: 627–639).

My doctoral thesis topic was: Role of mineral nutrient elements in the Mulberry (*Morus alba* L) plants with particular reference to oxidative metabolism. Nutrient deficiencies produced typical morphological features such as – general paling of old leaves by N- or P-deficiencies (J Integr Plant Biol 49: 313-322); cessation of growth and death of apical meristem by Ca-deficiency; chlorosis and scorched margins of middle and old leaves by K-deficiency (J Integr Plant Biol 49: 313-322); interveinal chlorosis in young followed by necrosis in old leaves by Mg-deficiency (Sci Hort 108: 7-14); yellowing and development of cup-shaped young leaves by S-deficiency (Environ Exp Bot 68: 301-308); interveinal chlorosis of young leaves by Fe-deficiency (Plant Sci 169: 1037–1045); mild interveinal chlorosis of middle leaves by Mn-deficiency (Acta Physiol Plant 35:3345–3356); chlorosis, necrosis and deformation of young leaves by Zn-deficiency (J Plant Nutr Soil Sci 171: 286-294); and deformation of leaf shape and development of cracks on midrib and major veins and formation of lenticels-like structure on the stem by B-deficiency (Tree Physiol 30: 68-77). The observations of my studies indicate that deficiencies of various essential nutrients increase the concentration of H<sub>2</sub>O<sub>2</sub>, but this did not necessarily increase lipid peroxidation in the leaves. Lipid peroxidation in leaves was found to be associated with the chloroplastic pigment or activities of Fe-enzymes, which is postulated to be an index of functional Fe (Plant Sci 169: 1037–1045; AoB Plants doi:10.1093/aobpla/plq002). Deficiency of Cu was found to specifically accumulate H<sub>2</sub>O<sub>2</sub> in the middle portion of the trichomes of leaves (Planta 223: 1145–1153). Apart from this, deficiencies of certain nutrient element modulate the activity and induced some additional isoforms and suppress some of preexisting ones of superoxide dismutase (Plant Sci 169: 1037-1045; Sci Hort 108: 7–14; Planta 223: 1145-1153).

## PUBLICATIONS

Research papers published in SCI international journals

	Articles	JCR Impact factor	Citation
	<b>RESEARCH PAPERS</b>		
37	Sharma PN, Tripathi A, Kumar N, Gupta S, Kumar P, Chatterjee J, <u>Tewari RK</u> (2016) Iron plays a critical role in stomatal closure in cauliflower. <b>Environmental and Experimental Botany</b> 131: 68-76, <a href="http://dx.doi.org/10.1016/j.envexpbot.2016.07.001">http://dx.doi.org/10.1016/j.envexpbot.2016.07.001</a>	4.369	--
36	<u>Tewari RK</u> , Horemans N, Nauts R, Wannijn J, Van Hees M, Vandenhove H (2015) Uranium exposure induces nitric oxide and hydrogen peroxide generation in <i>Arabidopsis thaliana</i> . <b>Environmental and Experimental Botany</b> 120:55-64, <a href="http://dx.doi.org/doi:10.1016/j.envexpbot.2015.08.004">http://dx.doi.org/doi:10.1016/j.envexpbot.2015.08.004</a>	4.369	02
35	Chatterjee J, Kumar P, Sharma PN, <u>Tewari RK</u> (2015) Chromium toxicity induces oxidative stress in turnip. <b>Indian Journal of Plant Physiology</b> 20:220–226, DOI 10.1007/s40502-015-0163-6	NA	03
34	<u>Tewari RK</u> , Bachmann G, Hadacek F (2015) Iron in complex with the alleged phytosiderophore 8-hydroxyquinoline induces functional iron deficiency and non-autolytic programmed cell death in rapeseed plants. <b>Environmental and Experimental Botany</b> 109: 151–160 <a href="http://dx.doi.org/10.1016/j.envexpbot.2014.07.016">http://dx.doi.org/10.1016/j.envexpbot.2014.07.016</a>	4.369	05
33	Mobin M, Wu C-H, <u>Tewari RK</u> , Paek K-Y (2015) Studies on the glyphosate-	2.002	10

	induced amino acid starvation and addition of precursors on caffeic acid accumulation and profiles in adventitious roots of <i>Echinacea purpurea</i> (L.) Moench. <b>Plant Cell, Tissue and Organ Culture</b> 120: 291–301, DOI 10.1007/s11240-014-0606-1		
32	<u>Tewari RK</u> , Satoh M, Kado S, Mishina K, Enami K, Misato A, Hanaoka M, Watanabe M (2014) Overproduction of stromal ferredoxin:NADPH oxidoreductase in H <sub>2</sub> O <sub>2</sub> -accumulating <i>Brassica napus</i> leaf protoplasts. <b>Plant Molecular Biology</b> 86: 627–639. DOI 10.1007/s11103-014-0252-3	3.356	--
31	<u>Tewari RK</u> , Paek KY (2014) Role of nitric oxide in adventitious roots development. In: KY Paek, HN Murthy, JJ Zhong (eds.) Production of Biomass and Bioactive Compounds Using Bioreactor Technology, Springer Science, pp. 429-443. DOI 10.1007/978-94-017-9223-3_18 Book Chapter	NA	--
30	<u>Tewari RK</u> , Kumar P, Sharma PN (2013) Oxidative stress and antioxidant responses of mulberry ( <i>Morus alba</i> ) plants subjected to deficiency and excess of manganese. <b>Acta Physiologiae Plantarum</b> 35:3345–3356. DOI 10.1007/s11738-013-1367-x	1.364	08
29	<u>Tewari RK</u> , Hadacek F, Sassmann S, Lang I (2013) Iron deprivation-induced reactive oxygen species generation leads to non-autolytic PCD in <i>Brassica napus</i> leaves. <b>Environmental and Experimental Botany</b> 91: 74–83. <a href="http://dx.doi.org/10.1016/j.envexpbot.2013.03.006">http://dx.doi.org/10.1016/j.envexpbot.2013.03.006</a>	4.369	17
28	<u>Tewari RK</u> , Singh PK, Watanabe M (2013) The spatial patterns of oxidative stress indicators co-locate with early signs of natural senescence in maize leaves. <b>Acta Physiologiae Plantarum</b> 35: 949–957. DOI 10.1007/s11738-012-1138-0	1.364	06
27	<u>Tewari RK</u> , Prommer J, Watanabe M (2013) Endogenous nitric oxide generation in protoplast chloroplasts. <b>Plant Cell Reports</b> 32: 31-44. DOI 10.1007/s00299-012-1338-5.	2.869	44
26	<u>Tewari RK</u> , Watanabe D, Watanabe M (2012) Chloroplastic NADPH oxidase-like activity-mediated perpetual hydrogen peroxide generation in the chloroplast induces apoptotic-like death of <i>Brassica napus</i> leaf protoplasts. <b>Planta</b> 235:99–110, DOI 10.1007/s00425-011-1495-8	3.361	22
25	<u>Tewari RK</u> , Paek KY (2011) Salicylic acid-induced nitric oxide and ROS generation stimulate ginsenoside accumulation in <i>Panax ginseng</i> roots. <b>Journal of Plant Growth Regulation</b> 30:396–404, DOI: 10.1007/s00344-011-9202-3	2.073	21
24	Kumar P, <u>Tewari RK</u> , Sharma PN (2010) Sodium nitroprusside-mediated alleviation of iron deficiency effects and modulation of antioxidant enzymes in maize plants. <b>AoB Plants</b> doi:10.1093/aobpla/plq002	2.238	30
23	<u>Tewari RK</u> , Kumar P, Sharma PN (2010) Morphology and oxidative physiology of sulphur-deficient mulberry plants. <b>Environmental and Experimental Botany</b> 68: 301–308, doi:10.1016/j.envexpbot.2010.01.004	4.369	24
22	<u>Tewari RK</u> , Kumar P, Sharma PN (2010) Morphology and oxidative physiology of boron-deficient mulberry plants. <b>Tree Physiology</b> 30: 68–77, DOI:10.1093/treephys/tpp093	3.653	22
21	Jo E-A, <u>Tewari RK</u> , Hahn EJ, Paek KY (2009) In vitro sucrose concentration affects growth and acclimatization of <i>Alocasia amazonica</i> plantlets. <b>Plant Cell Tissue and Organ Culture</b> 96:307–315, DOI: 10.1007/s11240-008-9488-4	2.002	45

20	<u>Tewari RK</u> , Kumar P, Kim S, Hahn EJ, Paek KY (2009) Nitric oxide retards xanthine oxidase-mediated superoxide anion generation in <i>Phalaenopsis</i> flower: an implication of NO in the senescence and oxidative stress regulation. <b>Plant Cell Reports</b> 28:267–279, DOI: 10.1007/s00299-008-0632-8	2.869	32
19	Jo E-A, <u>Tewari RK</u> , Hahn EJ, Paek KY (2008) Effect of photoperiod and light intensity on in vitro propagation of <i>Alocasia amazonica</i> . <b>Plant Biotechnology Reports</b> 2:207–212, DOI: 10.1007/s11816-008-0063-6	1.422	19
18	<u>Tewari RK</u> , Kim S, Hahn EJ, Paek KY (2008) Involvement of nitric oxide-induced NADPH oxidase in adventitious root growth and antioxidant defence in <i>Panax ginseng</i> . <b>Plant Biotechnology Reports</b> 2: 113–122 DOI: 10.1007/s11816-008-0052-9	1.422	46
17	<u>Tewari RK</u> , Kumar P, Sharma PN (2008) Morphology and physiology of zinc-stressed mulberry plants. <b>Journal of Plant Nutrition and Soil Science</b> 171: 286–294, DOI: 10.1002/jpln.200700222	2.102	70
16	<u>Tewari RK</u> , Hahn EJ, Paek KY (2008) Function of nitric oxide and superoxide anion in the adventitious root development and antioxidant defence in <i>Panax ginseng</i> . <b>Plant Cell Reports</b> 27: 563–573 DOI: 10.1007/s00299-007-0448-y	2.869	59
15	Kumar P, <u>Tewari RK</u> , Sharma PN (2008) Cadmium enhances generation of hydrogen peroxide and amplifies activities of catalase, peroxidases and superoxide dismutase in maize. <b>Journal of Agronomy and Crop Science</b> 194:72-80, DOI:10.1111/j.1439-037X.2007.00285.x	2.727	32
14	Kumar P, <u>Tewari RK</u> , Sharma PN (2008) Modulation of copper toxicity induced oxidative damage by excess supply of iron in maize plants. <b>Plant Cell Reports</b> 27: 399–409, DOI: 10.1007/s00299-007-0453-1	2.869	35
13	<u>Tewari RK</u> , Hahn E-J, Paek K-Y (2008) Modulation of copper toxicity-induced oxidative damage by nitric oxide supply in the adventitious roots of <i>Panax ginseng</i> . <b>Plant Cell Reports</b> 27:171–181 DOI: 10.1007/s00299-007-0423-7	2.869	75
12	Wu CH, <u>Tewari RK</u> , Hahn EJ, Paek KY (2007) Nitric oxide elicitation induces accumulation of secondary metabolites and antioxidant defence in the adventitious roots of <i>Echinacea purpurea</i> . <b>Journal of Plant Biology</b> 50: 636-643.	1.437	36
11	Kumar P, <u>Tewari RK</u> , Sharma PN (2007) Excess nickel induced changes in antioxidative processes in maize leaves. <b>Journal of Plant Nutrition and Soil Science</b> 170: 796–802. DOI: 10.1002/jpln.200625126	2.102	21
10	<u>Tewari RK</u> , Lee SY, Hahn E-J, Paek KY (2007) Temporal changes in the growth, saponin content, and antioxidant defense in the adventitious roots of <i>Panax ginseng</i> subjected to nitric oxide elicitation. <b>Plant Biotechnology Reports</b> 1: 227-235. DOI: 10.1007/s11816-007-0036-1	1.422	23
9	Lee S-H, <u>Tewari RK</u> , Hahn EJ, Paek KY (2007) Photon flux density and light quality induce changes in growth, stomatal development, photosynthesis and transpiration of <i>Withania somnifera</i> (L.) Dunal. plantlets. <b>Plant Cell, Tissue and Organ Culture</b> 90: 141–151, DOI: 10.1007/s11240-006-9191-2	2.002	108
8	<u>Tewari RK</u> , Kumar P, Sharma PN (2007) Oxidative stress and antioxidant responses in young leaves of mulberry plants grown under nitrogen, phosphorus or potassium deficiency. <b>Journal of Integrative Plant Biology</b> 49: 313-322. DOI: 10.1111/j.1672-9072.2006.00358.x	3.962	62

7	Tewari RK, Kumar P, Sharma PN (2006) Antioxidant responses to enhanced generation of superoxide anion radical and hydrogen peroxide in the copper-stressed mulberry plants. <b>Planta</b> 223: 1145–1153. <a href="http://dx.doi.org/10.1007/s00425-005-0160-5">http://dx.doi.org/10.1007/s00425-005-0160-5</a>	3.361	113
6	Tewari RK, Kumar P, Sharma PN (2006) Magnesium deficiency induced oxidative stress and antioxidant responses in mulberry plants. <b>Scientia Horticulturae</b> 108: 7–14. DOI:10.1016/j.scienta.2005.12.006.	1.624	119
5	Tewari RK, Kumar P, Neetu, Sharma PN (2005) Signs of oxidative stress in the chlorotic leaves of iron starved plants. <b>Plant Science</b> 169: 1037–1045. DOI:10.1016/j.plantsci.2005.06.006	3.437	67
4	Sharma PN, Kumar P, Tewari RK (2004) Early signs of oxidative stress in wheat plants subjected to zinc deficiency. <b>Journal of Plant Nutrition</b> 27: 449–461. <a href="http://taylorandfrancis.metapress.com/openurl.asp?genre=article&amp;id=doi:10.1081/PLN-120028873">http://taylorandfrancis.metapress.com/openurl.asp?genre=article&amp;id=doi:10.1081/PLN-120028873</a>	0.618	40
3	Tewari RK, Kumar P, Tewari N, Srivastava S, Sharma PN (2004) Macronutrient deficiencies and differential antioxidant responses – influence on the activity and expression of superoxide dismutase in maize. <b>Plant Science</b> 166: 687–694. DOI:10.1016/j.plantsci.2003.11.004.	3.437	120
2	Singh PK, Tewari RK (2003) Cadmium toxicity induced changes in plant water relations and oxidative metabolism of <i>Brassica juncea</i> L. plants. <b>Journal of Environmental Biology</b> 24: 107–112.	0.697	153
1	Tewari RK, Kumar P, Sharma PN, Bisht SS (2002) Modulation of oxidative stress responsive enzymes by excess cobalt. <b>Plant Science</b> 162: 381–388. <a href="http://dx.doi.org/10.1016/S0168-9452(01)00578-7">doi:10.1016/S0168-9452(01)00578-7</a> .	3.437	136
	<b>Cumulative impact and citations</b>	<b>92.812</b>	<b>1625</b>
	<b>Average citation</b> = (Total numbers of citations/numbers of papers published)		<b>43.92</b>
	<b>h index</b> (of the 37 documents considered for the <b>h index</b> , 22 have been cited at least 21 times according to Google scholar)		<b>22</b>
	<b>POPULAR ARTICLE</b>		
37	Tewari RK (1998) Bhari dhatuon dawara paryavaran pradushan karan aur nivanan. Paryavaran Digest 1998, June/July, pp. 14-17. Publisher: Samanavay Prakashan, 110, Dhanmandi, Ratlam, M.P.		

## EDUCATION

University of Lucknow, Lucknow, U.P.

**Ph. D. (Botany)** 2004

Ph.D. Title: **Role of mineral nutrient elements in mulberry (*Morus alba* L.) plants with particular reference to oxidative metabolism.**

Supervisor: **Professor P.N. Sharma, Department of Botany, University of Lucknow, Lucknow-226007.**

Council of Scientific and Industrial Research (CSIR), New Delhi,

**Qualified Joint C.S.I.R.–U.G.C. National Eligibility Test (NET) for Lecturership in Life Sciences,** 1999

University of Lucknow, Lucknow, U.P.

**Master of Philosophy (Botany)**, 1998,

M.Phil.Title: **Studies of certain aspects of cobalt toxicity in mungbean plants with particular reference to oxidative metabolism.**

Supervisor: **Professor S.S. Bisht, Department of Botany, University of Lucknow, Lucknow-226007.**

University of Lucknow, Lucknow, U.P.

**Master of Science (Plant Science)** 1996

University of Allahabad (Ewing Christian College), Allahabad, U.P.

**Bachelor of Science (Botany, Chemistry, Zoology)** 1994,

## **TECHNICAL EXPERTISE**

**Culture Technique:** Proficient in growing plants in sand and solution culture and inducing deficiency of different mineral nutrient elements. Working knowledge of handling and culture of microorganisms (bacteria), and plants and organ under In Vitro culture condition. Experience with handling and work with animal cell (CHO cells) culture and protoplast culture.

**Radioprotection and Biohazard training:** Experience with handling and use of radioactive materials in biological research under a protected laboratory condition. Experience with handling and culture of various *Arabidopsis* mutants under controlled laboratory condition.

**Mineral Nutrient Analysis:** Skilled in estimation of mineral elements, Skilled in operation of Flame Photometer, UV-Visible Spectrophotometer and Atomic Absorption Spectrometer.

**Fractionation Technique:** Skilled with different fractionation techniques. Skilled in the fractionation of various subcellular organelles using differential and density gradient centrifugation by high speed refrigerated centrifuge and ultracentrifuge. Knowledge of various chromatographic techniques including HPLC.

**Protein and Proteomic Experience:** Experience with protein and enzymes analysis. Experience with the Gel Electrophoresis including SDS-PAGE, Native PAGE, Slab and Isoelectric focusing. 2-D PAGE and Western blotting and in gel digestion. Also proficient in densitometric analysis of gel.

**Molecular Biology Technique:** Experience with basic molecular biology techniques like isolation of DNA, cloning, RNA extraction, PCR, and q-real time PCR, Transcriptomics, *E. coli* transformation.

**Enzymes Biochemistry:** Experience with analysis of various enzymes and metabolites by spectrophotometer, in situ and in gel localization of various enzymes.

**Microtomy and Microscopy:** Skilled in preparing thin sections, staining and mounting. Skilled at in situ staining and imaging of reactive oxygen species (ROS:  $O_2^{\cdot-}$  and  $H_2O_2$ ) with light microscope and  $H_2O_2$  and nitric oxide (NO) and peroxynitrite by confocal laser scanning microscope/ fluorescence microscope.

**Photosynthesis and Water Relation:** Basic knowledge of measurement of photosynthesis, transpiration, chlorophyll fluorescence using the portable photosynthesis system and estimation of water status (RWC, SWC, succulence etc) of plants.

**Computer Application:** Proficiency in using: Microsoft Excel, Microsoft Word, Microsoft Power Point, Sigmaplot and Sigmplot, Photoshop in Windows environment.

### **REVIEWING ASSIGNMENTS**

1. Acta Physiologiae Plantarum (Springer Science)
2. Biochemical Systematics and Ecology (Elsevier)
3. Ecotoxicology (Springer Science)
4. Ecotoxicology and Environmental Safety (Elsevier)
5. Environmental and Experimental Botany (Elsevier)
6. Journal of Plant Growth Regulation (Springer Science)
7. Journal of Plant Research (Springer Science)
8. Journal of Plant Physiology (Elsevier)
9. Journal of Plant Biology (Springer Science)
10. New Phytologist (John Wiley & Sons, Inc.)
11. Nitric Oxide (Elsevier)
12. Plant Cell, Tissue and Organ Culture (Springer Science)
13. Plant Physiology and Biochemistry (Elsevier)
14. Protoplasma (Springer Science)
15. Scientia Horticulturae (Elsevier)
16. Scientia Agricola (Brazil)
17. Soil Science and Plant Nutrition (Japan)
18. Plant Biotechnology Journal (Society for Experimental Biology, Association of Applied Biologists and John Wiley & Sons Ltd)

### **MEMBERSHIPS OF ACADEMIC SOCIETIES**

1. Indian Science Congress (2017-till date)
2. Indian Botanical Society (2017-Till date)
3. International Society of Environmental Botanists (2017-till date)
4. Clean and Green Environmental Society (2017-till date)
5. American Society of Plant Biologist (2007)
6. International Society for Horticultural Science (2007)
7. The Japanese Society of Plant Physiologists (2010)

## ACADEMIC REFEREES

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**Dr. P. N. Sharma,**  
Professor (Retd.) of Botany,  
University of Lucknow,  
Lucknow –226 007. India  
Residence: C-98, Sector – J  
Aliganj, Lucknow-226024,  
Tel. (R): + 91– (0)522–2761506  
E-  
Mail:[sharmapn42@gmail.com](mailto:sharmapn42@gmail.com)

**Prof. Dr. Masami Watanabe,**  
Laboratory of Plant Nutrition,  
Faculty of Horticulture, Chiba  
University, 648, Matsudo,  
Chiba, 271-8510, JAPAN  
Tel & Fax: +81-47-308-8820  
E-mail:  
[masamiwata@faculty.chiba-u.jp](mailto:masamiwata@faculty.chiba-u.jp)

**Dr. Franz Hadacek**  
Albrecht-von-Haller Institut,  
Plant Biochemistry,  
Crop Sciences,  
Molecular Phytopathology and  
Mycotoxin Research  
Georg-August-Universität  
Göttingen,  
Justus-von-Liebig-Weg 11,  
37077 Göttingen, Germany.  
Tel. +495513914418  
E-mail:  
[franz.hadacek@biologie.uni-goettingen.de](mailto:franz.hadacek@biologie.uni-goettingen.de)

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